

Guide to Marine Science and Technology Programs

In Higher Education



Marine
Technology
Society



MATE
MARINE
ADVANCED
TECHNOLOGY
EDUCATION
CENTER



CENTERS FOR OCEAN SCIENCES
EDUCATION EXCELLENCE



Guide to Marine Science and Technology Programs

In Higher Education

Compiled by



**Marine
Technology
Society**



MATE

MARINE
ADVANCED
TECHNOLOGY
EDUCATION
CENTER

Co-sponsored by

CoSEE

CENTERS FOR OCEAN SCIENCES
EDUCATION EXCELLENCE

Editor's Note:

The last edition of the *Guide to Marine Science and Technology Programs in Higher Education* was published by the Marine Technology Society (MTS) in 1995 (that publication was titled *Education and Training Programs in Oceanography and Related Fields*). In the process of updating that resource, we joined forces with the Marine Advanced Technology Education (MATE) Center, which hosts the most comprehensive listing of marine programs online at www.OceanCareers.com. Every effort has been made to make this Guide as accurate and comprehensive as possible. However, some inaccuracies and omissions may have occurred and for those we apologize.

We began updating the program listings for this Guide by sending electronic surveys to over 850 programs in the MATE Center educational institution database. The content of the database has been gathered over the past few years by MATE staff and student researchers. Our primary goal is to provide sufficient information in this volume for students, parents, and counselors to begin a productive search of the many options available nationwide in marine science and technology education. So, even with unavoidable errors, we are confident that this Guide, particularly with its many links to online resources and online contact information for almost all programs, will serve as a valuable jumping-off point for making contact with educational programs of interest.

If you do note errors or omissions in this catalogue, we invite you to contact the MATE Center at www.oceancareers.com/comments with the correct information. MATE's OceanCareers.com website is updated on an ongoing basis, and the online version of this MTS Guide will be updated periodically as well.

The Marine Technology Society gratefully acknowledges the assistance of those who provided the information for their respective institutions used to develop this Guide. We are particularly grateful for our collaboration with the MATE Center, and the wise and patient help from MATE's director, Deidre Sullivan; for database assistance from Bruce Ford of Clear Science, Inc.; for editorial support from MTS Communications Manager Susan Branting; and for the capable and persistent efforts of student researcher Heather Duncan to gather accurate information on over 1,000 programs.

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Marine Technology Society
5565 Sterrett Place, Suite 108
Columbia, MD 21044

Foreword

Dear Educators and Students:

The oceans offer fascinating and rewarding career opportunities for those who have an interest in science, technology, and engineering. If you're one of these people, or if you are a counselor or educator directing someone with an interest in the oceans, this *Guide to Marine Science and Technology Programs in Higher Education* is the ideal place to start.

The *Guide* is a collaboration of the Marine Technology Society (MTS) and the Marine Advanced Technical Education (MATE) Center. It is a natural outgrowth of their shared missions to educate the next generation of ocean scientists, engineers, and technologists.

For MTS, this mission is expressed through scholarships, student sections at U.S. colleges and universities, internships, the MTS Club for middle and high school students, and support for organizations like the MATE Center through financial and volunteer efforts.

For the MATE Center, this mission is accomplished in a number of ways, from its remotely operated vehicle (ROV) competitions for students to professional development institutes for faculty, research on the marine workforce, and more.

MTS had been offering the information in this *Guide* in printed form, while the MATE Center supplies it dynamically online at www.OceanCareers.com. It seemed logical to join our efforts to produce a comprehensive version that will allow counselors, students, and others to view it in both hardcopy and online formats.

Funding for this project was provided by the membership of MTS and the National Science Foundation's continuing grants to the MATE Center through the Centers for Ocean Sciences Education Excellence (COSEE) network and the Advanced Technological Education Program.

We know you will find the *Guide* useful and wish you all the best in guiding your students—or in guiding yourself—toward an exciting career in the world of ocean science and technology.

Sincerely,

Bruce C. Gilman, P.E.
President
Marine Technology Society

Deidre Sullivan
Director, Principal Investigator
MATE Center





The Marine Technology Society

is a not-for-profit society dedicated to promoting awareness, understanding, advancement and application of marine technology throughout the world. It provides education resources; information to professionals, the media, and the public; guidance to policy makers; and a home for marine engineers, technologists, academics, and educators to share research and ideas.

Supporting education is an important mission of the society. Through its scholarship program, MTS Club for middle school and high school students, support for university and college chapters, and discounted student membership fees, MTS encourages young people to become the next generation of marine engineers and technologists.

Once students enter the workforce, MTS offers numerous resources to help them advance in their careers, including:

- The *MTS Journal*, a peer-reviewed quarterly publication that is the primary means for researchers to publish articles on marine technology
- Professional Committees, which are interest groups that address specific technologies
- Sections, which meet to encourage networking and information sharing within a geographic location
- MTS/IEEE Oceans Conferences, which, held annually in North America, cover a broad range of ocean technology topics
- Underwater Intervention Conference, which focuses on remotely operated vehicles, diving, underwater imaging, and similar topics
- Dynamic Positioning Conference
- Offshore Technology Conference, which attracts more than 60,000 oil and gas technology workers annually
- Specialty workshops on specific technologies



Students from Memorial University in Newfoundland, Canada, who won the 2007 MATE/MTS ROV Committee International Competition met the chair of the MTS Remotely Operated Vehicle technical interest group at the 2007 Underwater Intervention Conference in New Orleans, Louisiana.

MTS CLUB

FREE for high school and middle school students

Join the **Marine Technology Society's** online club for future marine technologists and engineers.

You'll receive:

- MTS Club Membership Card
- MTS Button and Sticker
- Access to experts at MTS so you can ask about the use of technology to explore, study, and further the responsible and sustainable use of the oceans
- MTS Newsletter six times a year with:
 - Stories about technology and people who work every day to understand the oceans, improve the quality and sustainability of the oceans, and use resources from the oceans
 - Information about careers in marine technology
 - Scholarship opportunities and information on marine technology academic programs in the U.S. and around the world
 - Information about events and student programs around the country



Register online at **www.mtsociety.org/club** or complete this form and mail it to:

Marine Technology Society, 5565 Sterrett Place, Suite 108, Columbia, MD 20144

Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

E-mail: _____

Date of Birth (dd/mm/yyyy): _____ Grade: _____

Name of Your School: _____

Name of Your Guidance Councilor: _____

- ☐ The MTS Club newsletter is sent by e-mail. If you cannot receive the newsletter by e-mail, please check the box to receive it by U.S. mail.

Marine Technology Society



SOAR

REACH

FIND



Join the **Marine Technology Society** to reach the height of your career.

Student membership in the **Marine Technology Society** is the first step you should take toward a career as a marine engineer or technician. Whether you're an undergraduate or graduate student, MTS membership will bring you in contact with professionals in your chosen career, opening doors to jobs, internships, and friendships that can last a lifetime. And as an MTS student member, you will be eligible for members-only scholarships. Complete the application below and send it with payment to: Student Membership, Marine Technology Society
5565 Sterrett Place, Suite 108, Columbia, MD 21044

One-year membership includes the newsletter *Currents* and the online quarterly *MTS Journal*.

Name: _____

E-mail: _____

Street: _____

City: _____

School: _____

School year (circle): Freshman Sophomore Junior Senior

Degree (circle): Associate Bachelor Master Doctorate

MTS Student Membership Fee: \$25

The online version of the *MTS Journal* is free with your membership. Circle one of the following if you also want the print version:

Domestic: \$25 Foreign: \$50

Total Payment: _____

Please make checks payable in U.S. dollars to the Marine Technology Society

Credit Card (circle): Mastercard Diners Club

Visa American Express

Card No: _____

Expiration Date: _____

Signature: _____



Marine Advanced Technology Education (MATE) Center



www.marinetech.org

Monterey Peninsula College

980 Fremont Street, Monterey, CA 93940

831 645-1393

info@marinetech.org

The Marine Advanced Technology Education (MATE) Center was established as an Advanced Technological Education (ATE) Center of Excellence in 1997 with funding from the National Science Foundation. Headquartered at Monterey Peninsula College (MPC) in Monterey, California, the MATE Center is a national partnership of community colleges, high schools, universities, informal educational organizations, research institutions, marine industries, and working professionals. MATE's mission is to improve marine technical education and increase the number of highly-skilled technical professionals who enter ocean-related occupations. Since 2002, the MATE Center has been a part of the Centers for Ocean Sciences Education Excellence (COSEE) network.



A student launches his ROV over a mock-up of the International Space station at NASA Johnson Space Center's Neutral Buoyancy Lab in Houston, Texas.

"The annual ROV competitions have become a most outstanding vehicle to get students involved in technology and to help them understand why science and math are important."

Drew Michel, Chairman
Marine Technology Society
ROV Committee

The MATE Center strengthens the ocean workforce by:

- Conducting research on the ocean economy and sharing information about the ocean workforce through websites, publications, and reports
- Cultivating strong partnerships with academia, industry, government agencies, and professional societies to support marine technical education
- Offering technology-rich professional development for faculty
- Providing at-sea and shore-based technical internships for students
- Creating curricula and textbooks on marine technology, including submersible technology, marine GIS, and ocean careers
- Coordinating an annual international remotely operated vehicle (ROV) competition, as well as a network of regional ROV competitions, in partnership with the Marine Technology Society
- Promoting ocean career awareness through www.OceanCareers.com (one of the MATE Center's contributions to the COSEE network)

Please visit the MATE website at www.marinetech.org for details on these activities and more.



Centers for Ocean Sciences Education Excellence

www.cosee.net

The Centers for Ocean Sciences Education Excellence (COSEE) Network encompasses 11 thematic and regional Centers located around the United States. COSEE is dedicated to facilitating working relationships between scientists and educators to advance ocean literacy and make known the vital role the ocean plays in our lives.

The network, which is funded by the National Science Foundation (NSF), is focused on building pathways for scientists and educators—including both K-12 and a wide variety of informal educators—to work collaboratively with ocean scientists to enhance ocean literacy for a broad range of audiences including students, teachers, parents, policymakers, and others. We are especially interested in...

- Increasing public understanding of the ocean and its relevance to our social and economic well-being and the quality of our lives
- Increasing and diversifying the ocean workforce
- Increasing access to, and participation in, ocean sciences and ocean sciences education by underrepresented and underserved populations
- Improving the quality of K-12 ocean sciences teaching

To date, COSEE Centers have engaged more than 3700 teachers, almost 4000 ocean scientists, and 1400 informal educators in a broad range of programs and activities to meet these objectives. We are proud of our efforts to:

- Get scientists involved in education programs
- Develop a national framework for Ocean Literacy with our partners including the National Geographic Society (NGS), National Marine Education Association (NMEA), and many others!
- Deliver presentations, lectures, seminars, and workshops to increase awareness of our oceans
- Conduct high quality professional development and pre-service training for teachers that draw on scientists' expertise
- Develop educator-scientist mentoring programs

JOIN US!

- Visit the COSEE Network website at www.cosee.net to contact individual centers and get involved in COSEE
- Learn more about Ocean Literacy, at <http://www.coexploration.org/oceanliteracy/>



“The COSEE Network promotes a better understanding of the key role the ocean plays in global environmental cycles and processes. COSEE activities highlight the contributions ocean science researchers make to scientific knowledge in these important areas. NSF is encouraging the ocean science research community to become more involved in education at all levels.”

*– Larry Clark, acting director of NSF's
Division of Ocean Sciences, NSF, 2006*

Students determine marine mudsnails' feeding preferences as part of a new inquiry-based curriculum developed by ocean scientists and teachers working with COSEE-New England.

Table of Contents

Foreword	iii
----------------	-----

Colleges, Universities, and other Marine Science and Technology Education Institutions

Search for institutions by Location, beginning on page 167, and Discipline, beginning on page 171.

Alabama State University, Montgomery, AL.....	3
Alaska Vocational Technical Center, Seward, AK.....	3
Alexandria Technical College, Alexandria, MN	3
Amherst College, Amherst, MA	3
Auburn University, Auburn, AL.....	4
Auburn University at Montgomery, Montgomery, AL.....	4
Barry University, Miami Shores, FL	4
Bellingham Technical College, Bellingham, WA	4
Bloomsburg University of Pennsylvania, Bloomsburg, PA....	5
Boston University, Boston, MA	5
Bowdoin College, Brunswick, ME	5
Bowling Green State University, Bowling Green, OH	6
Brevard Community College, Cocoa, FL.....	6
Bristol Community College, Fall River, MA	7
Brookdale Community College, Lincroft, NJ	7
Brown University, Providence, RI	7
California Maritime Academy, Vallejo, CA.....	8
California State Polytechnic University, Pomona, CA	8
California State Polytechnic University, San Luis Obispo, San Luis Obispo, CA	8
California State University - California Maritime Academy, Vallejo, CA	9
California State University, East Bay, Hayward, CA	10
California State University, Fullerton, Fullerton, CA	10
California State University, Hayward, Hayward, CA.....	11
California State University, Long Beach, Long Beach, CA	11
California State University, Monterey Bay, Seaside, CA.....	11
California State University, Northridge, Northridge, CA... 11	
California State University, San José, San José, CA	11
California State University, Stanislaus, Stanislaus, CA	12
California State University, Stanislaus, Turlock, CA.....	12
California University of Pennsylvania, California, PA	12
Cape Fear Community College, Wilmington, NC.....	12
Carteret Community College, Morehead City, NC.....	13
Chapman School of Seamanship, Stuart, FL	13
Clatsop Community College, Astoria, OR	13
Coastal Carolina University, Conway, SC.....	14
Coastal School of Deep Sea Diving, Oakland, CA	14
College of Charleston, Charleston, SC	14
College of The Albemarle, Manteo, NC.....	14

College of the Atlantic, Bar Harbor, ME	15
College of the Redwoods, Mendocino Campus, Fort Bragg, CA	15
College of William & Mary, Williamsburg, VA.....	15
Columbia University, New York, NY	15
Columbia University – Lamont-Doherty Earth Observatory, Palisades, NY.....	16
Community College of Rhode Island, Warwick, RI	16
Cornell University, Ithaca, NY.....	16
Cuesta Community College, San Luis Obispo, CA	17
Cumberland County College, Vineland, NJ	17
Dalhousie University, Halifax, Nova Scotia, Canada	17
Dauphin Island Sea Lab, Dauphin Island, AL.....	18
DiveSafe International, Campbell River, Canada	19
Drexel University, Philadelphia, PA	19
Duke University Nicholas School Marine Laboratory, Beaufort, NC.....	19
Duke University Nicholas School of the Environment and Earth Sciences, Durham, NC	21
East Carolina University, Greenville, NC	22
Eckerd College, St. Petersburg, FL	23
Everett Community College, Everett, WA	23
Fairleigh Dickinson University, Teaneck, NJ	23
Five Colleges, Inc., Amherst, MA	24
Florida Atlantic University, Boca Raton, FL.....	24
Florida Atlantic University, Dania Beach, FL	25
Florida Atlantic University, Davie, FL	25
Florida Institute of Technology, Melbourne, FL.....	25
Florida Keys Community College, Key West, FL.....	26
Florida State University, Tallahassee, FL	26
Friday Harbor Laboratories, Univ. of Washington/Cornell University, Ithaca, NY	26
Furman University, Greenville, SC	27
Grays Harbor College, Aberdeen, WA	27
Great Lakes Maritime Academy/Northwestern Michigan College, Traverse City, MI	28
Gulf Coast Research Laboratory – University of Southern Mississippi, Ocean Springs, MS	28
Hampshire College, Amherst, MA	28
Hampton University, Hampton, VA.....	28
Harbor Branch Oceanographic Institution, Fort Pierce, FL	29
Harvard University, Cambridge, MA	29
Hawaii Pacific University, Honolulu, HI	30
Hillsborough Community College, Tampa, FL	30
Hocking College, Nelsonville, OH.....	30

Table of Contents

Hofstra University, Hempstead, NY	31	North Carolina State University, Raleigh, NC.....	51
Honolulu Community College, Honolulu, HI	31	Northeast Maritime Institute, Fairhaven, MA	52
Humboldt State University, Arcata, CA.....	31	Northeastern State University, Tahlequah, OK	52
Humboldt State University Marine Lab, Trinidad, CA.....	32	Northeastern University, Boston, MA.....	52
Ithaca College, Ithaca, NY.....	33	Northeastern University Three Seas Program, Nahant, MA	52
Jackson State University, Jackson, MS	33	Northwest Missouri State University, Kirksville, MO.....	53
Jacksonville State University, Jacksonville AL.....	34	Nova Southeastern University, City of Dania Beach, FL ...	53
Johns Hopkins University, Baltimore, MD	34	Oberlin College, Oberlin, OH	55
Kingsborough Community College of the City University of New York, Brooklyn, NY	34	Occidental College, Los Angeles, CA.....	55
Kutztown University of Pennsylvania, Kutztown, PA.....	35	Old Dominion University, Norfolk, VA.....	56
Lake Superior State University, Sault Ste. Marie, MI	35	Orange Coast College, Costa Mesa, CA	57
Lincoln Memorial University, Harrogate, TN.....	35	Oregon Coast Community College, Newport, OR.....	57
Lock Haven University of Pennsylvania, Lock Haven, PA.....	35	Oregon Health and Science University - Coastal Margin Observation & Prediction Program, Beaverton, OR	57
Loeb-Sullivan School of International Business & Logistics, Castine, ME	35	Oregon State University, Corvallis, OR.....	58
Long Beach City College, Long Beach, CA	36	Oregon State University - College of Oceanic and Atmospheric Science, Corvallis, OR	60
Long Island University, Southampton, NY	36	Palm Beach Atlantic College, West Palm Beach, FL.....	64
Louisiana State University, Baton Rouge, LA.....	36	Peninsula College, Port Angeles, WA	65
Louisiana Tech University, Ruston, LA.....	37	Pennsylvania State University, University Park, PA.....	65
Louisiana Technical College, Morgan City, LA.....	38	Perry Institute for Marine Science, Jupiter, FL	66
Louisiana Universities, Chauvin, LA	38	Prince William Sound Community College, Valdez, AK	66
Maine Maritime Academy, Castine, ME	39	Princeton University, Princeton, NJ.....	66
Marine Mechanics Institute of the Universal Technical Institute, Orlando, FL.....	42	Quality Maritime Training, LLC, St. Petersburg, FL	66
Marine Science Consortium, Inc., Wallops Island, VA.....	42	Rider University, Lawrenceville, NJ	67
Maritime Institute, Inc, San Diego, CA.....	42	Ripon College, Ripon, WI	67
Maritime Institute of Technology and Graduate Studies, Linthicum, MD.....	43	Roger Williams University, Bristol, RI	67
Massachusetts Institute of Technology, Cambridge, MA ...	43	Rowan College of New Jersey, Glassboro, NJ	67
Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, Cambridge, MA	43	Rust College, Holly Springs, MS.....	68
Medical University of South Carolina, Charleston, SC.....	44	Rutgers University, New Brunswick, NJ	68
Memorial University of Newfoundland, St. John's, Newfoundland, Canada	44	Saddleback Community College, Mission Viejo, CA.....	69
Millersville University of Pennsylvania, Millersville, PA	47	Saint Peters College, Jersey City, NJ.....	70
Mississippi State University, Mississippi State, MS	48	Salem State College, Salem, MA	70
Monmouth College, West Long Branch, NJ	48	Salisbury University, Salisbury, MD.....	71
Monterey Peninsula College, Monterey, CA	48	Samford University, Birmingham, AL	71
Moss Landing Marine Laboratories, Moss Landing, CA ...	49	San Diego State University, San Diego, CA	71
Mount Holyoke College, South Hadley, MA	49	San Francisco State University, San Francisco, CA.....	72
National Polytechnic College of Engineering and Oceaneering, Wilmington, CA	49	San José State University, San José, CA.....	73
Naval Postgraduate School, Monterey, CA	50	Santa Barbara City College, Santa Barbara, CA.....	73
New England Institute of Technology, Warwick, RI.....	51	Savannah State University, Savannah, GA	73
New Jersey Institute of Technology, Newark, NJ	51	Scripps Institution of Oceanography, La Jolla, CA.....	73
New Jersey Marine Sciences Consortium, Fort Hancock, NJ	51	Sea Education Association, Woods Hole, MA.....	73
		Seamen's Training Center, Sausalito, CA	74
		Seattle Central Community College, Seattle, WA	74
		Shippensburg University of Pennsylvania, Shippensburg, PA.....	74
		Shoals Marine Laboratory, Appledore Island, ME.....	75

Skagit Valley College, Whidbey Island Campus, Oak Harbor, WA	76	University of Maryland, College Park and Cambridge, MD.....	118
Slippery Rock University of Pennsylvania, Slippery Rock, PA.....	76	University of Massachusetts, Amherst, MA.....	120
Smith College, Northampton, MA.....	76	University of Massachusetts Boston, Boston, MA	120
South Dakota State University, Brookings, SD.....	77	University of Massachusetts School of Marine Sciences, Amherst, Boston, Dartmouth and Lowell, MA	121
Southern Maine Community College, South Portland, ME..	77	University of Memphis, Memphis, TN	124
Southwest Texas State University, San Marcos, TX.....	78	University of Miami Rosenstiel School of Marine and Atmospheric Science, Miami, FL	124
Stanford University, Stanford, CA	78	University of Michigan, Ann Arbor, MI.....	128
State University of New York - Maritime College, Bronx, NY	78	University of Minnesota, St. Paul, MN	131
State University of New York - Morrisville, Morrisville, NY..	79	University of Mississippi, University, MS	132
Stevens Institute of Technology, Hoboken, NJ	79	University of Mobile, Mobile, AL.....	132
Stony Brook University, Stony Brook, NY	80	University of New Hampshire, Durham, NH	133
Tennessee Technological University, Cookeville, TN	82	University of New Orleans, New Orleans, LA.....	134
Texas A&M University, College Station, TX.....	83	University of North Alabama, Florence, AL	135
Texas A&M University at Galveston, Galveston, TX.....	84	University of North Carolina at Chapel Hill, Chapel Hill, NC	136
The Center for Coastal Margin Observation & Prediction, Beaverton, OR	86	University of North Carolina at Wilmington, Wilmington, NC	136
Troy University, Troy, AL	86	University of North Dakota, Grand Forks, ND	138
Tuskegee University, Tuskegee, AL	87	University of Oregon, Eugene, OR	139
Union University, Jackson, TN.....	87	University of Oregon – Oregon Institute of Marine Biology, Charleston, OR.....	140
United States Merchant Marine Academy, Kings Point, NY	87	University of Rhode Island, Narragansett, RI	141
United States Naval Academy, Annapolis, MD	90	University of Rhode Island – College of the Environment and Life Sciences, Kingston, RI	145
University of Alabama, Tuscaloosa, AL	91	University of San Diego, San Diego, CA	147
University of Alabama at Birmingham, Birmingham, AL	92	University of South Alabama, Mobile, AL.....	148
University of Alabama at Huntsville, Huntsville, AL.....	92	University of South Carolina, Columbia, SC.....	148
University of Alaska, Anchorage, Anchorage, AK	92	University of South Florida, St. Petersburg, FL.....	149
University of Alaska, Fairbanks, Fairbanks, AK.....	92	University of Southern California, Los Angeles, CA	151
University of Alaska, Southeast, Juneau, AK.....	94	University of Southern California, Wrigley Institute, Los Angeles, CA	151
University of Arkansas at Little Rock, Little Rock, AR.....	95	University of Southern Mississippi, Stennis Space Center, MS.....	151
University of California, Berkeley, Berkeley, CA	95	University of Tampa, Tampa, FL.....	154
University of California, Davis, Davis, CA.....	96	University of Tennessee at Martin, Martin, TN	154
University of California, Irvine, Irvine, CA.....	98	University of Texas, Austin, Port Aransas, TX.....	154
University of California, Los Angeles, Los Angeles, CA	98	University of the District of Columbia, Washington, DC ...	155
University of California, San Diego, La Jolla, CA	99	University of Washington, Seattle, WA	155
University of California, San Diego – Scripps Institution of Oceanography, La Jolla, CA	99	University of West Alabama, Livingston, AL	158
University of California, Santa Barbara, Santa Barbara, CA	102	University of Wisconsin, Milwaukee, WI.....	158
University of California, Santa Cruz, Santa Cruz, CA	104	University of Wisconsin - Madison, Madison, WI	158
University of Connecticut, Groton, CT	106	University of Wisconsin - Stevens Point, Stevens Point, WI.....	159
University of Delaware, Lewes, DE	108	University of Wisconsin - Superior, Superior, WI	159
University of Georgia, Athens, GA.....	110	Virginia Institute of Marine Sciences, Gloucester Point, VA.....	160
University of Hawaii at Hilo, Hilo, HI	112		
University of Hawaii at Manoa, Honolulu, HI.....	113		
University of Maine, Orono, ME.....	116		

Table of Contents

Wesleyan University, Middletown, CT 160

West Virginia University, Morgantown, WV 160

Western Washington University, Bellingham, WA 160

Wilkes University, Wilkes-Barre, PA 162

Williams College and Mystic Seaport, Mystic, CT 162

Wisconsin Indianhead Technical College, Ashland, WI.. 163

Wittenberg University, Springfield, OH 163

Woods Hole Oceanographic Institution, Woods Hole, MA.. 163

Appendices

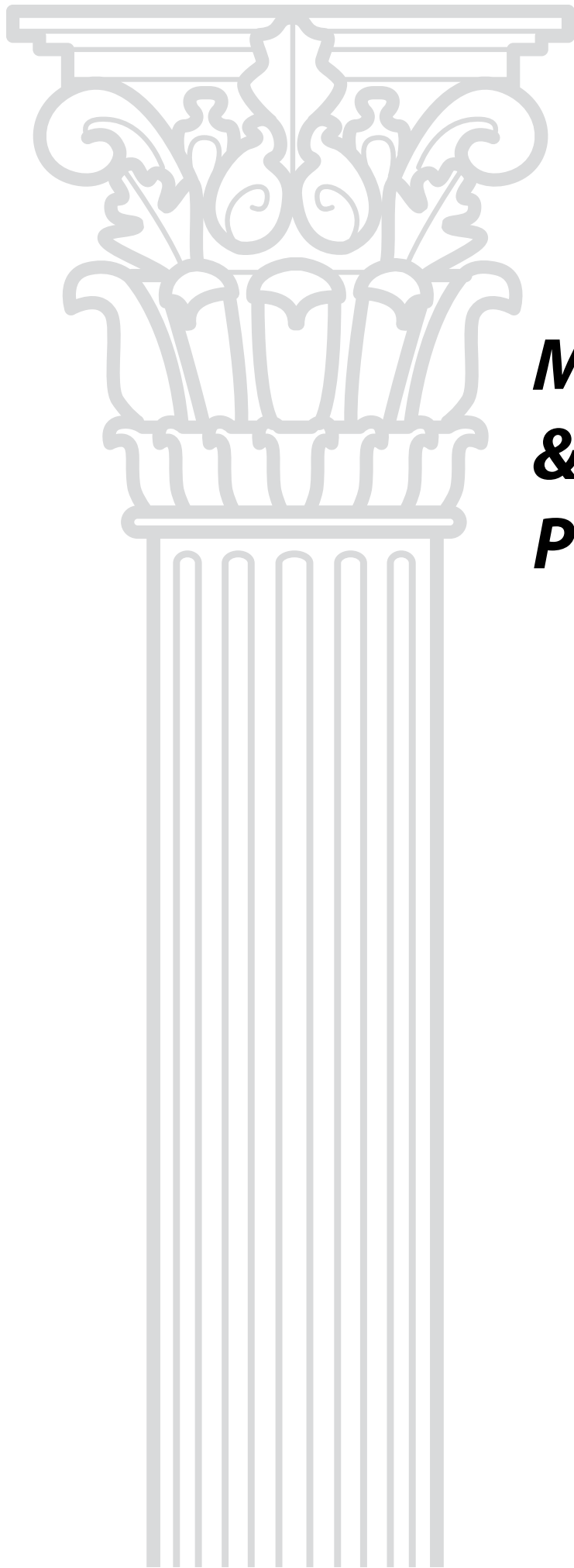
A. Geographic Index of Programs 167

B. Subject Index of Marine Science and Technology
Programs 171

C. Marine Science and Technology Internship
Programs 182

D. Marine Science- and Technology-Related
Professional Societies and Trade Associations 183

E. Scholarship Resources 189



***Marine Science
& Technology
Programs***



.....

Alabama State University
Montgomery, AL
See Dauphin Island Sea Lab

.....

Alaska Vocational Technical Center
Seward, AK

U.S. Coast Guard-Approved/STCW Compliant Maritime Training

Able Seamen, Automatic Radar Plotting Aids (ARPA), Bridge Resource Management (BRM), 5 Days Global Maritime Distress & Safety System (GMDSS), Master/Mate Limited, Proficiency in Survival Craft, Radar Observer (Unlimited), Ratings Forming Part of a Navigational Watch (RFPNW), Tankship Dangerous Liquids, Basic Safety Training, First Aid/CPR, Personal Safety and Social Responsibilities, Basic Fire Fighting, Personal Survival Techniques, Seafood Processor Orientation and Safety Course, Ship-board Emergency Medicine.

Contact: Chris Lopez, chris.lopez@avtec.edu

Admissions: 800-478-5389

Alaska Marine Safety Education Association (AMSEA) Instructor Course

To apply for this training, contact Jerry Dzugan, P.O. Box 2592, Sitka, AK 99835. Phone: 907-747-3287. This program prepares participants to be marine safety instructors.

Degree granted: Certificate - Bachelors degree not required

Program Website: http://www.avtec.alaska.edu/MF.htm#U.S._Coast_Guard

Contact: Curt O'Halloran, curtis.ohalloran@avtec.edu
Alaska Vocational Technical Center
Box 889
Seward, AK 99664

.....

Alexandria Technical College
Alexandria, MN

Marine and Small Engine Mechanic

Alexandria Technical College's Marine and Small Engine Mechanics program combines classroom theory with hands-on work experience, producing well-rounded graduates able to work on a variety of engines and equipment. Two hours of each day are spent in the classroom, learning engine and drive component theory as well as proper safety procedures. Additional training in business management, math, and communications enhances students' job versatility. Hands-on coursework provides the needed mechanical skills, and students spend the majority of the school day in the shop, learning to use special measuring and diagnostic tools and engine repair procedures. The two-year program also includes an internship at a dealership in the first year, introducing students to the working environment of a service dealer. Manufacturer support is a key element to ensure current training methods and equipment. The program has developed strong industry partnerships with Larson, Glastron, Briggs and Stratton, Yamaha, Arctic Cat, Stihl, Toro, and Polaris.

Students finish their course work in May of the second year, making them available for employment at a peak time in the marine and leisure craft industry. Graduates find employment in lawn and garden repair shops, marinas, implement, motorcycle, and recreational vehicle dealerships.

Degree granted: A.A.S./Diploma

Program Website: <http://www.alextech.edu>

Bombardier Recreational Products (BRP), Mercury, Stihl, EETC (Equipment & Engine Training Council)

Degree granted: Certificate-Bachelor's degree required
Program Website: <http://alextech.org/marinesmallengine/>

Contact: admissionsrep@alextech.edu

Alexandria Technical College
1601 Jefferson St.
Alexandria, MN 56308

.....

Amherst College
Amherst, MA
See Five Colleges, Inc.

Find useful information on Internships, Scholarships, and Professional Societies in the appendices at the back of this Guide.

Auburn University

Auburn, AL

See also Dauphin Island Sea Lab

Fisheries and Aquaculture

Degree granted: B.S.

Program Website: <http://www.ag.auburn.edu/fish/>

Contact: David Rouse, rousedb@auburn.edu

Biological Sciences Department

Marine Biology

Degree granted: B.S.

Program Website: http://www.auburn.edu/academic/science_math/biology/dbs/grad_info.htm

Contact: cosamwww@auburn.edu

Auburn University

101 Rouse Life Science Building

Auburn, AL 36849-5407

Phone: 334-844-4830

Auburn University at Montgomery

Montgomery, AL

Aquatic Resource Management

Degree granted: B.S.

Program Website: <http://www.ag.auburn.edu/fish/>

Contact: fish@auburn.edu

Barry University

Miami Shores, FL

Department of Natural and Health Sciences

Marine Biology

Degree granted: B.S.

Program Website: <http://www.barry.edu/marineBiology/>

Contact: admissions@mail.barry.edu

Phone: 800-756-6000

Ecological Studies

Degree granted: B.S.

Program Website: <http://www.barry.edu/ecologica-Studies/>

Contact: admissions@mail.barry.edu

Phone: 800-756-6000, ext. 3100

Department of Arts and Sciences

Environmental Science

This degree program is designed for the growing numbers of students who want to pursue careers in environmentally-related areas. Recognizing the sacredness of Earth and the fragility of its ecosystems, we commit ourselves to the healing of our planet by fostering right relationships and by confronting the destruction of life systems. We commit ourselves to engage in education to understand the interdependence of all life systems of our planet.

Degree granted: B.S.

Program Website: <http://www.barry.edu/sociologycriminology/environmental/default.htm>

Contact: Karen Callaghan, kcallaghan@mail.barry.edu

Phone: 800-756-6000, ext. 3474

Department of Human Performance & Leisure Sciences

Sport Management-Diving Industry Program

Degree granted: B.S.

Program Website: <http://www.barry.edu/diving/>

Sport Management-Diving Industry Program

Degree granted: Minor

Program Website: <http://www.barry.edu/diving/divingEducationMinor.htm>

Contact: admissions@mail.barry.edu

Phone: 800-756-6000, ext. 3100

Barry University

11300 NE 2nd Avenue

Miami Shores, FL 33161-6695

Bellingham Technical College

Bellingham, WA

Fisheries Technology

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.btc.ctc.edu/Courses/Programs/FisheriesTech/ProgOverview/DegreesCertificates.asp>

Fisheries Technology

The Fisheries Technology program prepares students for employment in a variety of fisheries occupations with emphasis on fish culture and aquaculture. The program offers an Associate in Applied Science degree or a certificate in Fisheries Resources. The Fisheries Technology program operates the Whatcom Creek Hatchery at the Maritime Heritage Center in Bellingham. The hatchery provides an actual work site for the instructional "labora-

tory."This complements the classroom theory and related instruction components. The Fisheries Technology program operates in partnership with several regional and statewide industries and agencies.

Degree granted: A.A.S.

Program Website: <http://www.btc.ctc.edu/Courses/Programs/FisheriesTech/ProgramMain.asp>

Contact: beltcadm@btc.ctc.edu
Bellingham Technical College
3028 Lindbergh Avenue
Bellingham, WA 98225
Phone: 360-752-7000

Bloomsburg University of Pennsylvania

Bloomsburg, PA

Biology with a Marine Biology emphasis

Degree granted: B.S.

Program Website: <http://www.bloomu.edu/prospective/programs/biology.php>

Contact: George Chamuris, gchamuri@bloomu.edu
Bloomsburg University of Pennsylvania
104 Warren Student Services Center
Bloomsburg, PA 17815-1301
Phone: 570-389-4316

Boston University

Boston, MA

Marine Program

The Boston University Marine Program is a hands-on, research-oriented curriculum in marine biology, with emphasis on marine ecology, molecular ecology, behavioral ecology, sensory biology, ichthyology, and oceanography. BUMP occupies a unique position as a section within Boston University's Biology Department, while offering some courses at the Marine Biological Laboratory (MBL) in Woods Hole, MA. With over 40 full-time faculty, BU's Biology Department offers broad expertise in research and education by leaders in all major areas of biology. The MBL is internationally known as a center for biological research. BUMP's graduate program offers both a two-year Research Master's degree and a Ph.D. degree in Biology. Undergraduates spend a semester taking intensive marine biology courses. In addition to undergraduate marine biology concentrators at BU, participants in the Program have come from other colleges and universities around the world. Contact individual faculty

members for information about postdoctoral training, research assistantships, and undergraduate research opportunities. Each year, courses and seminars are offered by BUMP resident and visiting faculty in a variety of subjects.

Degree granted: M.A., Ph.D.

Program Website: <http://www.bu.edu/bump/grad.html>

Biology with Specialization in Marine Science

Biology concentrators with a specialization in marine science spend a semester in Woods Hole, MA, taking intensive marine biology courses, typically their junior or senior year. The courses offered can be used to partially or completely fulfill all of the concentration requirements for Biology. The program is also open to students who attend colleges and universities that are far from a marine environment or do not have an affiliation with a marine studies program; contact the BUMP office for details on participation.

Degree granted: B.S.

Program Website: <http://www.bu.edu/bump/undergrad.html>

Contact: Sheri Hall, slhall@bu.edu
Boston University Marine Program
5 Cummington Street
Boston, MA 02215
Phone: 617-353-2432

Bowdoin College

Brunswick, ME

Coastal Studies Program

Bowdoin College's Coastal Studies Center (CSC) offers facilities and resources that support student and faculty research, and courses focused on coastal settings and issues. The scope of studies supported by the CSC is inter- and multi-disciplinary including humanities; arts;



Bowdoin College Coastal Studies Center summer research. Photo by Anne Henshaw.

social, natural and behavioral sciences; and mathematics. All viewpoints, separately and in combination, provide insight and understanding of the multiple facets of coastal studies. The Center is surrounded on three sides by the ocean and encompasses open fields, orchards, and old-growth spruce-fir forest. An active program of summer research brings together students and faculty from varied disciplines to study and share work related to Bowdoin's coastal environment. Other programs include a multidisciplinary scholar-in-residence, a marine biologist visiting scholar program, Coastal Studies Symposium Fund, and a Coastal Science Institute for Middle School teachers. Bowdoin's Coastal Studies Center is associated with: Darling Marine Center, Bigelow Laboratory for Ocean Sciences, Kent Island Research Institute, State of Maine Coastal Program, and the Island Institute.

Degree granted: B.A.

Facilities: The Center's facilities include a marine biological laboratory with flowing seawater for laboratory observation of live marine organisms, a terrestrial ecology laboratory, which serves as a field station for research and study of coastal ecology, a newly constructed pier which will greatly increase the opportunities Bowdoin students have to engage in marine science by expanding our areas of inquiry beyond the bounds of the property to the surrounding waters of Casco Bay and the Gulf of Maine, and a farmhouse which provides meeting space for classes and small symposiums.

Faculty: Faculty from across the academic disciplines supervise student research at the Coastal Studies Center. The CSC also invites visiting scholars to Bowdoin for a semester or academic year. Programming at the CSC is overseen by the Coastal Studies Center Advisory Committee, comprising Bowdoin faculty representing multiple disciplines.

Program Website: <http://academic.bowdoin.edu/csc/index.shtml>

Contact: Anne Henshaw, ahenshaw@bowdoin.edu
Bowdoin College Coastal Studies Center
6700 College Station
Brunswick, ME 04011
Phone: 207-725-3397

Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
for up-to-date education and scholarship information,
as well as a downloadable version of this Guide.

Bowling Green State University

Bowling Green, OH

Marine Program

Biology with Focus in Aquatic and Marine Science

Students interested in aquatic and marine science are encouraged to enroll in marine and freshwater biology courses at Bowling Green State University. The program, unmatched at Ohio universities, offers courses in aquatic and marine science and provides the opportunity to earn an undergraduate degree in biology with an emphasis in marine and freshwater science. In addition, a strong graduate program exposes undergraduates to the latest techniques and research opportunities.

Degree granted: B.S.

Facilities: The department maintains a 3,000-gallon inland marine laboratory with the eight major animal phyla represented in more than 66 genera of marine life including the horseshoe crab, sea anemones, stingray, skates, sea horse, starfish and lobsters. The lab has been in existence since 1963, when it had five 10-gallon tanks to house animals brought back by students from a spring trip. The lab now has more than 50 tanks including a wave tank, cold water tanks, a salt marsh environmental tank, and the recent construction of a touch tank. The animals in the lab are cared for by students, primarily for class study and research projects, but are also on view for visitors and other students. Marine biology students are encouraged to maintain a tank in the marine laboratory on a volunteer basis.

Program Website: <http://go2.bgsu.edu/choose/academics/majors/?guide=MARB>

Contact: contactcas@bgnet.bgsu.edu
Bowling Green State University
Bowling Green, OH 43403-0208
Phone: 419-372-6873

Brevard Community College

Cocoa, FL

Engineering Technology

The Engineering Technology A.A.S. includes a Composites Fundamentals course and a Non-destructive and Destructive Testing course that will fit into a Marine Technology option within the degree. The option is currently being worked on, and should be developed over the next year. Introduction to Electronics and Applied Mechanics will also be prime courses within a Marine Tech option under this degree.

Degree granted: A.A.S.

Facilities: We have both an Applied Mechanics lab and an Electronics lab that are used to build, maintain or repair submersibles used in Aqua-Bot summer programs for middle school students, as well as other projects required in the Engineering program. A boat mold will be used for the Composites course to learn the techniques of composite work.

2007 tuition: In-state residents: \$1,626; Out-of-State: \$5,928

Program Website: http://www.brevard.cc.fl.us/index.php?mainframe=/degree_programs/content/&subnavframe=/degree_programs/content/sub_nav.cfm

Contact: Sheryl Awtonomow,
AwtonomowS@brevardcc.edu
Brevard Community College
1519 Clearlake Road
Cocoa, FL 32922

Bristol Community College

Fall River, MA

Engineering, Technology & Environment Department

Environmental Technology

Students consider issues of safe land use, water resources, and hazardous waste management. They prepare for entry-level positions in the rapidly expanding enviro-tech industry with an in-depth review of the regulatory process.

Degree granted: A.A.

Facilities: Newly renovated environmental laboratory

Faculty: Robert Rak - Marine Biology and Waste Water Management

Marine Technology

Designed to provide the skills required for careers in the marine trades (boating) and marine fisheries industries. The program has two options: Marine Trades - Focuses on the boating industry and will concentrate on electrical, instrumentation, propulsion, and other marine systems. Marine Fisheries - Focuses on fisheries resources and fisheries technology.

Degree granted: A.A.

Program Website: http://srvweb.bristol.mass.edu/serena/catalog/indexes/ete_index.cfm

Contact: Meghan Abella-Bowen,
mabowen@bristol.mass.edu
Bristol Community College
777 Elsbree Street
Fall River, MA 02720
Phone: 508-678-2811 ext. 2576

Brookdale Community College

Lincroft, NJ

Environmental and Earth Sciences

Degree granted: A.S.

Contact: Dr. Cari Gigliotti,
cgigliotti@brookdalecc.edu
Brookdale Community College
765 Newman Springs Road
Lincroft, NJ 07738-1543

Brown University

Providence, RI

Geological Sciences

Our four concentration programs (Geological Sciences, Geology-Biology, Geology-Chemistry and Geology/Physics/Math) stress critical thinking and development of the analytical and communication skills that are so important for personal and career development. Research opportunities encompass a broad spectrum of basic and applied investigations, linked with environmental sciences, engineering, materials science, archaeology, space science, astronomy, economics, international relations, or meteorology. The geosciences faculty conduct internationally recognized research at the forefront of their fields. Students participate actively in this research through independent research projects or employment involving field work, laboratory experiments, or theoretical computer modeling. Students get meaningful hands-on experience as well as a chance to assess various career options. It is common for student research to be published.

Degrees granted: B.A. and M.S.

Facilities: Analytical facilities of the Earth System History include top-notch facilities for mass spectrometry, organic and inorganic geochemistry, and sedimentology. Oceanographic Field Equipment includes 18 ft research boat, 6 Seabird CTDs (one with SeaTech fluorometer), 2 Interocean S4 Current meters, Hydrolab Profiler system, Turner Fluorometer, Particle Data grainsize analyzer, GPS and GIS systems; Limnologic field equipment for water sampling, plankton sampling, water column monitoring, and gravity and piston coring.

Faculty: Professors Warren Prell, Tim Herbert, Jessica Whiteside, James Russell, Yongsong Huang, Jack Mustard, Meredith Hastings

Program Website: <http://www.geo.brown.edu>
Contact: geological_Sciences@brown.edu
Brown University
324 Brook Street, Box 1846
Providence, RI
Phone: 401-863-2449

California Maritime Academy

Vallejo, CA

See California State University - California Maritime Academy

California State Polytechnic University

Pomona, CA

See also University of Southern California-Wrigley Institute

Engineering: Minor in Ocean Engineering

Ocean engineering at Cal Poly provides the student with an overview of the ocean engineering field, and prepares the student for employment or graduate work leading to an advanced degree. The program emphasizes practical engineering by offering, in addition to classroom instruction, directed research under faculty supervision and at-sea operations utilizing the R/V Yellowfin, R/V Seawatch and the school's trailerable boats. Cal Poly prides itself on its "hands-on" approach to teaching. Mentoring is available from the faculty and a cadre of professional volunteers who are experts in their fields. As part of the Southern California Marine Institute, the program utilizes the facilities at Terminal Island and the Wrigley Institute of Environmental Studies on Catalina Island for engineering training, test and evaluation. Certification in research diving is also available.

Degree granted: B.S.

Facilities: The Wrigley Institute for Environmental Studies is a premier ocean research facility. Located on the Isthmus of Catalina Island, WIES has been the base for a variety of CPP Ocean Engineering activities. With full laboratories, diving facilities, and resident staff, WIES has greatly extended our activities off-shore. Operations at WIES have included: Diver Training Activities, Catalina Conservancy Divers (CCD) volunteer efforts, Testing of Galvanic cells, thermograph chains, and other projects.

Program Website: <http://www.csupomona.edu/~stkelly/index2.html>

Contact: Sam Kelly, skellycp@aol.com

Electrical Engineering with Control Robotics option

Degree granted: M.S.

On-campus housing available.

Program Website: <http://www.csupomona.edu/%7Eece/msee/index.html>

Contact: Dr. Hayden (Dept. Chair),
mkhayden@csupomona.edu

California State Polytechnic University

2801 West Temple Ave.

Pomona, CA 91768

Phone: 909-869-3210

California State Polytechnic University, San Luis Obispo

San Luis Obispo, CA

Biological Sciences Department

Biological Sciences

The department offers a set of courses and a thesis program leading to Masters of Science degree in Biological Sciences. Students with an interest in Marine Science work with a motivated group of faculty in a range of sub-disciplines including: Invertebrate Ecology, Developmental Biology, Environmental Physiology; Fisheries Biology, Coastal Oceanography, Plankton Ecology, Ecosystem Management, and Polar Ecosystems.

Degree granted: M.S.

Facilities: The department is housed in modern facilities equipped with up-to-date instrumentation. Cal Poly has direct access to the ocean through the Center for Coastal Marine Sciences. Cal Poly's geographical setting offers local opportunities for studying both coastal and estuarine ecosystems.

Program Website: <http://www.calpoly.edu/~bio/>

Contact: Maddie Nix, mnix@calpoly.edu

Biological Sciences with concentration in Marine Biology and Fisheries

The department offers a complete undergraduate program leading to a Bachelor of Science degree in Biological Sciences with a concentration in Marine Biology and Fisheries. The courses in the concentration provide students with hands-on experiences in diverse local marine and estuarine environments. Courses and research opportunities are enhanced by the involvement of the Center for Coastal Marine Sciences, an interdisciplinary center directed towards student learning.

Degree granted: B.S.

Facilities: The department is housed in modern facilities equipped with up-to-date instrumentation. Cal Poly has direct access to the ocean through the Center for Coastal Marine Sciences. Cal Poly's geographical setting offers local opportunities for studying both coastal and estuarine ecosystems.

Student Support: Students majoring in Biological Sciences are eligible for several departmental awards and scholarships. Contact the Cal Poly Financial Aid Office for application information.

Program Website: <http://www.calpoly.edu/~bio/>

Contact: Maddie Nix, mnix@calpoly.edu
California Polytechnic State University, San Luis Obispo
San Luis Obispo, CA 93407
Email: biosci@calpoly.edu
Phone: 805-756-2788

Department of Civil and Environmental Engineering

Engineering with a Specialization in Water Engineering

The mission of the Environmental Engineering Program is to provide its students with the highest quality technical and professional education in environmental engineering, with particular emphasis in the areas of air pollution control, water and wastewater quality, solid and hazardous waste management, and noise control.

Degree granted: M.S.

Faculty: The full-time faculty—24 tenured and tenure-track, all with extensive qualifications—are supported by over 20 full- and part-time lecturers, most of whom practice engineering in the local community.

Program Website: <http://ceenve.calpoly.edu/>

Contact: Kay Kibbe, ceenve@calpoly.edu
California State Polytechnic University, San Luis Obispo
Building 13, Room 263
San Luis Obispo, CA
Phone: 805-756-2947

California State University - California Maritime Academy Vallejo, CA

The California Maritime Academy (Cal Maritime) is a unique and specialized campus of The California State University that offers students bachelor's degrees in business administration, facilities engineering technology, global studies and maritime affairs, marine engineering technology, marine transportation, and mechanical engineering. Cal Maritime is one of only seven degree-granting mari-

time academies in the United States — and the only one on the West Coast. On-campus housing is available.

Facilities Engineering Technology Curriculum

Degree granted: B.S.

Program Website: <http://www.csum.edu/Academics/Majors/FET/>

Contact: Paul Jackson, pjackson@csum.edu

Global Studies and Maritime Affairs

Degree granted: B.S.

Program Website: <http://www.csum.edu/Academics/Majors/GSMA/>

Contact: Donna Nincic, DNincic@csum.edu

Marine Transportation

The student choosing a career as a licensed deck officer (mate) or a shoreside maritime manager majors in Marine Transportation. This major provides the broadest maritime industry training possible consistent with officer licensing requirements. A wide variety of shoreside management positions await the graduate in numerous maritime sectors, including vessel operations, ship's agency, marine insurance, stevedoring, charter brokering, and federal employment, as well as shipboard employment opportunities. This major is designed to prepare the student to take the U.S. Coast Guard STCW licensing exam for Second Mate and Officer in Charge of a Navigational Watch. Passing this examination, which results in the issuance of a Third Mate's license, is essential for a student seeking employment as a licensed deck officer on a commercial vessel.

Degree granted: B.S.

Facilities: 360-degree full mission bridge simulator; Training Ship *Golden Bear*

Faculty: <http://www.csum.edu/facultystaff/index.asp>

2007 Tuition: In-state residents: \$2,520; Out-of-State: \$10,170

Program Website: <http://www.csum.edu/Academics/Majors/MT/>

Contact: Paul Leyda, pleyda@csum.edu

Mechanical Engineering- USCG License Option

The ME-USCG option is designed for students who wish to use their engineering degree as marine engineers. The curriculum consists of courses that provide a traditional undergraduate education in mechanical engineering. In addition, there are courses intended to provide additional training for a marine engineer, much of which is required to obtain the merchant marine third engineer's license. Students are required to obtain experience at sea through three summer cruises, two of them aboard the academy's training ship, and one aboard a commer-

cial vessel. In addition, students in this option must pass the Third Assistant Engineer exam given by the United States Coast Guard (USCG).

Degree granted: B.S.

Facilities: Training Ship Steam Plant simulator, Diesel Plant Simulator

2007 tuition: In-state residents: \$2,520; Out-of-State: \$10,170

Program Website: <http://www.csum.edu/Academics/Majors/ME/>

Contact: Stephen Pronchick, stevep@csum.edu
California State University, California Maritime Academy
200 Maritime Academy Dr.
Vallejo, CA 94590
Email: admission@csum.edu
Phone: 707-654-1330



Cal State University East Bay's flagship trailable Research Vessel TELEOST, with an aquatic ecology class on this floating laboratory. Photo by Prof. Chris Kitting, CSUEB Biological Sciences.

California State University, East Bay
Hayward, CA

Department of Biological Sciences

Marine Science

CSUEB's Marine Science Program includes mainly advanced classes and research at Moss Landing Marine Labs (our consortium on Monterey Bay), plus related programs on San Francisco Bay and Delta through Hayward Campus Departments of Biological Sciences, Earth and Environmental Sciences, and Chemistry/Biochemistry. Each department works closely with other environmental organizations, including California Center for Integrative Coastal Research, San Francisco Bay National Wildlife Refuge Complex, and San Francisco Bay Wildlife Society. Full-time students can apply for extra classes at other bay-area CSUs and UCs, at no further cost, through the concurrent enrollment program.

Degree granted: B.S.

Facilities: Cal State U East Bay has a series of well equipped and versatile mobile labs on land and water, plus field facilities largely sponsored through collaboration with other environmental organizations such as San Francisco Bay Wildlife Society and San Francisco Bay area CSUs.

A major emphasis at CSUEB is Scientific, Multidisciplinary Environmental Restoration with Education. Marine and freshwater facilities include the CSU Consortium Marine Laboratories on Monterey Bay, Gazos Creek Field Station with Pescadero Alliance, and San Francisco Bay Shoreline Refuges.

Faculty: Prof. Christopher Kitting—Food Webs, Shore Restoration; Prof. Joy Andrews—Environmental Chemistry; Prof. Emeritus Samuel McGinnis—Ecology of Large Vertebrates of Marshes and Freshwater; Prof. Emeritus Edward

Lyke—Invertebrate Zoology; Associate Prof. Mitch Craig—Seismology and Sedimentary Science; Prof. Emeritus Dietlef Warnke—Deep Coring and History of Earth's Crust; Prof. Emeritus James Nybakken (Moss Landing Marine Labs)—Invertebrate Biology; Adjunct/Research Associate John Rees—Gelatinous Zooplankton Biology and other Cnidaria; other Moss Landing faculty.

2007 Tuition: In-state residents: \$2,970; Out-of-State: \$5,982

Program Website: <http://www.sci.csu Hayward.edu/biology/programs.html>

Contact: Ms. Kathleen Hackl, kathleen.hackl@csueastbay.edu
California State University, East Bay
25800 Carlos Bee Blvd
Hayward, CA 94542
Phone: 510-885-3471

California State University, Fullerton
Fullerton, CA

Biology with specialization in Marine Biology

Degree granted: B.S.

Program Website: http://www.fullerton.edu/catalog/academic_departments/biol.asp

Contact: Robert Koch, rkoch@fullerton.edu

Biology with specialization in Marine Biology

Degree granted: M.S.

Program Website: http://www.fullerton.edu/catalog/academic_departments/biol.asp

Contact: Kathryn Dickson, kdickson@fullerton.edu

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California State University, Hayward

Hayward, CA

See California State University, East Bay

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**California State University,
 Long Beach**
 Long Beach, CA

Marine Biology

Degree granted: B.S.

Program Website: <http://www.csulb.edu/depts/biology/>

Contact: Dr. Jesse Dillon, jdillon@csulb.edu

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**California State University,
 Monterey Bay**
 Seaside, CA

Division of Science and Environmental Policy

**Earth Systems Science & Policy - Marine &
 Coastal Ecology Concentration**

The Earth Systems Science & Policy (ESSP) program offers an innovative interdisciplinary B.S. degree program linking natural science, physical science, technology, economics, and policy. The program emphasizes the critical thinking and technical skills necessary to develop workable solutions to complex environmental problems. Unique in its commitment to linking earth systems science to environmental economics and social policy, ESSP provides students with active learning and applied research in marine, coastal, and watershed systems.

Degree granted: B.S.

Facilities: <http://sep.csUMB.edu/sep/html/research.htm>

Faculty: <http://sep.csUMB.edu/sep/html/directory.htm>

2007 Tuition: In-state residents: \$3,000; Out-of-State: \$10,170 (max)

Program Website: <http://essp.csUMB.edu>

Contact: Daniel Fernandez,
daniel_fernandez@csUMB.edu
 Phone: 831-582-4110

**M.S. in Marine Science at Moss Landing
 Marine Laboratories**

See Moss Landing Marine Laboratories

<http://www.mlml.calstate.edu/ga/Program-Description/>

**M.S. in Coastal and Watershed Science
 and Policy**

The mission of the Master of Science in Coastal and Watershed Science & Policy program is to build a community of professionals who can employ sound science, technology, and economics to produce, evaluate, and implement environmental decisions affecting the natural and managed systems of the coastal zone extending from watersheds to the continental slope.

Degree granted: M.S.

Facilities: State-of-the-art science labs, computer labs, research and survey vessels, advanced geospatial technology labs, coastal location.

Faculty: <http://sep.csUMB.edu/cwsp/faculty.htm>

Program Website: <http://sep.csUMB.edu/cwsp/>

Contact: Susan Alexander, Susan_Alexander@csUMB.edu
 California State University Monterey Bay
 Building 53, Room S314
 100 Campus Center
 Seaside, CA 93933
 Email: ESSPpeeradvisors@csUMB.edu
 Phone: 831-582-4739

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California State University, Northridge
 Northridge, CA

Biology with Marine Biology option

Degree granted: B.S.

Program Website: http://www.csun.edu/biology/undergraduate_start-page.htm

Contact: Vickie L Everhart, vickie.everhart@csun.edu

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California State University, San José
 San José, CA

Biology with Concentration in Marine Biology

Degree granted: B.S.

Program Website: <http://info.sjsu.edu/web-dbgen/catalog/departments/BIOL.html>

Contact: www.sjsu.edu/contact

You can find a complete version of
*The Guide to Marine Science and
 Technology Programs in Higher Education*
 along with other current educational resources and links
 at the MTS Website: <http://www.mtsociety.org>.

California State University, Stanislaus

Stanislaus, CA

Marine Science

Degree granted: M.S.

Program Website: <http://science.csustan.edu/pam/MarSci/index.htm>

Contact: Pamela Roe, pam@science.csustan.edu

California State University, Stanislaus

Turlock, CA

Department of Biological Sciences

Biology with Concentration in Marine Biology

The Department of Biological Sciences at CSU Stanislaus offers a concentration in Marine Biology within our undergraduate Biological Sciences program. Students taking the Marine Biology concentration take courses, or courses listed as fulfilling various areas within biology (such as ecology, physiology, animal diversity, plant diversity, etc.) required of all of our Biological Sciences students. Within the areas with several options, students in the Marine Biology concentration take the following courses: Invertebrate Zoology I, Invertebrate Zoology II, Marine Ecology, and either Marine Botany or Morphology of Plants, Algae and Fungi. At least one of these courses is taken at Moss Landing Marine Laboratories or another marine field station. Additionally, students in the Marine Biology concentration usually take one or both one-month winter term courses, Topics in Rocky Intertidal Biology and Deep-Sea Biology. All of these courses fulfill ecology, animal diversity, plant diversity and elective units required for the B.A. or B.S. in Biological Sciences, so students in the concentration do not have to take extra courses or units. Courses are taken on campus in Turlock, CA or at Moss Landing Marine Laboratories. We use Moss Landing Marine Laboratories facilities for many of the field trips that are part of virtually all of the courses listed above.

Degree granted: B.A. or B.S.

Facilities: Courses are given at CSU Stanislaus, in Turlock, CA. We moved into a new, "green" state-of-the-art Science Building shortly before the beginning of fall 2007 semester. Students in the Marine Biology concentration also take at least one course at Moss Landing Marine Laboratories. Additionally, virtually all courses in the Marine Biology concentration include field trips to Central California coastal areas, and we often use facilities at Moss Landing Marine Laboratories during field trips.

Faculty: Various faculty members in the Department of Biological Sciences, especially Dr. Pamela Roe, and various faculty members at Moss Landing Marine Laboratories.

Program Website: <http://science.csustan.edu/pam/>

Contact: Pamela Roe, pam@science.csustan.edu

California State University Stanislaus

One University Circle

Turlock, CA 95382

Phone: 209-667-3484

California University of Pennsylvania

California, PA

Environmental Studies: Fisheries and Wildlife Biology Concentration

Degree granted: B.S.

Program Website: <http://www.cup.edu/eberly/biology/index.jsp>

Contact: Beverly Russell, russell_be@cup.edu

Cape Fear Community College

Wilmington, NC

Marine Technology

The Marine Technology curriculum is designed to provide the practical skills and academic background essential for success in the area of marine scientific support. Students will become proficient in the knowledge and skills required of a scientific support technician, through both practical training aboard ship as well as in the classroom. The Marine Technology curriculum prepares individuals to use and maintain sophisticated equipment such as electronic navigation devices, physical and chemical measuring instruments, sampling devices, and data acquisition and reduction systems aboard ocean-going and smaller vessels.

Degree granted: A.A.S.

Facilities: Training in a wide range of shipboard observational and measurement techniques is accomplished aboard various research vessels including CFCC's own vessel, the R/V Dan Moore, a 85-ft. fisheries research vessel formerly operated by the State of North Carolina Division of Commercial and Sports Fisheries. All students spend a minimum of 30 days at sea during their two years in the program. Additional periods are spent off campus conducting marine projects relating to the estuaries, bays, and marshes of the area. The program is approved by the department of community colleges to conduct cooperative education programs with sponsoring marine

agencies. Credits are often transferable to four-year institutions offering related degrees. The school also operates a variety of small craft and has its own dock, chemical and biological laboratories, net loft, fishing gear shop, electrical lab, welding shop, woodworking shop, and oceanographic equipment repair and calibration facility.

2007 tuition: In-state residents: \$1,006; Out-of-State: \$5,326

Program Website: http://cfcc.edu/programs/mar_tech/

Contact: Jason Rogers, jrogers@cfcc.edu

Boat Building

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://cfcc.edu/programs/boatbuilding/>

Contact: Jason Rogers, jrogers@cfcc.edu

Cape Fear Community College

411 N. Front Street

Wilmington, NC 28401-3393

Phone: 910-362-7403

Carteret Community College

Morehead City, NC

Aquaculture

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.carteret.edu/education/academicprograms/AQUA/aquacultmain.htm>

Contact: Skip Kemp, kemps@carteret.edu

Marine Propulsion Systems

Degree granted: A.A.S.

Program Website: <http://www.carteret.edu/education/academicprograms/marinepro/index.htm>

Contact: David Eastwood, dge@carteret.edu

Chapman School of Seamanship

Stuart, FL

Professional Mariner Training

Degree granted: Courses for working professionals

Program Website: <http://www.chapman.org/training-programs/pmt.html>

Yacht & Small Craft Surveying

This is a 6-week course that prepares students to become independent marine surveyors or to secure employment with a marine insurance company or financial institution needing such services.

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.chapman.org/training-programs/survey.html>

Contact: Bruce Robertson, info@chapman.org

U.S.C.G. License Training

Degree granted: Courses for working professionals

Program Website: <http://www.chapman.org/training-programs/uscg.html>

Contact: info@chapman.org

Chapman School of Seamanship

4343 S.E. St. Lucie Boulevard

Stuart, FL 34997

Email: info@chapman.org

Phone: 800-225-2841

Clatsop Community College

Astoria, OR

Maritime Science

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.clatsopcc.edu/maritime/index.htm>

Contact: msd-info@clatsopcc.edu

Marine and Environmental Research and Training Station (MERTS)

Seamanship

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.clatsopcc.edu/merts/index.html>

Contact: tmiddleton@clatsopcc.edu

Vessel Operations

Degree granted: A.A.S.

Program Website: <http://www.clatsopcc.edu/maritime/index.htm>

Contact: tmiddleton@clatsopcc.edu

U.S. Coast Guard-Approved Licensing Program

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.clatsopcc.edu/maritime/index.htm>

Check the appendices at the back of this Guide for higher education program listings by Location and Subject.

Contact: msd-info@clatsopcc.edu
Clatsop Community College: Marine and Environmental
Research and Training Station (MERTS)
6550 Liberty Lane
Astoria, OR 97103

Coastal Carolina University
Conway, SC

Marine Science

Degree granted: B.S.
Program Website: <http://kingfish.coastal.edu/marine/>
Contact: Rob Young, ryoung@coastal.edu

Coastal Geology Minor

Degree granted: Minor
Program Website: <http://www.coastal.edu/science/minors.html#act>
Contact: Robert Young, ryoung@coastal.edu

Chemistry with Marine Science focus

Degree granted: B.S.
Program Website: <http://kingfish.coastal.edu/chemistry/>
Contact: Dave Evans, devans@coastal.edu

Coastal Marine and Wetland Studies

The Coastal Marine and Wetland Studies graduate program encompasses a wide range of modern scientific disciplines relevant to the coastal zone. The program emphasizes current knowledge about coastal marine, estuarine, watershed, and freshwater wetland environments, including the biology and ecology of marine and freshwater flora and fauna, geological and physical processes in the coastal zone, marine and freshwater environmental chemistry, and the ethical management of coastal and wetland resources. The thesis requirement calls for students to conduct and report on their original research.

Degree granted: M.S.
2007 tuition: In-state residents: \$330/credit hour; Out-of-State: \$412/credit hour
Program Website: <http://www.coastal.edu/science/coastalstudies/>
Contact: cmws@coastal.edu
Coastal Carolina University
College of Natural and Applied Sciences
P.O. Box 261954
Conway, SC 29528-6054
Phone: 843-349-2246

Coastal School of Deep Sea Diving
Oakland, CA

Deep Flight Sub Sea Aviation School

Degree granted: Courses for working professionals
Program Website: <http://www.deepflight.com/flight/index.htm>
Contact: Karen Hawkes, karen@deepflight.com

College of Charleston
Charleston, SC

Marine Biology

Degrees granted: B.S. and M.S.
Program Website: <http://www.cofc.edu/~biology/>
Contact: Allan Strand, stranda@cofc.edu
College of Charleston
Charleston, SC 29401

College of The Albemarle
Manteo, NC

Marine Science

The Marine Sciences curriculum prepares individuals for a variety of marine-related occupations, such as marine conservation, water analysis, marine scientific research and commercial fishing. Individuals will also be prepared as naturalists within the ecotourism industry. Coursework includes instruction in biological sciences, environmental sciences, and marine sciences. Field and laboratory experiences should prepare students to identify, observe, and collect scientific data associated with the fauna and flora found in the rivers, estuaries, sounds, and ocean. Graduates should qualify for employment opportunities with aquariums, fisheries, corps of engineers, marine patrol, ecotourism companies, and commercial fishing industries.

Degree granted: A.A.S.
Facilities: Well-equipped general labs, 24-ft pontoon boat
2007 tuition: In-state residents: \$539.00; Out-of-State: \$2,834.60
Student Support: College of The Albemarle Foundation provides more than \$160,000 annually in private scholarships. Students may obtain application forms from the College's website.

Program Website: <http://www.albemarle.edu>
Contact: Dana Newton, dnewton@albemarle.edu
College of The Albemarle
132 Russell Twiford Rd
Manteo, NC 27954
Phone: 252-473-2264

College of the Atlantic
Bar Harbor, ME

Marine Studies

College of the Atlantic stresses a strong field component in its Marine Studies program, matching students with individual faculty members to conduct original research either on an individual basis or as part of a research team. Students develop an individualized program of study during the academic year and are then encouraged to participate in field research each summer that they attend college.

Degree granted: B.S.

Facilities: The college maintains field stations on Great Duck Island (seabirds and insular botany) and Mt. Desert Rock (marine mammals). The college also has a fleet of watercraft ranging from sailboats and dinghies to the 42- foot R/V Indigo.

Faculty: John Anderson (seabirds), Sean Todd (marine mammals/oceanography), Chris Petersen (Ichthyology, fisheries biology), Helen Hess (Invertebrate ecology).

2007 tuition: In-state residents: 28,000; Out-of-State: 28,000

Program Website: <http://www.coa.edu/html/acfocusmarinestudies.htm>

Contact: John G.T. Anderson, jga@coa.edu
College of the Atlantic
105 Eden St.
Bar Harbor, ME 04609
Phone: 207-288-5015 ext. 269

**College of the Redwoods,
Mendocino Campus**
Fort Bragg, CA

Marine Science Technology

Degrees granted: Certificate-Bachelor's degree required

Program Website: <http://www.redwoods.edu/district/Degrees/mst-ca.asp>

Marine Science Technology

Degree granted: A.A.S.

Program Website: <http://www.redwoods.edu/district/Degrees/mst-as.asp>

Contact: Greg Grantham, greg-grantham@redwoods.edu
College of the Redwoods
1211 Del Mar Drive
Fort Bragg, CA 95437
Phone: 707-962-2687

College of William & Mary
Williamsburg, VA

Marine Science

Degrees granted: M.S. and Ph.D.

Program Website: <http://www.vims.edu/sms/>

Contact: John T. Wells, wells@vims.edu
College of William & Mary
Williamsburg, VA 23187-8795

**Center for Coastal Resources Management:
Wetlands and Coastal Resources**

Degrees granted: M.S. and Ph.D.

Program Website: <http://ccrm.vims.edu/education.html>

Contact: ccrm@vims.edu
Center for Coastal Resources Management
Virginia Institute of Marine Science
P.O. Box 1346
Gloucester Point, Virginia 23062-1346

Columbia University
New York, NY

Earth and Environmental Sciences

Degree granted: Ph.D.

Program Website: <http://eesc.columbia.edu>

Contact: missy@ldeo.columbia.edu
Columbia University
New York, NY 10027
Phone: 845-365-8550

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You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

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Columbia University – Lamont-Doherty Earth Observatory

Palisades, NY

Department of Earth & Environmental Sciences

Dual Master's in Earth and Environmental Science Journalism

The program is co-sponsored by the Lamont-Doherty Earth Observatory, the Columbia Graduate School of Journalism, and the Graduate School of Arts and Sciences (Department of Earth and Environmental Sciences).

In the first year of the program a student can take classes in marine-related subjects and can choose, among other things, to write a Master's thesis in a marine-related subject.

Degree granted: M.A.

Facilities: The facilities of the Columbia University campus in New York City and those of the Lamont-Doherty Earth Observatory in Palisades, NY are available. There are also cruises on the R/V Marcus G. Langseth.

Faculty: Marine specialties range from Marine Biology, Marine Geology, Marine Geophysics, Marine Science, and Marine Seismology.

2008 tuition: In-state residents: \$34,365; Out-of-State: \$34,365

Program Website: <http://www.ldeo.columbia.edu/edu/eesj/>

Contact: E&ESJ Program Director,
eesj@ldeo.columbia.edu
Columbia University
Lamont-Doherty Earth Observatory
61 Rt. 9W
Palisades, NY 10964-1000
Phone: 845-365-8550

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Community College of Rhode Island

Warwick, RI

Engineering with Electronics Technology focus

Degree granted: A.A.S.

Program Website: http://www.ccri.edu/Catalog/ps-engt.shtml#Electronics_Technology_Associate_Degree

Contact: Jerry Bernardini, jbernardini@ccri.edu

Science, Track B

Degree granted: A.S.

Program Website: http://www.ccri.edu/Catalog/ps-scia_scib.shtml

Contact: Jean Billerbeck, jbillerbeck@ccri.edu
Community College of Rhode Island
400 East Avenue
Warwick, RI 02886-1807

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Cornell University

Ithaca, NY

Department of Earth and Atmospheric Sciences

Satellite Remote Sensing Methods in Biological Oceanography

This is a 3-credit intensive training course that runs for 2 weeks each summer. The goal is to teach participants the basic skills needed to work independently to acquire, analyze, and visualize data sets derived from a variety of satellite sensors (e.g., SeaWiFS, MODIS-Aqua, MODIS-Terra, AVHRR, SeaWinds and Merged Topex/Jason/ERS1/ERS2). The course focuses on using the Ocean Color Web Data Server and developing IDL (Research Systems Inc.) programming skills needed to work with satellite image data. A central feature of the IDL programming effort will involve working with SeaDAS commands from within IDL to batch process large quantities of raw SeaWiFS and MODIS data to obtain high resolution mapped images of chlorophyll and other ocean-color related products. Background lectures will cover the fundamentals of bio-optics, pigment algorithms, primary production algorithms and, to a lesser extent, the underlying physical principals leading to the measurement of sea surface temperature, ocean wind speed and ocean topography. The class is typically made up of about 75% graduate students, 20% post-graduate professionals and 5% undergraduates. Participants come from universities, NOAA/NASA facilities and private companies. There is often fairly strong international representation. About 80% of past course participants have had no prior programming experience so the programming effort will begin at a basic level. More advanced students, with some prior programming experience, will be given more challenging programming problems from which to learn. Great effort is made to make the course fun and low-stress while at the same time challenging the participants to learn a very large amount of material in a short amount of time.

Degree granted: Certificate-Bachelor's degree required



Experiential activities empower learners of all ages to value the ocean as an integral part of the Earth system. Photo courtesy of COSEE-NE.

Facilities: Linux computer lab with 20 machines running IDL and SeaDAS software.

Program Website: <http://www.geo.cornell.edu/ocean/satellite/>

Contact: Bruce Monger, bcm3@cornell.edu
Cornell University
Ithaca, NY 14853
Phone: 607-227-2972

Cuesta Community College

San Luis Obispo, CA

Biological Sciences

Degree granted: A.S.

Contact: Debra Stakes, dstakes@cuesta.edu

Program Website: <http://academic.cuesta.edu/biology/>;
<http://academic.cuesta.edu/biology/marsci.htm>

Cumberland County College

Vineland, NJ

Aquaculture Technology

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.cccnj.edu/current/catalog/programDetails.cfm?programID=7>

Contact: Elizabeth Thompson, ethompson@cccnj.edu
Cumberland County College
Vineland, NJ 08362-1500

Dalhousie University

Halifax, Nova Scotia, Canada

Marine Affairs Program, Master of Marine Management

The Marine Affairs Program is one of five professional units in the Faculty of Management. The program offers the Master of Marine Management degree program. The Master of Marine Management (MMM) is a one-year professional, non-thesis and interdisciplinary graduate program designed for graduates who want to address solutions of marine management problems with interdisciplinary synthesis and integration through teamwork in research and planning. The MMM graduate will be equipped with the knowledge, skills and attitudes required to function as a manager who is mindful of the complementary and competing multi- and inter-disciplinary

interests that influence the design, implementation, and outcome of the management process in marine affairs. The MMM has been designed especially for mid-career professionals and those holding a first degree and experience in a relevant discipline when entering the program, as well as recent university graduates. The student body, approximately 20 per annum, comprises a remarkable diversity of professionals and recent graduates from many backgrounds and disciplines. The number of MMM alumni exceeds 300 from more than 40 nations holding positions ranging from fisheries officers to senior policy advisors, community development workers to naval commanders. The subject areas addressed include but are not limited to: Coastal zone management, Ecosystem-based management, Sea use planning and ocean governance, Fisheries management, Marine law and policy, Managing for climate change, Development and conservation of living and non-living resources, Marine transportation policy and administration, Coastal tourism and economics, Protection and preservation of the coastal and marine environments and their biodiversity, Maritime enforcement and conflict management.

Degree granted: Professional Master's Degree

2007 tuition: In-state residents: CAN \$7,431; Out-of-State: CAN \$14,691

Program Website: <http://marineaffairsprogram.dal.ca/index.php>

Contact: Becky Field, marine.affairs@dal.ca
Dalhousie University
Faculty of Management
6100 University Avenue, Suite 2127
Halifax, Nova Scotia, Canada, CN B3H 3J5
Phone: 902-494-3555

Marine Biology

Degree granted: B.S.

Program Website: <http://marine.biology.dal.ca/index.php>

Contact: Alan Pinder, Alan.pinder@Dal.Ca

Organismal Biology

Degrees granted: M.S. and Ph.D.

Facilities: The Aquatron system provides a flow-through seawater system to labs on 8 floors. We also have access to a 15m Pool Tank, a 10m deep Tower Tank, and 15 environmentally controlled wet labs with aquarium space. The Marine Gene Probe Laboratory (MGPL) is a basic and applied research facility in molecular and statistical genetics accessed "in house" by resident researchers and used as a regional facility for the development and application of molecular tools.

Program Website: <http://biology.dal.ca/>

Contact: Biology@Dal.ca, 902-494-3515

Department of Oceanography

Marine Biology/Oceanography

Degree granted: B.S.

Program Website: http://oceanography.dal.ca/ocean_4224.html

Contact: Bernard P. Boudreau, bernie.boudreau@dal.ca

Chemistry/ Oceanography

Degree granted: B.S.

Program Website: http://oceanography.dal.ca/ocean_4225.html

Contact: Bernard P. Boudreau, bernie.boudreau@dal.ca

Earth Sciences/Oceanography

Degree granted: B.S.

Program Website: http://oceanography.dal.ca/ocean_4226.html

Contact: Dianne Crouse, dianne.crouse@dal.ca

Atmospheric Science

Degree granted: M.S.

Program Website: http://oceanography.dal.ca/ocean_916.html

Contact: Richard Greatbatch, richard.greatbatch@dal.ca

Biological Oceanography

Degrees granted: M.S. and Ph.D.

Program Website: http://oceanography.dal.ca/ocean_917.html

Contact: Bernard P. Boudreau, bernie.boudreau@dal.ca

Chemical Oceanography

Degrees granted: M.S. and Ph.D.

Program Website: http://oceanography.dal.ca/ocean_1412.html

Contact: Bernard P. Boudreau, bernie.boudreau@dal.ca

Geological Oceanography

Degrees granted: M.S. and Ph.D.

Program Website: http://oceanography.dal.ca/ocean_927.html

Contact: Bernard P. Boudreau, bernie.boudreau@dal.ca

Physical Oceanography

Degrees granted: M.S. and Ph.D.

Program Website: http://oceanography.dal.ca/ocean_930.html

Contact: Dan Kelley, dan.kelley@dal.ca

Dalhousie University

1355 Oxford Street

Halifax, Nova Scotia, Canada B3H 4J1

Dauphin Island Sea Lab

Dauphin Island, AL

The Dauphin Island Sea Lab (DISL) is Alabama's marine science education and research laboratory. Located on the eastern tip of Dauphin Island, a barrier island in the Gulf of Mexico, the DISL is surrounded by Mobile Bay, Mississippi Sound and the waters of the Gulf, making it perfectly situated for a wide range of marine science activity. Dauphin Island Sea Lab offers Undergraduate Summer Programs and diverse opportunities for graduate study in the marine sciences, focusing on the oceanography and ecology of estuaries and near-coastal communities and ecosystems. Member schools with graduate programs include:

Alabama State University

Auburn University

Jacksonville State University

Tuskegee University

University of Alabama

University of Alabama at Birmingham

University of Alabama at Huntsville

University of South Alabama

Degree granted: While the DISL serves as the focal point of graduate education in marine science in the state, it is not a degree-granting institution, and graduate degrees are offered through nine of the twenty-one DISL Member Schools.

Program Website: <http://www.disl.org/aboutus.html>

Contact: Sally Brennan, Registrar, sbrennan@disl.org

251-861-2256

Dauphin Island Sea Lab

101 Bienville Blvd

Dauphin Island, AL 36528

Phone: 251-861-2141, Fax: 251-861-4646



Student volunteers clear debris from Adobe Creek, Petaluma, CA; courtesy NOAA Restoration Center.

DiveSafe International

Campbell River, Canada

Occupational Diver Programs

DiveSafe International trains divers in the use of SCUBA and Surface Supply diving equipment for occupational diving. We provide a special PLA course in order for Scientific Divers (CAUS) to cross-over and acquire their commercial SCUBA Divers certification. All courses are taught to the CSA (Canadian Standards Association) standards which are internationally recognized. Graduates go on to careers in aquaculture diving, underwater archaeology, seafood harvesting, underwater video production, environmental assessment diving, public safety diving, small vessel repair and servicing, search and recovery and more. DiveSafe International also develops curriculum and dive-related occupational health and safety training for other institutions.

In addition to core courses in Occupational Scuba and Inshore Surface Supply diving, DiveSafe International offers courses in Dive Accident Management, Underwater Video Production, Hyperbaric Chamber Operation, Dive Supervisor and more. Scientific Divers (AAUS and CAUS certified) may be eligible for advanced standing for prior learning and experience and be accelerated through courses.

Degrees granted: Certificate-Bachelor's degree required; Certificate-Bachelor's degree not required; Courses for working professionals

Facilities: DiveSafe International is at the Coast Marina in Campbell River on Vancouver Island on the west coast of British Columbia, Canada. The facility includes a 2,500-square-foot float house with office and classrooms and state-of-the-art diving equipment and nitrox blending system. The 10-meter dive vessel Samarinda II is an excellent dive platform that is outfitted with air compressor, diver-to-surface communications, diver recall system, side scan sonar and lifting hoist. Dive operations are carried out in Discovery Pass off Campbell River, BC, rated by Jacques Cousteau as the best cold water diving in the world. DiveSafe provides accommodations in the "Divers Floathouse."

Faculty: Faculty members are seasoned commercial divers with advanced certification in Adult Education.

2007 tuition: In-state residents: \$4450-5,250; Out-of-State: \$4450-5,250

Program Website: www.divesafe.com

Contact: Kelly Korol, info@divesafe.com
DiveSafe International
P.O. Box 342
Campbell River, CN V9W 5B6
Phone: 250-287-3837

Drexel University

Philadelphia, PA

See also Sea Education Association

Bioscience Department

Environmental Science

Allows students to apply 17 quarter credits toward their degree for participation in SEA Semester Programs. Students may concentrate in Marine Science by taking Marine Ecology and Aquatic Ecology on campus (each 3 credits) in addition to the SEA coursework.

Degree granted: B.S.

Facilities: Please see Sea Education Association (SEA)

Faculty: Please see Sea Education Association (SEA)

Program Website: <http://www.drexel.edu/coas/env-science/>

Contact: Susan Cole, coless@drexel.edu

Drexel University
3141 Chestnut Street
Philadelphia, PA 19104
Phone: 215-895-2905

Duke University Marine Laboratory Duke University Nicholas School of the Environment and Earth Sciences

Beaufort, NC

Marine Science and Conservation

The Duke University Marine Laboratory focuses on education, research, and service to understand marine systems, including the human component, and to develop approaches for marine conservation and restoration. Undergraduate, post-baccalaureate, professional masters, post-graduate, and doctoral students are all welcome to enroll in classes at the Duke Marine Lab during fall and spring semesters and summer terms. Small class sizes and an island setting facilitate rewarding student-faculty interactions; work on class materials and independent research projects also promotes beneficial interaction among student groups.

Beaufort Signature Courses – Extended Field Courses with Duke Faculty

The Duke Marine Lab seeks to provide national and international leadership in marine science education. To contribute to this goal, Marine Lab faculty offer a series of *Beaufort Signature Courses* in fall and spring semesters that include extended field trips to areas of particular



Courtesy COSEE:Central Gulf of Mexico

interest to undergraduate, professional, and doctoral scholars of marine science and conservation. During fall semester students can travel to Panama, California or France over an extended Fall Break; during spring semester blocks they can participate in courses with travel to Singapore, Trinidad, and Hawaii. These courses are led by Duke faculty and are true immersion experiences.

Undergraduate Programs

The Duke Marine Lab offers undergraduate residential courses in fall and spring semesters and in two summer terms. Courses are taught by world-renowned faculty from Duke University and other universities and research institutions. Enrollment is open to all qualified Duke and non-Duke students.

Marine Science Education Consortium

The Marine Sciences Education Consortium (MSEC) was developed to provide a formal curriculum in the marine sciences, including supervised research, to member institutions. Such institutions are liberal arts colleges or universities attended by students who are preparing for careers in the marine sciences or who have a strong liberal arts interest in the oceans, but for whom no specialized programs in marine sciences are available. MSEC students have access to the Duke Marine Lab's fall semester, spring semester, and two five-week summer terms. Currently, member institutions include Albright College, Allegheny College, Augustana College, Brown University, Bucknell University, Davidson College, Denison University, the Five Colleges Coastal and Marine Sciences Program (Amherst College, Hampshire College, Mount Holyoke College, Smith College and the University of Massachusetts), Furman University, Gettysburg College, Hampden-Sydney College, Hood College, Ithaca College, Kenyon College, Macalester College, Marquette University, Miami University, New College of Florida, North Carolina State University, University of North Carolina - Greensboro, University of

Notre Dame, Oberlin College, Presbyterian College, Rollins College, University of Richmond, Stetson University, Trinity College, Washington and Lee University, Wittenberg University, and the College of Wooster.

Marine Science and Conservation Leadership Certificate Program

This Certificate Program offers all undergraduates at Duke University the opportunity to supplement their majors with studies of leadership in marine science and conservation. This Program is designed to expand the academic breadth of Duke undergraduates who wish to pursue graduate degrees in biology, environmental science, social science, and policy, as well as professional careers in medicine and other disciplines. It seeks to stimulate interdisciplinary studies, including the human dimension, using marine systems as a model. It also fosters leadership skills in communication, management, values, and ethics. Students apply biological and ecological principles to the study of marine organisms and develop and evaluate solutions to conservation challenges. They are encouraged to think reflectively about their roles as citizens and leaders and the philosophical, ethical, and practical positions they will face in these roles. The Marine Science and Conservation Leadership Program is rooted in marine science and conservation, but includes studies in a variety of disciplines—biology, earth and ocean sciences, economics, engineering, environmental sciences and policy, markets and management studies, philosophy, political science, public policy, religion, and theater studies.

Graduate Programs

Professional Masters Degree in Environmental Management

The Master of Environmental Management (MEM) degree trains students to understand the scientific basis of environmental problems, as well as the social, political and economic factors that determine effective policy options. Students opting for a MEM degree in Coastal Environmental Management spend the first year in Durham fulfilling required course work; the second year is typically spent at the Marine Lab where further course work and a Masters Project are completed. Masters Projects may focus on subjects such as marine conservation biology and policy, fisheries management, marine protected area management, coastal zone management, water quality management or coastal sedimentary processes as part of the degree program. For additional information go to www.nicholas.duke.edu/programs/professional or contact CEM program director Dr. Mike Orbach at mko@duke.edu or 252-504-7606.

Doctoral Program

The Ph.D. degree is offered through the Duke Graduate School via various departments. The program is exclusive and small, with only three to four Ph.D. candidates accepted to the Duke Marine Lab each year. Contact Dr. Andrew Read, Director of Graduate Studies (aread@duke.edu or 252-504-7590), to discuss your specific interests prior to submitting an application.

Degree granted: Academic programs offered at the Marine Lab support undergraduate, professional masters, and doctoral degrees.

Facilities: The Marine Laboratory of Duke University, located on Pivers Island in the historic town of Beaufort, North Carolina, is a 15-acre campus with research laboratories, classroom buildings, dormitories, dining hall, library, student center and boats. It shares the Island with the NOAA Center for Coastal Fisheries and Habitat Research, and, together with the nearby marine laboratories of the University of North Carolina – Chapel Hill and North Carolina State University, is part of a vibrant and expanding community of researchers and students.

The location of the Duke Marine Lab provides easy access to marine habitats, including coastal settings with contrasting degrees of development. The Rachel Carson National Estuarine Research Reserve and the undeveloped Outer Banks stretch to the east of Pivers Island; to the west is Bogue Banks, a spit of developed land. The shallow waters of the Pamlico, Albemarle, Bogue, and other sounds are rich with estuarine life and fringed by expansive salt marshes. The Gulf Stream flows near shore; deepwater coral reefs and methane hydrate seeps are located within a 12-hour transit by boat. The Marine Lab campus includes historic classrooms ideally suited for study of marine organisms and a new state-of-the-art teaching facility: the Marguerite Kent Repass Ocean Conservation Center. The Repass Center is Duke's 'greenest' building, with geothermal wells for heating and cooling, solar panels for hot water, and photovoltaic rooftop panels to convert sunlight into electricity. The center of campus activity at noon is the Dining Hall, where faculty and students meet and mix during the lunch hour. Outdoor and indoor commons areas, with stunning views, the picturesque waterfront of Beaufort and the Rachel Carson Reserve, are favorite locales for coffee and doughnuts, receptions, and other formal and informal activities. A Student Center offers exercise equipment, billiards, and cable television. There are library and computer facilities within a one-minute stroll of any location on the Island; wireless computing is possible nearly everywhere. Street basketball, beach volleyball, croquet, canoeing, sunbathing and swimming are favorite diversions.

Faculty: Year-round faculty at the Marine Lab in the Division of Marine Science and Conservation are engaged in research, education, and service to understand marine systems, including the human component, and to develop approaches for marine conservation and restoration. Faculty research interests include marine biology, physiology, biochemistry, conservation biology and genetics, ecology, marine affairs and policy, and biological oceanography. Study organisms include dolphins and porpoises, sea turtles, blue crabs, and organisms living at deep-sea hydrothermal vents and seeps. Duke Marine Lab faculty include: Richard T. Barber, Celia Bonaventura, Joseph Bonaventura, Lisa M. Campbell, Jens Carlsson, Larry B. Crowder, Karen Eckert, Scott Eckert, Richard B. Forward Jr., Patrick N. Halpin, William W. Kirby-Smith, Michael K. Orbach, Joseph S. Ramus, Andrew J. Read, Dan Rittschof, Rafe Sagarin, Tom Schultz, Cindy Lee Van Dover.

Program Website: <http://www.nicholas.duke.edu/marinelab/>

Contact: Lauren Stulgis, lauren.stulgis@duke.edu
Duke University Marine Laboratory
135 Duke Marine Lab Road
Beaufort, NC 28516-972
Phone: 252-504-7531

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Duke University Nicholas School of the Environment and Earth Sciences

Durham, NC

The Nicholas School offers two professional master's degrees: the Master of Environmental Management and the Master of Forestry. These professional degrees offer students the opportunity to acquire education and skills training with a view to taking a leadership role in the management of the environment. These professional degrees prepare graduates for careers as expert environmental problem solvers. There are seven concentrations leading to the MEM and one in Forest Resource Management leading to the MF. The seven concentrations are: Coastal Environmental Management (see below), Ecosystem Science and Conservation, Energy and Environment, Environmental Economics and Policy, Environmental Health and Ecotoxicology, Global Environmental Change, and Water and Air Resources. In-depth descriptions of each of these concentrations, including program requirements, may be found at <http://www.nicholas.duke.edu/programs/professional/index.html>.

Of particular interest to students wishing to pursue careers in marine science, marine policy, coastal zone management, marine protected areas, fisheries manage-

ment and other related areas, is the **MEM concentration in Coastal Environmental Management**. MEM students in this concentration spend their first year on the Durham campus taking core and required courses; most students then spend their second year at the Duke Marine Laboratory in Beaufort, NC, three hours from Durham on the North Carolina coast. More information on the Duke Marine Lab may be found in the adjacent listing.

Admissions: There are two school-wide prerequisites, a college semester of calculus and a college semester of statistics. Each concentration may have additional prerequisites that are listed at the Web site. Other components of the application include the application form (electronic application is encouraged), three letters of recommendation, official transcripts of all college work, official GRE scores, official TOEFL scores for international students whose first language is not English, a personal statement and the application fee. Application deadline for fall is February 1.

Faculty: The Nicholas School is known for the quality of its faculty as measured by their scholarly achievements, commitment to quality education and impacts on our most important environmental and natural resources challenges. As of the 2008/2009 academic year, the Nicholas School includes a total of 52 faculty with primary appointments in the Nicholas School and approximately 75 faculty with secondary or joint appointments. <http://fds.duke.edu/db/Nicholas/faculty/>

Degree granted: Professional Master's Degree

2008-09 tuition: In-state residents: \$27,600; Out-of-State: \$27,600

Program Website: <http://www.nicholas.duke.edu/programs/Professional>

Contact: Cynthia Peters, petersca@duke.edu
Duke University Nicholas School of the Environment and Earth Sciences
Box 90330
Duke University
Durham, NC 27708
Email: admissions@nicholas.duke.edu
Phone: 919-613-8070

East Carolina University

Greenville, NC

Coastal Resources Management

To help meet the need for scientifically trained specialists able to move effectively between the worlds of coastal research, policy, and management, East Carolina University offers the Ph.D. program in coastal resources management. This multidisciplinary program draws on the expertise of faculty from some 16 different academic departments and the Institute for Interdisciplinary Coastal Science and Policy. Students concentrate in one of four areas, with complementary work in two others: coastal and estuarine ecology, coastal geosciences, social science and public policy, and maritime studies, which focuses on the cultural and historical dimensions of coastal resources.

Degree granted: Ph.D.

Student Support: Graduate assistantships of about \$20,000 and out-of-state tuition remissions are available to highly qualified applicants. Students may also receive support as research assistants on faculty grants and contracts or as recipients of nationally competitive fellowships.

2007 Tuition: In-state residents: \$4,700; Out-of-state, \$15,000

Program Website: <http://www.ecu.edu/biology/graduate.cfm>

Contact: Lauriston King, kingl@ecu.edu,
phone: 252-328-9372

Maritime Studies

The Graduate (M.A.) Program in Maritime Studies (PMS) is in its 25th year. The PMS is housed in the Department of History. We have conducted field work around the U.S., in Canada and Bermuda. Other research has been conducted in Britain, Poland, and in the Slovak Republic. We typically admit 10-15 students per year for the 2.5 year program. We have MOA with the National Park Service, NOAA, and other organizations. Better than one-sixth of our graduates go on to the Ph.D. level.

Degree granted: M.A.

Facilities: The PMS has its own building (Eller House) on the ECU campus. We have access to a variety of small water craft and our own remote sensing (Side Scan, Magnetometer, ROV) equipment. Classes are held in several locations, with most in Eller House.

Faculty: Four faculty members make up the core group with another faculty line being restored to the program in 07-08. Babits: Ph.D., Brown; Richards: Ph.D., Flinders; Rodgers: Ph.D., Union Institute; Stewart: Ph.D., Texas A&M. Three other faculty are contributing: Dudley: Ph.D. Alabama; Palmer: Ph.D., Temple; Swanson: Ph.D., Western Ontario.

You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

2007 tuition: In-state residents: \$1,992; Out-of-State: \$7,248

Program Website: <http://www.ecu.edu/Maritime>
Contact: Karen Underwood, underwoodk@ecu.edu
 East Carolina University
 Greenville, NC 27858
 Phone: 252-328-6097

Program Website: http://www.everettcc.edu/template.cfm?doc_id=1510
Contact: Ardi Kveven, akveven@everettcc.edu
 Everett Community College
 2333 Seaway Blvd.
 Everett, WA 98201-1390
 Phone: 425-267-0156

Eckerd College
 St. Petersburg, FL

Marine Science

The marine science major provides both an integrative science background and specialized foundation work especially suitable for students planning professional careers in marine fields. Students majoring in any track of the marine science major are expected to be knowledgeable regarding fundamental concepts of biological, geological, geophysical, chemical, and physical oceanography as well as research methods employed by oceanographers.

Degree granted: B.S.

Program Website: <http://www.eckerd.edu/academics/index.php?f=detail&m=MS&c=N>

Contact: admissions@eckerd.edu
 Eckerd College
 4200 54th Avenue South
 St. Petersburg, FL 33711
 Phone: 800-456-9009

Everett Community College
 Everett, WA

Ocean Research College Academy

ORCA is a unique opportunity for high school students, using the framework of the Running Start program and the resources of Everett Community College. Tuition is free! ORCA offers students a full-time college experience that satisfies all requirements for an Associate's degree and most requirements for a high school diploma. Using an innovative, project-based approach in a small "learning community" environment, students enjoy the challenge of designing and implementing their own learning experiences under the guidance of talented college faculty. While marine science provides the focus for interdisciplinary projects, students receive a rich education in all of the core subjects, with outstanding faculty members working with the students for two years.

Degree granted: A.S.

Fairleigh Dickinson University
 Teaneck, NJ

School of Natural Sciences

Marine Biology

The marine biology curriculum fulfills basic requirements for admission into graduate and professional schools. It also may serve as a terminal degree with which to enter the job market. The program includes a laboratory field experience, currently available at FDU's field station in Samana, Dominican Republic. At this station, students have a full semester of warm-water Caribbean field experience. The School of Natural Sciences' semester at Samana contains 15 credits of Marine Biology courses with a research project and an option of taking one online course (e.g., University Core) for a total of 18 credits. Each of the marine biology courses consists of a lecture and a field-based component, the field component is supported by laboratory studies. Fieldwork study sites will include reefs, mangroves, sea grass beds and salt marshes.

Degree granted: B.S.

Facilities: The Hackensack River flows through the campus giving students an opportunity to study organisms in freshwater environments north of the campus, estuarine environments on campus, and marine environments south of the campus. The University owns two 11-foot vessels for study in the water, and a monitoring station off the footbridge that connects the Teaneck and Hackensack sides of the campus. Marine organisms can also be studied at FDU's Samana marine biology facility in the Dominican Republic. This field station has a classroom that is connected to a wet lab that has both indoor and outdoor components.

Faculty: Alice Benzecry—Ph.D. Aquatic Vegetation; Irwin Isquith—Ph.D. Aquatic Ecology, Protozoology; Joseph Labriola—M.S. Wetlands; Richard Lo Pinto—Ph.D. Eco-toxicology of Aquatic Organisms; Marion McClary, Jr.—Ph.D. Behavioral and Physiological Ecology of Aquatic Animals.

Program Website: <http://view.fdu.edu/?id=1688>

Contact: Marion McClary, Jr., Ph.D.
marion_mcclary@fdu.edu
Fairleigh Dickinson University
1000 River Road
H-DH4-03
Teaneck, NJ 07666
Phone: 201-692-2606

Five Colleges, Inc.
Northampton, MA

Five College Coastal & Marine Sciences

Students attending Smith College, University of Massachusetts-Amherst, Hampshire College, Mount Holyoke College, and Amherst College may pursue interdisciplinary study leading to a certificate in coastal and marine sciences (certificate not currently available at Amherst College). In consultation with a faculty advisor from their home institution, students choose from over 100 courses at the five colleges to structure a program of study that complements their major and emphasizes competency in field work. Paid summer internships and scholarships for research and study-away programs are available.

Degree granted: General marine science courses

Program Website: <http://www.fivecolleges.edu/sites/marine>

Contact: Cindy Bright, Coordinator, marinesci@email.smith.edu

Five Colleges, Inc.
Smith College
Clark Science Center
Northampton, MA 01063
Phone: 413-585-3799

Florida Atlantic University
Boca Raton, FL

Ocean Engineering

The Ocean Engineering program at Florida Atlantic University offers B.S., M.S. and Ph.D. degree programs in Ocean engineering and takes pride in its faculty's commitment to excellence in teaching and research. Our Undergraduate Program, founded over 40 years ago as a Program of Distinction and as the first undergraduate ocean engineering program of its kind in the U.S., is today over 140 students strong and offers a multidisciplinary education in engineering as it pertains to human activities in the oceans. The students receive education in the basics of underwater acoustics, hydrodynamics,

materials, structures, signal processing, control systems, ship design and oceanography. The faculty have research interests in acoustics, autonomous underwater vehicles, hydrodynamics and physical oceanography, ship systems, ocean energy and marine materials, including nano-composites. The Department operates over dual campuses, from the original Boca Raton campus and from the Dania Beach campus, which is the home of SeaTech, our oceanside Institute for Ocean and Systems Engineering. Undergraduates spend their freshmen through junior years on the Boca Campus where they benefit from taking required non-engineering courses from other colleges and from participating in numerous extracurricular activities offered by FAU. The senior year is spent at the SeaTech campus, where the students, working in teams, undertake their two-semester capstone senior design projects. They benefit from working in research laboratories side-by-side with graduate students. Our programs are demanding, requiring total commitment and a one hundred percent effort from the student. Our goal is to provide an exciting and student-friendly educational environment and prepare outstanding individuals who will lead engineering endeavors in a challenging ocean environment. We actively help students with meaningful summer internships and with career placements upon graduation.

Degree granted: B.S.

Program Website: <http://www.oe.fau.edu/undergrad/ug.html>

Contact: Teresa Perez, Academic Advisor, mtperez@fau.edu
Florida Atlantic University (Boca Raton)
777 Glades Road
Bldg. 36, room 190
Boca Raton, FL 33431
Email: academic.advisor@oe.fau.edu
Phone: 561-297-3435

Ocean Engineering

Degree granted: M.S. and Ph.D.

Program Website: <http://www.oe.fau.edu/graduate/grad.html>

Contact: Manhar Dhanak, Chairman, dfiore@fau.edu
Florida Atlantic University (Boca Raton)
777 Glades Road
Bldg. 36, room 190
Boca Raton, FL 33431
Email: dhanak@oe.fau.edu
Phone: 561-297-3430

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Florida Atlantic University

Dania Beach, FL

Ocean Engineering

See program description for ***Ocean Engineering at Florida Atlantic University, Boca Raton***

Degree granted: B.S.

Program Website: <http://www.oe.fau.edu>

Contact: Manhar Dhanak, Chairman and Director of SeaTech, dfiore@fau.edu

Florida Atlantic University (Dania Beach)

101 North Beach Road

Dania Beach, FL 33004

Email: ghanak@oe.fau.edu

Phone: 954 924 7000

Ocean Engineering

Degree granted: M.S. and Ph.D.

Program Website: <http://www.oe.fau.edu/graduate/grad.html>

Contact: Manhar R. Dhanak, Chairman, dfiore@fau.edu

Florida Atlantic University (Dania Beach)

101 North Beach Road

Dania Beach, FL 33004

Email: ghanak@oe.fau.edu

Phone: 954-924-7000

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Florida Atlantic University

Davie, FL

Biology with specialization in Marine Biology

Degree granted: B.S.

Program Website: <http://www.science.fau.edu/biology/undergrad/undergraduate.html>

Contact: Dr. Rodney K. Murphey, rmurphey@fau.edu

Biology with focus on Marine Biology

Degree granted: M.S.

Program Website: <http://www.science.fau.edu/biology/graduate/graduate.html#>

Contact: Dr. Wyneken, jwyneken@fau.edu

Florida Atlantic University

Davie, FL 33314

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Florida Institute of Technology

Melbourne, FL

Oceanography

Degree granted: B.S. and M.S.

Program Website: <http://www.fit.edu/AcadRes/dmes/oceanography.html>

Contact: Geoffrey W.J. Swain, swain@fit.edu

Coastal Zone Management

Degree granted: B.S. and M.S.

Program Website: <http://www.fit.edu/AcadRes/dmes/zone.html>

Contact: dmes@marine.fit.edu

Environmental Sciences

Degree granted: B.S., M.S., and Ph.D.

Program Website: http://www.fit.edu/AcadRes/dmes/env_sci.html

Contact: Elizabeth A. Irlandi, irlandi@fit.edu

Marine Science

Degree granted: B.S. and M.S.

Program Website: <http://www.fit.edu/AcadRes/dmes/marines.html>

Contact: Charles R. Bostater, bostater@marine.fit.edu

Ocean Engineering

Degree granted: B.S. and M.S.

Program Website: <http://www.fit.edu/AcadRes/dmes/ocean.html>

Contact: Lee E. Harris, lharris@fit.edu

Aquaculture

Degree granted: B.S.

Program Website: <http://cos.fit.edu/biology/UGPrograms/Aquaculture.htm>

Contact: Junda Lin, jlin@fit.edu

Marine Biology

Degree granted: B.S.

Program Website: <http://cos.fit.edu/biology/UGPrograms/Marine.htm>

Contact: Richard L. Turner, rturner@fit.edu

Marine Biology

Degree granted: M.S.

Program Website: <http://www.fit.edu/admission/graduate/prgmpdfs/BioSci.pdf>

Degree granted: Ph.D.

Program Website: <http://cos.fit.edu/biology/>

Contact: Russell Weigel, rweigel@fit.edu

Environmental Resource Management

Degree granted: M.S.

Program Website: http://www.fit.edu/AcadRes/dmes/env_resource.html

Contact: Thomas V. Belanger, belanger@marine.fit.edu

Meteorology

Degree granted: M.S.

Program Website: <http://www.fit.edu/AcadRes/dmes/meteor.html>

Contact: George A. Maul, gmaul@fit.edu

Florida Institute of Technology

150 W. University Blvd.

Melbourne, FL 32901

Florida Keys Community College

Key West, FL

Marine Engineering

Degree granted: A.S.

Program Website: http://www.fkcc.edu/links/programs/marine_eng.htm

Contact: Gary Martin, martin_g@fkn.edu

Marine Environmental Technology

Degree granted: A.S.

Program Website: <http://www.fkcc.edu/catalog/07-08%20Catalog%20Site/Sections/programs/as.html>

Contact: Bill Trantham, trantham_w@fkn.edu

Diving Business and Technology

Degree granted: A.S.

Program Website: http://www.fkcc.edu/links/programs/marine_eng_prop_cert.htm

Contact: Bob Jason, rsjason@aol.com

Florida Keys Community College

5901 College Road

Key West, FL 33040

Florida State University

Tallahassee, FL

Biological Science, Marine Biology Track

Degree granted: B.S.

Program Website: <http://www.bio.fsu.edu/undergrad/>

Contact: Dr. Timothy S. Moerland, moerland@bio.fsu.edu

Physics and Interdisciplinary Oceanography

Degree granted: B.S.

Program Website: http://www.physics.fsu.edu/undergrads/Undergrads_Guide.pdf

Contact: Paul Cottle, cottle@phy.fsu.edu

Marine Biology

Degree granted: Certificate-Bachelor's degree required

Program Website: http://www.bio.fsu.edu/coleman_lab/certificate_page1.html

Contact: Dr. Timothy S. Moerland, moerland@bio.fsu.edu

Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://ocean.fsu.edu/>

Contact: Michaela Lupiani, lupiani@ocean.fsu.edu

Florida State University

Tallahassee, FL 32306

Friday Harbor Laboratories, University of Washington/Cornell University

Ithaca, NY

Earth and Atmospheric Sciences Department

Marine Bioacoustics/Bioacoustical Oceanography, 5-week course

The primary goal of this course is to provide advanced undergraduates, graduate students and postdoctoral investigators with a broad understanding of the acoustic tools and techniques required to address fundamental questions of the behavior and ecology of cetaceans, fishes and zooplankton. By bringing together many of the top research students in marine bioacoustics and bioacoustical oceanography, new cross-disciplinary interactions will be encouraged. Students will be exposed to the latest theories in underwater acoustics as they pertain to studying pelagic animal behavior and ecology *in situ*. Student also will have a unique opportunity to work with active scientists using state-of-the-art tools and techniques.

Degree granted: Courses for working professionals

Facilities: The teaching and research laboratories consist of eight one-story buildings of about 1,500 square feet each and three larger two-story research buildings. Running sea water, free from metallic contamination, is delivered to plexiglass aquaria and water tables through polyethylene or PVC pipes and fittings. A photographic

darkroom, walk-in cold rooms, a microtechnique room, and a shop are available. Analytical equipment for general use includes centrifuges, computers, scintillation counter, particle counter, a high-performance liquid chromatograph, nucleotide sequencer, PCR thermocyclers and other equipment for molecular biology, spectrophotometers, culture chambers, fluorescence microscope, video equipment, scanning laser confocal microscope, and electrophysiological equipment. A scanning electron microscope and transmission electron microscope may be used by investigators who have or can obtain appropriate training. A 58-foot steel research vessel, the R/V CENTENNIAL, is available for classwork and research. It is equipped for dredging, net hauls, ROV and CTD deployment and water sampling. Its 19.5-ft. beam permits comfortable interior spaces including a laboratory, a large sorting table and covered outdoor areas, with total passenger capacity of 34 people. A tidal station is maintained in cooperation with the National Ocean Survey (NOAA). Divers certified by the University of Washington may use five small power boats, and a limited number of tanks and weights for specific projects approved by the Diving Safety Officer (DSO). Study-site information as well as check-out dives are provided by the DSO. The library of over 18,000 volumes provides a core collection of books and journals dealing with the biology of marine organisms. The library is part of the UW Libraries system of over 5 million cataloged items. There are approximately fifteen Macintoshes and fifteen IBM-compatibles available for common use by students or researchers in three locations.

Faculty: Charles Greene (Cornell), John Horne (UW)

Program Website: <http://depts.washington.edu/fhl/studentClasslist2007.html>

Contact: Dr. Charles Greene, chg2@cornell.edu
Friday Harbor Laboratories, University of Washington/
Cornell University
Snee Hall, Cornell Univ.
Ithaca, NY 14853

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Furman University

Greenville, SC

Earth and Environmental Sciences Department

Earth and Environmental Sciences

This track is designed for students interested primarily in environmental science with a goal toward advanced degrees or a professional career in the environmental sciences.

Degree granted: A.S. and B.S.

Facilities: The Department of Earth and Environmental Sciences has an excellent array of laboratory facilities, and

has access to additional laboratories in the departments of chemistry and biology. These facilities are used both in teaching and research. During the undergraduate senior research experience, the student has access to any of the necessary instrumentation, and gains valuable experience learning how to properly use instrumentation and interpret the resulting data.

Program Website: <http://ees.furman.edu/>

Contact: Nina Anthony, Nina.Anthony@furman.edu
Furman University
3300 Poinsett Highway
Greenville, SC 29613

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Grays Harbor College

Aberdeen, WA

Aquaculture Technician

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://ghc.ctc.edu/catalog/programs2.htm#40>

Contact: rwenke@ghc.edu

Natural Resources Technology

Degree granted: A.A.S.

Program Website: <http://ghc.ctc.edu/catalog/programs2.htm#39>

Contact: Ronald McFarlane, rmcfarlane@nwifc.wa.gov

Aquaculture

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://ghc.ctc.edu/catalog/programs2.htm#41b>

Contact: rwenke@ghc.edu

Marine Biology

Degree granted: A.S.

Program Website: <http://ghc.ctc.edu/catalog/AStrack.htm>

Contact: Mohammad Ibrahim, mibrahim@ghc.ctc.edu

Fisheries

Degree granted: A.S.

Program Website: <http://ghc.ctc.edu/catalog/science.htm>

Contact: Mohammad Ibrahim, mibrahim@ghc.ctc.edu

Watershed Restoration

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://ghc.ctc.edu/catalog/programs2.htm#41>

Contact: admissions@ghc.edu

Watershed Assessment

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://ghc.ctc.edu/catalog/programs2.htm#41d>

Contact: admissions@ghc.edu

Natural Resources Management

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://ghc.ctc.edu/catalog/programs2.htm#41c>

Contact: rwenke@ghc.edu

Grays Harbor College

1620 Edward P. Smith Drive

Aberdeen, WA 98520-7599

Great Lakes Maritime Academy/ Northwestern Michigan College

Traverse City, MI

Deck Officer

Maritime Engineering

Maritime Power Plant Facilities Operator

Degree granted: A.A.S.

Program Website: <http://www.nmc.edu/maritime/programs/>

U.S. Naval Reserve/Merchant Marine Reserve (USNR/MMR) courses

Degree granted: Courses for working professionals

Program Website: <http://www.nmc.edu/maritime/programs/usnr-mm.html>

Contact: Jean Johnson, jjohnson@nmc.edu

Great Lakes Maritime Academy/Northwestern

Michigan College

1701 E. Front Street

Traverse City, MI 49686

Gulf Coast Research Laboratory University of Southern Mississippi

Ocean Springs, MS

The University of Southern Mississippi Gulf Coast Research Laboratory (GCRL), a unit of the School of Ocean and Earth Sciences within the College of Science and Technology, is a marine research and education enterprise sited in Ocean Springs, Miss., with a workforce of 200 faculty, researchers, graduate students and support staff. Research at GCRL focuses on sustainable coastal and

marine resources, development of new marine technologies, and the education of future scientists and citizens. Research is multidisciplinary and applications-oriented. Education opportunities span graduate degree programs in coastal sciences, undergraduate field courses in marine biology and hands-on discovery programs for precollege students and teachers. Research and education activities are conducted through one academic department and four centers at the GCRL:

- Department of Coastal Sciences,
- Center for Fisheries Research and Development,
- Gulf Coast Geospatial Center,
- J.L. Scott Marine Education Center, and
- Thad Cochran Marine Aquaculture Center.

Student Support: http://www.usm.edu/gcrl/coastal_sciences/scholarships.php

Program Website: http://www.usm.edu/gcrl/site_map/flash.php

Contact: <http://www.usm.edu/gcrl>

703 East Beach Drive,

Ocean Springs, MS 39564

Phone 228-872-4200, Fax 228-872-4204

Hampshire College

Amherst, MA

See Five Colleges, Inc.

Environmental Studies

Degree granted: Minor

Program Website: <http://essp.hampshire.edu/>

Contact: Robert Rakoff, rrakoff@hampshire.edu

Five College Coastal & Marine Sciences

Degree granted: General marine science courses

Program Website: <http://www.fivecolleges.edu/sites/marine>

Contact: Cindy Bright, Coordinator, marinesci@email.smith.edu

Hampton University

Hampton, VA

Marine & Environmental Science

Degree granted: B.S.

Program Website: <http://www.hamptonu.edu/academics/schools/science/marine/>

Contact: Dr. George P. Burbanck, george.burbanck@hamptonu.edu

Naval Science

Degree granted: B.S.

Program Website: http://www.hamptonu.edu/academics/schools/science/naval_sci/

Contact: hnrnotcrecruiter@odu.edu

Biology-Environmental Science

Degree granted: M.S.

Program Website: http://www.hamptonu.edu/academics/graduatecollege/degree_programs.htm

Contact: Dr. Elaine Eatman,
elaine.eatman@hamptonu.edu

Teaching-Marine Science

Degree granted: M.A.

Program Website: http://www.hamptonu.edu/academics/graduatecollege/degree_programs.htm

Contact: Dr. Martha Williams,
martha.williams@hamptonu.edu
Hampton University
Hampton, VA 23668

Harbor Branch Oceanographic Institution

Fort Pierce, FL

Experts in marine biology, oceanography, aquaculture, and biomedical marine research teach our intensive graduate and undergraduate courses, all of which are accredited by either Florida Atlantic University (FAU) or Florida Institute of Technology (FIT). FAU courses include "Semester by the Sea" for undergraduates; "Summer by the Sea" for undergraduate and graduate students; and two Fall FAU Courses. Our FIT summer courses are designed for graduate students and advanced undergraduates. In the spring semester of alternating years, we also offer a graduate-level course on "Biology of Tropical Marine Plants".



Photo courtesy of COSEE

Contact: Division of Marine Education, Harbor Branch Oceanographic Institution
5600 U. S. 1 North, Fort Pierce, FL 34946
Phone: 772-465-2400, x 500; Fax: 772-465-5743
E-mail: education@hboi.edu

Harvard University Cambridge, MA

Department of Earth and Planetary Sciences

Oceanography

Understanding our planet will be a fundamental challenge for the scientific community over the next century. Almost every practical aspect of society—population, environment, economics, politics—is and will be increasingly impacted by our relationship with the Earth. Facing these challenges requires approaches that transcend the boundaries of a traditional "geology" department; the Department of Earth and Planetary Sciences (EPS) uses an integrative scientific approach that encompasses and includes many aspects of physics, chemistry, astronomy, and biology.

In addition to the collaborative exchange with other Harvard departments such as astronomy, chemistry and chemical biology, organismic and evolutionary biology, and the Division of Engineering and Applied Sciences, EPS has reciprocal arrangements with Massachusetts Institute of Technology and the Woods Hole Oceanographic Institution for graduate students to take and receive credit for courses.

The laboratories, libraries, and lecture rooms of the Department of Earth and Planetary Sciences are housed in the University Museum and in the David and Arnold Hoffman Laboratory of Experimental Geology. The Division of Engineering and Applied Sciences is housed in Pierce Hall, across Oxford Street from the Hoffman Laboratory. The seismograph station is at the George R. Agassiz Station of the Astronomical Observatory in Harvard, Massachusetts, about 25 miles west of Cambridge. Laboratory facilities are available for radiogenic and stable isotope geochemistry, trace element geochemistry, geophysics, X-ray diffraction analysis, mineral analysis with an automated electron microprobe, spectroscopy, scanning and transmission electron microscopy, and sedimentology. The specimen collections in mineralogy, petrology, paleontology, and mining geology are among the best in the world.

Study in the various branches of oceanography can be done in Biology, Engineering Sciences and Applied Physics, or Earth and Planetary Sciences. Please visit the fol-

lowing websites for more information. <http://www.oeb.harvard.edu> <http://www.seas.harvard.edu> <http://www.eps.harvard.edu>

Degree granted: B.A. and Ph.D.

Faculty: Michael B. McElroy, Gilbert Butler Professor of Environmental Studies (Chair); Heinrich D. Holland, Harry C. Dudley Professor of Economic Geology; James J. McCarthy, Alexander Agassiz Professor of Biological Oceanography in the Museum of Comparative Zoology; Allan R. Robinson, Gordon McKay Professor of Geophysical Fluid Dynamics; Daniel P. Schrag, John L. Loeb Associate Professor of the Natural Sciences

Program Website: <http://www.eps.harvard.edu/>

Contact: Krista Lester, lester@eps.harvard.edu
Harvard University
Cambridge, MA 02138

Hawaii Pacific University

Honolulu, HI

Master of Science in Marine Science

Other courses are offered at the affiliated Oceanic Institute, <http://oceanicinstitute.org/nav.ph>.

Degree granted: M.S.

Program Website: <http://www.hpu.edu/index.cfm?section=graduate8789>

Contact: Chris Winn, cwinn@hpu.edu; 808-236-5819
Hawaii Pacific University
1164 Bishop Street
Honolulu, Hawaii 96813

Hillsborough Community College

Tampa, FL

Aquaculture

Degree granted: A.S.

Program Website: <http://www.hccfl.edu/br/aquaculture/index.html>

Contact: Dr. Craig S. Kasper, ckasper@hccfl.edu.

Environmental Science Technology

Degree granted: A.S.

Program Website: <http://www.hccfl.edu/departments/floridastudies/dep.htm#ENVIRONMENTAL%20SCIENCE%20TECHNOLOGY>

Contact: webb@hccexchange.hccfl.edu

Advanced Water Treatment

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.hccfl.edu/depts/detp/dhp.html>

Contact: fwebb@hccfl.edu.

Hillsborough Community College
Dale Mabry Campus
P.O. Box 30030
Tampa, FL 33630-3030

Hocking College

Nelsonville, OH

Fish Management & Aquaculture

This program is for students primarily interested in seeking employment in fisheries management or fish propagation after acquiring their 2-year Associate Degree. Both public and private sector positions are available with this major. In the public sector, jobs include technical positions in state and federal fish and game agencies, while in the public sector, grads find jobs with commercial fish farms and aquatic consulting firms.

Degree granted: A.A.

Program Website: http://www.hocking.edu/academics/schools/natural_resources/fish_management_and_aquaculture/index.htm

Wildlife Management/Wildlife Sciences

Your choice of Wildlife majors depends on whether you intend to go on to complete a Bachelor of Science degree in a 4-year program after leaving Hocking College, or whether you plan to enter the job market upon completion of your 2-year degree from Hocking. The Wildlife Management Major is for students primarily interested in seeking employment in fish and wildlife careers after acquiring their 2-year Associate Degree. Most positions with Ohio County and State Parks, and the Ohio Division of Wildlife require a 2-year wildlife degree. The Wildlife Sciences Program is for students considering going on for a 4-year Bachelor's degree. Students in the "Science" major take additional hours of math, biology, and more transferable classes in Social Sciences that aid in transfer to another school. Upon completion of the "Science" major you will qualify for same 2-year degree positions as the "Management" major but will be better prepared to go on to a 4-year program. Most professional positions with the U.S. Forest Service, U.S. Park Service, and U.S. Fish and Wildlife Service require a 4-year degree, as do most state wildlife agencies outside Ohio.

Degree granted: A.A.

Program Website: http://www.hocking.edu/academics/schools/natural_resources/wildlife_management/index.htm

Ecotourism & Adventure Travel

Ecotourism focuses on environmentally sound, culturally sensitive, and economically sustainable enterprises. Each quarter focuses on developing skills and knowledge in a specific area: Biological Sciences, Environmental Issues, Outdoor Leadership, Wilderness Travel Skills, Natural History, Cultural Interpretation, Resource & Business Management, Assessment of Ecotourism-Related Ventures.

Degree granted: A.A.

Program Website: http://www.hocking.edu/academics/schools/natural_resources/ecotourism_and_adventure_travel/index.htm

Geographical Information and Global Positioning Systems (GIS/GPS)

Geographics technology involves using satellites and computers for outdoor technological applications such as mapping, environmental monitoring, land and facilities management, emergency planning, and transportation systems design. This program teaches you everything from managing, manipulating, analyzing and displaying geographically referenced data to environmental issues, wetlands determination, geology, land management and soils and much more. Students gain real-world experience by working with government agencies and businesses through practicum experience.

Degree granted: A.A.

Program Website: http://www.hocking.edu/academics/schools/natural_resources/gis-gps/index.htm

Contact: Darlene Tipple, tipple_d@hocking.edu
Hocking College
3301 Hocking Pky
Nelsonville, OH 45764



Teachers and scientists studying plankton samples during a COSEE Summer Institute. Photo courtesy of COSEE

Hofstra University

Hempstead, NY

Biology with concentration in Marine and Freshwater Biology

Degree granted: M.A.

Program Website: http://www.hofstra.edu/Academics/Graduate/Programs/GP_BIO/index_GP_BIO.cfm

Contact: biorlb@hofstra.edu

Biology

Degree granted: B.A.

Program Website: http://www.hofstra.edu/Academics/HCLAS/Biology/index_Biology.cfm

Contact: biology@hofstra.edu

Honolulu Community College

Honolulu, HI

Small Vessel Fabrication and Repair

Degree granted: A.A.

Marine Diesel Maintenance & Repair

Degree granted: Certificate-Bachelor's degree required

Marine Electricity & Electronics

Degree granted: Certificate-Bachelor's degree required

Marine Mechanics

Degree granted: Certificate-Bachelor's degree required

Marine Technologies Boat Maintenance and Repair (MARMR)

Degree granted: A.A.S.

Program Website: <http://libart.honolulu.hawaii.edu/mop/>

Contact: Dr. Kakkala Gopal, gopalk@hcc.hawaii.edu
Honolulu Community College
10 Sand Island Parkway
Honolulu, HI 96819

Humboldt State University

Arcata, CA

Environmental Resources Engineering

Degree granted: B.S.

Program Website: <http://www.humboldt.edu/~humboldt/programs/ere.html>

Contact: Elizabeth A. Eschenbach, Ph.D., ea1@humboldt.edu

Biology with focus in Marine Biology

Degree granted: B.S.

Program Website: <http://www.humboldt.edu/~humboldt/programs/biol.html>

Contact: advise@humboldt.edu

Oceanography

Degree granted: B.S.

Program Website: <http://www.humboldt.edu/%7Eocn/>

Contact: Dr. Greg Crawford,
greg.crawford@humboldt.edu

Physics with option in Oceanography Physics

Degree granted: B.S.

Program Website: <http://www.humboldt.edu/~catalog/programs/phyx.html>

Contact: rlt1@axe.humboldt.edu

Department of Fisheries Biology

Fisheries Biology: Marine Fisheries option

Humboldt State University offers a very strong program in natural resources and biological sciences, with special strengths in marine-related areas including marine fisheries, oceanography and marine biology.

Degree granted: B.S.

Facilities: On-campus facilities include a modern Wildlife and Fisheries building with specialized fisheries laboratories, including those for pathology and genetics, and a fish museum; a large boat storage building housing small boats, including an electrofishing boat; a 90-ft ocean-going instructional research vessel docked in Eureka, CA, 15 minutes south of campus; and a marine laboratory 15 minutes north of campus.

2007 Tuition: In-state residents: \$4,000; Out-of-State: \$14,000

Program Website: <http://www.humboldt.edu/~humboldt/programs/fish.html>

Contact: Dave Hankin, fish@humboldt.edu
Humboldt State University
Arcata, CA 95521
Phone: 707-826-3951

Humboldt State University Marine Lab Trinidad, CA

Biology, Oceanography, Fisheries, Wildlife, and Natural Resources

The primary mission of this marine laboratory is to support undergraduate and graduate students with wide-ranging opportunities to carry out their own independent research projects.

Degree granted: B.S. in Biology, Oceanography, Fisheries, and Wildlife; M.S. in Wildlife, Fisheries, Natural Resources and Biology.

Facilities: HSU ML is supplied with the typical equipment (analytic balances, centrifuges, etc.) and materials (glassware, microscopes, etc.) required for marine biology, fisheries, mariculture and oceanographic instruction and research. More specialized major instrumentation include: UV-Vis double beam spectrophotometer, Technicon Auto Analyzer, gas chromatograph, high-capacity liquid scintillation counter, laser particle analyzer, x-ray machine, freeze dryer, HPLC, electrophoresis set-ups, electrophysiological recording equipment, and several research-grade inverted and polarizing microscopes. New dissecting microscopes and a compound microscope with phase interference optics, fluorescence, and digital video and photomicrography capability are also available for faculty and students. Underwater video cameras (VHS, High -8, and digital), underwater still cameras (film and digital), and a Remotely Operated Vehicle (Deep Oceans: Phantom 300 XL, with 75m and 330 m umbilical) are available. The 120,000 gallon recirculating seawater system supplies seawater to the wet lab, classroom and wet research labs with high-quality, filtered, chilled seawater. The lab operates 12 small outboard boats and a 90-foot, ocean-going research vessel, the R.V. Coral Sea, a well equipped modern support vessel for all types of offshore projects. Many R.V. Coral Sea projects involve the collection of local marine fauna and flora that are then maintained at HSU ML.

Faculty: Eric Bjorkstedt, Ph.D., Adjunct Professor of Fisheries Biology and research scientist with NOAA Fisheries SW Science Center—fisheries oceanography, modeling; Jeffry C. Borgeld, Ph.D., Professor of Oceanography—geological and near-shore processes, Milton J. Boyd, Ph.D., Professor of Zoology—marine and benthic ecology; Sean F. Craig, Ph.D., Assistant Professor of Biology—invertebrate zoology, molecular ecology; Greg Crawford, Ph.D., Associate Professor of Oceanography—physical oceanography; John DeMartini, Ph.D., Professor Emeritus of Biology—invertebrate zoology, parasitology, science education; Hal Genger, M.S., Lecturer—oceanography and fish biology;

Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
for up-to-date education and scholarship information,
as well as a downloadable version of this Guide.

P. Dawn Goley, Ph.D., Associate Professor of Zoology—marine mammals and behavioral ecology; David G. Hankin, Ph.D., Professor of Fisheries and Interim Director, TML—fish population dynamics, marine fisheries management, sampling theory; Andrew Kinziger, Ph.D., Assistant Professor of Fisheries—ichthyology, phylogenetics; Edward Metz, Ph.D., Associate Professor of Zoology—vertebrate evolutionary genetics; Helen Mulligan, Ph.D., Adjunct Professor of Fisheries Biology—ecological genetics, larval fish development; Timothy J. Mulligan, Ph.D., Professor of Fisheries—ecology, life history and culture of marine fishes; Peter Nelson, Ph.D., Adjunct Professor (pending) of Fisheries Biology and Humboldt-Del Norte Marine Fisheries Advisor, U.C. Sea Grant—marine fisheries ecology and conservation; Susan Schlosser, M.S., Faculty Associate in Fisheries Biology and Humboldt-Menodino Marine Advisor, U.C. Sea Grant—sea urchin growth, nutrition, and reproduction; Frank J. Shaughnessy, Ph.D., Associate Professor of Botany—marine phycology, freshwater algae.

2007 tuition: In-state residents: \$1,923; Out-of-State: \$5,991

Program Website: <http://www.humboldt.edu/~marinelb/>

Contact: Scott Quackenbush,
quackenbush@humboldt.edu
Humboldt State University
HSU Marine Lab
PO Box 690
Trinidad, CA 95570
Phone: 707-826-3685

Ithaca College
Ithaca, NY

Biology with focus in Marine Biology

Affiliations with two programs have been formalized so that biology students can now take marine biology courses at other institutions and have them count toward their degree. Students can even take their IC financial aid with them! This program is administered through the Office of International Programs at Ithaca College. One program enables students to study coastal and estuarine systems and is offered through the Duke University Marine Laboratory via the Marine Sciences Education Consortium. The other program enables students to study the open ocean and is offered through the Sea Education Association.

Degree granted: B.S.

Program Website: <http://departments.ithaca.edu/biology/options/marinebio/>

Contact: intlprog@ithaca.edu
Ithaca College
Office of International Programs
214 Muller Center
Ithaca, NY 14850
Phone: 607-274-3306

Jackson State University
Jackson, MS

Biology Department

Biology with concentration in Marine Science

A student who intends to major in Marine Science is required to take courses that satisfy the Biology curriculum requirement, and an additional 14 hours of courses in Marine/Environmental sciences.

Degree granted: B.S.

Faculty: Paulinus Chigbu, Ph.D.; Patricia Duncan, Ph.D. (Research Associate); Michael Rigdon, B.S. (Technician).

Program Website: <http://www.jsu.edu/~sst/cset/marinescienceprogram.htm>

Contact: Dr. Paulinus Chigbu,
paulinus.chigbu@jsu.edu
Jackson State University
P.O. Box 8540
Jackson, MS 39217-1050
Phone: 601-979-3461

Environmental Science with concentration in Marine Science

More than ever, responsible decision-making in an age of global awareness requires more information on the environmental consequences of our actions. Decisions based on new information need to be global, cooperative and interdisciplinary if we are to chart a course toward a sus-



Ocean Observing Educator Institute co-sponsored by University of New Hampshire, Coastal Observing Center and Gulf of Maine Ocean Observing System.

tainable world. The MS Environmental Science Program helps provide the student with the tools and knowledge to ask the proper questions and helps provide acceptable answers. The Environmental Science Master's program is located academically in the Department of Biology and serves students in the School of Science and Technology. Objectives of this program are to provide an education that allows for greater opportunities in employment and further education in the diverse field of environmental science, particularly as the need relates to minorities and women; and to provide a cadre of trained individuals committed to using their environmental literacy toward the betterment of the environment and mankind.

Degree granted: M.S.

Program Website: <http://www.jsums.edu/~sst/cset/biology.htm>

Contact: Dr. Charles Rhyne, crhyne@stallion.jsums.edu
Jackson State University
P.O. Box 18540
Jackson, MS 39217-1050
Phone: 601-968-7062

Jacksonville State University

Jacksonville, AL
See Dauphin Island Sea Lab

Johns Hopkins University

Baltimore, MD

Earth and Planetary Sciences

A flexible undergraduate program in the Department of Earth and Planetary Sciences allows students to tailor their course of study to meet their interests and objectives. The department offers programs of study for majors, joint majors and minors in Earth and Planetary Sciences and in the Environmental Earth Sciences. Majors in the Earth and Planetary Sciences can follow one of the three tracks: geological sciences, geophysical sciences, or geoecology. Undergraduates are strongly encouraged to become involved in research with the faculty. Such research may be taken for credit, and may lead to the completion of a senior thesis. Advice for those who wish to become involved in research can be obtained from the Coordinator for Undergraduate Programs, Professor Dimitri A. Sverjensky (sver@jhu.edu). Students who major in this department often attend graduate or professional school and then go on to careers in academic institutions, natural resource-oriented industries, or government agencies.

Degree granted: B.S.

Program Website: <http://www.jhu.edu/eps/education/index.html#undergraduate>

Contact: Dimitri Sverjensky, sver@jhu.edu
Phone: 410-516-7135

Earth and Planetary Sciences: Oceans

The Morton K. Blaustein Department of Earth and Planetary Sciences offers programs of graduate study and research leading to Ph.D. and M.A. degrees in a wide range of disciplines, covering the Atmosphere, Biosphere, Oceans, Geochemistry, Geology and Geophysics, and Planets. Our graduate program is designed to give every student the training and the tools needed for independent research and a rewarding scientific career. The core of our program is a close working relationship between the graduate student and faculty members at the cutting edge of research, with an education and research program tailored to meet the particular goals of each student. Graduate students in Earth and Planetary Sciences are full members of our academic family. They receive financial support in the form of tuition fellowships, research and teaching assistantships, and special scholarships. They share offices in Olin Hall, have access to all laboratories and research facilities, participate in seminars, field trips, and other intellectual activities. An undergraduate degree and/or professional experience in the earth or planetary sciences is beneficial, but it is not a requirement for graduate admission to our department.

Degree granted: Ph.D.

Program Website: <http://www.jhu.edu/eps/education/index.html#graduate>

Contact: Haine Thomas, Thomas.Haine@jhu.edu
Johns Hopkins University
34th and North Charles Streets
Baltimore, MD 21218
Phone: 410-516-7135

**Kingsborough Community College
of the City University of New York**
Brooklyn, NY

Maritime Technology

Degree granted: A.A.S.

Program Website: <http://www.kbcc.cuny.edu/apdegree/KCCMARIN.HTM>

Contact: info@kbcc.cuny.edu

Biology with concentration in Marine Biology

Degree granted: A.S.

Program Website: <http://www.kingsborough.edu/apdegree/KCCBIO.HTM#>

Contact: Dr. Loretta DiLorenzo, ldilorenzo@kbcc.cuny.edu
Kingsborough Community College
2001 Oriental Blvd.
Brooklyn, NY 11235

Kutztown University of Pennsylvania

Kutztown, PA

Marine Science

Degree granted: B.S.

Program Website: <http://www.kutztown.edu/acad/marinescience/>

Contact: Albert Answini, answini@kutztown.edu

Lake Superior State University

Sault Ste. Marie, MI

Department of Biological Sciences

Fisheries and Wildlife Management

Fisheries and Wildlife Management programs place a strong emphasis on understanding the relationship between organisms and their habitats by blending a conceptual understanding of fish and wildlife ecology and population dynamics with practical skills obtained during laboratory and field exercises. Students graduating from this rigorous, applied curriculum can meet the qualifications of state and federal natural resource management agencies as technicians and biologists. These programs require completion of general education requirements and electives so that at least 125 credits are earned.

Degree granted: B.S.

Facilities: Aquatic Research Laboratory located on the St. Marys River houses a fish hatchery along with typical lab, computing, and optics space. Equipment includes boats, fish sampling gear (backpack electrofishing units, fyke nets, gill nets, sonic telemetry, etc.), and limnological equipment (Hydrolab minisondes, current velocity meters, plankton tows, ponar samplers, etc.).

Faculty: Dr. Thomas Allan, ornithology and bird ecology; Dr. Barbara Evans, fish physiology and genetics; Dr. Ashley Moerke, aquatic ecology and restoration ecology; Dr. John Roese, mammology and wildlife ecology; Dr. Geoffrey Steinhart, fisheries ecology and animal behavior.

2007 Tuition: In-state residents: \$3,588; Out-of-State: \$7,176

Program Website: <http://www.lssu.edu/degrees/degree.php?id=5067>

Contact: Ashley Moerke, amoerke@lssu.edu
Lake Superior State University
650 W. Easterday Ave
Sault Ste. Marie, MI 49783
Phone: 906-635-2153

Lincoln Memorial University

Harrogate, TN

Wildlife and Fisheries Management

LMU offers one of the nation's only bachelor's degree programs in wildlife and fisheries management. This highly unique program offers you the opportunity to prepare for an exciting career, not only in wildlife and fisheries management, but in an array of other fields focusing on natural resource conservation.

Degree granted: B.S.

Program Website: <http://www.lmunet.edu/academics/programs/wildlife.html>

Contact: Dr. John Copeland, john.copeland@lmunet.edu

Lock Haven University of Pennsylvania

Lock Haven, PA

Biology with Marine Biology Option

Career opportunities for marine biologists exist for individuals with all levels of education. Employers include state and federal government offices and laboratories, educational institutions, industries, magazines, book publishers, television, radio, legal firms, environmental societies, and many others. Lock Haven University is a member of the Wallops Island Marine Science Consortium (WIMSC).

Degree granted: B.S.

Program Website: http://www.lhup.edu/academic/acad_affairs/biologyreq.htm

Contact: sturec_info@lhup.edu

Loeb-Sullivan School of International Business & Logistics

Castine, ME

International Business

Each Loeb-Sullivan faculty member is fully invested in the highly successful educational and professional outcome of every student who attends this dynamic graduate program. Our faculty is dedicated to teaching and involved in unique and challenging research. Our faculty is always

available to mentor students and advise them on the expanding international employment opportunities and the global reach of maritime and portside supply chain management-related fields. Moreover, our faculty will share their real-world insights garnered while working in business, governmental agencies, regulatory bodies, and management development programs here in the United States and abroad.

Degree granted: M.S.

Program Website: <http://ibl.mainemaritime.edu/>

Contact: grdschl@mma.edu

Loeb-Sullivan School of International Business & Logistics
Castine, ME 04420-5000

Long Beach City College

Long Beach, CA

Electrical Technology

Degree granted: A.S.

Program Website: <http://elect.lbcc.edu>

Contact: Scott Fraser, sfraser@lbcc.edu

Long Beach City College

Electrical Dept. - R2

4901 E. Carson Street

Long Beach, CA 90808

Phone: 562-938-4505

Long Island University

Southampton, NY

Marine Science (B.S.)

Southampton Graduate Campus of Long Island University and the Marine Sciences Research Center of SUNY Stony Brook are widely recognized as leading institutions for providing undergraduate (LIU) and graduate (SUNY) degrees in Marine Science. A new dual program between Southampton Graduate Campus and SUNY Stony Brook is designed as a fast-track option to provide students a combination of coursework and research experience which will lead to Bachelor of Science in Marine Science from Southampton Graduate Campus of Long Island University and a Master Environmental Science from SUNY. Students will benefit from the strong undergraduate marine science program at Southampton, and renowned research facilities and expertise offered by the graduate program of the Marine Sciences Research Center (MSRC) at Stony Brook. Moreover, students will complete both degrees in an abbreviated time period.

Degree granted: B.S.

Marine Science (M.S.)

Southampton Graduate Campus has an internationally acclaimed Marine Science Program that attracts students from around the world. The marine and environmental programs have produced 34 Fulbright Scholars in the past 28 years. The College's unique seaside location, research vessels and on-campus marine station provide access to a variety of habitats, both coastal and oceanic. A dedicated faculty provides exciting off-campus learning opportunities through the Co-op and Internship Programs. Four Marine Science degree options are available: Marine Biology, Oceanography, Marine Vertebrate Biology, or Marine Chemistry. These programs provide a solid introduction to the fundamentals of science with specialized marine courses in your area of interest.

Degree granted: M.S.

Program Website: <http://www.southampton.liu.edu/academic/mprogram/natsci/marinsci/>

Contact: Christopher Gobler,
CGobler@southampton.liu.edu

Louisiana State University

Baton Rouge, LA

Coastal Ecology

Degree granted: M.S. and Ph.D.

Program Website: <http://www.ocean.lsu.edu/academics/minor.aspx>

Contact: Dr. Charles Sasser, csasser@lsu.edu

Coastal Fisheries

The Department of Oceanography and Coastal Sciences (DOCS) at LSU provides unique graduate-level M.S. and Ph.D. programs that focus on ecological and oceanographic processes extending from the coastal zone to the deep ocean. DOCS is a component of the School of the Coast and Environment (SC&E). Our department contains four research institutes that reflect our strengths in the fields of coastal ecology, coastal fisheries, wetland soils and vegetation, and physical and geological oceanography. Our department is interested in recruiting highly qualified graduate students who can benefit from our interdisciplinary perspectives. The overarching theme of our graduate courses and research is understanding and predicting ecological changes across gradients that extend from coastal areas across the continental shelf. DOCS graduate students benefit from academic and research programs that draw from faculty expertise in physical, biological, geological and chemical oceanography and ecology. Compared to many other American institutions, LSU has a tremendous advantage in oceanography and coastal

sciences. Our proximity to the Mississippi River Delta, extensive estuaries and coastal wetlands, and abundant natural resources combined with the quality of our faculty and students are unrivalled. DOCS is nationally recognized as a center for research on deltaic wetland ecology, sedimentary geology, stratigraphy, sediment transport and coastal ecology. Our research program brings in over \$5.4 million in external funding to LSU. We are the primary university user of the State of Louisiana's excellent marine laboratory (LUMCON).

Degree granted: M.S. and Ph.D.

Program Website: <http://www.ocean.lsu.edu/academics/minor.aspx>

Contact: Donald Baltz, dbaltz@lsu.edu

Coastal Studies

Degree granted: M.S. and Ph.D.

Program Website: <http://www.ocean.lsu.edu/academics/minor.aspx>

Contact: Masamichi Inoue, coiino@lsu.edu

Wetland Biogeochemistry

Established in 1977, the LSU Wetland Biogeochemistry Institute investigates chemical and ecological interactions in marshes, mangroves, swamps, and flood plains of deltaic coastal settings. Research topics include chemical and biological behavior of plant nutrients and toxic substances in wetlands to understand structure and function of coastal ecosystems. The environmental impacts of plant nutrients, pesticides, toxic heavy metals, and hydrocarbons in wetlands are areas of faculty expertise. Current research includes studies on the processing of primary nutrients in coastal ecosystems (including sources and sinks), response of wetland plants to various environmental stressors such as anaerobic soil conditions and salinity, factors affecting the biodegradation of petroleum hydrocarbons and toxic synthetic organic compounds in wetlands, and physiochemical reactions of toxic metals in soils and sediment-water systems affecting their mobility and biological activity. Other important current research activities include comparative ecosystem ecology of wetlands, and chemical, physical, and biological factors affecting coastal marsh instability, including strategies for effective wetland restoration. In addition to University support, the institute receives grant and contract funding from various federal and state agencies and private industry.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.sc&e.lsu.edu/wbi/>

Contact: Robert R. Twilley, rtwilley@lsu.edu

Oceanography and Coastal Sciences

Degree granted: Minor

Program Website: <http://www.ocean.lsu.edu/academics/minor.aspx>

Contact: DeWitt Braud, dbraud1@lsu.edu

Wetland Science and Management

Degree granted: M.S.

Program Website: <http://www.environmental.lsu.edu/acadDegWSM.html>

Contact: Dr. Larry Rouse, lrouse@lsu.edu

Louisiana State University

Baton Rouge, LA 70803

Louisiana Tech University

Ruston, LA

Wildlife Conservation

The profession of wildlife management promotes the scientific management of wildlife populations and habitat. Although many wildlife biologists are interested in hunting and fishing, participation in the profession requires a deeper understanding of ecological principles and heightened appreciation of all environmental factors influencing wildlife habitats. Today's wildlife manager faces issues as varied as wetland habitat delineation, endangered species conservation, economics of land-leasing, habitat management for biological diversity, and the ethics of consumptive wildlife use. Tech's wildlife program is unique. No other university in North Louisiana offers a wildlife degree. Class sizes are small with fewer than 25 students in most upper division science classes. Each student is assigned a faculty advisor; dedicated faculty provide a personal touch that fosters successful academic and professional achievement. Graduates meet the requirements to become a certified wildlife biologist by the Wildlife Society. Certification is used as a hiring standard by some governmental employers.

Degree granted: B.S.

Facilities: Louisiana Tech is equipped with several Internet accessible computer labs and a state-of-the-art global positioning system laboratory. Radio-telemetry systems are used in teaching and research to track animal movements. An 80,000 specimen vertebrate museum and 100,000 specimens are available for teaching and research. The nearby Jackson-Bienville Wildlife Management Area along with numerous agricultural and timber tracts managed by Tech provide ample opportunities for field activities. Field experience is an integral part of wildlife education. The close proximity of North Louisiana's rich and varied environs and Tech's positive relationships

with state and federal wildlife management agencies and private industries provide a unique opportunity for “hands-on” field experience. Student participation in classes at the Marine Gulf Coastal Lab (LUMCON) and internships with state and federal wildlife agencies enhance the learning environment and promote successful employment after graduation.

Program Website: <http://ans.latech.edu/forestry-wildlife.html>

Contact: James G. Dickson, Ph.D.,
jdickson@ans.latech.edu
Louisiana Tech University
Ruston, LA 71272

Louisiana Technical College

Morgan City, LA

Commercial Diving

The purpose of the Commercial Diving program is to provide classroom instruction and practical experience to prepare students for entry-level employment in the commercial diving industry. The Commercial Diving program provides individuals with the knowledge necessary to understand the physics and physiology of hyperbaric environments as well as hands-on experience in areas such as equipment maintenance and equipment operations. Students perform actual underwater work similar to that done routinely by divers in oilfield operations. The program emphasizes safe and efficient work practices, basic occupational skills, and employability skills. The content is organized into competency-based courses that specify occupational competencies which the student must successfully complete.

Degree granted: Certificate-Bachelor's degree not required

Facilities: Three steel practice tanks and dock-side diving.

Faculty: Roger Thacker - Coastal School of Deep Sea Diving, Jerry Shepherd - College of Oceaneering

2007 tuition: In-state residents: \$1,200, Out-of-State: \$1,800

Program Website: <http://www.ltc.edu/curriculum/ProgramDetails.asp?id=14&name=Commercial%20Diving&nbr=490304&type=Cert>

Contact: Laurie Morrow, laurie.morrow@ltc.edu
Phone: 985-380-2436 ext. 206

Marine Operations

The purpose of this program is to provide specialized classroom instruction and practical training to prepare students to obtain various documents, licenses, and endorsements issued by the United States Coast Guard (USCG) and the Federal Communications Commission (FCC). These

credentials are required for a variety of jobs in the field of marine operations. The program prepares individuals to obtain credentials for employment on inland, near-coastal, and ocean-going vessels. It also assists individuals who wish to upgrade their credentials. The program provides instruction in subjects associated with marine safety, including seamanship, emergency procedures, communications, navigation, watchkeeping, and maritime law. The program emphasizes safe and efficient work practices and basic occupational skills. Program content is organized into competency-based courses that the student must successfully complete. These occupational competencies are derived from industry and certification standards. They are essential to achieving success in the marine industry. The Marine Operations program comprises individual programs related to a specific certification in the marine industry. For licensing and/or certification, students must meet certain requirements including proof of age and U.S. citizenship, character references, documentation of work experience on vessels, and physical standards including drug screens.

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.ltc.edu/curriculum/ProgramDetails.asp?id=47&name=Marine%20Operations&nbr=490309&type=Cert>

Contact: Earl Bouton Jr., ebouton@theltc.net

U.S. Coast Guard-Approved courses

Degree granted: Courses for working professionals

Program Website: <http://www.youngmemorial.com/marine.htm>

Contact: Earl Bouton Jr., ebouton@theltc.net
Louisiana Technical College
P.O. Drawer 2148
Morgan City, LA 70381

Louisiana Universities

Chauvin, LA

Louisiana Universities Marine Consortium (LUMCON)

LUMCON provides coastal laboratory facilities to Louisiana universities, and conducts research and educational programs in the marine sciences. LUMCON is uniquely situated within the coastal landscape and is close to the Mississippi and Atchafalaya rivers. LUMCON's research programs span coastal and marine systems from the freshwater end of Barataria Bay, across the coastal ocean and its intersection with the Mississippi River, to the open Gulf of Mexico, and across the global ocean. Part of our mission is to increase society's awareness of important

Louisiana coastal issues. Our educators provide excellent educational experiences for all ages to further the understanding of the natural and human-influenced processes underpinning the landscape and resources of coastal Louisiana. We also conduct university classes and educate graduate students.

The education program includes activities at the University, K-12, and Public Education levels to provide many audiences with field experiences and information about marine environments. LUMCON offers introductory and upper-level summer undergraduate courses which alternate between even and odd years in June and July. Graduate credit can be earned for upper-level courses. LUMCON also offers specialized classes, such as "Coastal Landscape Photography." In addition, internships give qualified undergraduate students the opportunity to work and learn at an active marine research station. LUMCON offers a spring semester course via state-wide Compressed Video network.

Degree granted: LUMCON is not a degree granting institution. The credits awarded for the courses taken at LUMCON accrue to the home institution. The LUMCON faculty train graduate students who are enrolled at member institutions.

Facilities: LUMCON's primary facilities are located at the DeFelice Marine Center in Cocodrie, approximately 85 miles southwest of New Orleans. The Marine Center is a modern, 75,000 square foot complex of research, instructional, housing, and support facilities. The Center includes 26,000 net usable square feet of laboratory, classroom, office, and library space. Eight laboratories are equipped with running sea water. Six additional laboratories are reserved for dry applications and instrumentation and are used for both research and teaching. A network of micro-computers and peripherals link users throughout the Center. Access to mainframe computers on the campuses of Consortium member institutions is provided via a T1 link. To provide additional access to special environments, a field station is maintained at Port Fourchon. Dormitory rooms and five apartments provide housing for up to 80 persons and are available for use by students, visiting investigators, and instructors. A cafeteria/general meeting room is situated in the center of the complex, linking the housing and research/instructional spaces. A 99-seat auditorium facilitates teaching activities, presentation of seminars, and the convening of conferences. LUMCON is a member of UNOLS and operates the R/V Pelican, a 116 ft. coastal research vessel intended for use on the continental shelf in the Gulf of Mexico, Caribbean, and Western Atlantic. The 58 ft. R/V Acadiana is available for short trips offshore and extended cruises in coastal bays, rivers and estuaries, and there are a number of small boats for use in the lakes, bays, and sounds of Louisiana.

Faculty: Dr. Edward Chesney - fisheries and fish ecology especially as they relate to the early life history or larval stages of fish; Dr. Michael Dagg - zooplankton processes in the ocean: as a control on phytoplankton production, as food for higher trophic levels; and as mediators of vertical flux; Dr. Rodney Powell - trace metal speciation (colloids, redox state, organic complexation) and how it affects metal cycling and bioavailability in estuarine and coastal systems; Dr. Nancy Rabalais - biological oceanography-continental shelf ecosystems influenced by large rivers, benthic ecology, distribution and dynamics of hypoxia, eutrophication, environmental effects of habitat alterations; Dr. Brian Roberts - ecosystem ecology and biogeochemistry, human-induced environmental impacts on aquatic ecosystems, and restoration ecology; Dr. Paul Sammarco - larval dispersal and recruitment processes in corals, particularly as they pertain to the continuum from highly localized dispersal and recruitment to distant dispersal.

Student Support: Tuition and fees for courses are paid to the home institutions. LUMCON provides summer program scholarships for room and board and internships for stipend, room and board.

Program Website: <http://www.lumcon.edu>

Contact: Dr. Nancy N. Rabalais, nralais@lumcon.edu
Louisiana Universities
LUMCON
8124 Hwy. 56
Chauvin, LA 70344
Phone: 985-851-2801

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Maine Maritime Academy

Castine, ME

Marine Systems Engineering

Marine Systems Engineering integrates systematic principles used in mechanical engineering design with hands-on operations of industrial scale equipment, especially of systems used in the marine vehicle and industrial power fields.

Degree granted: B.S.

Program Website: <http://www.mainemaritime.edu/academics/index.php?c1=Academics&c2=MSE>

Contact: jeffwright@mma.edu

Small Craft Design

Program prepares highly trained and skilled graduates for the thriving yacht and small craft design industry. Students attend MMA first year, enrolled in introductory-level courses in seamanship, science, math, and general education classes to fulfill Associate of Science degree.

Year two, students attend a rigorous 10-month Design program at the Landing School, Kennebunkport, ME. The Landing School was established in 1978 as a post-secondary institution dedicated to providing the highest quality vocational education in boatbuilding and design. There is a required co-operative work experience between the first and second years. Participation in the Regiment of Midshipmen is optional.

Degree granted: A.S.

Program Website: <http://www.mainemaritime.edu/academics/index.php?c1=Academics&c2=SCD>

Contact: jeffwright@mma.edu

Marine Engineering Operations

Concerned primarily with the operation and maintenance of marine and industrial steam and diesel power plants and with related electrical and refrigeration plants. Classroom studies are closely coordinated with practical shipboard experience and in laboratories. Successful completion of the program leads to the Bachelor of Science Degree and, after passing a federal examination, a USCG Third Assistant Engineer's license. Students majoring in this program may also enroll in any of the minor programs offered at the college. Graduates of this program are also eligible to apply for a Maine third-class stationary power plant operator's license. Graduates gain employment with shipping firms throughout the world, and by power generation and energy production companies. Participation in the Regiment of Midshipmen is required. Our Loeb-Sullivan School of International Business & Logistics offers a special 4 + 1 option for obtaining a Master of Science degree for MMA graduates. Regardless of major, MMA B.Sc. degree recipients may apply to the Loeb-Sullivan graduate school for a one-year fast track to an advanced degree.

Degree granted: B.S.

Program Website: <http://www.mainemaritime.edu/academics/index.php?c1=Academics&c2=MEO>

Contact: jeffwright@mma.edu

Marine Engineering Technology

Includes all of the practical shipboard experience and most of the required courses of the Marine Engineering Operations program, with additional required courses in mathematics, writing and communications, and technical sciences. Graduates gain employment in many areas of the maritime industry, both at sea and ashore, as well as in non-maritime industries such as public utilities and manufacturing. Successful completion of the program leads to the Bachelor of Science Degree and, after passing a federal examination, a USCG 3rd Assistant Engineer's license. Graduates of this program are also eligible to apply for a Maine third-class stationary power plant operator's license.

Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology ("TAC of ABET"). Participation in the Regiment of Midshipmen is required. Our Loeb-Sullivan School of International Business & Logistics offers a special 4 + 1 option for obtaining a Master of Science degree for MMA graduates. Regardless of major, MMA B.Sc. degree recipients may apply to the Loeb-Sullivan graduate school for a one-year fast track to an advanced degree.

Degree granted: B.S.

Program Website: <http://www.mainemaritime.edu/academics/index.php?c1=Academics&c2=MET>

Contact: jeffwright@mma.edu

Power Engineering Technology

Program is based on the body of knowledge inherent in Marine Engineering Operations, but is oriented toward the shore-side power industry rather than marine power plants. Includes additional studies in writing and communications, mathematics, and technical sciences. Students are required to participate in approved industrial co-op programs in shore-side power plants. Students may elect to join the First Year Cruise following successful completion of their first year, provided they meet academic and practical prerequisites. Graduates of this major are eligible to sit for the state of Maine Third Class Engineer (stationary plant engineer) license. Graduates gain employment in power generation and related industries throughout the eastern United States. Accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology ("TAC of ABET"). Our Loeb-Sullivan School of International Business & Logistics offers a special 4 + 1 option for obtaining a Master of Science degree for MMA graduates. Regardless of major, MMA B.Sc. degree recipients may apply to the Loeb-Sullivan graduate school for a one-year fast track to an advanced degree. Participation in the Regiment of Midshipmen is optional.

Degree granted: B.S.

Program Website: <http://www.mainemaritime.edu/academics/index.php?c1=Academics&c2=PET>

Contact: jeffwright@mma.edu

Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
for up-to-date education and scholarship information,
as well as a downloadable version of this Guide.

Marine Transportation Operations

Curriculum is organized to develop those skills and abilities which are necessary in pursuing a professional career at sea. Classroom studies are closely coordinated with practical shipboard experience and in laboratories. Students majoring in this program may also participate in any minor programs. Successful completion of this program leads to a Bachelor of Science Degree and the opportunity to sit for the USCG 3rd Mate's license. Participation in the Regiment of Midshipmen is required. Our Loeb-Sullivan School of International Business & Logistics offers a special 4 + 1 option for obtaining a Master of Science degree for MMA graduates. Regardless of major, MMA B.Sc. degree recipients may apply to the Loeb-Sullivan graduate school for a one-year fast track to an advanced degree.

Degree granted: B.S.

Program Website: <http://www.mainemaritime.edu/academics/index.php?c1=Academics&c2=MTO>

Contact: jeffwright@mma.edu

Small Vessel Operations

Curriculum is designed to prepare students for positions of responsibility in the operation and management of a variety of vessels from yachts to small commercial craft. The schooner *Bowdoin* is the flagship and primary training vessel for the program. Organized in a two-plus-two format: four academic semesters (two years) plus a co-operative work experience during the summer following the first year lead to an Associate of Science degree; four additional academic semesters (two years) plus two additional cooperative work experiences lead to a Bachelor of Science degree. A license track leads to a USCG 200 ton mate, near coastal, (up to 200 miles offshore) license (associate degree program) and 500 ton mate, near coastal license (bachelor degree program). Our Loeb-Sullivan School of International Business & Logistics offers a special 4 + 1 option for obtaining a Master of Science degree for MMA graduates. Regardless of major, MMA B.Sc. degree recipients may apply to the Loeb-Sullivan graduate school for a one-year fast track to an advanced degree. Participation in the Regiment of Midshipmen is optional.

Degree granted: B.S.

Program Website: <http://www.mainemaritime.edu/academics/index.php?c1=Academics&c2=SVO>

Contact: jeffwright@mma.edu

Marine Biology

The Corning School offers separate majors leading to the Bachelor of Science in Marine Biology or in Marine Science. The first year of both programs is similar, allowing

students to switch between the majors while completing necessary foundation courses in the sciences. Students in both majors can complete minors (see the College Catalog for a list of minors and requirements) as part of the normal degree program, and can qualify for the Secondary Science Teaching Option. Marine Science majors can also elect a concentration in Marine Biology. Marine Biology builds a general foundation in the sciences and an advanced understanding of the biology of marine organisms. The latter develops through studies of genetics, microbiology, physiology, botany, and ecology, plus electives in animal behavior, fish, development of organisms, marine invertebrates and other topics. At the core of the Marine Biology major is a hands-on focus. Labs are central to most courses. Frequent experimentation and, often, study at sea and in the field are required. These offer great opportunities to develop good technical and problem-solving skills, to communicate data and ideas, and to think critically about the natural world. Graduates of this program work in marine-related careers such as aquaculture, aquarium management, laboratory research, fisheries observation, and public education, and can go on to graduate school in biology, aquaculture, oceanography and other fields.

Degree granted: B.S.

Program Website: <http://oceans.mma.edu/BSMB.htm>

Marine Science

See *Marine Biology Program description above*. Marine Science majors can also elect a concentration in Marine Biology. Marine Science encompasses the biology, chemistry, geology, and physics of the ocean environment. To learn one requires knowledge of the others, and of their interactions. Marine Science graduates are truly "interdisciplinary". Their broad training in the sciences leads to careers as scientists, teachers, marine and laboratory technicians, and more. The interdisciplinary Marine Science perspective affords many career and advanced study options. Marine Science majors learn by doing. Labs put classroom ideas into practice. Research cruises to nearby waters require learning to operate a great variety of modern oceanographic equipment. Cruise data and field samples are studied in class. By spring of their junior year, Marine Science majors acquire the skills to design individualized, two-semester research projects.

Degree granted: B.S.

Program Website: <http://oceans.mma.edu/BSMS.htm>

Contact: Dr. Ann Cleveland, acleveland@mma.edu

Maine Maritime Academy

101 Dirigo Hall

Castine, ME 04220

Marine Mechanics Institute of the Universal Technical Institute

Orlando, FL

Marine Volvo-Penta

In this Volvo Penta of the Americas-supported course, learn about Volvo Penta's diesel, inboard, outboard, gasoline sterndrive and diesel sterndrive engines. Perform set-up and maintenance tasks on these engines as well as on Volvo Penta drive systems, and much more.

Degree granted: Certificate-Bachelor's degree not required

Marine Honda

First, identify the various models of Honda four-stroke outboard motors. Learn about Honda outboard warranty policy and factory Honda outboard special tools. Troubleshoot Honda's DC-CDI and TMI ignition systems, and much more.

Degree granted: Certificate-Bachelor's degree not required

Marine Yamaha

Gain a solid understanding of Yamaha Motor Corporation products. Begin by identifying Yamaha outboard motors and performing rigging procedures. Inspect, maintain and troubleshoot Yamaha fuel systems (carburetors, Electronic Fuel Injection and High Pressure Direct Injection), oil-injection systems, and more.

Degree granted: Certificate-Bachelor's degree not required

Mercury Marine

Gain the knowledge and experience necessary to become an entry-level technician in the Mercury Marine dealer network. Mercury Marine equips with current outboard and MerCruiser products. Discover Mercury's method of service administration, and more.

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.uticorp.com/go/schools/mami/programs/>

Contact: FAdept-uticentral@uticorp.com

Marine Science Consortium, Inc.

Wallops Island, VA

The Marine Science Consortium is a nonprofit educational corporation comprising regional universities and colleges. The Consortium is committed to excellence in education and research in the marine and environmental sciences. This commitment is realized in programs for undergraduate, graduate, pre-college, and continuing

education students. The Marine Science Consortium is a cooperative educational venture, where Member Institutions pool resources to offer courses and to provide facilities to students from all Member Institutions. The Consortium maintains the Wallops Island Marine Science Center, a residential marine field station near Chincoteague and Assateague Islands in Virginia, where both field and laboratory investigations of coastal ecosystems are conducted under the supervision of university faculty and qualified marine education instructors. The Consortium participants include:

Bloomsburg University of Pennsylvania

California University of Pennsylvania

East Stroudsburg University

Kutztown University

Lock Haven University

Millersville University

Saint Francis University

Shippensburg University

Slippery Rock University

Virginia Space Flight Academy

Wesley College

West Virginia University

Wilkes University

York College of Pennsylvania

Program Website: <http://www.msconsortium.org/index.html>

Contact: mscva@msconsortium.org

The Marine Science Consortium

7278 Enterprise St.

Wallops Island, VA 23337

Phone: 757-824-5636

Maritime Institute, Inc.

San Diego, CA

Captain's Course for U.S. Coast Guard Master's License

Degree granted: Courses for working professionals

Program Website: <http://www.maritimeinstitute.com/Courses/index2.html>

Contact: info@maritimeinstitute.com

Maritime Institute, Inc.

1310 Rosecrans Street, Suite G

San Diego, CA 92106

**Maritime Institute of Technology
and Graduate Studies**
Linthicum, MD

**Marine License Advancement
Weather**

**Marine Safety & Security
Military Sealift Command**

Degree granted: Courses for working professionals

Shipboard Medical

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.mitags.org>

Contact: Diane Ford, dford@mitags.org

Massachusetts Institute of Technology
Cambridge, MA

Physical Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://web.mit.edu/mit-who/academic/po/index.html>

Contact: mit-who-www@mit.edu

Mechanical and Ocean Engineering

Degree granted: B.S.

Program Website: <http://meche.mit.edu/academic/undergraduate/course2oe/>

Contact: mehq@mit.edu

Ocean Engineering

Naval Engineering

Naval Architecture and Marine Engineering

Degree granted: M.S.

Program Website: <http://meche.mit.edu/academic/graduate/>

Contact: mehq@mit.edu

Biological Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://web.mit.edu/mit-who/academic/bo/index.html>

Contact: mit-who-www@mit.edu

Chemical Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://web.mit.edu/mit-who/academic/co/index.html>

Contact: mit-who-www@mit.edu

Marine Geology and Geophysics

Degree granted: M.S.

Program Website: <http://web.mit.edu/mit-who/academic/mgg/index.html>

Contact: mit-who-www@mit.edu

Massachusetts Institute of Technology

Cambridge, MA 02139-4307

**Massachusetts Institute of Technology/
Woods Hole Oceanographic Institution**
Cambridge, MA

Academic Programs Office

Joint Degree in Oceanography

The MIT-WHOI Joint Program is one of the premier marine science programs in the world. It draws on the complementary strengths and approaches of two great institutions: the Massachusetts Institute of Technology (MIT) and the Woods Hole Oceanographic Institution (WHOI). Choose from one or more areas of research from among MIT/WHOI Joint Program's disciplines: Applied Ocean Science and Engineering, Biological Oceanography, Chemical Oceanography, Marine Geology and Geophysics, and Physical Oceanography.

Degree granted: Ph.D.

Facilities: The field research opportunities in the Joint Program are also world-class. WHOI supports one of the largest research fleets in the United States, including Atlantis, one of the nation's newest research vessels, and Alvin, a deep sea submersible. Using these resources, the Joint Program offers unparalleled opportunities for going to sea.

Faculty: To guide students in their academic preparation, the MIT/WHOI Joint Program faculty is organized around five basic science and engineering disciplines. Applicants who know that their interests and experience lie principally within one of these disciplines may indicate this on their application under "Area of Research." Applied Ocean Science and Engineering Keywords: fluid mechanics, acoustics, vehicles, instruments; Biological Oceanography Keywords: phytoplankton, zooplankton, microbial ecology, marine mammals, environmental toxicology, larval ecology, benthic ecology, mathematical ecology, population genetics, microbiology, fish ecology, biogeochemistry; Chemical Oceanography Keywords: air-sea exchange, atmospheric chemistry, biogeochemistry, carbon cycle science, environmental chemistry, geochemistry, global change, ocean tracers, radiochemistry; Marine Geology and Geophysics Keywords: seafloor volcanic, tectonic and hydrothermal processes, mantle dynamics, ocean crustal

structure, continental rifting, paleoceanography, paleo-climatology, coastal processes; Physical Oceanography
Keywords: physics, fluid dynamics, applied mathematics, observations, theory, modeling, ocean circulation, climate.

Student Support: Students admitted to the MIT/WHOI Joint Program pursuing a doctoral degree receive a stipend and paid tuition. This full funding can last for up to five years, while they continue to make satisfactory academic progress. All applicants and students are encouraged to apply for outside fellowships. Information about the funding structure and fellowship opportunities can be found at <http://web.mit.edu/mit-who/missions/finaid.html>.

Program Website: <http://web.mit.edu/mit-who/www/academics/mgg/index.html>

Contact: education@who.edu

Massachusetts Institute of Technology/Woods Hole
Oceanographic Institution
Cambridge, MA 02139-4307
Phone: 508-289-2219

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Medical University of South Carolina Charleston, SC

Marine Biomedicine and Environmental Sciences

Marine Biomedicine and Environmental Sciences (MBES) is an academic center of the Medical University of South Carolina providing a multidisciplinary program of graduate education and basic research. Mission: To investigate the reciprocal relationships of organisms and their marine environment using modern molecular, biochemical, and cell biological techniques. Emphasis is placed on aspects of human health and disease.

Degree granted: Ph.D.

Program Website: <http://www.musc.edu/mbes/home.htm>

Contact: Eric R. Lacy Ph.D., lacyer@musc.edu

Medical University of South Carolina
Charleston, SC 29425



Undergrad and graduate science students learn to teach K-12 ocean science. Photo courtesy of COSEE:California.

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Memorial University of Newfoundland St. John's, Newfoundland, Canada

Marine Institute

Marine Studies (Fisheries Resource Management)

The Program consists of 21 credit hours which will normally consist of courses in Fisheries Ecology, Quantitative Methods in Fisheries, Fisheries Economics, Fisheries Policy, Fisheries Planning and Development, Business Management for Fisheries, Evolution of Fisheries, and Seminar in Fisheries Management; a seminar course; and a major report. Each course will normally be offered only once in an academic year, with four courses offered in the fall semester and four, including the seminar course, offered in the winter. Candidates are expected to undertake and complete the work required for the report in the summer semester. Those admitted as full-time students at the beginning of an academic year in September will normally complete all requirements for the Program, including the report, by the end of that academic year (the following August). A waiver of a program course may be granted by the Dean of Graduate Studies on the recommendation of the Program Committee if the student can demonstrate that the material in the course has been substantially covered by a course taken at this or another recognized university. In such cases, the course must be replaced in the candidate's program by another course at Memorial chosen in consultation with, and approved by, the Program Committee. This replacement course must be taken during the student's period of enrolment in the program.

Degree granted: M.S.

Program Website: <http://www.mi.mun.ca/mms/courses.htm>

Contact: Dr. Peter Fisher, peter.fisher@mi.mun.ca

Integrated Coastal and Ocean Management

The Marine Institute Advanced Diploma in Integrated Coastal and Ocean Management allows graduates of degree and diploma programs to specialize in the multidisciplinary elements associated with integrated coastal zone and ocean management. The program of study focuses on the bio-ecological, socio-economic, cultural and technological elements of coastal zone development and management. Graduates gain an integrated view of the issues and alternative solutions to the conflicts which may arise from multiple uses of coastal zones. They will be familiar with methods and tools for working with various constituents in the use and management of coastal zone and ocean areas. The focus is to support and facilitate the sustainable development of these regions

and the resolution of complex issues with decision makers, planning agencies, community agencies and other constituents.

Degree granted: Certificate-Bachelor's degree required
Program Website: http://www.mi.mun.ca/webcalendar/prog_advdp_coastal.htm
Contact: admissions@mi.mun.ca

Water Quality

The Program, which can be completed in three 13-week academic terms, consists of a balance of theory and practical applications through lectures, discussion seminars, case studies, laboratory, field trips and projects. The third term consists of a work term.

Degree granted: Certificate-Bachelor's degree required
Program Website: http://www.mi.mun.ca/webcalendar/prog_advdp_water.htm
Contact: admissions@mi.mun.ca

Marine Diesel Mechanics

The Marine Diesel Mechanics Program prepares students for a career in the operation and maintenance of marine diesel engines and auxiliary equipment found on marine vessels or offshore drilling installations. The Program lays the foundation for a student to eventually become a practicing marine engineer after required sea time is obtained. This Program is also an excellent foundation for those seeking positions in shore-based marine industry as technicians (Fitters) involved in the installation and servicing of marine systems or in the area of marketing associated equipment.

Degree granted: Certificate-Bachelor's degree required
Program Website: http://www.mi.mun.ca/webcalendar/prog_voc_marine_diesel.htm
Contact: admissions@mi.mun.ca

Offshore Structural Steel/Plate Fitter

This ten-month vocational certificate program is designed: to provide a theoretical and practical education in fitting and welding related to offshore construction and fabrication; to enable students to comply with safety standards, quality assurance, and production requirements related to offshore construction and fabrication; to prepare students for employment in offshore construction, fabrication and related industries.

Degree granted: Certificate-Bachelor's degree required
Program Website: http://www.mi.mun.ca/webcalendar/prog_voc_offshorestructural.htm
Contact: admissions@mi.mun.ca

Vocational Certificate-Bridge Watch Program

Degree granted: Certificate-Bachelor's degree required
Program Website: http://www.mi.mun.ca/webcalendar/prog_techcert_presea.htm
Contact: cap@mi.mun.ca

Quality Assurance Specialist

Continuing changes in customer expectations of seafood products in national and international markets are creating more demands on the quality of seafood products. Your certificate provides both the theory and practical application in sanitation, quality assessment techniques and quality assurance planning to meet the increasing demands of the market place.

Degree granted: Certificate-Bachelor's degree required
Program Website: http://www.mi.mun.ca/programs/cert_quality_assurance.htm
Contact: admissions@mi.mun.ca

Seafood Processing Specialist

As new technologies and new products are created, so too is the demand for trained workers, at home and around the world. Now you can gain the supervisory skills you need to tap this ever-changing job market. Your certificate includes theory and practical experience in productivity and improvements in seafood processing. You will also immerse yourself in the development of by-products and under-utilized species, both of which play a major role in the industry's future.

Degree granted: Certificate-Bachelor's degree required
Program Website: http://www.mi.mun.ca/programs/cert_seafood.htm
Contact: admissions@mi.mun.ca

Marine Engineering Technology

This Program, approved by Transport Canada, and nationally accredited by the Canadian Council of Technicians and Technologists/Canadian Technology Accreditation Board, is designed to: provide a strong technical education in engineering technology; prepare students for employment in both land-based and marine industries; develop analytical and synthesis skills complemented by practical shop and industrial training; prepare students to challenge the Transport Canada Fourth Class Certificate of competency as a Marine Engineer (Motor/Steam).

Degree granted: A.A.
Program Website: http://www.mi.mun.ca/webcalendar/prog_diptech_marineeng.htm
Contact: admissions@mi.mun.ca

Marine Engineering Systems Design

This Program, nationally accredited by the Canadian Council of Technicians and Technologists/Canadian Technology Accreditation Board, is designed: to provide a strong technical education in marine engineering systems design supported by a proper knowledge of naval architecture; to provide a good technical education in general mechanical engineering technology; to prepare students for employment in both land-based and marine environments; to develop analytical and synthesis skills complemented by practical training.

Degree granted: A.A.

Program Website: http://www.mi.mun.ca/webcalendar/prog_diptech_marinesystems.htm

Contact: admissions@mi.mun.ca

Nautical Science

The Diploma of Technology in Nautical Science is a globally recognized, co-operative program which is accredited by Transport Canada in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended in 1995 (STCW Convention). This cadet program is designed to: provide a strong theoretical and practical education in the field of nautical science; prepare students for employment in marine transportation; produce graduates who are capable of accepting the responsibilities and performing the duties assigned to them as ship's officers; prepare students for professional recognition as seafaring officers by Transport Canada; and to sit for the remaining Transport Canada examinations for the Watchkeeping Mate (Ship) Certificate of Competence.

Degree granted: A.A.

Contact: admissions@mi.mun.ca

Diploma of Technology- Naval Architecture

Degree granted: A.A.

Program Website: http://www.mi.mun.ca/webcalendar/prog_diptech_naval.htm

Contact: cap@mi.mun.ca

Electro-Mechanical Engineering

This program, nationally accredited by the Canadian Council of Technicians and Technologists/Canadian Technology Accreditation Board, is designed: to provide a broad education in the electro-mechanical technician discipline; to prepare students for employment in the marine electro-mechanical, land-based and offshore industries; to develop analytical skills complemented by "hands-on" practical training.

Degree granted: A.A.

Program Website: http://www.mi.mun.ca/webcalendar/prog_technician_dip_elec_mech.htm

Contact: admissions@mi.mun.ca

Electronics Engineering

This program, nationally accredited by the Canadian Council of Technicians and Technologists/Canadian Technology Accreditation Board, is designed: to provide a broad education in marine systems; to prepare students for employment in the marine industry; and to develop analytical skills complemented by "hands-on" practical training.

Degree granted: A.A.

Program Website: http://www.mi.mun.ca/webcalendar/prog_technician_dip_marine.htm

Contact: admissions@mi.mun.ca

Marine Engineering

This program, nationally accredited by the Canadian Council of Technicians and Technologists/Canadian Technology Accreditation Board, is designed: to provide a broad education in marine systems; to prepare students for employment in the marine industry; to develop analytical skills complemented by "hands-on" practical training.

Degree granted: A.A.

Program Website: http://www.mi.mun.ca/webcalendar/prog_technician_dip_marine.htm

Contact: admissions@mi.mun.ca

Joint Diploma of Technology/Bachelor of Technology in Ocean Instrumentation

Students completing our four-year ocean instrumentation program will earn both a diploma of technology and a bachelor of technology degree. This is a four-year program that incorporates all the elements of a diploma of technology along with the courses to complete the Bachelor of Technology. It consists of 8 semesters and 3 technical sessions. The technical component of the program will provide you with the knowledge and skills necessary to become a professional technologist with a specialty that is critical in the ocean technology sector. Beyond this, the courses required to complete the degree will provide an introduction to technology and business management that will enhance your career development options.

The ocean instrumentation program provides its graduates with proficiency in the specification, installation, operation and maintenance of ocean instrumentation sensors and systems. The program targets employment opportunities related to instrumentation in the ocean environment, including on board ships, oil and gas drilling and production platforms and in the area of ocean observation systems. Some careers may require specific

safety training such as the Basic Survival Training (BST) as specified by the regulators of the industry.

Degree granted: B.S.

Program Website: http://www.mi.mun.ca/webcalendar/prog_oi.htm

Contact: Corinne Breen, Corinne.Breen@mi.mun.ca

Advanced Technical Certificate—Remotely Operated Vehicles (ROV) Operator

This one-year, post-diploma program is designed for students with a strong technology background in mechanics, electronics, and/or electrical technology who wish to pursue further education in the area of Remotely Operated Vehicles. Graduates of the Marine Institute's ROV Program will be eligible to be certified as ROV Pilot/Technicians Level 2. At this level they will have the knowledge to operate, maintain and repair an ROV. They will have the basic training in ROV deployment methodologies that encompasses safety, inspection, and operation and working load requirements. Under the terms of the draft guidelines being produced by the Diver Certification Board of Canada, they will have to successfully complete an ROV candidate aptitude test before commencement of the program.

Degree granted: Certificate

Program Website: http://www.mi.mun.ca/webcalendar/prog_techcert_rov.htm

Contact: Corinne Breen, Corinne.Breen@mi.mun.ca

Remotely Operated Vehicles (ROV) Technician Diploma Program

This program is designed for students who wish to pursue a career in the area of Remotely Operated Vehicles and is structured to accept students with or without previous post-secondary education. Graduates of the Marine Institute's ROV Program will be eligible to be certified as ROV Pilot/Technicians Level 2. At this level they will have the knowledge to operate, maintain, and repair an ROV. They will have the basic training in ROV deployment methodologies that encompasses safety, inspection, and operation and working load requirements. Under the terms of the draft guidelines being produced by the Diver Certification Board of Canada, they will have to successfully complete a ROV candidate aptitude test before commencement of the program.

Graduates from the program will be prepared for careers in the offshore oil and gas, nuclear, military, law enforcement, pipeline, and cable industries, as a substitute for or supplement to commercial (manned) diving operations. The Marine Institute's ROV technician program will be an ideal option for the targeted group who are presently working, or aspire to be working, in the field

of Remotely Operated Vehicles. This program is structured such that technology graduates may enter directly into the second year of the program.

Degree granted: Bachelor of Technology

Contact: Corinne Breen, Corinne.Breen@mi.mun.ca

Maritime Studies

Degree granted: B.S.

Program Website: <http://www.mi.mun.ca/bms/intro.htm>

Contact: cap@mi.mun.ca

Memorial University of Newfoundland

P.O. Box 4920

St. Johns NL Canada A1C 5R3

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Millersville University of Pennsylvania Millersville, PA

Marine Biology

Marine Biologists are scientists who study the biology, behavior, natural history, and ecology of animals and plants that live in or in close association with the oceans. Marine biologists are curious about how nature works, enjoy solving problems, and are deeply committed to solving pressing environmental problems and helping society. Marine biologists study a wide variety of organisms, including fishes, sharks, mammals, birds, invertebrates, algae and other plants, and utilize an assortment of approaches ranging from the tools of molecular biology to those of ecology. Marine Biologists work in the public and private sectors, for aquaria, commercial fisheries, the pet industry, zoological gardens, state and federal agencies, as ecological consultants, and as natural resource managers.

Degree granted: B.S.

Program Website: http://muweb.millersville.edu/~biology/academics_careers/marine_biology_program.php

Contact: Dr. Jean G. Boal, jean.boal@millersville.edu

Millersville University of Pennsylvania
Millersville, PA 17551

Find useful information on Internships,
Scholarships, and Professional Societies
in the appendices at the back of this Guide.

Mississippi State University
Mississippi State, MS

Wildlife and Fisheries with Aquaculture Science option

Students who wish to seek employment immediately following receipt of a B.S. degree or pursue advanced degrees, and wish to obtain positions in fisheries science, aquaculture and/or aquatic management should select this option. Employment is possible in state and federal agencies, with limited positions in private industry. A Master of Science (M.S.) degree will allow an individual to be more competitive, particularly if an advanced position and a higher salary is desired. This degree is intended for serious, academically strong students who can maintain an A-B grade record (GPA > 3.00), which is the minimum required for admittance into graduate degree programs.

Degree granted: B.S.

Program Website: <http://www.cfr.msstate.edu/wildlife/undergrad.htm>

Contact: Bruce D. Leopold, bleopold@cfr.msstate.edu

Agricultural Engineering Technology & Business: Natural Resources & Environmental Management

Natural Resources & Environmental Management emphasis provides an enhanced background in geology, hydrogeology, resource conservation, and water quality for students pursuing careers that require environmental training. Enhanced knowledge of ground and surface water supplies, water transport, and water pollution is also gained. This emphasis provides graduates with the opportunity to excel in positions requiring environmental management skills.

Degree granted: B.S.

Program Website: <http://www.abe.msstate.edu/Undergraduate/AETB/Natural/>

Contact: William D. Batchelor, bbatchelor@abe.mssta

Wildlife and Fisheries Science

The Wildlife and Fisheries Department offers graduate education leading to the Master of Science in Wildlife and Fisheries Science with emphasis in wildlife, fisheries, and aquaculture. The Master's of Science degrees requires 24 hours of course work, including one graduate course in statistics, a thesis and a comprehensive oral examination. Students are also required to take an ecology proficiency exam during the first two weeks of acceptance into the program. A Ph.D. degree is offered in Forest Resources with emphasis in wildlife, fisheries, and aquaculture. The Ph.D. requires a comprehensive written diagnostic examination, one graduate level statistics course, variable hours

of course work (determined by graduate committee), oral and written comprehensive preliminary examinations, a dissertation and oral defense of dissertation.

Degree granted: M.S.

Student Support: A limited number of graduate research assistantships are available.

Program Website: <http://www.cfr.msstate.edu/wildlife/grad.htm>

Contact: Dr. Bruce Leopold, bleopold@cfr.msstate.edu
Mississippi State University

110 Thompson Hall

Mississippi State, MS

Monmouth College
West Long Branch, NJ

Biology with a Concentration in Marine and Environmental Biology

Degree granted: B.S.

Program Website: <http://www.monmouth.edu/academics/registrar/curr.ug/new/ug.bybe.curr.pdf>

Contact: John Tiedemann, jtiedema@monmouth.edu

Marine and Environmental Biology and Policy

Degree granted: B.S.

Program Website: http://www.monmouth.edu/academics/departments/marine_environmental_biology_policy.asp

Contact: John Tiedemann, jtiedema@monmouth.edu

Monterey Peninsula College
Monterey, CA

Marine Science and Technology Certificate

The Marine Science and Technology program is designed to meet the need for workers who can apply science and technology intelligently and responsibly to coastal and ocean-related activities. The curriculum offers courses in ocean data collection, shipboard operations, submersible technology, research diving, GIS and marine science applications. At-sea or land-based internships are required for students earning a certificate or degree.

Degree granted: Certificate-Bachelor's degree not required

2007 tuition: In-state residents: \$480, Out-of-State: \$4,632

Program Website: <http://www.mpc.edu/apps/pub.asp?Q=995&T=Degrees%20Offered&B=2>

Contact: Deidre Sullivan, dsullivan@mpc.edu,
info@marinetech.org, 831-645-1393

Marine Science and Technology

The Marine Science and Technology program is designed to meet the need for workers who can apply science and technology intelligently and responsibly to coastal and ocean-related activities. The curriculum offers courses in ocean data collection, shipboard operations, submersible technology, research diving, GIS and marine science applications. At-sea or land-based internships are required for students earning a certificate or degree.

Degree granted: A.S.

Program Website: <http://www.mpc.edu/apps/pub.asp?Q=985&T=Degrees%20Offered>

Contact: Deidre Sullivan, dsullivan@mpc.edu, info@marinetech.org, 831-645-1393

University Studies: Oceanography Emphasis

Degree granted: A.A.

Program Website: <http://www.mpc.edu/apps/pub.asp?Q=759&T=Degrees%20Offered&B=1>

Contact: Alfred Hochstaedter, ahochstaedter@mpc.edu
Monterey Peninsula College
980 Fremont Street
Monterey, CA 93950

Moss Landing Marine Laboratories

Moss Landing, CA

Geological Oceanography

Degree granted: M.S.

Program Website: <http://geooce.mlml.calstate.edu/>

Contact: Ivano W. Aiello, iaiello@mlml.calstate.edu

Biological Oceanography

Degree granted: M.S.

Program Website: <http://biooce.mlml.calstate.edu/>

Contact: Nick Welschmeyer, welschmeyer@mlml.calstate.edu

Chemical Oceanography/Trace Metals

Degree granted: M.S.

Program Website: <http://chemoce.mlml.calstate.edu/>

Contact: Kenneth H. Coale, coale@mlml.calstate.edu

Physical Oceanography

Degree granted: M.S.

Program Website: <http://physoce.mlml.calstate.edu/>

Contact: Erika McPhee-Shaw, eshaw@mlml.calstate.edu

Vetebrate Ecology

Degree granted: M.S.

Program Website: <http://birdmam.mlml.calstate.edu/>

Contact: James T. Harvey, Harvey@mlml.calstate.edu

Ichthyology

Degree granted: M.S.

Program Website: <http://ichthy.mlml.calstate.edu/>

Contact: Dr. Richard M. Starr, starr@mlml.calstate.edu

Invertebrate Zoology

Degree granted: M.S.

Program Website: <http://invert.mlml.calstate.edu/>

Contact: Dr. Jonathan Geller, geller@mlml.calstate.edu
Moss Landing Marine Laboratories
Moss Landing, CA 95039

Mount Holyoke College

South Hadley, MA

Five College Coastal & Marine Sciences

Degree granted: General marine science courses

Program Website: <http://www.fivecolleges.edu/sites/marine>

Contact: Cindy Bright, Coordinator, marinesci@email.smith.edu

National Polytechnic College of Engineering and Oceaneering

Wilmington, CA

Marine Technology (commercial diving) with concentrations in wet welding, NDT, and advance dive medicine

National Polytechnic College of Engineering and Oceaneering is a non-profit higher education institution accredited by the Accrediting Commission of Community and Junior Colleges of the Western Association of Schools and Colleges (ACCJC/WASC). The education and skills obtained at National Polytechnic can turn your love of action into a rewarding career. The College's marine technology certificate and degree program prepares students for careers in commercial diving with concentrations in underwater wet welding, nondestructive testing, advanced dive medicine, and Homeland Security Management. To earn the Associate of Science degree in Marine Technology, 92 quarter credits are required. Credits must come from the following sources: Completion of Marine

Technology I (38 quarter credits) Completion of Marine Technology II (24 quarter credits) General education credits (30 quarter credits)

Degree granted: A.A.S.

Program Website: <http://www.natpoly.edu/Programs/COO/Programs/MarineTechnologyI.html>

Contact: Shelly Mitchell, SMitchell@natpoly.edu

Advanced Dive Medicine (MedTech)

Goal is to prepare students to provide immediate and responsible medical assistance at the scene of an injury or illness, particularly on offshore rigs and in other remote locations. Students gain the ability to provide basic life support and emergency first aid medical care for diving-related injuries and diseases. The graduate is qualified to take the exam to be certified as an EMT-Basic by the National Registry Emergency Medical Technicians and receives the Advanced Diving Medical Technician certification through the National Board of Diving and Hyperbaric Medical Technology (NBDHMT).

Degree granted: A.A.S.

Program Website: <http://www.natpoly.edu/Programs/COO/Concentrations/ADM.html>

Contact: James A. Spelich, jspelich@natpoly.edu

Underwater Nondestructive Testing (SpecTech)

Goal is to provide skills in various nondestructive testing (NDT) inspection methods for determining the integrity of structures in accordance with various industry codes and standards. It also provides training in the use of sophisticated techniques that include underwater photography, video documentation, ultrasonic, magnetic particle, dye penetrant, and visual inspection. NOTE: Student's vision, corrected or uncorrected, must be at least 20/40 prior to enrollment in SpecTech.

Degree granted: A.A.S.

Facilities: The College has campuses located in Wilmington and San Diego, CA and in Honolulu, HI. Facilities include dive training tanks, harbor/boat access, hyperbaric chambers, rigging yards, and much more.

Program Website: <http://www.natpoly.edu/Programs/COO/Concentrations/NDT.html>

Contact: Shelly Mitchell, SMitchell@natpoly.edu or Nancy Herbst, NHerbst@natpoly.edu

National Polytechnic College of Engineering and Oceaneering
272 South Fries Avenue
Wilmington, CA 90744
Email: moreinfo@natpoly.edu
Phone: 800-432-3483

Naval Postgraduate School Monterey, CA

Oceanography

Degree granted: M.S.

Program Website: <http://www.oc.nps.navy.mil/>

Contact: occhair@nps.navy.mil

Electrical and Computer Engineering

Degree granted: M.S. and Ph.D.

Program Website: <http://www.nps.navy.mil/ece/>

Contact: Jeffrey B. Knorr, jknorr@nps.edu

Engineering Acoustics

Degree granted: M.S.

Program Website: <http://www.nps.edu/Academics/GSEAS/Navigation/ENGINEERING%20ACOUSTICS%20v2.htm>

Contact: Kevin Smith, kbsmith@nps.edu

Mechanical and Astronautical Engineering

The Department of Mechanical and Astronautical Engineering (MAE) provides a strong academic program, which spans the engineering disciplines of thermal-fluid sciences, structural mechanics, dynamic systems, guidance and control, materials science and engineering, propulsion, and systems engineering, including total ship systems engineering and spacecraft design. These disciplines are blended together with a strong emphasis on naval engineering applications required by surface vessels, submarines, and spacecraft. Furthermore, the department provides advanced education in classified topics in Astronautical Engineering.

Degree granted: M.S.

Program Website: <http://www.nps.edu/Academics/GSEAS/MAE/index.asp>

Contact: Tony Healy, healey@nps.edu

Meteorology

Degree granted: M.S.

Program Website: <http://www.weather.nps.navy.mil/>

Contact: Philip A. Durkee, durkee@nps.edu

Physics

Degree granted: M.S.

Program Website: <http://www.physics.nps.navy.mil/>

Contact: James Luscombe, luscombe@nps.navy.mil

Ship Systems Engineering

Degree granted: M.S.

Program Website: <http://www.nps.navy.mil/se/MSSE%20SSE%20Flyer%20v2-5.pdf>

Contact: Dr. Cliff Whitcomb, cawhitco@nps.edu
Naval Postgraduate School
833 Dyer Road Rm 328
Monterey, CA 93943-5193

New England Institute of Technology

Warwick, RI

Marine Technology

Degree granted: A.A.S.

Program Website: <http://www.neit.edu/careerchoices/mt.html>

New England Institute of Technology
2500 Post Road
Warwick, RI 02886-2266
Website: <http://www.neit.edu/index.html>

New Jersey Institute of Technology

Newark, NJ

Environmental Engineering

Degree granted: B.S.

Program Website: <http://catalog.njit.edu/undergraduate/programs/environmentaleng.php>

Contact: Walter Konon, walter.konon@njit.edu
New Jersey Institute of Technology
Newark, NJ 07102-9895

New Jersey Marine Sciences Consortium

Fort Hancock, NJ

Marine Sciences

The New Jersey Marine Sciences Consortium is a non-profit affiliation of colleges, universities and public and private institutions dedicated to advancing knowledge of New Jersey's marine and coastal environment. Founded in 1969 as a cooperative center for the study of marine and related environmental science, today the NJMSC acts as a resource partner to its member institutions (most of the state's colleges and universities) promoting and advancing understanding of New Jersey's marine and coastal environment. The NJMSC meets its mission through sponsored research and innovative education and outreach programs that

address coastal sustainability, ecosystem health, sustainable fisheries, marine technology, science-based management practices and improved ocean science literacy and stewardship. Undergraduate and graduate level courses include advanced topics in marine science and may be taken for direct credit by students registered at NJMSC's member institution colleges or universities. Other students may register through member institutions for transfer credit. A non-credit, audit policy is also in place.

Degree granted: The NJMSC does not offer degree programs although college credit for certain NJMSC programs can be obtained through NJMSC's many member institutions.

Facilities: Although the NJMSC is represented statewide by its many member institutions, the NJMSC's headquarters and main field station are located within Gateway National Park at Sandy Hook in Building #22 in the Fort Hancock Historic zone. This location offers easy access for direct observation and investigation of barrier beach, maritime forest and salt marsh environments.

Faculty: NJMSC faculty is drawn from its member institutions which include most of NJ's colleges and universities.

2007 tuition: Tuition rates vary and depend on the tuition rate of each participating member institution.

Student Support: Internships are sometimes available.

Program Website: <http://www.njmssc.org/>

Contact: Claire Antonucci, cantonucci@njmssc.org
New Jersey Marine Sciences Consortium
Building #22
Fort Hancock, NJ 07732
Phone: 732-872-1300 x 22

North Carolina State University

Raleigh, NC

NC State University conducts academic, research and outreach programs across a broad spectrum of marine science and technology fields, led by more than 45 marine sciences faculty in 13 departments and four colleges: Agriculture and Life Sciences, Engineering, Physical and Mathematical Sciences, and Veterinary Medicine. B.S., M.S. and Ph.D. degrees related to various aspects of marine science and technology are offered in a variety of disciplines concerning marine and estuarine ecology; conservation biology; fisheries science; physical, biological, chemical and geological oceanography; environmental toxicology; aquatic animal health; physiology and behavior; watershed hydrology; environmental engineering; seafood science and technology; aquaculture; biological sciences; environmental technology; remote sensing; geographic information systems; atmospheric science

and meteorology; coastal resource management; and tourism and recreation. To find out more about specific programs visit www.ncsu.edu/academics/degrees-programs and www.ncsu.edu/majors-careers. Application and admission information is available at www.ncsu.edu/future-students.

In addition to the wide array of programs and specialized facilities on main campus in Raleigh, the Center for Marine Sciences and Technology (CMAST), located on the shores of Bogue Sound in Morehead City, NC, provides additional opportunities for both resident and campus-based faculty, students and staff. This 51,000 sq. ft. facility, opened in August 2000, houses office and lab space, electronics, equipment fabrication and machine shops, classrooms and computer teaching labs, a seafood science test kitchen, state-of-the-art computing, electronic library access, television conference facilities that can link to main campus and elsewhere, wet labs with flow-through, filtered seawater for experiments with marine organisms, warehouse storage space for equipment, and numerous boats.

CMAST is within short walking distance of the UNC Institute of Marine Science and the NC Division of Marine Fisheries headquarters, and is within five miles of the Duke University Marine Laboratory, the National Atmospheric and Oceanic Administration/National Ocean Service Center for Coastal Fisheries and Habitat Research, the NC Maritime Museum and the NC Aquarium at Pine Knoll Shores. It is conveniently located in close proximity to the unique coastal and near-ocean environment of the Croatan-Albemarle-Pamlico Estuarine System—the largest lagoonal-type estuary and the second largest estuary in the U.S.—with direct access to offshore environments through nearby Beaufort Inlet.

CMAST website: www.cmast.ncsu.edu

Contact: Dr. David Eggleston, Director, eggleston@ncsu.edu
Phone: 252-222-6301

Northeast Maritime Institute

Fairhaven, MA

U.S. Coast Guard, Commonwealth of Dominica Maritime Administration approved & STCW compliant courses

Northeast Maritime Institute is a private co-educational maritime education and training and regulatory analysis and development institution. Courses are offered in OUPV, Able Seaman, Basic and Advanced Firefighting, Basic Shiphandling, Bridge Resource Management, First Aid/CPR, Launch Tender, Master 100 Gross ton - 200 ton, Sailing Endorsement, and Radar Observer, and others that are useful to the professional mariner.

Degree granted: Courses for working professionals

Program Website: <http://www.northeastmaritime.com/>

Contact: registration@northeastmaritime.com

Northeast Maritime Institute

32 Washington St.

Fairhaven, MA 02719

Northeastern State University

Tahlequah, OK

Biology: Fisheries and Wildlife emphasis

Degree granted: B.S.

Program Website: <http://arapaho.nsuok.edu/%7Enaturalsciences/biol.html>

Contact: Dr. Myron Cherry, cherry@nsuok.edu

Northeastern State University

Tahlequah, OK 74464

Northeastern University

Boston, MA

Biology: Marine Biology Concentration

Degree granted: B.S.

Program Website: <http://www.cas.neu.edu/undergrad/bio.html>

Contact: Fred Davis, f.davis@neu.edu

Northeastern University

Boston, MA 02115

Northeastern University

Three Seas Program

Nahant, MA

Marine Biology

Degree granted: Professional Master's Degree

Program Website: <http://www.marinebioms.neu.edu/>

Contact: Sal Genovese, s.genovese@neu.edu

Northeastern University

Marine Science Center

East Point

Nahant, MA 01908

Email: threeseas@neu.edu

Northwest Missouri State University

Kirksville, MO

Marine Biology

Degree granted: B.S.

Program Website: <http://www.nwmissouri.edu/dept/biology/DEGREES/MARINE.HTM>

Contact: Dr. Gregg Dieringer, greggd@nwmissouri.edu

Wildlife Ecology & Conservation

Degree granted: B.S.

Program Website: <http://www.nwmissouri.edu/dept/biology/DEGREES/BSWEC.HTM>

Contact: Dr. Gregg Dieringer, greggd@nwmissouri.edu

Wildlife Ecology & Conservation

Degree granted: B.A.

Program Website: <http://www.nwmissouri.edu/dept/biology/DEGREES/BAWEC.HTM>

Contact: Dr. Gregg Dieringer, greggd@nwmissouri.edu

Biology

Completion of 32 hours of approved graduate credit (courses numbered at 500 or above) is required. Sixteen hours must be at the 600 level or above. A maximum of 16 approved hours may be taken outside of the department.

Degree granted: M.S.

Program Website: <http://www.nwmissouri.edu/graduate/science.htm>

Contact: Dr. Gregg Dieringer, greggd@nwmissouri.edu

Geographic Information Science

Degree granted: M.S.

Program Website: <http://catpages.nwmissouri.edu/m/geopage/>

Contact: Dr. Greg Haddock, haddock@nwmissouri.edu
Northwest Missouri State University
Kirksville, MO 64468



NOAA's Teacher at Sea program

Nova Southeastern University

City of Dania Beach, FL

Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://www.nova.edu/ocean/imcs.html>

Contact: Richard Spieler, spielerr@nova.edu

Marine Biology (Ph.D.)

The Ph.D. degree requires a minimum of 90 credits beyond the baccalaureate. At least 48 credits must consist of dissertation research and 42 credits must be in upper-level course work, which usually consists of tutorial studies with the major professor. The student also must successfully complete the Ph.D. comprehensive examination (normally taken after the majority of the coursework has been completed and within 1.5 years of starting the Ph.D. program) and defend the completed dissertation before the committee, interested faculty, and students. Students are expected to complete the program in nine years or less, a minimum of three years of which must be in residence. Previous degree(s) should be in the area of mathematics (for physical oceanography) or an appropriate area of the natural sciences (for marine biology). A master's degree in biological oceanography, biology or marine biology, or a related science is preferred, especially for the biological sciences Ph.D. Applicants should have obtained agreement from a faculty member to serve as major professor. For the biological sciences, Ph.D. applicants should have a completed draft dissertation proposal that must be submitted with the application. The proposal content will be a major factor in acceptance.

Degree granted: Ph.D.

Program Website: <http://www.nova.edu/ocean/imcs.html>

Contact: Melissa Dore, missy@nova.edu

Marine Biology (M.S.)

This course of study is designed to equip students with a substantial understanding of the nature and ecology of marine life and grounding in the other overlapping areas of marine science. Program flexibility provides preparation for further graduate study, secondary education career enhancement, or employment in technical research institutions, government agencies, or environmental consulting firms. Applicants should hold a bachelor's degree in biology, oceanography, or a closely-related field, including science education.

Degree granted: M.S.

Program Website: <http://www.nova.edu/ocean/imcs.html#marbio>

Contact: Melissa Dore, missy@nova.edu

Marine Biology (B.S.)

The marine biology major is designed to prepare students for a career or further graduate study. The curriculum consists of a set of core courses in physical and natural science, leading to a degree that is designed as a solid basis for entering the field of marine biology, as well as preparation for further graduate study in this area. A dual admission combined bachelor's-master's program with the Oceanographic Center is available for select, qualified students. Information on this program can be obtained from the undergraduate Office of Admissions.

Degree granted: B.S.

Program Website: <http://www.undergrad.nova.edu/admissions/majordescription.cfm?MajorID=136>

Contact: Melissa Dore, missy@nova.edu

Coastal Zone Management

This program leads to a multidisciplinary professional M.S. degree, intended for employees of government and industry seeking career enhancement, as well as for recent college graduates seeking careers in planning and management with governmental agencies, industries, and other activities depending on or affecting the coastal zone or its resources. The program also can be of value for enhancement of careers in education. It focuses on contemporary problems and conflicts arising from increased use of coastal areas and emphasizes the evaluation of alternative policy management solutions. Coastal studies combine elements of ecology, geology, physics, engineering, economics, law, the social sciences, and management. Because of this diversity, applicants with any undergraduate major will be considered for admission. A science major is most useful. A science background including general biology, chemistry, and organic chemistry is essential.

Degree granted: M.S.

Facilities: The Oceanographic Center is located on a 10-acre site on the ocean side of Port Everglades, adjacent to the port's entrance. The center has a one-acre boat basin. Its location affords immediate access to the Gulf Stream, the Florida Straits, and the Bahama Banks. The center is composed of three buildings, and several modulars. The main two-story building houses seven laboratories, conference rooms, workroom, and 13 offices. A second building contains a large two-story warehouse and staging area, classroom, biology laboratory, electron microscopy laboratory, darkroom, machine shop, carpentry shop, electronics laboratory, library, student computer lab, computing center, and 15 offices. A one-story building contains a wetlab/classroom, coral workshop, and an X-ray facility. A modular laboratory is used for aquaculture studies.

2007 tuition: In-state residents: \$14,200; Out-of-State: \$14,200

Program Website: <http://www.nova.edu/ocean/imcs.html#czm>

Contact: Melissa Dore, missy@nova.edu

Marine Environmental Sciences

This master's degree program results from the need to educate professionals beyond the bachelor's in a synthesis of diverse disciplines, each of which views the marine environment in disparate ways. We anticipate that students who complete the M.E.S. Program will enter, or re-enter, the workforce directly. This professional degree program is designed to serve working professionals in Florida and across the nation with training and education beyond the bachelor's degree. It is also appropriate for marine scientists who are interested in learning how the marine system works. Graduates can find employment in environmentally oriented agencies/organizations and hopefully 'make a difference' in the ways of the world. The M.E.S. is not designed as an intermediate degree for the Ph.D., although some M.E.S. graduates will be well prepared for, and may later apply to, a Ph.D. program either at the Oceanographic Center or elsewhere. The program is of value for prospective or actual employees of government and industry seeking careers in areas of marine science. Because of this diversity, applicants with any undergraduate major will be considered for admission. However, a science major is most useful and a science background is essential.

It is important to differentiate the Marine Environmental Sciences MS Program from the Coastal Zone Management MS Program. We view the M.E.S. as a more broadly-based degree without the management emphasis of C.Z.M. The potential M.E.S. curriculum contains some, but does not accentuate management elements.

Degree granted: M.S.

Program Website: <http://www.nova.edu/ocean/imcs.html#marenv>

Contact: Melissa Dore, missy@nova.edu

Marine Ecology

The marine ecology minor focuses on the interactions among marine organisms and the relationships between these organisms and their environment. This minor is intended for marine biology majors who want more specific training in marine ecological science. Students in other majors who meet the prerequisites may also pursue this minor. This minor is available to PALS (day) students only.

Degree granted: Minor

Program Website: <http://www.undergrad.nova.edu/MST/minors/marineeco.cfm>

Contact: Melissa Dore, missy@nova.edu
Nova Southeastern University
8000 North Ocean Drive
City of Dania Beach, FL 33004

Oberlin College

Oberlin, OH

Biology

Degree granted: B.S.

Program Website: <http://www.oberlin.edu/biology/>

Contact: twila.conley@oberlin.edu

Oberlin College

Oberlin, OH 44074

Occidental College

Los Angeles, CA

Biology Department

Marine Biology

Marine Biology is an area of concentration within the Biology major at Occidental College. The foundation of the marine biology emphasis is coursework spanning the breath of the major from biochemistry and molecular biology to ecology and evolution. Students must complete 10 courses in the Biology department to satisfy the requirement for the major. Students considering graduate programs also need a year of inorganic and organic chemistry, physics, and calculus/biostatistics. Courses should be selected in consultation with their academic advisors. In addition, marine biology students are exposed to: research with faculty, work experience on oceanographic vessels, involvement with the Vantuna Research Group (VRG), scuba diving (when certified), and seminars by visiting scientists. Our marine biology students are well prepared for future careers in teaching and research. They have pursued advanced degrees at graduate schools such as Woods Hole, Scripps, University of Hawaii, University of Washington and Sydney University. Some of those graduates have accepted teaching positions; others are working with companies that focus on environmental monitoring.

Degree granted: B.S.

Program Website: <http://departments.oxy.edu/marinebio/academia.html>

Contact: Dr. Gary Martin, gmartin@oxy.edu

Marine Biology

Occidental College is a small, private liberal arts college with an undergraduate enrollment of about 1600 students and a long-standing commitment to marine science. Of our 30 students who graduate with a BA in Biology each year, approximately 5 complete an emphasis in Marine Biology. Our Biology department has 10

faculty, of which three have ongoing research involving marine organisms. Our marine emphasis includes courses in Zoology, Marine Biology, Invertebrate Morphology and Physiology, Marine Fishes, Biological Oceanography, Biodiversity and Organization of Marine Ecosystems, Evolution and Statistics. A small number of students continue on for an M.S. in Biology studying marine systems. We pride ourselves in providing our students with strong background courses complemented by the ability to get them involved in ongoing research projects with the faculty. Oxy is a member of the Southern California Marine Institute (<http://www.scmi.us/>), a consortium including USC and Cal State Universities. This association provides access to vessels capable of investigating the various habitats between the southern California mainland and the Channel Islands. This combination of courses, field and lab research has proven effective in training students to compete effectively at the graduate level. We also offer a 5 week summer program in Marine Biology for rising High School seniors, which involves lab and field work and students earn college credit (see www.oxy.edu/ony/marinebio/summer).

Degree granted: M.S.

Facilities: The Department of Biology is housed within the Bioscience building which is contiguous with the Moore Laboratory of Zoology. These excellent facilities are well suited for studies in all areas of biology. Facilities include the bird and mammal collections (70,000 specimens) of the Moore Laboratory of Zoology, greenhouses, herbarium, transmission electron microscope, fluorescence-activated cell sorter, fluorescence microscopes, ultracentrifuges, scintillation counters, a tissue culture suite, equipment for PCR and DNA sequencing, several field vehicles, and three research vessels for nearshore marine studies and SCUBA diving. Occidental College is ideally suited for field and laboratory studies in marine biology.

Faculty: Dr. Gary G. Martin, Professor of Biology, teaches courses in zoology, invertebrate biology, histology and electron microscopy. His research centers on the structure and function of cells and tissues that help fight infection and disease in penaeid shrimp and mollusks. Dr. Dan Pondella, Assistant Professor of Biology, teaches biology of marine fishes, marine exosystems, marine biology and biological oceanography. His research interests include: 1) the ecology of California marine fish, 2) the evolution of marine fishes in the tropical eastern Pacific, and 3) the life history of fishes including species from the Gulf of California. Dr. Joseph Schulz, Assistant Professor of Biology, teaches biochemistry and vertebrate physiology. His research focuses on the activity and evolution of venom peptides in fish-hunting cone snails. The venom peptides are neurotoxins and are valuable tools for basic research and biomedicine.

2007 tuition: In-state residents: \$17,220, Out-of-State: same

On-campus Housing Available: yes

Program Website: <http://departments.oxy.edu/marinebio/Master's.html>

Contact: Dr. Gary Martin, gmartin@oxy.edu

Occidental College

1600 Campus Road

Los Angeles, CA 90041

Phone: 323-259-2890

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Old Dominion University

Norfolk, VA

Biology: Marine Biology concentration

A variety of faculty, facilities and courses are available for biology majors interested in a concentration in marine biology. Facilities include a museum collection of marine fishes and marine invertebrates; research laboratories in fish biology, fisheries science, phytoplankton ecology, zooplankton ecology, benthic invertebrate ecology, wetlands plants and marine microbiology; and a wet lab/aquarium room. Field collection and laboratory course trips to the Chesapeake Bay, coastal ocean areas, local estuaries, wetlands and salt marshes are supported by departmental field vehicles and boats, as well as by the Department of Oceanography's 55-foot research vessel, the R/V Fay Slover.

Degree granted: B.S.

Facilities: The *Blackwater Ecologic Preserve* borders the Blackwater River in Isle of Wight County, Virginia. Included on this 319-acre property are unique plant communities and some of the rarest species in the state of Virginia. Most important is the longleaf pine community which is the northernmost community of this type in the United States. In addition to the longleaf communities, the preserve's amazing diversity includes pocosins, river bluff, cypress swamp, old field, and riverine habitat. The *Chesapeake Bay Program* collects data to support the objectives of the Virginia Department of Environmental Quality to restore the environmental health of the Chesapeake Bay. The Chesapeake Bay Monitoring Program, initiated in 1985, is a multipurpose program that includes long-term studies conducted by ODU. The objective is to characterize the present state of the Bay, determine long-term trends, and provide insights into ecological interactions. The program provides information necessary to measure effectiveness of point and non-point source programs in reducing nutrient input to the Bay and determine progress towards achievement of living resources and water quality habitat goals.

The *Electron Microscopy Laboratory* is equipped for transmission electron microscopy (including X-ray diffraction, scanning transmission electron microscopy/STEM and X-ray microanalysis) and scanning electron microscopy. Complete specimen preparation equipment and supplies are available for a wide variety of biological and non-biological specimens. A well-equipped darkroom provides a complete environment for negative development and print or slide making. The laboratory director and laboratory specialist are available for consultation in experimental design and electron microscopic technique. The laboratory has extensive experience in processing many types of specimens for a variety of users at the university and from the community. The ODU *Herbarium* provides a well-curated collection of vascular plants and bryophytes for use in teaching, research, and public service. Major emphasis is placed on development of excellent representation of all taxa in the local flora (southeastern Virginia and northeastern North Carolina), including the Dismal Swamp and the Blackwater Ecologic Preserve. Our herbarium represents the definitive collection of the regional flora, and is consulted by the Natural Heritage Program of the Commonwealth of Virginia. We also loan specimens to specialists in different parts of the country and the world. Due to our exchange program, the herbarium also has a good representation of genera of plants of the southeastern United States as well as representative orders on a worldwide basis. Specialized areas of interest include development of collections of both native and cultivated poisonous plants as well as strength in parasitic angiosperms. At present, the total number of mounted specimens is approximately 26,000. The teaching collection contains approximately 3,000 specimens. The *Phytoplankton Analysis Laboratory* (PAL) has been monitoring phytoplankton populations, algal blooms, and potential toxin-producing species in the Chesapeake Bay and several of its major tributaries since 1985. Since 1997, in a more extensive coverage of Virginia estuaries, phytoplankton water and sediment samples have been analyzed for *Pfiesteria* spp., *Pfiesteria*-like organisms (PLO), and other toxin-producing algal species.

Faculty: <http://sci.odu.edu/biology/directory/faculty.shtml>

Program Website: <http://sci.odu.edu/biology/academics/bsmarine.shtml>

Contact: Dr. Lytton John Musselman, lmusselm@odu.edu

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Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
for up-to-date education and scholarship information,
as well as a downloadable version of this Guide.

Biological Oceanography
Chemical Oceanography
Geological Oceanography
Physical Oceanography

Degree granted: M.S.

Program Website: <http://sci.odu.edu/oceanography/academics/grad/master.shtml>

Contact: F.C. Dobbs, fdobbs@odu.edu

Oceanography

Degree granted: Ph.D.

Program Website: <http://sci.odu.edu/oceanography/academics/grad/doct.html>

Contact: F.C. Dobbs, fdobbs@odu.edu
 Old Dominion University
 Norfolk, VA 23529

Orange Coast College
 Costa Mesa, CA

Biology with Marine Science emphasis

Degree granted: A.S.

Program Website: http://www.orangecoastcollege.edu/academics/divisions/math_science/marine_science/

Contact: Tom Garrison, tgarrison@occ.cccd.edu

Oregon Coast Community College
 Newport, OR

Aquarium Science

The college offers a 2-year Associate of Applied Science degree in Aquarium Science and a 1-year certificate. The 2-year degree is for individuals who do not have a B.S. degree or higher in a Life Science. The 1-year certificate is available for individuals who have earned a B.S. or higher in a Life Science. Both options require that you apply to the program. The certificate encompasses 51 credit hours taken over the course of one academic year. Students who are pursuing the certificate take classes alongside individuals who are studying for the Associate's degree. Certificate track students take first and second year courses concurrently rather than sequentially. All Aquarium Science students enroll in a required 12 credit hour internship at a facility of their choice which includes both classroom learning as well as a hands-on, real work environment approach to develop aquatic animal husbandry skills. These courses are designed to qualify individuals for work in the aquatic animal husbandry profession.

Potential employment opportunities include: public aquariums and zoos, ornamental fish trade, aquaculture businesses, research programs, educational centers, self-employment, state and federal natural resource agencies.

Degree granted: A.A.S.

Program Website: <http://www.occc.cc.or.us/aquarium/index.html>

Contact: Bruce Koike, bkoike@occc.cc.or.us
 Oregon Coast Community College
 332 SW Coast Highway
 Newport, OR 97365

Oregon Health and Science University
Coastal Margin Observation & Prediction Program (CMOP)
 Beaverton, OR

The Science and Technology Center for Coastal Margin Observation and Prediction (CMOP) provides a unique opportunity for students to engage in interdisciplinary graduate studies. Our research integrates fields such as coastal oceanography, environmental microbiology, biogeochemistry, computational sciences, and information technology, and our education and training programs prepare professionals for rewarding careers in and across these quickly growing fields. Established with major funding from the National Science Foundation (NSF), CMOP is a collaborative effort among several academic and industry partners. Oregon Health & Science University (OHSU) is the lead CMOP institution. Primary partners are Oregon State University and University of Washington. CMOP is one of 17 active NSF Science and Technology Centers and is the only one focused on coastal margins.



Isaac K'Owino, a postdoctoral student, conducts research in the Coastal Margin Observation & Prediction program at Oregon Health & Science University. Photo by Matthew Sachs.

CMOP graduate students enjoy:

- Close interaction with world-renowned faculty at OHSU and partner institutions
- Flexibility in designing a research program that best matches student interests and faculty strengths
- Interdisciplinary coursework and research, preparing students to understand the broad context while contributing significant original work
- Access to state-of-the-art research resources, including high-performance computing and ship time
- Hands-on experience with emerging coastal margin environmental and natural resource management issues, particularly in the Pacific Northwest
- Excellent preparation for rewarding careers in academia, industry, and state and federal governments.

At OHSU, applicants must apply online at www.ogi.edu/admissions/ to a participating graduate degree program at the OGI School of Science & Engineering, and express interest in joining CMOP. At other partner universities, applicants must be accepted to a participating graduate degree program at the CMOP partner institution, following institution-specific procedures. Once accepted, the student and faculty advisor need to submit a supplemental application for CMOP affiliation. For up-to-date procedures and lists of participating faculty advisors and degree programs, see www.stccmop.org/education.

Degree granted: Ph.D. or M.S. in Environmental Science and Engineering; Ph.D. or M.S. in Biochemistry and Molecular Biology; Ph.D. or M.S. in Computer Science and Engineering; Ph.D. or M.S. in Electrical Engineering.

Facilities: CMOP students enjoy new, state-of-the-art facilities at the flagship campus, OHSU. CMOP students can also study with professors located at our partner institutions. Coursework can include individual and group work in our classrooms and laboratories as well as fieldwork on research vessels which travel throughout the Columbia River system.

Faculty: CMOP faculty include investigators from each of our partner institutions.

Student Support: CMOP offers paid and unpaid undergraduate internships. Please visit our website for further information. Entering full-time Ph.D. students may be eligible to obtain financial support through a combination of tuition scholarships, OGI fellowships, named fellowships and graduate research assistantships. Part-time Ph.D. students may be eligible for some of the above. Partial-tuition scholarships may be awarded to entering full-time M.S. students. Subsidized and Unsubsidized Federal Stafford Loans are available to students who have been formally admitted to a M.S. or Ph.D. program at OGI. To be eligible for a loan, students must take at least 5 credits each quarter, and must be U.S. citizens or eligible

non-citizens (e.g. permanent residents). For application materials and additional information, contact the Financial Aid Office at OHSU at (503) 494-7800 or 1-800-775-5460 or finaid@ohsu.edu.

Program Website: <http://www.stccmop.org/>

Contact: Vanessa Green, greenv@stccmop.org
Director of Higher Education and Diversity
Science and Technology Center for Coastal Margin
Observation & Prediction
Oregon Health & Science University
OGI School of Science & Engineering
Mail code: OGI-100
20000 NW Walker Road
Beaverton, OR 97006-8921
Phone: 503-748-1609
Fax: 503-748-1273

Oregon State University

Corvallis, OR

Biology- Marine Biology option

See related information at <http://www.coas.oregonstate.edu/marineportal/index.html>.

Degree granted: B.S.

Facilities: Oregon State University's 16-credit course in Marine Biology is the centerpiece of the Marine Biology Option in Biology. The program is taught each spring at Hatfield Marine Science Center in Newport, Oregon. Although the course is designed for students with an interest in Marine Biology, it is an excellent field and laboratory course for any qualified students and does not assume a background in marine biology. Students wishing to take Marine Biology should be juniors or seniors who have taken one term of an ecology course (BI 370 or equivalent) as well as other significant science coursework, but interested students should inquire if they foresee difficulties in meeting these requirements. Course admission is by application only, and students should be prepared for a challenging program. Marine Biology integrates field and laboratory experiences with what is taught in class. Many days during the term involve heading out to the field to collect data during a low tide, a lecture in the classroom, and work in the laboratory studying collected organisms. The training in general research methods, as well as field and laboratory techniques, prepares students well for further undergraduate research, graduate work, or jobs. Furthermore, the small size of the course and the long days allow for close interactions with professors and graduate students.

On-campus Housing Available: yes

Program Website: <http://biology.science.oregonstate.edu/>

Contact: Dr. Robert Mason,
robert.mason@oregonstate.edu
Oregon State University
Biology Program, 2042 Cordley Hall
Corvallis, OR 97331

Fisheries & Wildlife Science, Fisheries Science Example

A generalized option intended for students interested in a career in the science and management of fishery resources, but who have not refined their career goals sufficiently to develop a specialized option.

Degree granted: B.S.

Program Website: <http://fw.oregonstate.edu/Undergraduate%20Study/fisheries.htm>

Contact: Nancy Allen, nancy.allen@oregonstate.edu

Fisheries & Wildlife Science, Wildlife option

The Wildlife Science undergraduate program in the Department of Fisheries and Wildlife emphasizes wildlife research concerning interaction of wildlife with land uses, migratory bird biology, forestry-wildlife relationships, endangered species management, and population dynamics.

Degree granted: B.S.

Program Website: <http://fw.oregonstate.edu/Undergraduate%20Study/wildlife.htm>

Contact: Nancy Allen, nancy.allen@oregonstate.edu

Fisheries & Wildlife Science, Marine Science Example

Degree granted: B.S.

Program Website: <http://fw.oregonstate.edu/Undergraduate%20Study/marine.htm>

Contact: Nancy Allen, nancy.allen@oregonstate.edu

Fisheries

The Fisheries Science graduate program focuses on quantitative analyses of marine and freshwater fish populations, water quality, fish systematics, fish and invertebrate physiology, stream ecology, modeling of aquatic ecosystems, land use interactions, endangered species, and aquaculture. Areas of Concentration in Fisheries: Aquaculture, conservation biology, fish genetics, ichthyology, limnology, parasites and diseases, physiology and ecology of marine and freshwater fishes, stream ecology, toxicology, water pollution biology.

Degree granted: M.S. and Ph.D.

Program Website: <http://fw.oregonstate.edu/Graduate%20Study/index.htm>

Contact: Nancy Allen, nancy.allen@oregonstate.edu
Oregon State University
Corvallis, OR 97331-5033

School of Civil and Construction Engineering

Ocean Engineering

The Coastal and Ocean Engineering Program at Oregon State University is a comprehensive curriculum of graduate studies and research leading to the degrees of Master of Science (M.S.), Master of Ocean Engineering (M.Oc.E.), and Doctor of Philosophy (Ph.D.). The program is administered by the School of Civil and Construction Engineering and has strong ties with the College of Oceanic and Atmospheric Sciences and the College of Science. The M.Oc.E. program requires a thesis (6-12 credits) and is typically completed in two academic years. A minimum of three additional years of study is needed for highly motivated students to complete the Ph.D. program. As an alternative to the M.Oc.E. degree, a student may elect to obtain a Master of Science in Civil Engineering and major in Coastal and Ocean Engineering. This is a non-thesis option that requires project research-in-lieu-of-thesis (3-6 credits) and may be completed in less than two years. Both these Master's degrees require a minimum of 45 graduate credits; including the thesis or project. The Ph.D. degree requires an additional 63 credits, which includes 36-45 credit hours for the Ph.D. thesis.

Degree granted: M.S., M.Oc.E. and Ph.D.

Facilities: The O.H. Hinsdale Wave Research Laboratory together with the Coastal and Ocean Engineering Program at Oregon State University is a leading center for research and education in coastal engineering and nearshore science. Our strengths are: 1) A critical mass of faculty specializing in physical and numerical modeling of coastal dynamics, 2) an expanding, interdisciplinary graduate program offering M.Sc., M.Oc.E. and Ph.D. degrees, 3) one of the largest and technically most advanced laboratories for coastal research, and 4) expertise in tsunami and coastal hazard mitigation. In 2001, the WRL was designated by the National Science Foundation as a site for Tsunami research within the Network for Earthquake Engineering Simulation.

Faculty: Dan Cox, Associate Professor, Director, O.H. Hinsdale WRL; Merrick Haller, Assistant Professor, Coastal & Ocean Engineering program coordinator; Rob Holman, Professor; Tuba Ozkan-Haller, Assistant Professor; Peter Ruggiero, Assistant Professor, Geosciences; Harry Yeh, Professor; Solomon C. Yim, Professor.

2007 tuition: In-state residents: \$3,042; Out-of-State: \$4,932

Program Website: <http://wave.oregonstate.edu/>

Contact: Dr. Merrick Haller, hallerm@engr.orst.edu
Oregon State University
220 Owen Hall
Corvallis, OR 97331
Email: Kathy.Westberg@oregonstate.edu

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Oregon State University College of Oceanic and Atmospheric Science Corvallis, OR

Oceanography, the application of the sciences to the study of the oceans, is an interdisciplinary environmental science concerned with all processes in the ocean: biological, chemical, geological, and physical, as well as the interactions between the ocean and atmosphere. The oceanography graduate program of the College of Oceanic and Atmospheric Sciences offers Master of Arts, Master of Science, and Doctor of Philosophy degrees. Faculty and students of Oregon State University's College of Oceanic and Atmospheric Sciences are advancing the frontiers of knowledge about the ocean, atmosphere and Earth system. Our success is based on an interdisciplinary approach and state-of-the-art technology and facilities.

COAS is a national leader in the study of coastal zones and ocean processes. Through field experiments, theoretical investigations and numerical modeling and simulations, we study all aspects of ocean, land and atmosphere processes and interactions.

Recognized as a leader in the study of small-scale ocean physics and mixing processes, COAS also has expertise in instrument design, field experiments, theory and modeling. COAS researchers lead national and international research using satellites for remote-sensing.

For all areas in oceanography, applicants should have a strong quantitative background and an undergraduate degree in a relevant field of science or engineering and one year each of chemistry, physics, and calculus. Prior background in oceanography is not essential. Graduate Record Exam scores are required of all applicants. Within the OSU college, discipline groups oversee research and educational programs in atmospheric sciences, oceanography and marine resource management: Research in **biological oceanography** involves the interactions of oceanic plants and animals with each other and with chemical, physical and geological processes in the sea. The ecological aspects of marine biology in the open ocean, coastal zones, and estuaries are emphasized. Candidates should have an undergraduate major in biology or chemistry.

Chemical processes of the ocean and their relation to the biological, physical, and geological processes of sea, land, and air are the concern of **chemical oceanography** research efforts. Applicants must have an undergraduate major in chemistry. Graduate students in chemical oceanography may concentrate on natural or con-

taminant organic, nutrient, trace metal, or radionuclide materials in the oceans, assessing the oceanic effects of such materials and their exchanges with atmospheric and terrestrial reservoirs.

In **geological oceanography (marine geology)**, a broad range of geological processes that influence the ocean is studied. Fields of interest include plate tectonics and the structure of the ocean basins, igneous petrology and geochemistry, sedimentation, paleoceanography and paleoclimatology, the chemistry of hydrothermal solutions and coastal sedimentary processes. The undergraduate degree of candidates for graduate study should show strength in one or more of these fields: earth science, chemistry, physics, biology or mathematics.

Physical oceanography research covers the physical processes in the sea, exchange of energy and momentum at the air-sea interface, and the transmission and absorption of energy in the sea (e.g., light, heat, and sound). Circulation, tides, waves, heat content, and density distributions are some of the other phenomena of particular interest. Candidates should have an undergraduate major in physics, mathematics, or engineering.

Interdisciplinary oceanography combines research in more than one discipline, allowing for an integrated approach to the quest for knowledge of the oceans.

Interdisciplinary research: Climate change and global warming, Earth systems, the Arctic, tsunamis, earthquakes, the North Pole, pollution, weather, clouds and haze, life on Mars, hydrothermal vents, geophysics, nearshore dynamics, ocean observing and many other activities associated with oceanography and the atmosphere.

Facilities: COAS operates numerous state-of-the-art laboratories and two oceanographic research vessels. These facilities include general-purpose and specialized facilities and laboratories for chemical and biological analyses. The vessels operate out of the port facility at the Hatfield Marine Science Center (HMSC) in Newport, Oregon. *Computer Facilities:* Atmospheric Sciences Facilities, Boundary-Layer Data Facility, Satellite Data Analysis Facility. *Biological Oceanography Facilities:* Bio-optics/Plankton Laboratory, Earth Observing System Direct Broadcast Site, Microbiology Laboratory, Zooplankton Laboratory. *Chemical Oceanography Facilities:* Organic Geochemistry Laboratories. *Marine Geology and Geophysics Facilities:* Active Tectonics and Seafloor Mapping Laboratory; Coastal Imaging Laboratory; Coring Facility; Electron Microprobe Laboratory; Experimental Petrology Laboratory; Micropaleontology Laboratory; OSU/COAS Stable Isotope Mass Spectrom-

eter Facility; OSU/COAS Marine Geology Sample Repository; W.M. Keck Collaboratory for Plasma Spectrometry; $^{40}\text{Ar}/^{39}\text{Ar}$ Geochronology Laboratory; Seismic Station and Seismic Imaging Electromagnetic Imaging; Hydrothermal, Marine, and Observatory Instrumentation.

Physical Oceanography Facilities: Coastal Ocean Radar System, Moored Instruments, Ocean Mixing Laboratory, Optical Properties Laboratory.

Faculty: Seventy-five teaching and research faculty work with 80 research associates, recent Ph.D. recipients (post-docs) and faculty assistants, while engaging 100 graduate students in master's and Ph.D. programs.

Tuition: http://oregonstate.edu/fa/businessaffairs/studentfinance/tuition/tuition_corvallis_0607.php

Student Support: Most students are supported on Graduate Research Assistantships, which provide a monthly stipend, insurance subsidy, and full tuition remission.

Program Website: www.coas.oregonstate.edu

Contact: Robert Allan, rallan@coas.oregonstate.edu
Telephone: 541-737-1340, Fax: 541-737-2064

Atmospheric Sciences

Atmospheric Sciences within OSU is at the forefront of advancing knowledge in ocean-atmosphere interaction, climate variability and change, and atmospheric boundary layer processes. Work on these three themes takes advantage of the unique structure and strengths of COAS, the College of Forestry, and the College of Agricultural Sciences. Advances in understanding and simulating atmospheric boundary layer processes directly support applications to geographically localized studies of climate and weather, which is of particular value to agriculture, forestry, and the economic development of the Pacific Northwest. Major research initiatives in the area of climate variability and change require expertise in observing and modeling of physics and chemistry of the atmosphere and in the modeling and analysis of climate variability. Critical to all of the areas is the expansion of modeling and observing capabilities in atmospheric meso-scale, boundary layer, and cloud processes. COAS faculty conduct research in atmospheric physics, chemistry, and dynamics, and the interaction of the atmosphere with ocean and land surfaces. Research areas include aerosols, clouds, and climate studies, large-scale weather systems studies, boundary layers and land-atmosphere interactions, and the Oregon Climate Service. Graduate research is available in the following areas of faculty expertise: atmospheric radiation and remote sensing; aerosol and cloud chemistry and physics; planetary atmospheres; air-sea and land-atmosphere interactions; climate and statistical meteorology; and turbulence and convection. Atmospheric Sciences applicants should have an undergraduate degree in physics, mathematics, engi-

neering, chemistry, atmospheric science, or related fields with strength in mathematics. Applicants should have completed one year of physics with calculus, one year of chemistry, and courses in vector calculus and differential equations. Courses in probability and statistics are also desirable. An interdisciplinary doctorate is available.

Degree granted: M.S. and Ph.D.

Facilities: The COAS satellite data-analysis facility includes large archives of satellite data and advanced image-processing and data-analysis capabilities. The facility is used to extract global-scale cloud, aerosol, and surface properties from satellite observations, including those being collected by NASA's Earth Observing System. COAS studies of the exchanges of energy, mass, and momentum between the Earth's surface and the atmosphere involve researching the atmospheric aspects of hydrology. This research includes several joint projects with the department of Bioresource Engineering, and researching the vegetation-atmosphere exchange of heat, moisture, carbon dioxide, and other trace gases, which is done partly in conjunction with the department of Forest Science, NASA, and NSF.

Program Website: <http://www.coas.oregonstate.edu/index.cfm?fuseaction=content.display&pageID=502>

Contact: Jeffrey Barnes, barnes@coas.oregonstate.edu

Biological Oceanography

Biological Oceanography is the study of ocean ecology. The focus is on how marine organisms interact with each other and with physical, chemical, and geological processes in the ocean. Biological processes in the ocean play a critical role in many Earth systems. For example, marine life is important in global biogeochemical cycling of many bioactive elements (such as C, N, and S), and has a first-order effect on the accumulation of carbon dioxide in the atmosphere. Focus areas of the 14-member COAS biological oceanography faculty include phytoplankton physiology and ecology, aquatic microbial ecology, zooplankton ecology, bio-optics, population-to-ecosystem modeling, and benthic sedimentary ecology of continental shelves and estuaries. Spatial scales of interest range from microbial food webs to primary production at regional and global scales studied via ocean bio-optics and satellite remote sensing. Temporal scales of interest range from studies of suspension feeding activity over a tidal cycle to inter-annual variation in nutrient dynamics in the Oregon upwelling system. COAS biological oceanographers are active in field studies at remote locations (for example, the Southern Ocean, Arctic Ocean, and Mediterranean Sea), as well as local sites (the Yaquina estuary and Pacific Northwest coast). Applicants to the COAS Biological Oceanography program should have an undergraduate major (or the equivalent) in biology

or chemistry; other fields are also considered. A strong quantitative background is desirable.

Degree granted: M.S. and Ph.D.

Facilities: Students in Biological Oceanography have access to state-of-the-art research and computer facilities, either within COAS or throughout the university for specialized equipment. COAS facilities include a flow cytometer and image-analysis laboratory for measuring detailed properties of individual microbial cells, a state-of-the-art seafloor sampling package that collects high-resolution seafloor images and sediment samples from diverse bottom types, and controlled environment rooms for laboratory culture and experiments on marine organisms. At the Oregon coast, HMSC, our two research vessels, and small skiffs provide facilities for field sampling and laboratory studies.

Program Website: <http://www.coas.oregonstate.edu/index.cfm?fuseaction=content.display&pageID=501>

Contact: Mark Abbott, mark@coas.oregonstate.edu

Chemical Oceanography (M.S.)

Graduate education in the Chemical Oceanography program incorporates course work and research in descriptive, analytical, and theoretical chemistry and in parts of biological, physical, and geological oceanography, reflecting the broad interdisciplinary nature of this field. During their first year, all incoming Chemical Oceanography students take core chemical, physical, biological, and geological oceanography courses with students from other oceanography disciplines. Specialized courses in such areas as isotope geochemistry, advanced thermodynamics, organic geochemistry, radiochemistry, pollution chemistry, and instrumental methods of chemical analysis are subsequently elected to fulfill the curricular requirements and needs of individual students. Students are expected and encouraged to participate in all aspects of chemical oceanographic research, from formulation of initial questions and experimental designs, through development and operation of analytical equipment in the laboratory and at sea, to data analysis and subsequent presentation



COAS operates the NSF-owned R/V Wecoma out of the Hatfield Marine Science Center in Newport.

and publication of results. Initial research topics pursued by our students are usually closely related to the interests and funding of individual faculty members. For the Ph.D. degree, however, students are expected to develop their own independent, creative research project.

Degree granted: M.S.

Facilities: Chemical oceanography students at OSU have access to a wide variety of research environments ranging from alpine lakes in the nearby Cascade mountains to hydrothermal systems located conveniently off the coast of Oregon. The OSU research vessel Wecoma affords many opportunities for coastal and deep-water work throughout the Pacific Ocean. Analytical facilities within the college include inductively coupled plasma mass spectrometry (high-resolution multi-collector and standard versions) with ion chromatography and laser ablation capabilities, atomic absorption spectrophotometry, capillary gas chromatography/mass spectrometry, high-performance liquid chromatography with spectrofluorimetric and diode-array spectrophotometric modes of detection, dual-inlet and continuous-flow isotope ratio mass spectrometry, and extensive computer networks. Other analytical capabilities such as electron microscopy, ion-probe analysis, and neutron-activation analysis are shared with agricultural and environmental chemists and biochemists on campus. Collaboration with students, faculty members, and professional scientists in other OSU departments and affiliated agencies is encouraged and often includes interaction with researchers and facilities at local USEPA laboratories and HMSC.

Program Website: <http://www.coas.oregonstate.edu/index.cfm?fuseaction=content.display&pageID=500>

Contact: Robert Collier, rcollier@coas.oregonstate.edu

Chemical Oceanography (Ph.D.)

Chemical oceanographers at COAS study the chemistry of the oceans and other aquatic environments to record changes in the environment over time. They study interactions with plants, animals, and microorganisms; the Earth's seafloor and continents; and the atmosphere. They examine chemicals in oceans, lakes, and rivers to understand the natural and anthropogenic changes affecting these environments. Focus areas of the faculty include development of analytical methods and chemical sensors, chemical hydrography, biogeochemical cycles, hydrothermal and gas hydrate chemical processes, and biomarker studies. Applicants to the COAS Chemical Oceanography program must have an undergraduate degree in chemistry or another discipline of science, with at least one year each of general chemistry, organic chemistry, and physical chemistry. Additional background in differential equations, probability, and statistics is

desirable. Prior exposure to environmental study through independent, undergraduate laboratory, or field experience provides excellent preparation for our program but is not a requirement.

Degree granted: Ph.D.

Facilities: See description above of chemical oceanography M.S. program facilities.

Program Website: <http://www.coas.oregonstate.edu/index.cfm?fuseaction=content.display&pageID=500>

Contact: Robert Collier, rcollier@coas.oregonstate.edu

Marine Geology and Geophysics

Management, sharing, and stewardship of global resources demand an understanding of global environmental change, Earth resources, and natural hazards related to the dynamics of the solid Earth, oceans, and atmosphere on time scales longer and over ranges larger than have been recorded by human experience. The COAS Marine Geology and Geophysics program emphasizes five themes: *Crust and mantle processes:* Research focuses on the interplay of magmatic and tectonic processes along the global mid-ocean ridge system, volcanic and tectonic history of oceanic hotspots, tectonic evolution of ocean basins, and the dynamics of the Earth's mantle. This research involves a substantial geochemical component that is supported by several laboratories.

Active tectonics: Research focuses on the study of active submarine faults in convergent and strike-slip settings, which leads to models that provide understanding of how deformation interacts with subduction. COAS is active in the emerging field of marine paleoseismology, which deciphers the earthquake history of large-fault systems from the geologic record to better understand earthquake and tsunami hazards. *Paleo-oceanography and paleoclimatology:* Research emphasizes the ice ages as a natural laboratory for understanding climate change. Recent projects include factors causing changes in global ocean circulation and the global carbon cycle, documenting the role oceans play in long-term climate changes, the role that unstable tropical climates play in triggering global climate effects, and analyzing patterns of large-scale climate change. *Biogeochemical processes:* Research focuses on understanding the implications of ocean fluxes, and the influence of microorganisms on the Earth's geological and geochemical systems. Scientists are also involved in the search for life in extreme environments.

Coastal processes: Research includes the fluid dynamics of near-shore waves and currents, sediment transport driven by those flows, and the morphologies created by these systems. The Coastal Imaging Laboratory supports a broad array of digital imaging tools to monitor coastal variations in locations that span the globe and include

real-time observing systems based on radar and satellite measurements. Applicants to the COAS Marine Geology and Geophysics Program should have good quantitative skills and a background that includes both Earth science and one or more of the physical sciences.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.coas.oregonstate.edu/index.cfm?fuseaction=content.display&pageID=499>

Contact: Robert Duncan, rduncan@coas.oregonstate.edu

Physical Oceanography

Oceanic circulation and the interactions among the ocean, the atmosphere, and solid Earth influence the Earth's climate and directly affect people. COAS physical oceanographic researchers develop and use *in situ* and remote-sensing instruments to better understand ocean dynamics and thermodynamics. Observations and models are used to investigate the interaction among air and sea, physical oceanography and ocean biology, and chemistry and geology. Faculty study coastal-ocean processes, small-scale ocean physics and mixing, remote sensing and upper-ocean circulation, air-sea interaction, and ocean modeling and prediction. Major contributions are made in the fields of ocean optics, turbulence, coastal and mesoscale dynamics, polar processes, and open-ocean observations and theory. Applicants to the Physical Oceanography program should have an undergraduate degree in physics, mathematics, or engineering, or a related field with a strong background in mathematics.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.coas.oregonstate.edu/index.cfm?fuseaction=content.display&pageID=507>

Contact: Jack Barth, barth@coas.oregonstate.edu

Marine Resource Management

COAS is a national leader in the study of coastal zones and ocean processes. Through field experiments, theoretical investigations and numerical modeling and simulations, we study all aspects of ocean, land and atmosphere processes and interactions. Marine Resource Management (MRM) is a science-based, interdisciplinary master's program based in COAS. The program provides students with the multidisciplinary training necessary to function confidently and effectively in professional resource management positions. Marine and coastal issues are techni-

You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

cally and politically complex, involving many interests, perspectives and stakeholders. To deal effectively with these issues, marine resource managers need a broad-based background in both physical and social sciences. Graduates from the program are trained to bridge the gap between science and policy. One of the hallmarks of the program is the flexibility in your program design to meet your needs, interests, and research direction.

Areas of Concentration:

- Coastal Processes, Policy and Hazards
- Fisheries Management
- Marine Pollution and Coastal Water Quality
- Marine Conservation
- Specific Skills Emphasis
 - GIS and Remote Sensing
 - Policy and Planning
 - Communication and Marine Education

The program offers two tracks: a Professional track and a Thesis track.

- The Professional track requires 57 credits of course work plus 9 internship or project credits for a total of 66 credits.
- The Thesis track requires 40 credits course work and 12 Thesis credits for a total of 66 credits.

Students on a Professional Track develop a project and defend a report on that work, based on either an internship or a research project. Projects are conducted under the guidance of the student's major professor and/or committee members. Recent examples include an assessment of alternative shore-protection techniques and an evaluation of the capacity and training needs of coastal watershed councils for assessing aquatic nuisance species in their watersheds.

Internships may be with local, state or federal agencies, with nongovernmental organizations, or with private firms, including consultants. Organizations that have provided internships include Hatfield Marine Science Center, Oregon Department of Fish and Wildlife, NOAA Marine Protected Area Science Center, and The Nature Conservancy.

Students on a Thesis Track are expected to produce a more extensive and rigorous piece of original work and analysis, and must meet additional requirements set by the Graduate School and advisor. An additional committee member (graduate council representative) is required for the final oral exam, and all additional Graduate School thesis guidelines must be followed.

Facilities: MRM has 180 alumni and 25-30 students in residence. More than 40 faculty from COAS, other university departments and outside institutions partici-

pate in MRM. These partnerships include departments of Fisheries and Wildlife, Geosciences, Agricultural and Resource Economics, Political Science, Sociology, and Anthropology; Sea Grant extension specialists; and scientists and management professionals from state and federal agencies. The program has earned national and international recognition for its exceptional training of marine management professionals.

Degree granted: M.S. (on average, 10 students per year)

Student Support: Most of the MRM students receive financial aid in the form of student hourly wage support, scholarships and fellowships, and Graduate Research Assistantships. The program successfully matches students with research needs, which often leads to funding support.

2007 Tuition: http://oregonstate.edu/fa/businessaffairs/studentfinance/tuition/tuition_corvallis_0607.php

Program Website: <http://www.coas.oregonstate.edu/index.cfm?content.display&pageID=209>

Contact: Robert Allan, rallan@coas.oregonstate.edu
Oregon State University
202 Apperson Hall
Corvallis, OR 97331

Palm Beach Atlantic College

West Palm Beach, FL

Oceanography

Degree granted: Minor

Program Website: http://www.pba.edu/Academic/Majors_Description.cfm?schoolid=1#Natural%20Science%20&%20Mathematics

Contact: Dr. Donald Lovejoy, Donald_Lovejoy@pba.edu

Marine Biology

Degree granted: B.S.

Program Website: <http://www.pba.edu/undergraduate/arts-sciences/science-mathematics/majors-minors.cfm?degree=BIMBMJ06>

Contact: Dr. Maurice Thomas, Maurice_Thomas@pba.edu
Palm Beach Atlantic College
West Palm Beach, FL 33401

Peninsula College

Port Angeles, WA

Fisheries and Aquaculture

Our approach in the fisheries and aquaculture program is to use hands-on projects and experiences to reinforce a strong theoretical foundation in aquatic sciences. Skills and knowledge are learned in the framework of inquiry by means of integrating research-based projects in nearly all the program courses. Communication skills, teamwork and computer use are interwoven throughout the curriculum.

There are several degree and certificate pathways to help you achieve your career goals. The Associate of Applied Science degrees (AAS and AAS-T) provide an effective balance of vocational preparation for immediate entry into the workplace as well as transferability to four-year programs. Those who are interested in aquaculture can also use the AAS or AAS-T degrees as effective preparation for the Peninsula College Bachelor of Applied Science degree in business management. The Associate of Science degree is recommended for those planning on immediate transfer into a four-year fisheries science program. The one-year Aquaculture Certificate is a good addition to other degrees or as a stand-alone credential for entry-level work in aquaculture.

Degree granted: Associate of Applied Science; Associate of Applied Science-Transfer; Associate of Science; Aquaculture Certificate

Program Website: <http://pc.ctc.edu/fish>

Contact: Jack Ganzhorn, jackg@pcadmin.ctc.edu
Fisheries and Aquaculture Program
Peninsula College
1502 E. Lauridsen Blvd.
Port Angeles, WA 98362

Pennsylvania State University

University Park, PA

Wildlife Fisheries Science

The purpose of the Wildlife and Fisheries Science major is to develop the knowledge, skills, and professional ethics of undergraduates interested in the conservation and management of fish and wildlife and their environments. The curriculum is designed to provide a broad-based science background that incorporates natural resource management principles that prepare our students for a diverse array of opportunities such as graduate school, natural resource management agencies, consulting firms, non-profits, etc. Students can choose from two options: Wildlife option and Fisheries option. Each option enables

students to gain greater depth of knowledge in one area of the discipline. Coursework required for the Wildlife option meets The Wildlife Society's requirements for professional certification, and coursework required for the Fisheries option meets the American Fisheries Society's requirements for professional certification. For the B.S. in Wildlife and Fisheries Science, a minimum of 120 credits is required for the Wildlife option and a minimum of 122 credits is required for the Fisheries option.

Degree granted: B.S.

Program Website: http://www.psu.edu/bulletins/blue-book/major/w_f_s.htm

Contact: Professor Larry H. McCormick,
admissions@psu.edu

Minor in Marine Science

This program provides an excellent opportunity for undergraduates to pursue their interests in the study of the oceans and make more informed decisions about future graduate studies in marine sciences. Although Penn State does not award degrees in this field, a number of faculty pursue research interests in the marine sciences, and a varied selection of undergraduate courses in the marine sciences is available. The student can either complete the requirements for the minor at University Park (UP) or participate in an intensive semester-long oceanography experience at the Southampton, UK, Oceanography Centre (SOC) through Education Abroad: http://www.international.psu.edu/students_study_abroad/programs_southampton.htm.

The latter option may be of particular interest to students from non-UP locations. SOC has designed a program for PSU students that provides abundant opportunity to participate in shipboard oceanographic research, including a week of day cruises in the spring and a 2-week series of cruises in June. Students who elect to pursue this minor at UP have the opportunity to receive training as scientific scuba divers through Penn State's Science Diving Program and participate in a number of other field experiences in the marine sciences.

Degree granted: Undergraduate minor in Marine Science; B.S., M.S. and Ph.D. in a variety of marine-related disciplines including Acoustics, Biology, Biochemistry, Microbiology and Molecular Biology, Earth Sciences, Geosciences, and Meteorology.

Facilities: Penn State utilizes the marine facilities of other institutions, including the Marine Science Consortium at Wallops Island, Virginia; and the Gerace Research Center on San Salvador, Bahamas. The University has many laboratories devoted to marine research, a fully equipped scientific diving program, and small boats for lake or coastal research.

Faculty: <http://www.ocean.psu.edu/faculty.html>

Tuition: Undergraduate - (PA residents): \$11,646 per academic year (2006/2007; lower division); (non-PA resident): \$22,194 per academic year (2006/2007; lower division)

Program Website: <http://www.ocean.psu.edu>

Contact: Lee R. Kump, lkump@psu.edu

Penn State University

Dept. of Geosciences

535 Deike Bldg.

University Park, PA 16802

Telephone: 814-863-1274, Fax: 814-863-7823

Perry Institute for Marine Science

Jupiter, FL

Bahamas Field Courses in Marine Science

Degree granted: Courses for working professionals

Program Website: http://www.perryinstitute.org/field_courses.htm

Contact: dso@perryinstitute.org

Prince William Sound Community College

Valdez, AK

Industrial Technology Certificate:

Oil Response Emphasis

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.pwscc.edu/degrees/itec-oil.html>

Contact: Dawn Caynor, dcaynor@pwscc.edu

Industrial Technology: Oil Spill Response

Degree granted: A.A.S.

Program Website: <http://www.pwscc.edu/training.shtml>

Contact: Dr. Robert S. Benda, bbenda@pwscc.edu

Oil Spill Response

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.pwscc.edu/training.shtml>

Contact: Paul "Wes" Lundburg, plundburg@pwscc.edu

Safety Management

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.pwscc.edu/training.shtml>

Contact: Paul "Wes" Lundburg, plundburg@pwscc.edu

Prince William Sound Community College

PO Box 97

Valdez, AK 99686

Princeton University

Princeton, NJ

Atmospheric & Oceanic Science

Degree granted: Ph.D.

Program Website: <http://www.aos.princeton.edu/Ph.D.%20Program.html>

Contact: Michael Bender, bender@NOSPAM.princeton.edu

Environmental Engineering & Water Resources

Degree granted: Ph.D.

Program Website: <http://cee.princeton.edu/eewr/>

Contact: Jennifer Poacelli, poacelli@Princeton.EDU

Department of Ecology and Evolutionary Biology

Marine Biology Summer Program

Degree granted: Minor

Program Website: <http://www.eeb.princeton.edu/UNDERGRAD/Intro.html>

Contact: Lolly O'Brien, lolly@princeton.edu

Quality Maritime Training, LLC

St. Petersburg, FL

Licensing and Certification Department

Mariner Training and Certification

Provider of USCG-approved merchant marine deck license and endorsement training courses and programs. Many of our training programs are also approved as meeting the International Seafarer's Training Certification & Watchkeeping (STCW) Code requirements for training & certification from entry level mariner through Master of ocean-going vessels.

Degree granted: Certificate-Bachelor's degree required

Facilities: Classroom sites are located in St. Petersburg, Florida; affiliated with the St. Petersburg College system for marine fire-fighting training. Other hands-on training courses, such as proficiency in survival craft and lifeboat training, are conducted onboard the S.S. American Victory ship in the Port of Tampa, Florida.

Program Website: <http://www.qualitymaritime.info/>

Contact: Janice Trowbridge, jrt86@qualitymaritime.info
Quality Maritime Training, LLC

8601 4th Street North, Suite 209

St. Petersburg, FL 33702

Email: courses@qualitymaritime.info

Phone: 800-581-5509

Rider University
 Lawrenceville, NJ

Liberal Studies: Marine Ecological Emphasis

Degree granted: B.S.

Program Website: <http://www.rider.edu/gems>

Contact: Dr. Jonathan M. Husch, husch@rider.edu

Oceanography

Degree granted: Minor

Program Website: <http://www.rider.edu/gems>

Contact: Dr. Jonathan M. Husch, husch@rider.edu

Marine Sciences

Rider University is a private, non-sectarian teaching university with approximately 4,000 undergraduate students located on two campuses in Lawrenceville and Princeton, New Jersey. The marine sciences major, one of six offered by the Department of Geological, Environmental, and Marine Sciences (GEMS), is located on the Lawrenceville campus. Students majoring in marine sciences can investigate chemical, biologic, geologic, and physical marine processes and their connection to other earth systems.

Degree granted: B.S.

Facilities: All GEMS programs, including marine sciences, are housed in the Rider University Science and Technology Center, along with all other science departments. GEMS maintains field facilities at the Lighthouse Education Center in Waretown, NJ, and also provides field experiences at the Bermuda Institute of Ocean Sciences, Bermuda, and the Roatan Institute for Marine Sciences, Honduras.

Faculty: Dr. Jonathan Husch, Chair, Professor of Geological and Environmental Sciences, Geochemistry; Dr. Reed Schwimmer, Associate Professor, Coastal Processes; Dr. Gabriela Smalley, Assistant Professor, Plankton Ecology; Dr. Hongbing Sun, Associate Professor, Hydrology and Soil Science; Dr. Paul Jivoff, Associate Professor, Marine Biology.

2007 tuition: In-state residents: \$25,650; Out-of-State: \$25,650

Program Website: <http://www.rider.edu/gems>

Contact: Dr. Jonathan Husch, husch@rider.edu
 Rider University

2083 Lawrenceville Road
 Lawrenceville, NJ 08648
 Phone: 609-896-5092

Ripon College
 Ripon, WI

Biology

Degree granted: B.S.

Program Website: <http://www.ripon.edu/academics/biology/index.html>

Contact: biology@ripon.edu

Ripon College

Ripon, WI 54971-0248

Roger Williams University
 Bristol, RI

Marine Biology

Degree granted: B.S.

Program Website: <http://departments.rwu.edu/biology/index.htm#marinebiology>

Contact: Dr. Sean Colin, scolin@rwu.edu

Environmental Science

Degree granted: B.S.

Program Website: <http://www.rwu.edu/academics/departments/environmentalscience.htm>

Contact: Dr. Sean Colin, scolin@rwu.edu

Roger Williams University
 Bristol, RI 02809

Rowan College of New Jersey
 Glassboro, NJ

Biology

Degree granted: B.S.

Program Website: <http://www.rowan.edu/colleges/las/departments/biologicalSci/>

Contact: Luke Holbrook, holbrook@rowan.edu

Rowan College of New Jersey

Glassboro, NJ 08028



Behavior data logger attached to a finless porpoise

Rust College
Holly Springs, MS

Biology

Degree granted: B.S.

Program Website: <http://www.rustcollege.edu/rust/rust2/depts/divsciandmath/degreeprograms.html>

Contact: fyeh@rustcollege.edu

Rust College

Holly Springs, MS 38635

Rutgers University
New Brunswick, NJ

Department of Marine and Coastal Sciences

Marine Sciences (Minor)

An 18-credit minor in Marine Sciences is offered for students who wish to show that their studies have included a focus on some aspect of marine science. Two terms of biology, calculus, chemistry, physics, and an introductory geology course are recommended and/or required for many of the courses in the program.

Degree granted: Minor

2007 tuition: In-state residents: \$11,669; Out-of-State: \$21,837

On-campus Housing Available: yes

Program Website: http://marine.rutgers.edu/ed/marine_minor.html

Contact: Judy Grassle, jgrassle@imcs.rutgers.edu

Phone: 732-932-6555 ext 351

Marine Sciences (B.S.)

Marine Science is the study of the marine environment and its interactions with the earth, the biosphere, and the atmosphere. It is therefore an interdisciplinary science requiring knowledge of the principles of physics, geology and geophysics, mathematics, chemistry, and biology. A major in marine sciences provides students with a broad curriculum in the sciences, which demonstrates how the different disciplines can be brought to bear on understanding marine processes and managing ocean resources wisely.

Degree granted: B.S.

2007 tuition: In-state residents: \$11,669; Out-of-State: \$21,837

On-campus Housing Available: yes

Program Website: <http://marine.rutgers.edu/ed/MainUndergrad.html>

Contact: Judy Grassle, jgrassle@imcs.rutgers.edu

Phone: 732-932-6555 ext 351

Fisheries Science

This certificate program addresses the growing demand for trained fisheries professionals in the region. The certificate provides students from several curricula with courses and practical experience and is modeled on the guidelines of the American Fisheries Society.

Degree granted: Certificate-Bachelors degree required

2007 tuition: In-state residents: \$11,669; Out-of-State: \$21,837

On-campus Housing Available: yes

Program Website: http://marine.rutgers.edu/ed/fisheries_certificate.html

Contact: Judy Grassle, jgrassle@imcs.rutgers.edu

Phone: 732-932-6555 ext 351

Oceanography

The Graduate Program in Oceanography is centered in the Institute of Marine and Coastal Sciences, which serves as a focus of interdisciplinary studies and research in estuarine, coastal and open-ocean environments. A broad range of research opportunities are available, including: real-time studies in the coastal ocean using advanced underwater instrumentation; biological and geological processes at deep-sea hydrothermal vents; remote sensing and ocean modeling; advanced underwater optics and fish behavior; biodiversity and marine molecular biology; coastal geomorphology; organism-sediment interactions; cycling of organic and inorganic materials in the ocean; watershed ecosystems.

Degree granted: M.S. and Ph.D.

2007 tuition: In-state residents: \$13,855; Out-of-State: \$19,880

On-campus Housing Available: yes

Program Website: <http://marine.rutgers.edu/gpo/GradProg.html>

Contact: Sarah Kasule, kasule@marine.rutgers.edu

Phone: 732-932-6555, ext 500

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You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

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Saddleback Community College

Mission Viejo, CA

Department of Marine Science Technology/Aquarium Aquaculture Science

Aquarium and Aquaculture Science

Saddleback College is a comprehensive two-year institution of higher education and offers more than 140 programs leading to an Associate in Arts or Science degree in academic subjects or occupational certificates. Saddleback is accredited by the Western Association of Schools and Colleges and is located within a 10-minute drive to Dana Point Harbor. Classes are offered on the college's 200-acre hillside campus, as well as at approximately 40 community sites. The Aquarium and Aquaculture Science Program is the first and only approved and accredited program of its kind in the California Community College System. The program offers an Occupational Certificate and Associate of Science degree and is aimed at the future in producing a technically skilled and knowledgeable workforce that will be necessary to fill the predicted job market growth in aquarium and aquaculture-related venues. The Aquarium and Aquaculture Science program provides students with career preparation for entry-level work in public aquarium, interpretive/education centers, pet industry, private business or aquaculture related venues. For those already in the field, a skills upgrade in the latest techniques and information relating to water chemistry and toxicology, filtration, life support and habitat design, culture protocols, health, nutrition and disease, and equipment will be covered using hands-on application and innovative scientific approach. Current industry standards, state and federal regulations and licensing are addressed. Through guided practical and technical experience, field trips and internships, students will acquire good husbandry skills required to properly care for aquatic organisms and the dynamics involved in aquarium science. We produce aquarists, farm technicians, and knowledgeable business-oriented aquarists. We educate and train teachers and the public, produce aquatic organisms, and introduce students into research. We also provide education opportunities for those already in the profession and host many tours and special workshops for special interest groups. The program and coursework are open-enrollment. There are no pre-requisites for this program, although a suggested sequence of courses is preferred. There is no application or wait-list for the A.A.S. program, but there is an application and fee to enroll in courses at Saddleback College. Please see <http://www.saddleback.edu> for more information.

Degree granted: A.A.S.

Facilities: Training begins here on our Saddleback College campus in our 3,000 ft² Aquarium Science Lab. We circulate 2,500–4,000 gallons of seawater in several stand-alone and multiple tank systems and also operate a freshwater aquaponic system. We are partnered with over 14 local and regional facilities, many provide on-site workshops at their facilities and host our student interns: Aquarium of the Pacific, Birch Aquarium of Scripps Institution of Oceanography, Ocean Institute of Dana Point, Cabrillo Marine Aquarium, Hubbs-Sea World Research Institute, Hubbs Fish Hatchery, Doheny Aquarium, Chula Vista Nature Center, Newport Bay Interpretive Center and many more.

2007 tuition: In-state residents: \$350 (approx);

Out-of-State: \$4,200 (approx)

Program Website: <http://www.saddleback.cc.ca.us/ap/atas/MarineScienceTech/aas.html>

Contact: Julie Anderson, janderson@saddleback.edu
Phone: 949-582-4541

Aquarium and Aquaculture Science Certificate

The Aquarium and Aquaculture Science certificate program provides students with career preparation for entry-level work in public aquarium, interpretive/education centers, pet industry, private business, or aquaculture related venues. For those already in the field, a skills upgrade in the latest techniques and information relating to water chemistry and toxicology, filtration, life support and habitat design, culture protocols, health, nutrition and disease, and equipment will be covered using hands-on application and innovative scientific approach. Current industry standards, state and federal regulations, and licensing are addressed. Through guided practical and technical experience, field trips, and internships, students will acquire good husbandry skills required to properly care for aquatic organisms and the dynamics involved in aquarium science.

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.saddleback.edu/ap/atas/MarineScienceTech/aas.html>

Contact: Julie Anderson, janderson@saddleback.edu

Department of Environmental Sciences/ Marine Science Technology

Marine Science Technician

Rapid growth of the field of marine environmental management in Southern California brings demand for marine science technicians having the practical seaman-ship skills of navigation, vessel operation, marine systems and equipment maintenance, as well as scientific expertise. Flexibility in study areas of concentration allows for

tailoring coursework to specific employment opportunities. Classroom work in oceanographic disciplines is combined with seagoing laboratory experience aboard marine research vessels, both sail and power. The program is designed to develop a solid educational foundation so that graduates will be prepared to work closely with scientists, researchers, engineers, and marine survey and operations personnel as they endeavor to manage this enormous resource for the good of mankind.

Degree granted: A.S.

Facilities: Fleet of sailboats available, from 14-40 ft; Floating Marine Laboratory of the Ocean Institute in Dana Point Harbor; Dana Point Marine Wildlife Refuge at the Ocean Institute.

Faculty: Mark Wakeman Howe: Marine Biology, Oceanography, Marine GIS, Seamanship (USCG lic.); Ron Grant: Seamanship/Navigation (USCG lic.); Marc Hughston: Seamanship (USCG lic.); Diane Wenzel: Seamanship/Small Boat Safety (USCG lic.); Ed Tackett: Undersea Robotics/ROV, Computer-assisted design and production.

2007 tuition: In-state residents: \$20/unit; Out-of-State: \$171/unit

Program Website: <http://www.saddleback.edu/ap/atas/MarineScienceTech/courses.html>

Contact: Morgan E. Barrows Ph.D.
mbarrows@saddleback.edu
Saddleback Community College
28000 Marguerite Parkway
Mission Viejo, CA 92692
Phone: 949-582-4624

Seamanship

This program is designed to prepare individuals as boat operators, to prepare students to take Coast Guard licensing examinations, as well as to train marine technicians in the seagoing disciplines. Fieldwork is conducted throughout Southern California and the Channel Islands from Dana Point and Newport Harbors.

Degree granted: Certificate-Bachelors degree not required

Facilities: Boats include 28-ft to 48-ft. sailing and power vessels as well as safety sail training and introductory boating experience on Saddleback's fleet of 14-ft Capri sailboats.

Faculty: Mark Wakeman Howe: Marine Biology, Oceanography, Marine GIS, Seamanship (USCG lic.); Ron Grant: Seamanship/Navigation (USCG lic.); Marc Hughston: Seamanship (USCG lic.); Diane Wenzel: Seamanship/Small Boat Safety (USCG lic.); Ed Tackett: Undersea Robotics/ROV, Computer-assisted design and production.

2007 tuition: In-state residents: \$20/unit; Out-of-State: \$171/unit

Program Website: <http://www.saddleback.cc.ca.us/ap/atas/MarineScienceTech/courses.html#SCP>

Contact: Morgan E. Barrows Ph.D.
mbarrows@saddleback.edu
Saddleback Community College
28000 Marguerite Parkway
Mission Viejo, CA 92692
Phone: 949 582-4624

Saint Peters College

Jersey City, NJ

Biology with courses in Marine Biology

Degree granted: B.S.

Program Website: <http://www.spc.edu/pages/436.asp>

Contact: Dr. Raleigh, FRaleigh@spc.edu
Saint Peters College
Jersey City, NJ 07306

Salem State College

Salem, MA

Biology: Aquaculture Concentration

At Salem State College the Aquaculture Concentration within the Department of Biology manifests its ecological heritage. Students explore energy flow and allocation in aquatic systems. Techniques to repackage energy into organisms considered desirable by humankind are examined analytically. The recently approved curriculum affords students the opportunity to learn about aquaculture and to apply newly acquired skills in real-life situations. Hands-on experience and practical applications are pursued at the 6.1-hectare Northeastern Massachusetts Aquaculture Center (NEMAC) operated by SSC that includes the 510 m² Cat Cove Marine Laboratory and 3.25-hectare Smith Pool. Developing projects investigate the biology of regionally important shellfish (e.g., surf clams, Atlantic scallops, and oysters) and finfish (e.g., tautog, sturgeon) as well as environmental impacts of aquaculture. Cat Cove Marine Laboratory Aquaculture efforts at SSC highlight conservation and management, but business, computer, networking and other essential skills are equally emphasized. Growing fish is a hobby; marketing fish profitably is a business! Students who successfully navigate the Aquaculture Concentration at SSC will have gained knowledge and skills to practice aquaculture successfully in New England or halfway around the world in New Caledonia.

Degree granted: B.S.

Program Website: <http://www.salemstate.edu/biology/aquaculture/aboutus.html>

Contact: Dr. Mark Fregeau, mfregeau@salemstate.edu

Biology: Marine Biology concentration

The Marine Biology Concentration provides a broad science background supported by observations of marine organisms and their environment. The ocean and marshes of the North Shore offer a unique learning laboratory.

Degree granted: B.S.

Program Website: <http://www.salemstate.edu/biology/>

Contact: Mark R. Fregeau, mark.fregeau@salemstate.edu
Salem State College
Salem, MA 01970

Salisbury University

Salisbury, MD

Biology & Environmental/Marine Science Dual Degree

This Dual Degree Program provides the student with a comprehensive background in Biology and Environmental-Marine Science. It is a collaborative 4-year course of study offered through the Department of Biological Sciences at Salisbury University (SU) in cooperation with the Department of Natural Sciences at the University of Maryland Eastern Shore (UMES). Upon successful completion, the student receives both a Bachelor of Science in Biology from SU and a Bachelor of Science in Environmental Science with a Marine concentration from UMES. Study at the two campuses provides exposure to a diverse faculty, extensive laboratory and research facilities and broad course offerings. The curriculum provides a solid and extensive science background. Course work focuses on marine, estuarine, and wetland systems, aquatic and atmospheric pollution, and global-scale environmental study, with an analytical foundation in Physics, Mathematics, and Chemistry. Extensive field experiences are directed at study of environmental systems, especially aquatic ones, including estuaries, wetlands, coral reefs, barrier islands, and the oceans.

Degree granted: B.S.

Program Website: <http://www.salisbury.edu/schools/henson/biology/DuaDeg/DuaDeg01.html>

Contact: Judith Stribling, jmstribling@salisbury.edu
Salisbury University
Salisbury, MD 21801

Samford University

Birmingham, AL

Biology: Marine Science Emphasis

Degree granted: B.S.

Program Website: <http://www.samford.edu/schools/artsci/biology/index.htm>

Contact: Ronald N. Hunsinger, rnhsin@samford.edu
Samford University
Birmingham, AL 35229

San Diego State University

San Diego, CA

Biology: Marine Biology Concentration

All biology majors complete lower division preparatory courses in biology, chemistry, mathematics, and physics. The major consists of upper-division core courses in cell and molecular biology, biochemistry, genetics, ecology, evolution, and electives. These elective courses enable students to specifically prepare for professional schools, complete secondary credential in science requirements, or specialize in one or more of the following formal emphases: Cellular and Molecular Biology; Ecology; Evolution and Systematics; Marine Biology; Zoology. Field-oriented classes are supported by a wide array of field instruments and a strikingly varied set of natural "laboratories" near the campus. The Pacific Ocean, with its rocky inter-tidal zone, sandy beaches, and estuaries is only seven miles away. Twenty-five miles to the east are the pine and oak forests of the Laguna Mountains, and just beyond is the desert, which harbors surprisingly rich flora and fauna. The campus itself is located in a chaparral zone of canyons and mesas with natural drainages, reservoirs, and vernal pools. Regional field studies are also carried out along the Colorado River and in nearby Baja California..

Degree granted: B.S.

Facilities: Well-equipped instructional laboratories range from those having excellent study collections of major animal and plant groups to others equipped for instruction in recombinant DNA technology, radioisotope analysis, and computer-assisted ecological and physiological measurements.

Faculty: Students have direct access to the faculty. There is opportunity to become involved in special studies with faculty members in both field and laboratory research. Students may conduct independent research during their junior and senior years under the supervision of a

faculty member. The faculty is highly active and nationally recognized for significant research. Federal and state agencies and institutions support our research efforts.

Program Website: <http://arweb.sdsu.edu/es/admissions/ab/biology.htm>

Contact: bioundergrad@sunstroke.sdsu.edu

Environmental Engineering

The SDSU programs provide the scientific and technical knowledge to effectively tackle the environmental problems of not only the present but also the future. Environmental Engineers are needed in both private and public sectors. The SDSU programs provide students with an education that will allow them to compete successfully for positions in engineering consulting firms, industries, private and municipal agencies, local, state and federal government, international agencies, research institutions and universities. The environmental engineering field and environmental engineering education are multi-disciplinary. The B.S. degree provides a solid foundation in the fundamentals of mathematics, physics, chemistry and engineering design that are needed to practice the profession or to pursue a graduate degree. Environmental engineering education also includes a range of other disciplines, such as biology, ecology, geology, public health, economics, computer science, and process engineering principles. To be able to address the spectrum of issues facing the environment, environmental engineers are broadly educated, as well as technically trained.

Degree granted: B.S., M.S. and Ph.D.

Facilities: There are eight Environmental Engineering Laboratories, fully equipped with state-of-the-art instruments: Biodegradation and Bioremediation, Chemical Oxidation, Analytical Instrumentation, Composting, Soil Erosion and Sediment Transport.

Faculty: The expertise of four environmental engineering faculty members covers a wide range of specialties, including water quality engineering, pollution control, water and wastewater treatment, hazardous and solid waste management, water quality modeling, watershed management and air pollution. Several faculty members have extensive academic and research accomplishments, and several are registered professional engineers with extensive industrial and consulting experience.

Program Website: <http://arweb.sdsu.edu/es/admissions/ab/envirengineering.htm>

Contact: ce@engineering.sdsu.edu

Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
for up-to-date education and scholarship information,
as well as a downloadable version of this Guide.

Geological Sciences: Marine Geology emphasis

The department offers a major in geological sciences with a Bachelor of Science degree in applied arts and sciences. Students entering this program will choose one of the following emphases, depending on their specific interests: general geology, engineering geology, geochemistry, geophysics, hydrogeology, marine geology or paleontology.

Degree granted: B.S.

Facilities: Facilities include laboratories, open to students, with major facilities in X-ray diffraction and fluorescence, paleomagnetism, geochronology, isotope geology, geophysics (including gravity, magnetism, magnetotellurics, and seismology), geochemistry, soils, hydrology, computing, and microscopy, as well as equipment for fieldwork.

Program Website: <http://arweb.sdsu.edu/es/admissions/ab/geologicalsciences.htm#Program>

Contact: department.office@geology.sdsu.edu
San Diego State University
San Diego, CA 92182

San Francisco State University

San Francisco, CA

Marine Biology

Degree granted: B.S.

Program Website: http://www.sfsu.edu/~puboff/programs/undergrad/mari_bio.htm

Contact: biology@sfsu.edu

Biology - Concentration in Marine Biology

The curriculum in general biology allows for breadth of exposure to all areas of biology. Since basic principles of physical science are central to many biological concepts, course work in physics and chemistry is included in the lower division requirements. This curriculum will satisfy the requirements for a major program in Life Sciences leading to a Single Subjects Credential. Students who are considering teaching life sciences should see a credential advisor in the Biology Department before planning the major. Specific courses and a competency assessment are required for admission to the credential program.

Degree granted: B.A.

Program Website: <http://www.sfsu.edu/%7Ebiology/>

Contact: biology@sfsu.edu

Biology - Concentration in Marine Biology

Degree granted: M.S.

Program Website: <http://www.sfsu.edu/~bulletin/current/programs/biology.htm#1815>

Contact: [Katharyn Boyer, katharynboyer@sfsu.edu](mailto:Katharyn.Boyer@katharynboyer.com)

Marine Science

Students can choose Biology, Geosciences, or another appropriate department at San Francisco State University. The prospective student must meet the entrance requirements for that department and be accepted into conditionally classified graduate status. (Refer to the appropriate Bulletin section for the department of interest.) The student will become classified upon completion of Moss Landing Marine Laboratories' (MLML) requirements. Completed graduate applications must be received at MLML by October 15 for the spring semester and March 15 for the fall semester. Different departments have different application deadlines, and prospective students must contact the selected campus department to insure that his/her application meets both the San Francisco State University deadline and the MLML deadline. All students must be registered through one of the seven consortium campuses to attend MLML. Classes at MLML are open to properly qualified upper division undergraduate and graduate students enrolled through the consortium campuses. Application information is available from the admissions offices at the consortium campuses or from the Laboratories.

Degree granted: M.S.

Program Website: <http://www.sfsu.edu/~bulletin/current/programs/marines.htm#282>

Contact: frontdesk@mlml.calstate.edu

San Francisco State University

San Francisco, CA 94132

San José State University

San José, CA

See California State University, San José

Santa Barbara City College

Santa Barbara, CA

Commercial Diving Skills Competency Award

Program Website: <http://www.sbccc.edu/apply/files/skills/commdiv.pdf>

Marine Diving Technician

Degree granted: Certificate

Program Website: <http://www.sbccc.edu/apply/files/cert/mardiv.pdf>

Biological Sciences

Degree granted: A.A.

Program Website: http://www.sbccc.edu/apply/files/aa_as/biology.pdf

Santa Barbara City College

721 Cliff Drive

Santa Barbara, CA 93109

Savannah State University

Savannah, GA

Marine Sciences

Degree granted: B.S.

Program Website: <http://www.savstate.edu/scitech/sc-math/html/marine/index.html>

Degree granted: M.S.

Program Website: <http://www.savstate.edu/scitech/sc-math/html/marine/msms.html>

Savannah State University

10 Ocean Science Circle

Savannah, GA 31411

Scripps Institution of Oceanography

See University of California, San Diego—

Scripps Institution of Oceanography

Sea Education Association (SEA)

Woods Hole, MA

SEA Semester

A unique study-abroad program that offers academic challenge combined with the adventure of an extended research cruise under sail. More than 6,000 students from colleges and universities across the country have taken advantage of our 12-week, full-credit program and 8-week summer session. Participants gain:

- A broad understanding of the world's oceans through an interdisciplinary curriculum that combines the sciences, social sciences, humanities, and public policy.
- Demanding academics on shore followed by practical application at sea.
- 12 weeks of study (8 weeks for the summer session) divided between a 6-week shore component at Woods Hole on Cape Cod and a 6-week sea component in the Atlantic, Atlantic/Caribbean, or Pacific.

- The only ocean education program to offer extended deep-sea sailing/research experience. Open to students with or without sailing experience.
- The ability to work one-on-one with a dedicated faculty of specialists.
- The opportunity to plan and conduct an original research project.
- Stops at intriguing ports of call integrated into the curriculum.
- Leadership development and personal growth.

Degree granted: Academic credit from Boston University that can be transferred to most colleges and universities, with direct credit for students at affiliated institutions. The 12-week programs carry 17 credits for successful completion (12 credits for the 8-week summer session).

Facilities: *Corwith Cramer* is a 134-foot steel brigantine built as a research vessel for operation under sail. *Robert C. Seamans* is a 134-foot steel brigantine and is the most sophisticated oceanographic research/sailing school vessel ever built in the United States. Improvements in design and equipment, including a wet/dry laboratory and larger library, classroom, and computer laboratory, enhance the SEA academic program. SEA vessels fly the United States flag and are inspected and certified by the United States Coast Guard as Sailing School Vessels (SSV). All SEA vessels meet or exceed the safety requirements for their class.

Program Website: http://www.sea.edu/home/index_flash.asp

Student Support: <http://www.sea.edu/admissions/tuitionandfinancia.asp>

Contact: admission@sea.edu, 508-540-3954 x770

Sea Education Association

P.O. Box 6

Woods Hole, MA 02543

Phone: 800-552-3633 or 508-540-3954

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Seamen's Training Center

Sausalito, CA

Ordinary Seaman, Oiler, Steward & Technician

Program Website: <http://www.seamenstrainingcenter.org/courses.htm>

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Seattle Central Community College

Seattle, WA

Marine Deck Technology

Degree granted: A.A.S.

Program Website: <http://seattlecentral.edu/proftech/PROmarinedeck.php#crs>

Marine Engineering Technology

Degree granted: A.A.S.

Program Website: <http://seattlecentral.edu/proftech/PROmarineeng.php>

CPR/First-Aid Certification

Degree granted: Certificate

Program Website: <http://seattlecentral.edu/maritime/prog.php>

EPA Refrigeration Technician Certification

Degree granted: Certificate

Program Website: <http://seattlecentral.edu/maritime/prog.php>

Able Seaman

Degree granted: Certificate

Program Website: <http://seattlecentral.edu/maritime/prog.php>

(QMED) Qualified Member of the Engineering Department

Degree granted: Certificate

Program Website: <http://seattlecentral.edu/maritime/prog.php>

SMA License Training Program

Degree granted: Certificate

Program Website: <http://seattlecentral.edu/maritime/prog.php>

Science with focus on Oceanography

Degree granted: A.A.

Program Website: <http://seattlecentral.edu/sci-math/prog.php>

Seattle Central Community College

4455 Shilshole Ave. NW

Seattle, WA 98107

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Shippensburg University of Pennsylvania

Shippensburg, PA

Biology

Degree granted: B.S. and M.S.

Program Website: <http://www.ship.edu/academic/index.html>

Shippensburg University of Pennsylvania

Shippensburg, PA 17257

Shoals Marine Laboratory

Appledore Island, ME

Shoals Marine Laboratory is a seasonal program operated by Cornell University and the University of New Hampshire. SML has longstanding ties with the Sea Education Association, with whom we offer joint programs. SML offers more than 30 college-credit courses for high school students, undergraduates and graduates (http://www.sml.cornell.edu/sml_students_creditcourses.html). Our courses award college credits at Cornell or UNH that can be transferred to other institutions. We sponsor research opportunities for undergraduates, graduate students and citizens and offer a variety of internships in biology, conservation, and sustainable engineering. We work with local, state and federal entities to preserve the natural environment of Appledore Island and the Isles of Shoals Archipelago.

College prefreshmen and presophomores can take A Marine Approach to Introductory Biology to fulfill the introductory biology requirement for Biology Majors at Cornell. Students who have completed a college course in introductory biology can choose among a variety of offerings. For first-time students at SML, we recommend Field Marine Science, Field Marine Biology and Ecology, Coastal Ecology and Bioclimates, or Sustainability in the 21st Century. Advanced offerings include courses in microbiology (2 courses: Field Microbial Ecology and Symbiosis, offered in alternate years), organismal and conservation biology (9 courses: Seaweeds, Plankton and Seagrasses; Biodiversity and Biology of Marine Invertebrates; Marine Vertebrates; The Diversity of Fishes; Sharks; Field Ornithology; Seabird Conservation; and Functional Morphology of Marine Organisms), behavioral ecology (2 courses: Ecology of Animal Behavior and The Herring Gull's World), and research training (5 courses: Research in Marine Biology; Underwater Research; Biological Illustration; Forensic Science for Marine Biologists; and GIS for Field Scientists). Admission is competitive; both merit-based and need-based financial aid are available.

SML sponsors three internship programs for college undergraduates. The eight-week program, Research Internships in Marine Science, is primarily for Cornell and UNH undergraduate biology majors who have completed at least 8 credits of coursework at SML. It pairs undergraduates with research mentors to conduct original investigations in marine ecology, behavior, reproductive biology, parasitology and other fields; results of intern research have been published in *Science*, *Ecology*, and *The Proceedings of the National Academy of Sciences* as well as specialty journals. The four-week program, Island Engineering Internships for Sustainability is primarily for Cornell and UNH undergraduates majoring in civil or



Shoals Marine Lab: Community spirit, environmental awareness and sustainability in action at Shoals Marine Laboratory on Appledore Island, Maine. Every Wednesday at 5:00PM, all students, staff and faculty take a break from their studies to unload food and supplies from the R/V JOHN M. KINGSBURY. Photo by William E. Bemis.

environmental engineering who have completed at least one course at SML. It focuses on our water, wastewater and electrical systems on Appledore Island with the goal of improving sustainable practices at SML and elsewhere. A three-week program, Seabird Conservation Internships, is open to any student who has completed the Seabird Conservation course at SML. Interns spend a week working on tern restoration on nearby White Island in the Isles of Shoals Archipelago and then spend two weeks working on puffin restoration on islands in downeast Maine.

Facilities: The campus of Shoals Marine Laboratory consists of 18 buildings on 89 of the 95 acres of Appledore Island, six miles off the coast of New Hampshire. Appledore is the largest island in the Isles of Shoals Archipelago, a group of islands known for their beauty and abundant wildlife, especially nesting seabirds. With a 10-ft tidal range, Appledore offers exceptional opportunities to study and work in the rocky intertidal area. The laboratory is open from May to October; the 12 weeks from Memorial Day to mid-August are dedicated to college credit courses and internships. Teaching and research facilities allow as many as 80 students to attend courses or conduct research on Appledore at any given time. Student housing and dining are included with all SML programs, which gives SML the feeling of a residential college in which the community of learners is the focus. SML's research vessels include the 47-ft R/V JOHN M. KINGSBURY and the 36-ft R/V J. B. HEISER as well as smaller craft. We provide round-trip transportation to Appledore Island from our docks in Portsmouth, New Hampshire. Because of the isolation of Appledore Island, we generate our electricity, purify our water, and operate a small sanitary treatment facility. Thus, SML is on the frontline of issues related to sustainable engineering practices for small communities.

Faculty: SML Faculty are drawn from a variety of leading colleges and universities in the United States, Canada and Europe. All are committed to the experiential educational approach that characterizes SML courses, and most have been associated with SML for many years. This has given them the time and opportunity to develop and fine-tune their courses into well known and highly regarded training opportunities. All lead instructors for courses designed for college students hold a Ph.D. or M.D. For a complete list of current faculty, see the SML website.

Tuition: For SML Summer 2008, a 7-day, 2-credit course is projected to cost \$1,805 including tuition, round trip transportation from Portsmouth, New Hampshire to Appledore Island, Maine, and all lodging and meals on Appledore Island.

Student Support: SML offers significant need-based financial aid. Students are encouraged to apply even if they do not qualify for financial aid on their home campus.

Program Website: <http://www.sml.cornell.edu/>

Contact: Jane Paige, shoals-lab@cornell.edu
Shoals Marine Laboratory, Stimson Hall
Cornell University, Ithaca, NY 14853
Phone: 607-255-3717; Fax: 607-255-0742

**Skagit Valley College,
Whidbey Island Campus**
Oak Harbor, WA

Marine Maintenance Technology

The Marine Maintenance Technology (MT) program prepares students for entry-level employment in the marine trades, with training focused on repair and maintenance of recreational and small commercial craft in boat repair yards, production boat shops, boat and motor dealerships, with charter companies, and in independent employment. The program includes engine and auxiliary equipment (mechanics), and hull repair and outfitting (rigger). All classes combine theory with practical hands-on training. The mechanic courses provide instruction and training in repair and maintenance of inboard engines, and drive train systems, inboard outdrive propulsion systems, outboard engines, auxiliary systems, and vessels electrical systems. The rigger courses provide instruction and training in repair and maintenance of vessels' hull, decks and small parts along with installation of on-board electrical and mechanical systems. Detailed courses in structural development, hull repair and marine coatings are included.

Degree granted: A.A.S.

Program Website: http://www.skagit.edu/directory.asp_Q_pagenumber_E_209

Contact: Mike Swietzer, mike.swietzer@skagit.edu
Skagit Valley College, Whidbey Island Campus
1900 SE Pioneer Way, Oak Harbor, WA 98277
Telephone: 360-675-6656

**Slippery Rock University
of Pennsylvania**
Slippery Rock, PA

Biology: Marine Sciences concentration

Degree granted: B.S.

Program Website: <http://www.sru.edu/pages/2280.asp>

***Geography, Geology, & the Environment:
Concentration in Marine Science***

Degree granted: B.S.

Program Website: <http://academics.sru.edu/gge/ggesite/programs/programs.html>
Slippery Rock University of Pennsylvania
Slippery Rock, PA 16057

Smith College
Northampton, MA

Marine Sciences Minor

The marine sciences minor permits students to pursue interests in coastal and oceanic systems through an integrated sequence of courses in the natural and social sciences. An introduction to marine sciences is obtained through completion of the two basis courses. Students may choose to concentrate their further study principally on the scientific investigation of the oceans or on the policy aspects of ocean exploitation and management. Students should consult with one of the co-directors as early as possible in the course selection process.

Degree granted: Minor

Program Website: <http://www.fivecolleges.edu/sites/marine/minor/>

Contact: marinesci@smith.edu

Five College Coastal and Marine Sciences

Degree granted: General marine science courses

Program Website: <http://www.fivecolleges.edu/sites/marine>

Contact: Cindy Bright, Coordinator, marinesci@email.smith.edu

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South Dakota State University

Brookings, SD

Wildlife and Fisheries Sciences

Degree granted: B.S.**Program Website:** <http://wfs.sdstate.edu/wfsdept/Undergraduate%20Degree/Undergraduate%20Degree.htm>**Contact:** <http://www3.sdstate.edu/>

Wildlife and Fisheries Sciences - Wildlife Specialization

Degree granted: M.S.**Program Website:** <http://wfs.sdstate.edu/wfsdept/Graduate%20Degrees/Graduate%20Degrees.htm>**Contact:** <http://www3.sdstate.edu/>

Wildlife and Fisheries Sciences - Fisheries Specialization

Degree granted: M.S.**Program Website:** <http://wfs.sdstate.edu/wfsdept/Graduate%20Degrees/Graduate%20Degrees.htm>**Contact:** <http://www3.sdstate.edu/>

Biological Science - Fisheries Science Specialization

Degree granted: Ph.D.**Program Website:** <http://wfs.sdstate.edu/wfsdept/Graduate%20Degrees/Graduate%20Degrees.htm>**Contact:** <http://www3.sdstate.edu/>

Biological Science - Wildlife Science Specialization

Degree granted: Ph.D.**Program Website:** <http://wfs.sdstate.edu/wfsdept/Graduate%20Degrees/Graduate%20Degrees.htm>**Contact:** <http://www3.sdstate.edu/>

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Southern Maine Community College

South Portland, ME

Science Department

Applied Marine Biology & Oceanography

The Applied Marine Biology & Oceanography (AMBO) program provides students with the academic background and applied skills required for employment as research assistants and technicians in a variety of aquatic and environmental fields. The curriculum emphasizes

hands-on laboratory and field procedures. Skills learned are commonly used by professionals working for companies and organizations involved in aquatic research and ecosystem management. Special attention is given to collecting and identifying a diversity of marine organisms, performing oceanographic sampling procedures aboard our own research vessel, service learning experiences in the southern Maine community, plus microbiology and chemistry laboratory techniques. Many graduates of SMCC's AMBO program have found employment with public and private marine biology laboratories, state and federal marine-resource agencies, state and federal environmental protection agencies, environmental consulting firms, and water districts and pollution control facilities. Graduates of the AMBO program who wish to pursue a baccalaureate degree can benefit from agreements with the University of Maine, the University of Southern Maine, the University of Maine Machias and the University of New England. These agreements and past practice allow students to transfer all or nearly all of their credits toward four-year degrees in Marine Biology, Biology, or Marine Resources Management. A formal "2+2" articulation agreement has currently been completed with the baccalaureate degree program in Ocean Science at Maine Maritime Academy.

Degree granted: A.S.

Facilities: 75-acre campus located on the shores of South Portland, Maine; seven well-equipped science labs; a 36-ft research vessel used weekly by students; a new pier over Casco Bay; a lighthouse and beach abutting the campus.

Faculty: Chuck Gregory, M.S., Ph.D. - plankton ecology; Robert Siegel, M.S. - Invertebrate zoology; John Ney III - Marine Botany; Brian Tarbox, M.S. - Fisheries & Nautical Science

2007 tuition: In-state residents: \$2,000+, Out-of-State: \$4,100+

Program Website: <http://www.smccme.edu/catalog/2005-2006/index.php?section=5&navid=96&docid=0>**Contact:** John Ney III, jney@smccME.edu

Phone: 207-741-5509

Environmental Science & Technology

Degree granted: A.S.**Program Website:** <http://www.smccme.edu/catalog/2005-2006/index.php?section=5&navid=97&docid=0>**Contact:** Chuck Gregory, cgregory@smccME.edu

Southern Maine Community College

2 Fort Road

South Portland, ME 04016

Southwest Texas State University
San Marcos, TX

Aquatic Biology (B.S.)

Degree granted: B.S.

Program Website: http://www.aquaticresources.bio.txstate.edu/degree_undergrad.html

Contact: <http://www.txstate.edu/>

Aquatic Biology (M.S.)

Degree granted: M.S.

Program Website: http://www.aquaticresources.bio.txstate.edu/degree_Master's.html

Contact: <http://www.txstate.edu/>

Aquatic Biology (Ph.D.)

Degree granted: Ph.D.

Program Website: http://www.aquaticresources.bio.txstate.edu/degree_phd.html

Contact: <http://www.txstate.edu/>
Southwest Texas State University
San Marcos, TX 78666

Stanford University
Stanford, CA

Biology: Specialization in Marine Biology

Degree granted: B.S.

Program Website: http://www.stanford.edu/dept/biology/programs_bs.html

Marine Biology (Ph.D.)

Degree granted: Ph.D.

Program Website: http://www.stanford.edu/dept/biology/programs_phd.html

Marine Biology (M.S.)

Degree granted: M.S.

Program Website: http://www.stanford.edu/dept/biology/programs_bsms.html
Stanford University
Stanford, CA 94305

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You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

**State University of New York -
Maritime College**
Bronx, NY

Marine Environmental Science

SUNY Maritime College offers a Marine Environmental Science major with a choice of either a Marine Biology or a Meteorology and Oceanography minor. Students in this degree program have the option of pursuing a 3rd Mate Coast Guard License in addition to their Bachelor of Science degree. Our degree program provides students with a solid scientific foundation including chemistry, physics, geology, biology, meteorology and oceanography during their first 5 semesters. The last 3 semesters include environmental science classes such as Environmental Law and Policy and Environmental Pollution, and specialized classes for your minor. Students in the Marine Biology minor take classes such as Marine Biology and Fisheries Science. The Meteorology & Oceanography minor includes classes such as Dynamic Oceanography and Synoptic Meteorology.

Facilities: The Science Department laboratories were renovated in 2006 and are equipped with state-of-the-art equipment for undergraduate student use. The College's vessels are available for use in many of the biology and oceanography laboratory courses. The Science Department is also home to an automated weather station, part of the National Weather Service's national observation network, to which students have access.

Faculty: Faculty in the Science Department at SUNY Maritime College include a marine biology professor, a meteorology professor, an oceanography professor, and several chemistry and physics professors.

Degree granted: B.S. in Marine Environmental Science; Minor in Marine Biology and Meteorology & Oceanography; Optional USCG Third Mate License. 15-20 students graduate each year with a Bachelor's Degree in Marine Environmental Science.

2007 Tuition: In-State tuition available for residents of NY, CT, RI, NJ, VA, MD, DE, DC, NC, SC, GA, FL, LA, PA and AR: \$4,350.00; Out-of-State: \$10,610.00; Room & Board: \$8,919.00.

Student Support: A variety of merit-based scholarships and financial aid programs.

Program Website: <http://www.sunymaritime.edu>

Contact: Dr. Kathy Olszewski, Science Department Chair,
olszewski@sunymaritime.edu
SUNY Maritime College
6 Pennyfield Avenue
Bronx, NY 10983
Phone: 718-409-7366, Fax: 718-409-7364

Marine Electrical & Electronic Systems Marine Engineering

Degree granted: B.S.

Program Website: <http://www.sunymaritime.edu/Academics/Programs/Engineering/BE.htm>

Contact: Erik J. Kneubuehl, ekneubuehl@sunymaritime.edu

Naval Architecture

Degree granted: B.S.

Program Website: <http://www.sunymaritime.edu/Academics/Programs/Engineering/BE.htm>

Contact: syahalom@sunymaritime.edu

Engineering: Computer and Information Technology

Degree granted: B.S.

Program Website: <http://www.sunymaritime.edu/Academics/Programs/Engineering/BS.htm>

Contact: syahalom@sunymaritime.edu

Engineering: Management

Degree granted: B.S.

Faculty: Faculty in the Science Department at SUNY Maritime College include a marine biology professor, a meteorology professor, an oceanography professor, and several chemistry and physics professors.

2007 tuition: In-state residents: \$4,350; Out-of-State: \$10,610

On-campus Housing Available: yes

Program Website: <http://www.sunymaritime.edu/Academics/Programs/Engineering/BS.htm>

International Transportation Management

Degree granted: B.S. and M.S.

Program Website: <http://www.sunymaritime.edu/Academics/graduateprogram/FiveYearProgram.htm>

Contact: jpuglisi@sunymaritime.edu

International Transportation Management

Degree granted: M.S.

Program Website: <http://www.sunymaritime.edu/Academics/graduateprogram/MSDegreeProgram.htm>

Contact: LHoward@sunymaritime.edu

Chartering

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.sunymaritime.edu/Academics/graduateprogram/CertificatePrograms.htm>

Contact: apalmiotti@sunymaritime.edu

Third Mate License Program (Merchant Marine)

Degree granted: Courses for working professionals

Program Website: <http://www.sunymaritime.edu/Academics/graduateprogram/LicenseDegreeProgram.htm>

Contact: jahlstrom@sunymaritime.edu
State University of New York, Maritime College
6 Pennyfield Ave.
Bronx, NY 10465

State University of New York - Morrisville

Morrisville, NY

Aquaculture and Aquatic Sciences - concentration in Aquaculture Technology Aquaculture and Aquatic Sciences - concentration in Aquatic Science

Degree granted: A.A.S.

Program Website: http://www.morrisville.edu/Academics/Ag_NRC/NRC/html/AquacultureAAS.htm

Contact: Prof. William Snyder, snyderw@morrisville.edu
State University of New York - Morrisville
Marshall Hall, SUNY
Morrisville, NY 13408

Stevens Institute of Technology

Hoboken, NJ

Engineering with a concentration in Naval Engineering

Degree granted: B.S.

Program Website: <http://www.stevens.edu/engineering/index.php#>

Coastal Engineering

Degree granted: Minor

Program Website: <http://www.stevens.edu/engineering/ceoe/UG/index.html>

Ocean Engineering

Degree granted: M.S.

Program Website: <http://www.stevens.edu/engineering/ceoe/Grad/ocean.html>

Maritime Systems- Environmental Engineering Track

Degree granted: M.S.

Program Website: <http://www.stevens.edu/engineering/ceoe/Grad/ocean.html>

Maritime Systems-Structural Engineering Track

Degree granted: M.S.

Program Website: <http://www.stevens.edu/engineering/ceoe/Grad/ocean.html>

M.S. in Maritime Systems- Management Track

Degree granted: M.S.

Program Website: <http://www.stevens.edu/engineering/ceoe/Grad/ocean.html>

Maritime Systems - Marine Transportation Track

Degree granted: M.S.

Program Website: <http://www.stevens.edu/engineering/ceoe/Grad/ocean.html>

Environmental Engineering- Environmental Processes concentration

Degree granted: M.S.

Program Website: <http://www.stevens.edu/engineering/ceoe/Grad/environmental.html>

Environmental Engineering- Inland and Coastal Environmental Hydrodynamics concentration

Degree granted: M.S.

Program Website: <http://www.stevens.edu/engineering/ceoe/Grad/environmental.html>

Contact: Stevens Institute of Technology
Davidson Laboratory
Hoboken, NJ 07030

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Stony Brook University Stony Brook, NY

School of Marine and Atmospheric Sciences

The School of Marine and Atmospheric Sciences offers an undergraduate B.A degree in Environmental Studies, two undergraduate B.S. degrees, which emphasize marine biology (Marine Sciences and Marine Vertebrate Biology) and a B.S. degree in Atmospheric and Oceanic Sciences, which emphasizes the physics of the ocean and atmosphere. We also offer minors in both Marine Sciences and Environmental Studies. Our graduate programs include M.S. and Ph.D. degrees with research focuses in both Marine Sciences and Atmospheric Sciences.

2007 undergraduate tuition: In-state residents: \$2,175 per semester; Out-of-State: \$5,305 per semester.

2007 graduate tuition: In-state residents: \$6,900 for 24 credits; Out-of-State: \$10,920 for 24 credits

The **Marine Sciences** major provides students with a solid background in biology as well as the physics and chemistry of the ocean. Upper-division electives permit each student to gain a deeper understanding of particular groups of organisms (microorganisms, algae, marine invertebrates, fish and marine mammals) and of habitats (salt marshes, rocky intertidal environments, barrier islands, dunes, estuaries and the open ocean).

Degree granted: B.S.

Program website: http://alpha1.msrb.sunysb.edu/education/education_bsrb.html

Contact: Mary Scranton, mscranton@notes.cc.sunysb.edu

The degree in **Marine Vertebrate Biology** provides students with a solid background in basic biology with an emphasis on marine vertebrate organisms such as fish, sharks, birds, turtles and marine mammals. It provides a more intensive zoology background than the Marine Sciences degree.

Degree granted: B.S.

Program website: http://alpha1.msrb.sunysb.edu/education/education_bsmvb.html

Contact: Mary Scranton, mscranton@notes.cc.sunysb.edu

The **Atmospheric and Oceanic Sciences** major has two tracks, one intended for students wishing to learn about the physical behavior of the atmosphere and its application to weather forecasting and the other for students who wish to learn about physical phenomena in the atmosphere and the oceans and their interactions.

Degree granted: B.S.

Program website: <http://atmos.msrb.sunysb.edu/npages/undergrad.html>

Contact: Brian Colle, colle@cyclone.msrb.sunysb.edu

The **Environmental Studies** major is designed to provide students with the analytical and communication skills and the broad background necessary to understand and address complex environmental issues. The major also offers the opportunity for students to carry out focused study within a specific area of interest. The curriculum is interdisciplinary and integrates principles and methodologies from the social sciences, engineering, the natural sciences, and humanities.

Degree granted: B.A.

Program Website: http://www.msrb.sunysb.edu/education/education_baens.html

Contact: Mary Scranton, mscranton@notes.cc.sunysb.edu

For all majors, students are encouraged to participate in research and internships. Opportunities for experiential learning related to marine science are available through field and laboratory courses taught at or near the Stony Brook or Southampton campuses and from a field station near the ocean in Southampton.

Minor in Marine Sciences

The minor in Marine Sciences is open to students who are majoring in another science and who either wish to prepare themselves for future graduate education in marine sciences or who are preparing for a career in a marine-related field. The minor, which is interdisciplinary in nature, provides a foundation in marine aspects of biology, chemistry, geology, and physics for the undergraduate. The minor assumes completion of basic courses in mathematics, physics, chemistry, biology, or geology. Completion of the minor requires 18 credits.

Degree granted: Minor

Program Website: http://www.somas.stonybrook.edu/education/minor_mar.html

Contact: Mary Scranton, mscranton@notes.cc.sunysb.edu

Minor in Environmental Studies

The Environmental Studies minor is offered to all students interested in adding an Environmental focus to their studies. Students in the natural or social sciences learn about both scientific and social issues important to solving environmental problems. Completion of the minor requires 18 credits including 3 credits of research or internship

Degree granted: Minor

Program Website: http://www.somas.stonybrook.edu/education/minor_ens.html

Contact: Mary Scranton, mscranton@notes.cc.sunysb.edu



Student intern aboard a research vessel prepares an oceanographic instrument for deployment.

The Environmental Studies, Marine Sciences, Marine Vertebrate Biology and Atmospheric and Oceanic Sciences majors and Environmental Studies and Marine Science minors are administered by the School of Marine and Atmospheric Sciences, one of the leading oceanographic institutions in the nation. The School of Marine and Atmospheric Sciences (SoMAS) is the center for marine research, education, and public service in the marine and environmental sciences for the State University of New York system. In addition, the SoMAS is the University at Stony Brook's center for research, education, and public service in the atmospheric sciences. The SoMAS is one of the nation's leading coastal oceanographic and atmospheric institutions, and the expertise of the SoMAS faculty places them at the forefront of addressing and answering questions about regional environmental problems, as well as problems relating to the global ocean and atmosphere. The primary focus of the SoMAS faculty is on fundamental research designed to increase understanding of the processes that characterize the coastal ocean and the atmosphere. The SoMAS is also committed to applying the results of research to solve problems arising from society's uses and misuses of the environment. The Center includes institutes in several major areas: the Institute for Terrestrial and Planetary Atmospheres, the Living Marine Resources Institute, the Long Island Groundwater Resource Institute, and the Waste Reduction and Management Institute. The institutes and many research projects add a wealth of varied resources to education and research at Stony Brook.

M.S. in Marine Sciences and Atmospheric Sciences

The M.S. program consists of a rigorous set of core courses designed to provide the basic understanding of oceanographic and atmospheric processes. Students specialize in either marine or atmospheric sciences but are free to build an interdisciplinary program of study that best fits their interests. All students complete a research thesis. Our graduate program emphasizes synthetic, interdisciplinary approaches to solving problems and understanding basic processes at local to global scales. Students have the opportunity to conduct research in the diverse oceanographic environments contiguous to Long Island and at locations around the world. Graduates are prepared to embark on rewarding careers in government, industry, academia, and consulting. Virtually all students receive full tuition scholarships and competitive teaching or research assistantships throughout their course of study.

Degree granted: M.S.

Program Website: <http://www.msra.sunysb.edu>

Contact: Anne McElroy, amcelroy@notes.cc.sunysb.edu

Ph.D. in Marine and Atmospheric Sciences

The Ph.D. program is designed to prepare students to identify and solve problems in oceanographic and atmospheric sciences. Ph.D. students follow the same general curriculum required for M.S. students, but embark on more independent and comprehensive dissertation projects, and obtain additional instruction in teaching at the college level. The Ph.D. program offers a flexible, interdisciplinary program and prepares students to become effective, independent problem solvers. Students will be free to emphasize their own interests in this field but are expected to acquire a broad base of interdisciplinary knowledge. Graduates are prepared to effectively compete for faculty positions, managerial positions at government and industrial research laboratories and consulting firms, as well as leadership positions in non-governmental agencies. Virtually all students receive full tuition scholarships and competitive teaching or research assistantships throughout their course of study. An M.S. is not required for entry into the Ph.D. program.

Degree granted: Ph.D.

Program Website: http://www.msrb.sunysb.edu/education/education_ms.html

Contact: Anne McElroy, amcelroy@notes.cc.sunysb.edu

Facilities: Through its Marine Sciences Research Center, SoMAS operates a fleet of well-equipped research vessels. The 80-foot RV Seawolf, berthed in nearby Port Jefferson Harbor, carries students and faculty on extended trips for large-scale oceanographic sampling and trawling. We use the RV Pritchard for sampling near-shore waters around Long Island. The SoMAS Southampton Marine Station, on Old Fort Pond in Shinnecock Bay, gives direct access to the Atlantic Ocean. Live marine species are housed at the station's aquarium. Vessels maintained at Southampton include the 44-foot, oceangoing RV Paumanok; the RV Shinnecock (a 35-foot platform craft); and the RV Peconic, a 45-foot catamaran. A pristine tidal estuary located only a few miles from campus, Flax Pond is a beautiful place of great biodiversity. It is home to a large variety of birds, plants, shellfish, diamondback terrapins, and a marine laboratory. The Flax Pond lab supports experiments that require a 24-hour, flowing sea water environment. SoMAS is also home to the Marine Animal Disease Laboratory that provides diagnostic services for marine disease outbreaks. The Ocean Instrument Laboratory provides engineering and technical support for our oceanographic research. Specific services include electronic repair, instrument and systems design, instrument calibration, and shipboard support. Atmospheric research at SoMAS is supported by state-of-the-art weather and remote sensing laboratories, and faculty and students have access to the IBM Blue Gene supercomputer housed at Brook Haven National Laboratory.

***** **Tennessee Technological University** Cookeville, TN

Wildlife and Fisheries Science

Wildlife Science

Fisheries Science

The Department of Biology offers several courses of study at both the undergraduate and graduate levels. Undergraduate students can choose among the three concentrations in Wildlife and Fisheries Science B.S. degree (Conservation Biology, Fisheries Science, or Wildlife Science).

Degree granted: B.S.

Program Website: http://www.tntech.edu/biology/wfs_degree.html

Contact: Biology@tntech.edu

Biology

The purpose of the Master of Science degree program in the Department of Biology is to prepare graduates for high-level careers in various areas of biology. The department offers the M.S. degree with the option of selecting from a variety of thesis research topics based on individual research interests of the faculty.

Degree granted: M.S.

Program Website: http://www.tntech.edu/gcat/asp/specific_arts_biology.asp

Contact: Daniel L. Combs, Gradstudies@tntech.edu

Earth Science- GIS concentration

Earth Science- Environmental Geology concentration

Degree granted: B.S.

Program Website: <http://www.tntech.edu/earth/concentrations.html>

Contact: Dr. Mike Harrison, MHarrison@tntech.edu
Tennessee Technological University
Cookeville, TN 38505



Texas A&M University at Galveston

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Texas A&M University

College Station, TX

Ocean Engineering (B.S.)**Degree granted:** B.S.**Program Website:** <http://oceaneng.civil.tamu.edu/academics/UGCurriculum.htm>**Contact:** Jennifer Irish, jirish@civil.tamu.edu***Ocean Engineering (M.S.)***

The pre-requisite for the Ocean Engineering Graduate Program is that a degree candidate have a Bachelor's Degree in an engineering discipline. Student-specific pre-requisite requirements may also be imposed by the faculty for students with a weak background in the basics of ocean engineering (such as dynamics, fluid mechanics, and mechanics of materials). The Master of Engineering degree requires a minimum of 30 credit hours and a written project report.

Degree granted: M.S.**Program Website:** <http://oceaneng.civil.tamu.edu/academics/GRME.htm>**Contact:** Scott Socolofsky, socolofs@tamu.edu***Ocean Engineering (Ph.D.)***

Students are formally admitted to the Doctor of Philosophy (Ph.D.) Program after passing a written and oral General Exam to be taken at the end of the first semester of Ph.D. studies. The Ph.D. degree requires a minimum of 64 credit hours beyond the Master's Degree and a dissertation. Of the 64 credit hours, typically 32 hours must be in coursework. To complete the coursework for the Ph.D., six credits must be selected in the area of mathematics, statistics and numerical methods and three credit hours in the area of fluid mechanics in addition to the requirements for the Master's degree.

Degree granted: Ph.D.**Program Website:** <http://oceaneng.civil.tamu.edu/academics/GRPhD.htm>**Contact:** Scott Socolofsky, socolofs@tamu.edu

Texas A&M University

3136 TAMU Blvd.

College Station, TX

Geosciences : Ocean Observing Systems**Degree granted:** M.S.**Program Website:** <http://oceanography.tamu.edu/Education/oos.html>**Contact:** Jana Corley, jcorley@ocean.tamu.edu

Texas A&M University

3136 TAMU Blvd.

College Station, TX

Department of Oceanography***Oceanography***

Graduate degrees are awarded at the M.S. and Ph.D. levels in Oceanography. We also offer a non-thesis Master of Geoscience degree, and a certificate in Ocean Observing Systems. The certificate program is intended to train a new generation of oceanographic professionals who will be knowledgeable in the development, design, and implementation of real-time operational oceanography systems. A minor in Oceanography is offered at the undergraduate level. Basic research funding plus partnerships with industry and agencies lead to many research opportunities in seafloor exploration, seafloor hazards, sediment transport, plate tectonics, paleo-oceanography and climate change, biogeochemistry, benthic ecology, biodiversity, carbon/nitrogen/sulfur cycling, phytoplankton and zooplankton ecology, bio-physical measurements and modeling, measurement and modeling of the ocean shelf, estuarine circulation and climate cycles, and oceans and human health.

Oceanography graduate students bring expertise from the traditional sciences, engineering and mathematics and apply it to fascinating research on ocean processes. Our greatest strength is our diversity, but our common passion is the oceans. You will find exciting opportunities to explore ocean systems in the classroom, in the laboratory, through computer models, on the coast, and on ships in all oceans of the world. We have state-of-the-art laboratory and computer facilities and a sea-going environment. Our faculty members are enthusiastic and are committed to developing new knowledge about the oceans. Please visit our web site, ocean.tamu.edu, for information about our faculty and their research specialties, as well as details about each of our four subdisciplines: **biological, chemical, geological and physical oceanography**.

Degree granted: M.G.S., M.S. and Ph.D.

Facilities: Facilities include state-of-the-art laboratories and field equipment, including workstation computer labs, flow cytometry, digital deep-tow seismic survey systems and mass spectrometers. Researchers also have access to central university facilities such as electron microscopes, supercomputers, a visualization laboratory, wave tanks and a nuclear reactor.

Faculty: A 40-member faculty offers a range of graduate courses; research is assisted by an additional 17 research scientists. Some of our faculty hold joint appointments at Texas A&M's Galveston campus, which provides a coastal setting for graduate students with research interests in estuarine and near-shore studies. Several research centers are affiliated with our department. These include the Integrated Ocean Drilling Program, an international

consortium studying the structure and history of the seafloor deposits and crust as well as the deep biosphere; the Texas Sea Grant Program, a state-federal partnership focused on practical coastal issues; and the Geochemical and Environmental Research Group, an applied oceanography research center with programs in petroleum geochemistry, real-time ocean observations and environmental monitoring.

2007 tuition: In-state residents: \$7,616; Out-of-State: \$14,288

Program Website: <http://ocean.tamu.edu>

Contact: Jana Corley, jcorley@ocean.tamu.edu

Texas A&M University

1204 O&M

College Station, TX 77843-3146

Email: info@ocean.tamu.edu

Phone: 979-845-7412

Texas A&M University at Galveston Galveston, TX

Department of Marine Biology

Facilities: Classrooms, laboratories and meeting spaces are housed within 15 major buildings on the Mitchell Campus. There are three residence halls on campus, a physical education facility, and the Mary Moody Northern Student Center with cafeteria services. The Jack K. Williams Library contains over 43,000 books, 35,000 bound volumes of journals and a collection of charts and maps. The University training ship, in addition to being a floating campus during summer cruises, provides additional classroom, meeting and training space during the school year.

Faculty: A brief description of all of our faculty and their credentials can be found on at: <http://www.tamug.edu/catalog/faculty.html>.



Students at Texas A&M University at Galveston

Marine Biology - License Option

The Marine Biology License Option program allows the marine biology student to prepare for a career as an officer aboard a seagoing vessel by participating in the U.S. Maritime Service Corps of Cadets. The curriculum provides the basics of marine biology as well as courses leading toward licensing as a Third Mate of any gross tonnage upon oceans, steam, or motor vessels in the U.S. Merchant Marine. The Marine Biology License Option curriculum is an abbreviated version of the Marine Biology curriculum and is oriented toward field activities consistent with service aboard research vessels. Students who wish to attend a biologically-oriented graduate program, or are interested in the medical professions, are advised to take additional coursework in developmental biology, genetics, biochemistry, and physiology. Cadets who enroll in and apply to graduate under one of the license option curricula must complete the appropriate license examination for Third Mate Assistant Engineer in order to graduate from Texas A&M University. Certain USCG courses require a minimum grade of C (70%).

Degree granted: B.S.

Program Website: <http://www.marinebiology.edu/curriculum.htm>

Contact: witterp@tamug.edu

Texas A&M University at Galveston

Box 1675

Galveston, TX 77553-1675

Marine Biology/Biomedical Sciences

This collaboration is intended to maximize the course offerings and resources of both the Biomedical Sciences program in College Station and the Marine Biology program in Galveston to provide students a greater wealth of opportunities. The certificate program prepares the graduate for careers in aquatic animal health, seafood technology and various marine-related disciplines as well as advanced studies in veterinary medicine, human medicine, allied health, biological oceanography and related biological disciplines. The program provides depth in an applied understanding of aquatic animal health and disease. Interested students should visit with an academic advisor in the department offering the certificate at least one semester prior to entry to discuss departmental requirements as well as to select coursework appropriate to his or her individual interests. Students should also consult an academic advisor in the major to determine how the certificate coursework will be applied to the degree. Students should seek additional advising if planning to pursue admission to medical school or veterinary medicine school.

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.marinebiology.edu/curriculum.htm>

Contact: Truman Glenn, glennt@tamug.edu
Texas A&M University at Galveston
Box 1675
Galveston, TX 775531675
Phone: 409-740-4832

Marine Fisheries

The curriculum in Marine Fisheries provides educational opportunities in the biological sciences, with emphasis on marine management. Ecology, taxonomy, zoogeography, culture, and general biology of commercial species are emphasized. Course offerings are structured to provide not only a strong basis of formal academic instruction but also considerable hands-on field and collection experience by taking advantage of the coastal location of the University. A strong preparation in the sciences is recommended. Marine Fisheries graduates are prepared to work as fisheries managers or research biologists for state and federal agencies, ecological consulting firms, and educational institutions. Qualified degree recipients may undertake postgraduate studies in resource management, mariculture, systematics, seafood technology, and fisheries economics.

Degree granted: B.S.

Program Website: <http://www.marinebiology.edu/curriculum.htm>

Contact: Truman Glenn, glennt@tamug.edu
Texas A&M University at Galveston
Box 1675
Galveston, TX 775531675
Phone: 409-740-4832

Marine Biology

The Marine Biology program provides an excellent education on the biological sciences through studies undertaken in a unique coastal environment. The curriculum offers broad training in general biology, while emphasizing the local flora and fauna in estuaries and the marine environment. Students receive hands-on field sampling experience as well as internship opportunities.

Degree granted: B.S.

Program Website: <http://www.marinebiology.edu/curriculum.htm>

Contact: Truman Glenn, glennt@tamug.edu
Texas A&M University at Galveston
Box 1675
Galveston, TX 775531675
Phone: 409-740-4832

Marine Resources Management

The Master of Marine Resources Management (MARM) provides students with a broad understanding of coastal and ocean policy and management. The demand for graduates from this program in industry, government, academia and non-governmental organizations (NGO's) has never been stronger. Federal agencies employing graduates include the U.S. Coast Guard, the U.S. Army Corps of Engineers, and the Environmental Protection Agency. State agencies include the Texas General Land Office and the Texas Commission on Environmental Quality. Industries employing graduates include oil and natural gas, environmental consulting companies, ports, and tourism. These organizations have identified the need for a degree which focuses on national and international ocean resource law and policy; coastal zone management; physical and geochemical marine resources management strategies; and fisheries management. This degree program views marine natural resources management and policy development from both an ecological and policy perspective. The degree may be viewed as comparable to an MBA, as an alternative terminal degree for people working in marine/ocean/coastal organizations. In addition, the degree program may address the needs of some public school science teachers seeking a degree outside the field of education. Both non-thesis and thesis options are available.

Degree granted: M.S.

Program Website: <http://www.tamug.edu/mars/new/curmaster.htm>

Contact: Marine Sciences Graduate Advisor, 409-740-4518
Texas A&M University at Galveston
Box 1675
Galveston, TX 775531675

Department of Marine Sciences

Marine Sciences

The Marine Sciences curriculum offers undergraduate degrees in Galveston and graduate degrees in College Station. The Marine Sciences program concentrates on the physical and chemical aspects of science of the marine, estuarine, and coastal environment. The coastal location of the campus enables students to acquire extensive hands-on field experience in addition to a solid base of academic instruction in chemistry, geology, physics, biology, and mathematics. Advanced work centers around four semesters of oceanography. Electives in the junior and senior year allow the student to obtain a broader background in ocean studies or to specialize, usually in the areas of environmental science, geology, or chemistry, or to prepare for admission to graduate school or professional positions in industry or government. Students may choose to pursue a minor in geology or chemistry through TAMU.

Degree granted: B.S.

Facilities: Classrooms, laboratories and meeting spaces are housed within 15 major buildings on the Mitchell Campus. There are three residence halls on campus, a physical education facility, and the Mary Moody Northern Student Center with cafeteria services. The Jack K. Williams Library contains over 43,000 books, 35,000 bound volumes of journals and a collection of charts and maps. The University training ship, in addition to being a floating campus during summer cruises, provides additional classroom, meeting and training space during the school year.

Faculty: <http://www.tamug.edu/mars/new/facultypage.htm>

Program Website: <http://www.tamug.edu/mars/>

Contact: Ernest L. Estes, estese@tamug.edu

Marine Sciences with License Option

This program retains the basic physical science core of the Oceanography Department's Marine Sciences program but leads as well toward a license as a deck officer in the United States Merchant Marine. The student who successfully completes the license program will be qualified to sit for the U.S. Coast Guard examination as a Third Mate of any gross tonnage upon oceans, steam, or motor vessels. Students combine a broad base of courses in physical science and mathematics and practical instruction in seamanship and navigation with upper-level oceanography courses chosen by the student. The objective of the program is to provide students with a sound intellectual and educational background to function in a scientifically and technologically advanced society, while also providing the practical hands-on training needed for employment in the maritime industry. Graduates are particularly well qualified to serve on research vessels where an understanding of the scientific purpose of the voyage is required. Students who wish to enter a physical science graduate program will need to take additional course work in science and mathematics. Cadets who enroll in and apply to graduate under one of the license option curricula must complete the appropriate license examination for Third Mate or Third Assistant Engineer in order to graduate from Texas A&M University. Certain USCG courses require a minimum grade of C (70%).

Degree granted: B.S.

Faculty: <http://www.tamug.edu/mars/new/facultypage.htm>

Program Website: <http://www.tamug.edu/mars/index.htm>

Contact: Ernest L. Estes, estese@tamug.edu

Ocean and Coastal Resources

The Ocean and Coastal Resources degree bridges the gap between science and its practice in modern society. Courses in economics, law and management have been added to a strong basic physical and biological science curriculum. Graduates work as managers for industry and government involved with the expanding use of our oceans and coasts.

Degree granted: B.S.

Faculty: <http://www.tamug.edu/mars/new/facultypage.htm>

Program Website: <http://www.tamug.edu/mars/new/curocre.htm>

Contact: Ernest L. Estes, estese@tamug.edu

Texas A&M University at Galveston

Box 1675

Galveston, TX 775531675

Phone: 409-740-4832

The Center for Coastal Margin Observation & Prediction

Beaverton, OR

*See Oregon Health and Science University—Coastal Margin
Observation & Prediction Program (CMOP)*

Troy University Troy, AL

Environmental and Biological Science Department

Marine Biology

Degree granted: B.S.

Program Website: [http://www.troy.edu/catalogs/0506undergrad/U11CAsa.htm#MARINE_BIOLOGY_PROGRAM_\(55_HOURS\)](http://www.troy.edu/catalogs/0506undergrad/U11CAsa.htm#MARINE_BIOLOGY_PROGRAM_(55_HOURS))

Contact: jawilson@troy.edu

Environmental and Biological Sciences

The Master of Science Graduate Program in Environmental and Biological Sciences is designed to broaden the student's perspective and provide skills and knowledge for understanding and solving problems in the environmental and biological sciences. The Program teaches students the direct and indirect economic, social, and political contributions of the environmental and biological sciences. The Program underscores the interdisciplinary and cooperative nature of environmental and biological issues, teaches how to manage conflicts, and emphasizes the importance of effectively communicating with the private and public sectors, regulatory agencies, interest groups, and communities.

Degree granted: M.S.

Program Website: http://www.troy.edu/catalogs/0506grad/G3CAS.htm#MASTER_OF_SCIENCE_IN_ENVIRONMENTAL_AND_BIOLOGICAL_SC

Contact: jawilson@troy.edu

Phone: 800-551-9716

Tuskegee University

Tuskegee, AL

See also Dauphin Island Sea Lab

Department of Agricultural, Environmental & Natural Sciences

Biological-Marine Biology option

Degree granted: B.S.

Program Website: <http://www.tuskegee.edu/Global/story.asp?S=3372459>

Contact: caens@tuskegee.edu

Tuskegee University

Tuskegee, AL 36088

Phone: 334-727-8157

Union University

Jackson, TN

Marine Biology

The Department of Coastal Sciences conducts a Bachelor of Science program in partnership with the Department of Biological Sciences. The program is designed to provide students with a solid background in the biology of marine and coastal organisms, with emphasis on field opportunities and to prepare graduates for a career in Marine Biology. The degree is conferred by the Department of Biological Sciences.

Degree granted: B.S.

Program Website: http://www.usm.edu/gcrl/coastal_sciences/bachelor_science.php

Contact: Kalin Lloyd, Kalin.B.lloyd@usm.edu

United States Merchant Marine Academy

Kings Point, NY

Department of Marine Transportation

Marine Transportation

The Marine Transportation major builds on this business core which offers additional courses for those students planning a shoreside career in the maritime industry. Most of the courses in the major are maritime specific. Moreover, they are all designed to introduce students to parts of the industry where many Kings Pointers have made careers in the past and are likely to go into in the future. The course in Chartering and Brokerage, for example, relates to the tanker and dry bulk sectors of the maritime industry—an area in which many graduates have specialized and will continue to do so. The course in Marine Insurance covers a career that has also proven popular with Kings Pointers. The course in Maritime Law and International Law of the Sea introduces the student to Admiralty Law, a profession where Kings Pointers have distinguished themselves. The course in Human Resource Management is also industry specific. This course includes Maritime Labor Relations, which is an important aspect of the maritime industry. No manager in the industry can be effective without understanding the role of unions and other aspects of labor relations. The Marine Transportation major also includes one elective, which must be selected from the Maritime Business area (in addition to the free electives in each major that students can still take in any department). In general, this major has been designed to give the students a greater understanding of the business aspects of the maritime industry. But the courses offered are not general business courses such as might be offered in a typical business school. Kings Point is in a unique position as the premier maritime academy, and this major draws on that expertise to offer a program that teaches business skills as they relate to and within the context of the maritime industry. It therefore represents a program that is both academically sound and related to the career goals of our students. Graduates of the Marine Transportation program, with their broad educational background complemented by specific professional management skills, have a wide variety of career opportunities. All branches of the Armed Forces offer possibilities for active duty. The U.S. Coast Guard commissions graduates to serve in marine inspection and environmental regulation. In the commercial sector, job opportunities include serving on a merchant ship as an officer; in terminal operations management; ship and cargo surveying; vessel chartering and broker-

Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
for up-to-date education and scholarship information,
as well as a downloadable version of this Guide.

age; sales and marketing; port administration; admiralty and business law; marine insurance; stevedoring; commodities trading; international banking and finance. Graduates can also serve in state and federal government agencies that regulate transport and commerce; in the Foreign Service; and in research policy analysis.

Degree granted: B.S.

Program Website: <http://www.usmma.edu/academics/curriculum/marinetransportation.htm>

Contact: CAPT. George Edenfield, edenfieldg@usmma.edu

Maritime Operations and Technology Program

The Maritime Operations and Technology program is administered by the Department of Marine Transportation in conjunction with the Department of Engineering. The purpose of the Maritime Operations and Technology program is to produce a deck officer who is well prepared for the new generation of modern, efficient vessels with unattended engine rooms. These vessels feature engine control and monitoring equipment on the navigating bridge. The Maritime Operations and Technology major will be prepared to take the third mate's license examination, but will also graduate with an enhanced knowledge of pragmatic marine engineering and an excellent business background. Such a graduate will be effective within any modern, sophisticated organization in the transportation industry, afloat or ashore. Midshipmen in the Maritime Operations and Technology program take courses in the core curriculum, nautical science and maritime business administration. They take fewer electives than the Marine Transportation major. This feature allows for additional courses in marine engineering. Graduates of this program will earn a third mate's license and certification as a Qualified Member of the Engine Department, the highest unlicensed position in the engine room. The Maritime Operations and Technology program gives the student a firm foundation in three critical areas: nautical science, maritime business, and marine engineering. The student can increase education in any of the three fields of study. A Maritime Operations and Technology major will have the same nautical science background as the Marine Transportation major, and the same maritime business core courses. Postgraduate work, after sailing, can be pursued in any number of fields. This is a versatile program for the student with interest in several fields.

Degree granted: B.S.

Program Website: <http://www.usmma.edu/academics/curriculum/marineoperationsnadtechnology.htm>

Contact: CAPT. George Edenfield, edenfieldg@usmma.edu

Logistics and Intermodal Transportation

The principal objective of the Logistics and Intermodal Transportation Program is to prepare future leaders of the nation's commercial and military logistics and transportation systems. This purpose is consistent with the Academy's mission to graduate officers and leaders who are "dedicated to serving the economic and defense interests of the United States...and who will contribute to an intermodal transportation system that effectively ties America together." The goal is achieved through an integrated program of study and experiential learning, the cornerstone of which is an academic major. The Logistics and Intermodal Transportation Program builds on the Academy's traditional maritime core competencies to provide midshipmen with the knowledge and skills required to manage complex intermodal supply chains and to address the challenges facing the global transportation system. Midshipmen who elect this major take the same core courses in Nautical Science, Maritime Business, and general education (math, science, and humanities) as do their counterparts enrolled in other majors in the Department of Marine Transportation. They must also meet requirements for a U.S. Coast Guard license as third mate. Courses specific to the Logistics and Intermodal Transportation major include Integrated Logistics Management, Intermodal Transportation Systems, Intermodal Port and Terminal Operations, Global Supply Chain Management, and the capstone Logistics and Intermodal Seminar. Elective options include such offerings as Operations Research for Transportation, Information Technology and Management, Defense Transportation System, and Environmental Management. Central themes of the major are the role of ports and maritime elements in logistical and intermodal systems, the development of a systems view, the application of information technology, and the importance of an international orientation. The major emphasizes the development of oral and written communications capabilities through research papers, written reports, and formal presentations. Teamwork skills are enhanced through case studies and applied research projects that focus on real-world tasks identified through the program's extensive industry outreach efforts. Problem solving abilities are refined through use of computer-based simulation and analysis software. Independent certification of professional competency through the American Society of Transportation and Logistics is an attractive optional component of the program. A guest lecture series brings prominent industry figures to the Academy to discuss current issues and career opportunities for graduates.

Degree granted: B.S.

Program Website: <http://www.usmma.edu/academics/curriculum/logisticsandintermodaltransportation.htm>
Contact: CAPT. George Edenfield, edenfieldg@usmma.edu

Department of Marine Engineering

Marine Engineering (B.S.)

The Engineering Majors provide midshipmen with the education and training to design, build, operate, maintain and repair the engineering systems used on modern marine vessels and to prepare them for positions of increasing responsibility in the maritime and intermodal transportation industries. The Engineering Majors also provide midshipmen with a sound, broad-based engineering education while simultaneously preparing them for an unrestricted license as a third assistant engineer of steam and motor vessels. The Academy offers three engineering majors: Marine Engineering; Marine Engineering Systems; and Marine Engineering and Shipyard Management.

The synergistic combination of classical engineering studies and operations-oriented training and experience offers graduates an unbeatable amalgamation of skills that prepare them for a broad range of professional occupations. The special nature of the Academy makes the engineering graduates well suited for professions in the maritime industry as well as in related fields such as power generation and intermodal transportation.

Degree granted: B.S.

Program Website: <http://www.usmma.edu/academics/curriculum/marineengineering.htm>

Contact: Prof. Jose Femenia, femeniaj@usmma.edu, 516-773-5743

Marine Engineering (M.S.)

The USMMA Master of Marine Engineering program is an on-line, distance-learning program focused at the practicing marine engineer. The program is for designers, builders and operators of vessels and marine structures, those who will design and manufacture shipboard components and those who will guide the design and building of future vessels and platforms. The faculty is composed of Academy faculty and leading industry experts.

Degree granted: M.S.

Facilities: When individuals register for a course they receive a CD with 26 one-hour lessons. The individuals are responsible for completing the lessons including submitting the required student work. Once per week the professor will conduct a live synchronous class session with the students. Some courses require a one- or two-day mid-semester laboratory session at the USMMA campus located at Kings Point, New York. The Academy has 20 engineering laboratory and simulator facilities.

Faculty: <http://www.usmma.edu/gradcourse>.

2007 tuition: \$900 per credit

Program Website: <http://www.usmma.edu/gradcourse>

Contact: Jose Femenia; femeniaj@usmma.edu, 516-773-5743

Marine Engineering Systems

Degree granted: B.S.

Student Support

Program Website: <http://www.usmma.edu/academics/curriculum/marineengineeringsystems.htm>

Contact: Prof. Jose Femenia, femeniaj@usmma.edu, 516-773-5743

Marine Engineering and Shipyard Management

An important element of the Marine Engineering and Shipyard Management program is the design experience interwoven throughout a student's four years, culminating in the capstone design project in the senior year.

The student participates as part of a team tasked with developing a ship construction or ship repair project.

The project is spread over two terms and finishes with a presentation of the final design to a panel of faculty and invited industry professionals. The Marine Engineering and Shipyard Management program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

Degree granted: B.S.

Program Website: <http://www.usmma.edu/academics/curriculum/marineengineeringandshipyardmanagement.htm>

Contact: Prof. Jose Femenia, femeniaj@usmma.edu, 516-773-5743

Dual License

The Dual License program is administered jointly by the Departments of Engineering and Marine Transportation. Midshipmen should apply for admission to the program at the end of the first term of plebe year. They receive professional preparation as both deck and engineering officers, leading to licensing as both a third mate and third assistant engineer. The dual license graduate is qualified to fill licensed shipboard positions requiring skills in both the deck and engineering departments.

The demands of completing the requirements for two licenses in four academic years does not allow for electives. Only students with substantial significant prior college-level coursework (particularly in mathematics, science and engineering) can complete the Dual License program. In addition, students wishing to apply for admission to the program should have a 3.0 average at the end of the first term of plebe year.

Degree granted: other

Program Website: <http://www.usmma.edu/academics/curriculum/dual.htm>

Contact: CAPT. George Edenfield, edenfieldg@usmma.edu

Training courses in Nautical Science

Special training programs, seminars, and conferences can be developed for a wide variety of subject matter upon request. In addition, any calendar courses can be redesigned to meet an organization's specific requirements, provided sufficient students are enrolled, and requested dates are available.

Degree granted: other

Program Website: <http://gmats.usmma.edu/info/courses/?@=ix&cat=D>

Contact: CDR Brian Hall, hallb@usmma.edu, 516-773-5120

Special training courses in Marine Engineering

Degree granted: other

Program Website: <http://gmats.usmma.edu/info/courses/?@=ix&cat=E>

Contact: 516-773-5120

Special training courses in Transportation, Logistics, and Management

Degree granted: other

Program Website: <http://gmats.usmma.edu/info/courses/?@=ix&cat=T>

Contact: 516-773-5120

Special Training courses in Research and Special Projects

Degree granted: other

Program Website: <http://gmats.usmma.edu/info/courses/?@=ix&cat=R>

Contact: 516-773-5120

U.S. Merchant Marine Academy
300 Steamboat Road
Kings Point, NY 11024

Website: <http://www.USMMA.edu>



U.S. Naval Academy research vessel

United States Naval Academy Annapolis, MD

Naval Architecture

Naval architects combine imagination, artistic instincts, scientific principles, and engineering considerations in designing future means of ocean transportation. The many types of ships, boats, and vehicles needed to operate on, under, or just above the ocean's surface comprise the broad field in which the naval architect works. Building on a foundation of mathematics, physics, and basic engineering subjects such as statics, fluid dynamics, and material science, the naval architecture student at the U.S. Naval Academy learns modern engineering concepts for the design, analysis, and performance prediction of marine vehicles. Innovative solutions to these open-ended engineering problems are provided by their learned knowledge, enthusiasm, and creativity. The student's academic career culminates in a capstone project involving the design, model construction and laboratory testing of an ocean-going vessel.

Degree granted: B.S.

Program Website: <http://www.usna.edu/NAOE/oe.htm>

Contact: Dr. Paul H. Miller, phmiller@usna.edu

Ocean Engineering

The key to unlocking Earth's last frontier lies in the hands of the ocean engineer. Ocean scientists can provide us with a basic knowledge of the ocean environment, but it is the ocean engineer who must apply modern engineering concepts to solve the many open-ended problems associated with the ocean environment and to provide ways to utilize the oceans more effectively. By blending the fundamentals of oceanography, mathematics, physics, and material science, with the basic elements of civil, mechanical, and electrical engineering, the ocean engineering student at the Naval Academy is able to ap-

Find useful information on Internships,
Scholarships, and Professional Societies
in the appendices at the back of this Guide.

ply their acquired knowledge to solve diverse problems in ocean energy and materials, beach erosion, life support systems, mariculture, ports and harbors, underwater vehicles, wetlands, wave mechanics, and the design of a wide variety of coastal and offshore structures. Students majoring in ocean engineering can elect to concentrate in the civil engineering track, the deep ocean technology track, the environmental engineering track, or the ocean resources management track.

Degree granted: B.S.

Program Website: <http://www.usna.edu/NAOE/oe.htm>

Contact: Dr. Jennifer K. Waters, jwaters@usna.edu

Oceanography

The Naval Academy has one of the most extensive undergraduate oceanographic and meteorological facilities in the country. The oceanographic laboratory complex includes traditional physical, biological, geological and chemical “wet” laboratories, in addition to three advanced computer laboratories for oceanographic and meteorological applications. The course of study features the use of a 108-foot Yard Patrol Craft (YP686), fully instrumented for near and off-shore data collection. The vessel docks at the Hendrix Pier Laboratory for instrumentation by the technical staff and embarking/debarking the scientific party. A comprehensive suite of sensors includes CTDs, rosettes, profiling fluorometer, side-scan sonar, subbottom profiler, hull mounted and portable acoustic Doppler current profilers, etc. The Naval Academy also maintains a state-of-the-art meteorological laboratory. The computerized MetLab features the capability to ingest, process, and display a variety of meteorological products including NOAA/NCEP and FNMOC weather products, online access to worldwide meteorological and oceanographic data, real-time satellite imagery and radar data. Additionally, a fully automated roof-mounted weather station is linked to classroom monitors to display and computers to archive local observations. The Oceanography Department is heavily involved with AMS education programs, annually hosting the Maury Project summer workshop, and is involved in mentoring for two AMS distance-learning courses (Water in the Earth System and DataStreme-Ocean).

Degree granted: B.S.

Program Website: <http://www.usna.edu/Oceanography>

Contact: Dr. David R. Smith, Chair, drsmith@usna.edu

Facilities: Both the Naval Architecture and Ocean Engineering majors programs and, to a lesser extent, the Oceanography Department share the extensive laboratory facilities located on the ground floor of Rickover Hall. The Academy’s Hydromechanics Laboratory includes a 380-ft towing tank, a world class facility, capable of testing

ship models up to 25 feet in length and weighing several thousand pounds. There is also a 120-ft towing tank, a coastal engineering basin, a low-turbulence water tunnel and a circulating water channel. All Academy students receive laboratory instruction in this facility during their course of studies. Students in the marine-related majors gain significant laboratory experience, often testing their capstone designs and undertaking research projects using these facilities. Student design projects and faculty research programs are also supported by highly structured shop facilities for model making and instrumentation.

Website: <http://intranet.usna.edu/Hydromechanics/>

Contact: Director, Hydromechanics Laboratory
Phone: 410-293-5101

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University of Alabama

Tuscaloosa, AL

See also Dauphin Island Sea Lab

Biology and Marine Sciences

Chemistry and Marine Science

We offer a dual degree program in biology (or geology or chemistry) and marine science that requires our students to spend several summers at the Dauphin Island Sea Lab (<http://www.disl.org/>), located just south of Mobile. This program allows our students to work on a biology degree here on main campus during the academic year, where the bulk of our courses are geared toward freshwater and terrestrial ecosystems, and then spend time in highly intensive, hands-on marine science courses during the summers. This schedule permits the students to complete their general requirements (e.g., general chemistry, math, geology) as well as the university’s required core courses for graduation at main campus with the maximum of options. In order to fulfill the requirements of our marine science program, students take 2 semesters of general chemistry, geology, and physics, and a single semester of statistics on main campus. Required marine science classes at the Sea Lab include: Marine Biology, Marine Geology, Oceanography, Marine Technical Methods, and an Elective. These courses are in addition to the liberal arts core curriculum designated by the university and the requirements of the chosen co-major. With two summers of marine science courses at Dauphin Island Sea Lab and a realistic load of classes each semester, graduation in four years is very possible. The program is highly regarded and our graduates are very conversant in the sciences, making them well suited for a number of career options after graduation.

Degree granted: B.S.

Program Website: <http://bama.ua.edu/%7Emarsci/>

Contact: Julie Olsen, jolson@biology.as.ua.edu

Geology and Marine Sciences

See description above.

Degree granted: B.S.

Program Website: <http://bama.ua.edu/%7Emarsci/>

Contact: Juan Lopez-Bautista, jlopez@ua.edu

University of Alabama

Tuscaloosa, AL 35487-0268

University of Alabama at Birmingham

Birmingham, AL

See also Dauphin Island Sea Lab

Biology with a Marine Sciences Concentration

Degree granted: B.S.

Program Website: [http://main.uab.edu/nsm/show.](http://main.uab.edu/nsm/show.asp?durki=63483&site=1121&return=64234)

[asp?durki=63483&site=1121&return=64234](http://main.uab.edu/nsm/show.asp?durki=63483&site=1121&return=64234)

Contact: David W. Kraus, dwkraus@uab.edu

Biology with a focus in Ecology of Aquatic Organisms

The Department of Biology offers programs of study leading to the M.S. and Ph.D. degrees including the Fifth Year Master's Degree Program. Graduate students may specialize in research activities at all levels of biological organization, with emphases on ecophysiology, cellular and molecular biology, endocrinology, and ecology of aquatic organisms, or on models related to human disease. The aim of the department is to provide a broad background and a field of specialty that prepare the student for a professional career in research and/or teaching. Two types of master's programs are available. A student may choose a research-based program that requires, in addition to a thesis, a minimum of 24 hours of committee-approved course work. The non-research plan requires a minimum of 30 hours of approved course work and a thesis incorporating a review and analysis of a topic of current or historical interest in biology. Either plan of study can be completed in approximately two years.

Degree granted: M.S. and Ph.D.

Facilities: Well-equipped research laboratories for the department are located in Campbell Hall. Facilities are available for warm-blooded and cold-blooded vertebrates, invertebrates, marine and freshwater forms, and botanical specimens. The University operates two farms suitable for field studies. For students interested in marine biology, the University is a member of the Marine Environmental Science Program at Dauphin Island near Mobile, Alabama. The Lister Hill and Mervyn Sterne libraries have extensive holdings in biological and related sciences. Computer services are provided by the computer

research laboratory, and several microcomputers in the department are available for students' use.

2007 tuition: In-state residents: \$2,916; Out-of-State: \$7,290

Program Website: <http://www.uab.edu/uabbio/by3.htm>

Contact: Dr. Stephen A. Watts, sawatts@uab.edu

University of Alabama at Birmingham

375 Campbell Hall

Birmingham, AL 35294

Phone: 205-934-8308

University of Alabama at Huntsville

Huntsville, AL

See Dauphin Island Sea Lab

University of Alaska, Anchorage

Anchorage, AK

Graduate Certificate in Port & Coastal Engineering

Degree granted: Certificate-Bachelor's degree required

Program Website: http://www.engr.uaa.alaska.edu/advising/current_students.cfm

Contact: Robert Lang, afrijl@uaa.alaska.edu

University of Alaska, Fairbanks

Fairbanks, AK

Fisheries

Alaskans rely on sound science to sustain their rich fisheries, to manage carefully the harvest of its fish and shellfish, and the use of their habitats. Our school's fisheries science faculty educate the scientists who work in Alaska's industry and conservation agencies. Our students enjoy a high faculty ratio and chances to work on the biology of Alaska's many unspoiled species. Nearly all our graduate students have financial support from fellowships, research grants, and internships awarded by companies, and public and private agencies. Most of our graduates stay in Alaska and work for those agencies and companies.

Faculty supervise students' research on a broad array of biological problems in laboratories that specialize on quantitative stock assessment, on the biology and ecology of marine and freshwater species, on molecular genetics, on behavioral ecology, etc. Our students' theses and dissertations have addressed problems of fisheries science in the Arctic, the interior Yukon, Kuskokwim, and

Copper Rivers, the Bering Sea, Prince William Sound, the Gulf of Alaska, and the Inside Passage of southeast Alaska. They have ranged in topic from the effects of the Exxon Valdez Oil Spill to the evolution of salmon or rockfish to the submarine movements of deep sea crabs. Our students learn techniques ranging from wintertime scuba diving to DNA fingerprinting to the classical methods of fisheries science—boats, ships, nets, and hipboots. Quantitative techniques (statistical analysis, sampling, stock assessment, GIS) are a part of every student's program and are the particular focus of many.

Degree granted: Ph.D.

Facilities: University facilities are located across Alaska at the Juneau Center, Seward, Kodiak, and Fairbanks. Our students also work in laboratories and facilities of public and private agencies such as NOAA Fisheries' Auke Bay Laboratory, USGS's Glacier Bay Field Station, Alaska Department of Fish and Game's Mark Tag and Age Lab, and the Salmon Broodstock Lab at DIPAC's Macaulay Hatchery.

Program Website: <http://www.sfos.uaf.edu/academics/degrees/grad/fisheries/index.html>

Contact: Gordon Kruse, gordon.kruse@uaf.edu

Fisheries with focus in Freshwater Fisheries and Habitat Ecology

Fisheries with focus in Marine Fisheries and Aquaculture

The University of Alaska Fairbanks offers degree programs on the Fairbanks campus and at the Juneau Center, through the Fisheries Division of the School of Fisheries and Ocean Sciences. Freshwater fisheries and habitat ecology are emphasized at Fairbanks, and marine fisheries and aquaculture at Juneau. Students can take classes at one or both campuses as part of their degree program. Both undergraduate (B.S.) and graduate (M.S. and Ph.D.) degrees are offered.

The undergraduate degree program is offered only at the Fairbanks campus, but courses also can be taken at the Juneau Center. The program provides a broad education, qualifying graduates to enter fisheries management, law enforcement, and public education. The undergraduate fisheries program provides a firm foundation for graduate studies in fisheries science.

Degree granted: B.S., M.S. and Ph.D.

Program Website: <http://www.sfos.uaf.edu/academics/degrees/undergrad/index.html>

Contact: Gordon Kruse, gordon.kruse@uaf.edu
University of Alaska, Fairbanks
P.O. Box 757480
Fairbanks, AK 99775-7480

Marine Biology

Since its establishment in 1960, the SFOS and the Institute of Marine Science has provided opportunities for graduate education to students who have previously earned baccalaureate degrees in areas of natural science. Undergraduate training in marine science is not required for admission to the program; a thorough grounding in biology or a related discipline is excellent preparation.

Degree granted: Degree programs leading to the M.S. and Ph.D. degrees are offered. M.S. candidates must demonstrate through course work and comprehensive examination both a broad grasp of marine science and detailed knowledge of marine biology. There are no fixed course requirements for the Ph.D., nor is a prior M.S. required. The Ph.D. is awarded for proven ability and scholarly attainment; each candidate's program is planned with his or her own advisory committee.

Program Website: <http://www.sfos.uaf.edu/academics/degrees/grad/marinebiology/index.html>

Contact: Russel Andrews, russ_andrews@alaskasealife.org

Oceanography

Oceanography is an interdisciplinary science. Our research staff constitutes a team with backgrounds in physical, biological, geological, and chemical fields that combines their expertise to investigate the marine environment and marine life.

SFOS and the Institute of Marine Science provide opportunities for graduate education to students who have previously earned baccalaureate degrees in any natural science or, in some cases, mathematics or engineering. Undergraduate training in marine science is not required for admission to the program.

M.S. candidates concentrate in biological, chemical, fisheries, geological, or physical oceanography. For each of these specializations, students must demonstrate through course work and comprehensive examination both a broad grasp of marine science and detailed knowledge of their specialty. There are no fixed course



The Polar Submersibles ROV Team gets wet during a practice session in Fairbanks, Alaska.

requirements for the Ph.D., nor is a prior M.S. required. The Ph.D. is awarded for proven ability and scholarly attainment; each candidate's program is planned with his or her own advisory committee.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.sfos.uaf.edu/academics/degrees/grad/oceanography/index.html>

Contact: Mark Johnson, johnson@ims.uaf.edu

Seafood Science and Nutrition

The Fishery Industrial Technology Center (FITC), the UAF School of Fisheries and Ocean Sciences (SFOS), and the UAF Graduate School's Interdisciplinary Program offer students a graduate program of study in seafood science and nutrition.

FITC in Kodiak is Alaska's state-of-the-art seafood research and development organization. With knowledge from diverse scientific disciplines, scientists along with students, work year-round to discover new methods to harvest, preserve, process and package Alaska's ocean resources.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.sfos.uaf.edu/academics/degrees/grad/seafoodsci/index.html>

Contact: Quentin Fong, qfong@sfos.uaf.edu

University of Alaska, Fairbanks

P.O. Box 757480

Fairbanks, AK 99775-7480

University of Alaska, Southeast

Juneau, AK

Marine Biology

UAS offers a Bachelor of Science degree in Biology and Marine Biology. A Bachelor of Arts degree in Biology will soon be available. Students learn biological principles and skills in lecture, laboratory, and field courses, with an emphasis on involvement in research projects. The program is composed of full-time faculty actively involved in a wide range of disciplines including marine ecology, marine mammalogy, phycology, comparative physiology, neurobiology, population genetics and conservation biology. The location of the university provides students with a natural laboratory that includes extensive marine habitat, rainforest, wetlands, and ice fields—all within walking distance of the classrooms. A small student-to-professor ratio ensures a more personal approach to learning than is possible at larger universities.

Degree granted: B.S.

Program Website: <http://www.uas.alaska.edu/biology/index.html>

Contact: admissions@uas.alaska.edu

Fisheries Technology

UAS Ketchikan Fisheries Technology program prepares students for employment in a variety of fisheries occupations with emphasis in fish culture and aquaculture. The program offers a Certificate in Fisheries Technology as well as an Associate of Applied Science degree. The program is currently being offered both locally and through distance delivery methods. There is some course work that involves lab work that may require travel to complete.

Degree granted: A.A.S.

Program Website: <http://www.uas.alaska.edu/ketchikan/departments/academicprograms/fisheries/index.html>

Contact: Kate Sullivan, kate.sullivan@uas.alaska.edu

Power Technology with Marine Oiler emphasis

Degree granted: A.A.S.

Program Website: <http://www.uas.alaska.edu/diesel/>

Contact: Amber King, amber.king@uas.alaska.edu

Certificate in Power Technology: Diesel/Marine emphasis

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.uas.alaska.edu/diesel/>

Contact: Amber King, amber.king@uas.alaska.edu

UAS Marine Mechanic

This training is for the student who wants to work in the marine field of diesel powered vessels. The course content covers the different support systems as well as the diesel engine. All of the classes are at least 50% hands-on to let students practice their new skills. UAS has a wide selection of excellent training aids such as engines, marine transmissions, hydraulic components, generator sets, and many other items.

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.uas.alaska.edu/diesel/programs/marine.htm>

Contact: mike.bell@uas.alaska.edu

University of Alaska, Southeast

11120 Glacier Way

Juneau, AK 99801

Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
for up-to-date education and scholarship information,
as well as a downloadable version of this Guide.

University of Arkansas at Little Rock

Little Rock, AR

Biology: emphasis in Fisheries and Wildlife Management

This concentration is designed to prepare students studying conservation biology for research or management positions with federal, state, or other agencies, such as the U.S. Fish and Wildlife Service, state game and fish departments, and national and state parks. The curriculum is also designed to prepare students to enter graduate programs in fish and wildlife management and meets the certification requirements of the American Fisheries Society and the Wildlife Society. This program of courses is a major-minor combination; no separate minor field is required.

Degree granted: B.S.

Program Website: <http://www.ualr.edu/biology/http://www.ualr.edu/biology/>

Contact: Janet Lanza, jxlanza@ualr.edu
University of Arkansas at Little Rock
Little Rock, AR 72204

University of California, Berkeley

Berkeley, CA

College of Engineering

Mechanical Engineering with Ocean Engineering option

A set of elective courses are offered by the College of Engineering faculty to support the undergraduate Ocean Engineering Option in Mechanical Engineering. Mechanical Engineers often find themselves working on the design of mechanical systems that operate in the ocean environment. As the ocean is viewed as the earth's "last frontier," its exploration and safe exploitation represent important areas of professional opportunities for many engineers. As an example, the engineering of shipboard machinery, navigation and control systems, underwater robotics, propulsion devices will require mechanical-engineering skills. ME students would benefit from an exposure to the technical problems and solution methods in the ocean fields. The liaison of these disciplines has been traditional. ASME (the American Society of Mechanical Engineers) has a division directly related to ocean activities: the Ocean, Offshore and Arctic Engineering Division (OOAE), which sponsors the annual Offshore Mechanics and Arctic Engineering (OMAE) Conference. The Society of Naval Architects and Marine Engineers also plays an important role in supporting naval architectural and marine professional activities.

Degree granted: B.S.

Program Website: http://coe.berkeley.edu/Surface-Waves/yeung/me-oe_option.html

Contact: oceaneng@coe.berkeley.edu

Ocean Engineering

Ocean Engineering is the field of study concerned with learning how the various components of the ocean work and how people can best apply technology to the ocean environment. Ocean Engineering deals with such issues as what humans can do to harness the resources of the ocean in a safe and environmentally responsible way. Ocean Engineering-related jobs are found in the oil/gas industry, shipping/shipbuilding industry, ocean research/exploration, environmental agencies, government, and many more. Ocean Engineering expertise is needed in a wide range of coastal, river, and ocean-related engineering projects or research. Successful application of technology in the world's oceans requires a wide knowledge base in such areas as Civil Engineering, Environmental Engineering, Mechanical Engineering, Electrical Engineering, Oceanography, and many others. Topics of interest in Ocean Engineering include: Ocean and coastal processes (physical, chemical, biological); Fluid mechanics (computational, environmental); Ocean structures (design, construction, operation, maintenance); Ship structures/Ocean vehicles (design, construction, operation, maintenance); Remotely Operated Vehicles (ROVs); Autonomous Underwater Vehicles (AUVs); Underwater life support; Ocean sensors and measurement; Ocean exploration; Resource extraction (oil, natural gas, minerals, food); Management of marine technology; ... and virtually any technology as it leads to a better understanding of, or better work on, in, under, and through the world's oceans

Degree granted: M.S. and Ph.D.

Program Website: <http://www.coe.berkeley.edu/oceaneng/>

Contact: oceaneng@coe.berkeley.edu



Training ocean science educators; photo courtesy of COSEE: New England.

Applied Science & Technology

The Graduate Program in Applied Science and Technology (AS&T) focuses on studies involving the application of physical and mathematical techniques to fundamental investigations and emerging areas within the physical and life sciences. Major areas of emphasis are in applied physics, engineering sciences, and mathematical sciences. AS&T is a Ph.D. program; however, students who are interested in pursuing a Master's of Science degree may complete the additional requirements while continuing to work toward the Ph.D. In addition, students who have been admitted to the program may also apply for the newly-created Designated Emphasis (DE) in Nanoscale Science and Engineering (NSE), and the newly-created emphasis (DE) in Energy, Science, and Technology (DE EST).

Degree granted: M.S.

Program Website: <http://www.coe.berkeley.edu/AST/>

Contact: Paul Alivisatos, alivis@berkeley.edu

Applied Science & Technology

Degree granted: Ph.D.

Program Website: <http://www.coe.berkeley.edu/AST/>

Contact: David Attwood, attwood@eecs.berkeley.edu

Department of Earth and Planetary Sciences

Earth and Planetary Science: Marine Science Track

The Department of Earth and Planetary Science at UC Berkeley offers undergraduate and graduate education opportunities in basic fields of marine science and marine science communication. There is a Marine Science Track of the Earth and Planetary Science undergraduate major, that allows students to take a variety of marine and earth science courses. There is a close link of research programs and faculty on campus including the Dept of Integrated Biology and those at the nearby Lawrence Berkeley National Laboratory.

Degree granted: B.S.

Facilities: The Department occupies three and one-half floors of the McCone Building on Campus. Undergraduates have the Ramsden Study Center and graduate students are provided shared office space. Labs include: sedimentary and microfossil analysis, and stable and radiogenic geochemistry laboratories for analyzing sediment cores, waters, and other natural materials for elemental and isotopic compositions. Ship-deployed sampling technologies include the Multiple Unit Large Volume *in situ* Filtrate System. We have pioneered and deployed robotic Carbon Explorers (ARGO floats adapted to follow fast variations of biomass) capable of profiling to kilometer depths and operating for over one year and returning real-time data streams to shore. The newest

autonomous free vehicle is designed to follow variations of carbon sedimentation in real time for seasons. We benefit from nearby engineering and shop and field facilities at LBNL. Advanced analytical instrumentation for marine geochemistry includes inductively coupled plasma mass spectrometers (single and multiple collector instruments), isotope ratio mass spectrometers, and scanning electron microscope, electron microprobe and the synchrotron probe facilities at the Advanced Light Source at LBNL.

Faculty: Lynn Ingram: paleoceanography; James Bishop: ocean biogeochemistry, chemical oceanography; Don Depaolo: isotope geochemistry; Barbara Romanowicz: seismology; Thomas Powell: physical oceanography, biological systems modeling; Mimi Kohel: marine biology; Don Weston: marine pollution; Bill Berry: marine geochemistry.

Program Website: <http://eps.berkeley.edu/education/marinescience.php>

Contact: Catherine Pauling, cpauling@berkeley.edu
University of California, Berkeley

305 McCone Hall, EPS - #4767

Phone: 510-643-4068

Naval Reserve Officers Training Corps

Degree granted: General marine science courses

Program Website: <http://navyrotc.berkeley.edu/>

Contact: vgarza@military.berkeley.edu

152 Hearst Gymnasium

University of California

Berkeley, CA 94720-3640

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University of California, Davis Davis, CA

Wildlife, Fish & Conservation Biology

Because of the diversity of problems in the field, the major emphasizes broad training in biological and physical sciences, with specialization in one of eight areas. The major is primarily for students interested in eventually becoming professionals in wildlife, fish, and conservation biology, but its breadth of course requirements, when combined with suitable electives, also make it suitable as a preparatory major for such areas as veterinary medicine and secondary school teaching. Certification by professional societies such as The Wildlife Society, American Fisheries Society, or the Ecological Society of America, or preparation for specialized resource-related graduate studies may also be achieved by careful planning of electives with a faculty adviser.

Degree granted: B.S.

Program Website: http://registrar.ucdavis.edu/UCDWebCatalog99_00/WebCatCrsgc_wfc.htm

Contact: Deborah L. Elliott-Fisk, dlelliottfisk@ucdavis.edu

Geology with an Oceanography emphasis

Degree granted: B.S.

Program Website: http://registrar.ucdavis.edu/UCDWebCatalog99_00/WebCatCrsgc_gel.htm

Contact: Magali I. Billen, billen@geology.ucdavis.edu

Ecology: Marine Ecology emphasis

Now celebrating its 40th year, the UC Davis Graduate Group in Ecology (GGE) is the largest and most comprehensive ecology graduate training group of its kind. Offering unparalleled diversity and depth in course work and research opportunities, the group is recognized as a center for academic and training excellence. The group's diverse and dynamic collection of 200 students and 125 faculty comes from 24 different departments/ units on campus. Offering both Master's and Ph.D. degrees, the Graduate Group is organized into nine areas of emphasis that include both basic and applied ecology. The GGE defines ecology broadly to span scales from genes to landscapes and explicitly includes human ecology and policy. GGE members become the professionals best trained to protect our natural resources. They strive to develop basic ecological theory as well as work with resource management agencies to help solve ecological problems. GGE graduates are found on the staffs of virtually every natural resource managing agency in the federal government (Fish and Wildlife, Forest Service, Geological Survey, NOAA Fisheries, National Parks, EPA, and others), the California state government (Fish and Game, Water Resources, Air Resources, Food and Agriculture, EPA, Energy Commission, etc.), private conservation organizations (Nature Conservancy, etc.) and innumerable environmental consulting and biotech companies.

Degree granted: M.S. and Ph.D.



Ocean education training.

Program Website: <http://ecology.ucdavis.edu/>

Contact: schillyer@ucdavis.edu

Biological Sciences: Marine Biology emphasis

The area of emphasis in marine biology offers the student a broad background in biological marine sciences. The program of study begins with core introductory courses in mathematics, physical sciences and biology. These are followed by more specialized courses that allow the student to focus his or her studies in marine biology, featuring involvement with the Bodega Marine Lab.

Degree granted: B.S.

Program Website: <http://biosci.ucdavis.edu/undergrad/majors/bis/plans/marbio.html>

Contact: ganevitt@ucdavis.edu

Environmental Science Major

The Information Center for the Environment (ICE) is an environmental information brokerage and research laboratory in the Department of Environmental Science & Policy at the University of California, Davis, under the direction of Professor Jim Quinn and Academic Administrator Mike McCoy. ICE specializes in the development and dissemination of geospatial data and technologies; the development of robust data architectures dedicated to the cataloging of global environmental information; and the creation of decision-support systems geared toward improving the capabilities of resource managers in a variety of sectors. ICE currently employs ~30 professional staff and students.

Degree granted: B.S.

Program Website: <http://www.des.ucdavis.edu>

Contact: Howard V. Cornell, hvcornell@ucdavis.edu

Bodega Marine Laboratory (Marine Science Courses)

Degree granted: General marine science courses

Program Website: <http://www.bml.ucdavis.edu/student-info/courses.html>

Contact: ealenz@ucdavis.edu

University of California, Davis
One Shields Avenue
Davis, CA 95616

University of California, Irvine Irvine, CA

Earth and Environmental Sciences

The Department offers a major in Earth and Environmental Sciences and an interdisciplinary minor in Earth and Atmospheric Sciences. Both the major and the minor consist of a set of required Earth System Science core courses and a group of elective courses drawn from offerings in Physical Sciences, Biological Sciences, Engineering, and Social Ecology. The core courses focus on the application of physical, chemical, and biological principles to understanding the complex interactions of the atmosphere, ocean, and land through climate and biogeochemical cycles. The Department also offers a group of lower-division breadth courses appropriate for non-science majors.

Degree granted: B.S.

Program Website: <http://www.ess.uci.edu/undergrad/>

Contact: Eric S. Saltzman, esaltzma@uci.edu

Earth System Science

Applicants to the Earth System Science Ph.D. program should have a broad quantitative scientific background, with an undergraduate degree in natural science or related fields such as applied mathematics and engineering. Undergraduate preparation should involve mathematics including differential equations, a year-long sequence of physics and of chemistry, and courses in general biology, ecology, or geology. Entering graduate students plan their courses and research with the help of the Earth System Science Advisory Committee of academic and research faculty. Students are admitted to the Ph.D. program only; the Master's degree is awarded upon progress to the Ph.D.

Degree granted: Ph.D.

Program Website: <http://www.ess.uci.edu/grad/>

Contact: Ralph J. Cicerone, rjcicero@uci.edu
University of California, Irvine
Irvine, CA 92697

University of California, Los Angeles Los Angeles, CA

Marine Biology

Degree granted: B.S.

Program Website: http://www.eeb.ucla.edu/ugrad_marinemajor.php

Contact: Malcolm Gordon, msgordon@ucla.edu

Mathematics/Atmospheric and Oceanic Sciences

A new undergraduate interdepartmental program (IDP) combining courses from the Mathematics and Atmospheric & Oceanic Sciences (A&OS) departments has been created. The program is designed to provide rigorous mathematical training with a comprehensive background in topics relevant to atmospheric, oceanic and environmental sciences. The program is intended to provide particularly good preparation for graduate studies in a streamlined course of study. The IDP curriculum consists of six upper-division courses in Mathematics and six in A&OS, along with their lower-division prerequisites and a "capstone" course in which a research project or thesis is produced.

Degree granted: B.S.

Program Website: <http://www.atmos.ucla.edu/idp/>

Contact: Prof. Robert Fovell, rfovell@ucla.edu

Atmospheric and Oceanic Sciences

The UCLA Department of Atmospheric and Oceanic Sciences offers M.S. and Ph.D. degrees in the physics, chemistry, and biology of the atmosphere-ocean system. Our research in theory, modeling, and observations has broad applications to environmental issues, including air quality, weather and climate prediction, climate change, and natural resource management. The M.S. degree is generally completed within two years. It may be obtained either by examination or, for students with exceptional academic standing, by writing a research thesis. The Ph.D. degree is attained upon completion of the dissertation and the final oral examination. There are four major research areas within the Department: Climate and Weather; Chemistry and Radiation; Oceanography; and Space Physics. Students generally concentrate their efforts within one of these, although interdisciplinary programs are not uncommon. The Department's unique strength lies in the breadth of its educational and research programs

Degree granted: M.S. and Ph.D.

Program Website: <http://www.atmos.ucla.edu/>

Contact: Larry Lyons, larry@atmos.ucla.edu
University of California, Los Angeles
Los Angeles, CA 90095

You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

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University of California, San Diego

La Jolla, CA

Ecology, Behavior & Evolution

Research in the Section of Ecology, Behavior, & Evolution is focused on investigating ecological and evolutionary processes operating at the level of populations, species, and communities. Major foci include understanding the processes structuring the distribution and abundance of organisms, behavioral adaptations to environmental and social challenges, the processes and patterns of evolutionary change, and the application of all of these areas to the conservation of biodiversity. Researchers in this section use a variety of approaches, including DNA techniques for assaying genetic variation and estimating genealogical relationships among taxa, field experiments for hypothesis testing, telemetry and satellites for assessing patterns in species distributions, paleobiological data for quantifying the history of biodiversity, and computer simulations of evolving systems. Unlike other subdisciplines, which concentrate on a few model taxa, evolutionary biologists use data from many different organisms from all over the world to test hypotheses about biological diversity. The unifying theme underlying all of these studies is that an evolutionary approach is needed to solve most biological problems.

Degree granted: B.S.

Program Website: <http://biology.ucsd.edu/biosections/ebe.html>

Contact: Peter Andolfatto, pandolfatto@ucsd.edu

Applied Ocean Science

Degree granted: B.S.

Program Website: <http://biology.ucsd.edu/biosections/ebe.html>

Contact: Denise Darling, ddarling@ucsd.edu
University of California, San Diego
La Jolla, CA 92093



Photo courtesy of MATE

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University of California, San Diego—Scripps Institution of Oceanography

La Jolla, CA

A graduate department of the University of California at San Diego, Scripps is one of the oldest and largest centers for global science research and graduate training in the world. More than 300 research programs are now conducted at Scripps, aimed at gaining comprehensive understanding of the oceans, atmosphere and structure of the Earth. Scripps scientists pioneered exploration of the world's marine environments. They are leaders in studies of climate change, plate tectonics, ocean circulation, marine biology and ecology, marine pharmaceuticals, seafloor mapping, seismology, coastal processes, the El Niño phenomenon, biodiversity and conservation, and atmospheric sciences. Scripps offers excellent graduate instruction and students perform a significant part of Scripps research activities.

Students are encouraged to take courses from various UC San Diego departments, and to pursue interdisciplinary research projects. A full list of courses can be found at <http://www.ucsd.edu/catalog/0506/courses/SIO.html>. The graduate program normally takes five to six years to complete and consists of coursework the first year or two, a departmental and qualifying examination, submission of a dissertation based on original research and a final exam where the thesis is publicly defended.

Undergraduate Programs: Faculty and researchers at Scripps Institution of Oceanography teach over 45 undergraduate courses covering a wide breadth of earth and marine sciences including several introductory classes for non majors, and upper-division courses intended for a wide range of students in natural science majors. For students interested in careers in earth sciences, the Scripps Institution of Oceanography offers a B.S. degree and a contiguous B.S. and M.S. in Earth Sciences. Scripps also offers an undergraduate minor program in Marine Science. The minor curriculum is designed to complement the strong disciplinary training of UCSD basic science majors by providing a broad interdisciplinary perspective with an environmental focus. Ocean-related science is relevant to many contemporary environmental issues and problems and central to understanding earth-system evolution, dynamics, climate and sustainability. The minor consists of courses and research opportunities offered primarily through faculty and researchers at Scripps. The mix of these components can be tailored to reflect students' career interests through an "all courses" track or a "research" track. The "all courses" track offers a very flexi-

ble curriculum that serves students with a broad range of educational and career interests including environmental management and regulation, teaching, environmental law, economics and policy and a wide variety of graduate programs. The "research" track is designed for students interested in an undergraduate research experience at Scripps and serves as excellent preparation for graduate research studies.

Facilities: The research vessels and facilities at Scripps and its associated laboratories are available to Scripps students, many of whom participate in oceanographic research at sea. Scripps operates four ships for local and global seagoing expeditions. In addition, Scripps operates the unique research platform FLIP (FLoating Instrument Platform) for conducting stable research operations at sea. The Scripps Library, one of the largest oceanographic libraries in the world, contains more than 217,000 volumes, 1,200 print periodicals and 10,000 electronic journals. The 1,090-foot-long Scripps Pier houses apparatus for a number of serial oceanographic observations and is used as a platform from which to deploy and retrieve small boats. Other resources include a saltwater system, which provides clean seawater to the biological laboratories and the aquarium; access to underwater areas in which to conduct research and collect marine specimens; several thousand deep-sea sediment cores from diverse localities; original echograms and underwater geophysical data from several hundred thousand miles of ship tracks; an oceanographic data archive of half a million bathythermograph observations; several thousand seawater samples from the world's oceans; the Scripps Marine Vertebrates Collection with more than 2.5 million specimens and 5,700 cataloged species of marine fish; the Scripps Benthic Marine Invertebrates Collection containing 40,000 lots of 750,000 specimens and many identified species; the Scripps Pelagic Invertebrates Collection with over 114,000 zooplankton samples; and large oceanographic collections of benthic invertebrates, dredged rocks, and cores. Additional resources include the Scripps Analytical Facility, providing training and access to state-of-the-art research instrumentation.

Faculty: There are more than 95 full-time faculty members in the Department and an additional 46 adjunct professors and lecturers who are also actively involved in the instruction activities of the Department. Each member of the instructional staff belongs to one or more of several curricular programs. The interdisciplinary nature of research in marine, earth and atmospheric sciences yields a great diversity of instruction.

Program Website: <http://www.siograddept.ucsd.edu>

Contact: siodept@sio.ucsd.edu

University of California, San Diego

Scripps Institution of Oceanography

9500 Gilman Drive, Mail Code 0208

La Jolla, CA 92093-0208

Phone: 858-534-3206

Applied Ocean Science

Applied Ocean Science is a multidisciplinary program focused on the application of advanced technology to ocean exploration and observation. Applied Ocean Science (AOS) students perform research in marine acoustics, optics, electromagnetics, geophysics, ecology, sediment transport, coastal processes, physical oceanography and air-sea interaction. The emphasis is on the resolution of key scientific issues through novel technological development. The science focus of the Scripps AOS program is complemented by parallel Applied Ocean Science programs in both the Structural Engineering (SE) and Electrical and Computer Engineering (ECE) Departments. Students have access to professors, courses and research facilities across all three departments.

Degree granted: Ph.D.

Program Website: <http://www.siograddept.ucsd.edu>

Contact: Joshua Reeves, jdreeves@ucsd.edu

Phone: 858-534-1694

Biological Oceanography

Biological Oceanography is concerned with the interactions of populations of marine organisms with one another and with their physical and chemical environment. Because these interactions are frequently complex, and because the concepts and techniques used are drawn from many fields, biological oceanography is, of necessity, interdisciplinary. Therefore, studies in physical oceanography, marine chemistry, marine geology, and several biological areas are pertinent. Research is conducted on space/time scales ranging from short-term interactions between individual organisms (mm, sec.) to interdecadal variation in widely dispersed populations. The techniques used in these investigations are diverse, and can include field observation and manipulations, experimentation in the laboratory, and mathematical modeling. Research topics include primary and secondary productivity and nutrient regeneration, fishery biology and management, community ecology of benthic and pelagic organisms, population dynamics, habitat changes and disruptions, systematics and biogeography, population genetics and evolution, and behavior as it affects distribution. Development and testing of new tools (molecular, optical, acoustic), design of sampling programs, and statistical/mathematical analyses of data also are significant activities.

Degree granted: Ph.D.

Program Website: <http://www.siograddept.ucsd.edu>

Contact: siodept@sio.ucsd.edu

Phone: 858-534-1694

Marine Chemistry and Geochemistry

Marine Chemistry and Geochemistry concerns chemical and geochemical processes operating in a broad range of study areas: the oceans, the solid earth, the atmosphere, marine organisms, polar ice sheets, lakes, meteorites, and the solar system. Areas of advanced study and research include the physical and inorganic chemistry of seawater; ocean circulation and mixing based on chemical and isotopic tracers; marine organic and natural products chemistry; geochemical interactions of sediments with seawater and interstitial waters; geochemistries of volcanic and geothermal phenomena; chemical exchanges between the ocean and the atmosphere; geochemical cycles of carbon, oxygen, sulfur, nitrogen, and other elements; isotopic geochemistry of the solid earth and meteorites; atmospheric trace gas chemistry; paleoatmospheric composition recorded in polar ice cores, corals and sediments; and chemistry of lakes and other freshwater systems. Studies are typically interdisciplinary and involve integration of chemical concepts with information about the physical, biological, or geological processes that influence natural systems. Students in the Marine Chemistry and Geochemistry curricular group are encouraged to explore these links.

Degree granted: Ph.D.

Program Website: <http://www.siograddept.ucsd.edu/>

Contact: siodept@sio.ucsd.edu

Physical Oceanography

Physical Oceanography deals with observations of the properties and movement of ocean water and the understanding and modeling of these natural phenomena using fundamental concepts of fluid mechanics, applied physics, and mathematics. In other words, physical oceanography concerns how water moves and mixes in the ocean, changes its properties, and carries and distributes dissolved chemicals, nutrients, plankton, and pollutants. The discipline is intertwined with atmospheric and climate studies. A goal of all these fields is understanding the energy and momentum transfer through the seas and across their boundaries. A central intellectual challenge of physical oceanography is understanding the range of space and time scales that are involved. Physical oceanographers use a combination of acoustical, optical, satellite, and *in situ* measurements. Recent technological advances, such as autonomous sampling and acoustic tomography, are producing an increasingly detailed picture of the three-dimensional ocean circulation. Because of

these new technologies, oceanic processes that are now seen dimly, or not at all, will be uncovered. Understanding this exciting new data with powerful computer models, fluid mechanics, and modern descriptive tools is the future of physical oceanography.

Degree granted: Ph.D.

Program Website: <http://www.siograddept.ucsd.edu>

Contact: siodept@sio.ucsd.edu

Phone: 858-534-3206

Advanced Studies in Marine Biodiversity and Conservation

The Center for Marine Biodiversity and Conservation, in cooperation with UCSD Division of Extended Studies and Public Programs, has established a new program leading to a Master of Advanced Studies in Marine Biodiversity and Conservation. The program is designed to teach current and future professionals about marine ecosystems from the scientific, economic, and policy perspective, as well as to provide important cultural and communication skills needed to improve conservation of marine biodiversity in the world's most diverse and threatened ecoregions through development of local capacity and management tools.

Degree granted: M.S.

Program Website: http://www.siograddept.ucsd.edu/Graduate_Students/Masters_in_Advanced_Studies/

Contact: cmbc@ucsd.edu

Marine Biology

Marine Biology is the study of marine organisms. It is concerned with evolutionary, organismic, genetic, physiological, and biochemical processes in these organisms, and the relationship between them and their biotic and physical environment. Marine biology encompasses several major areas of modern biology, and is interpreted by understanding the physical and chemical dynamics of the oceans. Faculty research focuses on microbiology, photobiology, high pressure biology, deep-sea biology, developmental biology, genetics, biomechanisms, comparative biochemistry and physiology, behavior, ecology, biogeography, and evolution of marine prokaryotes and eukaryotes. Processes ranging from the fertilization of sea urchin eggs to the role of bacteria in marine food web dynamics are under study in over twenty independent research laboratories.

Degree granted: Ph.D.

Program Website: <http://www.siograddept.ucsd.edu>

Contact: siodept@sio.ucsd.edu

Phone: 858-534-3206

Geophysics

Geophysics emphasizes the application of general principles of mathematics and experimental physics to fundamental problems of the oceans, oceanic and continental lithosphere, and crust and deep interior of the Earth. Research interests of the group include: observational and theoretical studies of electric and magnetic fields in the oceans and on the land; paleomagnetism; theoretical seismology with special emphasis on the structure of the Earth from free-oscillation and body wave studies; broadband observational seismology, including ocean bottom and multichannel seismology; earthquake source mechanisms; the measurements of slow crustal deformations using satellite and observatory methods on continents and in the oceans; marine geodynamics and tectonophysics; gravity measurements; geophysical inverse theory; magnetohydrodynamics of the core of the Earth; geophysical instrumentation for oceanic and continental geophysical measurements; acoustic propagation in the oceans.

Degree granted: Ph.D.

Program Website: <http://www.siograddept.ucsd.edu>

Contact: siodept@sio.ucsd.edu

Phone: 858-534-3206

Climate Science

Climate Sciences concerns the study of the climate system of the earth with emphasis on the physical, dynamical, and chemical interactions of the atmosphere, ocean, land, ice, and the terrestrial and marine biospheres. The program encompasses changes on seasonal to interannual time scales and those induced by human activities, as well as paleoclimatic changes on time scales from centuries to millions of years. Examples of current research activities include: interannual climate variability; physics and dynamics of El Niño; studies of present and future changes in the chemical composition of the atmosphere in relation to global warming and ozone depletion; effects of cloud and cloud feedbacks in the climate system; paleoclimate reconstructions from ice cores, banded corals, tree-rings, and deep-sea sediments; the origin of ice ages; air-sea interactions; climate theory; terrestrial and marine ecosystem response to global change.

Degree granted: Ph.D.

Program Website: <http://www.siograddept.ucsd.edu>

Contact: siodept@sio.ucsd.edu

Phone: 858-534-3206

University of California, Santa Barbara Santa Barbara, CA

Biology: Aquatic Biology concentration

Degree granted: B.S.

Program Website: <http://www.bren.ucsb.edu/>

Contact: Patricia Holden, holden@bren.ucsb.edu

University of California, Santa Barbara

M.A. in Ecology, Evolution, and Marine Biology

The Department of Ecology, Evolution and Marine Biology at the University of California, Santa Barbara provides broad, interdisciplinary training leading to the Master of Arts and the Doctor of Philosophy degrees with an emphasis on ecology and evolution as broadly defined. The diversity of research interests, perspectives, and expertise within the Department promotes the development of a broad foundation in ecology and evolution and appreciation for interdisciplinary approaches to education and research, while also allowing students to develop depth in specific subdisciplines, including population and community ecology, ecosystems ecology and biological oceanography, ecological physiology, evolution, population genetics, and organismal biology. Faculty in the Department are strong in both field and laboratory-based approaches and most combine both in their research programs.

Degree granted: M.A.

Program Website: <http://www.lifesci.ucsb.edu/eemb/programs/graduate/index.html>

Contact: Alice Alldredge, alldredg@lifesci.ucsb.edu

Ph.D. in Ecology, Evolution, and Marine Biology

The Department of Ecology, Evolution and Marine Biology at the University of California, Santa Barbara provides broad, interdisciplinary training leading to the Master of Arts and the Doctor of Philosophy degrees with an emphasis on ecology and evolution as broadly defined. The diversity of research interests, perspectives, and expertise within the Department promotes the development of a broad foundation in ecology and evolution and appreciation for interdisciplinary approaches to education and research, while also allowing students to develop depth in specific subdisciplines, including population and community ecology, ecosystems ecology and biological oceanography, ecological physiology, evolution, population genetics, and organismal biology. The Department contains over 30 faculty of which approximately 50% work in marine systems and with marine organisms. The graduate program has about 70 students, most of whom are Ph.D. students. The UCSB campus is one of the few

research universities in the world located directly on the ocean, making it an ideal site for marine research and education. Marine laboratory facilities at other institutions are usually isolated from the main campus, often by hundreds of miles, but marine education and research at UCSB occurs directly on the main campus where access to the full range of resources, facilities, and intellectual expertise offered by a large, research university are immediately available.

Degree granted: Ph.D.

Facilities: UCSB provides a full spectrum of modern facilities in marine science. These include a flow-through seawater system serving three main buildings on campus, electron and laser confocal microscopes, a fleet of coastal boats, scuba facilities, collection services for marine organisms, and extensive modern computing, GIS, remote sensing and mapping facilities. A TeraScan ground station on campus automatically receives and processes global satellite imagery, including sea surface temperature and ocean color. Extensive chemical analysis is available through the Marine Science Institute Analytical Laboratory. The University maintains field stations on Santa Cruz Island and two local estuaries, which are part of the University of California Natural Reserve System.

2007 tuition: In-state residents: \$8,074; Out-of-State: \$23,062

Program Website: <http://www.lifesci.ucsb.edu/eemb/>

Contact: Jennifer Farrar, eemb-info@lifesci.ucsb.edu
Phone: 805-893-3023

M.S. in Marine Science

The Master of Science (M.S.) degree is viewed as a goal in its own right, rather than as a stepping stone to a Ph.D. The M.S. degree in Marine Science is by thesis only. The M.S. requirements are designed to provide maximum flexibility to accommodate individual student interests while also assuring a basic level of competence within Marine Science. M.S. candidates follow an integrated course of study recommended by their thesis advisor and thesis committee.

Degree granted: M.S.

Program Website: <http://www.marinegp.ucsb.edu/degree/degree.php>

Contact: Alice Alldredge, alldredg@lifesci.ucsb.edu

Ph.D. in Marine Science

The student must demonstrate by coursework and a written and oral examination superior competence in the field of specialization, broad knowledge of the field of marine science, and satisfactory knowledge of sciences other than marine sciences that are relevant to the dissertation topic. Ph.D. candidates will follow an integrated course of study recommended by their thesis advisor and dissertation committee.

Degree granted: Ph.D.

Program Website: <http://www.marinegp.ucsb.edu/degree/degree.php>

Contact: Alice Alldredge, alldredg@lifesci.ucsb.edu

Geological Sciences - Earth Systems Emphasis

Degree granted: B.S.

Program Website: <http://www.bren.ucsb.edu/about/overview.asp>

Contact: John Melack, melack@bren.ucsb.edu

Hydrologic Sciences

Hydrology is a science dealing with the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere. Many of the significant environmental problems that society is facing today are related to hydrologic or water issues. These include the hydrologic impact of climate change; the transportation of hazardous materials in both ground and surface water; the maintenance of high quality water for human consumption, industry, irrigation, recreation, energy generation, and agriculture; the understanding of geological hazards; and the management of important aquatic environments. Because water is important to and affected by physical, chemical, and biological principles, the curriculum of the B.S. degree in hydrologic sciences is multidisciplinary. The main focus of the hydrologic sciences program and major is to provide students with the scientific training needed to understand and solve complex hydrologic problems at local, regional, and global levels. The goal of the hydrologic sciences curriculum is to provide a rigorous framework for students to examine the hydrologic process in our environment. Although the program is housed within the Environmental Studies Program, the curriculum for this degree is offered cooperatively by the departments of Ecology, Evolution, and Marine Biology; Chemistry; Geography; and Geological Sciences. Lower-division courses concentrate on the physical and natural sciences. In the upper-division, students complete a core group of hydrology courses and then select one of the following four science concentrations to complement their hydrology emphasis: biology, chemistry, geography, or geology.

You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

Degree granted: B.S.

Program Website: http://www.es.ucsb.edu/curriculum_info/hs_major.php

Contact: Jordan F. Clark, jfclark@geol.ucsb.edu
University of California, Santa Barbara

Interdepartmental Graduate Program in Marine Science

The Interdepartmental Graduate Program in Marine Science at UCSB is a multidisciplinary program bringing together marine faculty from across the campus to provide graduate training leading to the Master of Science and the Doctor of Philosophy degrees in Marine Science. The diversity of research interests, perspectives, and expertise within the program promotes the development of a broad foundation in marine science and appreciation for interdisciplinary approaches to education and research while also allowing students to develop depth in specific subdisciplines within the field. The >40 faculty participating in the program come from 9 departments on campus including the Departments of Ecology, Evolution and Marine Biology, Earth Science, Geography, Molecular, Cellular and Developmental Biology, Chemical Engineering, Mechanical Engineering, Chemistry and Biochemistry, Donald Bren School of Environmental Science and Management, and Anthropology. The UCSB campus is one of the few research universities in the world located directly on the ocean, making it an ideal site for marine research and education.

Degree granted: M.S. and Ph.D.

Facilities: UCSB provides a full spectrum of modern facilities in marine science. These include a flow-through seawater system serving three main buildings on campus, electron and laser confocal microscopes, a fleet of coastal boats, scuba facilities, collection services for marine organisms, and extensive modern computing, GIS, remote sensing and mapping facilities. A TeraScan ground station on campus automatically receives and processes global satellite imagery, including sea surface temperature and ocean color. Extensive chemical analysis is available through the Marine Science Institute Analytical Laboratory. The University maintains field stations on Santa Cruz Island and two local estuaries, which are part of the University of California Natural Reserve System.

2007 tuition: In-state residents: \$8,074; Out-of-State: \$23,062

Program Website: <http://www.marinegp.ucsb.edu/about/about.ph>

Contact: Melanie Fujii-Abe, marinegp-info@lifesci.ucsb.edu
Phone: 805-893-8605

University of California, Santa Cruz Santa Cruz, CA

Ocean Sciences

Although offering a range of undergraduate courses, the Ocean Sciences Department presently offers only graduate degrees. The undergraduate major in marine biology, sponsored by the Biological Sciences Departments, includes required and elective courses in ocean sciences, and there is an ocean sciences concentration in Earth Sciences for undergraduates. Students interested in ocean sciences should major in a discipline such as biology, marine biology, chemistry, Earth sciences, physics, or mathematics and take ocean sciences-related electives. Students with a bachelor's degree in one of these disciplines or equivalent course work may apply directly for admission to the graduate program through the Division of Graduate Studies.

Degree granted: B.S. from other departments

Program Website: <http://oceansci.ucsc.edu/>

Contact: meyo@ucsc.edu

M.S. in Ocean Sciences

The Ocean Sciences department offers an Ocean Sciences Master of Science degree. The degree combines core courses and electives to provide depth and breadth in ocean sciences with a focused thesis to provide experience in original research. In addition to the core Ocean Sciences faculty, the Affiliated Faculty includes faculty from related disciplines within Biology, Chemistry, Earth Sciences, Environmental Studies, and Physics who sponsor students in the program. While the Ocean Sciences Ph.D. program has a focused oceanographic orientation, the Ocean Sciences Master's program is broader, and has traditionally attracted many students in marine biology and ecology. All of the four pathways described in the Ph.D. program description, as well as customized programs of study that combine related disciplines, are supported. Graduates from the program are thoroughly prepared to take research or management positions in organizations concerned with the marine environment, become marine science educators, or enter first-rate doctoral programs in ocean sciences and related fields.

Degree granted: M.S.

Program Website: <http://oceansci.ucsc.edu/>

Contact: meyo@ucsc.edu

Ph.D. in Ocean Sciences

The doctoral program leading to the Ph.D. degree in ocean sciences is designed with a core training in oceanography, supplemented and focused by advanced training in oceanography and in the traditional disciplines (biology, chemistry, Earth sciences, and physics) as chosen by the students and their advisors. The core training is provided through core courses in ocean sciences, a subset of which is taken by all students in the first two years, and reinforced by the student's seminars throughout the program. In addition to core courses in ocean sciences, preparation includes upper-division/graduate courses in ocean sciences and in the specialty discipline, graduate seminars, independent research credits, participation in departmental student seminar series, and a minimum requirement for the number of quarters as a teaching assistant. There is no formal language requirement.

Degree granted: Ph.D.

Program Website: <http://oceansci.ucsc.edu/phd.html>

Contact: meyo@ucsc.edu

Environmental Studies

The environmental studies major prepares students for meaningful lifetime engagement with the major environmental challenges facing society. Students pursue an interdisciplinary curriculum that combines course work in ecology and the social sciences. The program emphasizes the integration of ecological knowledge with an understanding of social institutions and policies in ways that support the conservation of biodiversity, the practice of sustainable agriculture, and the careful management of other ecological and environmental systems.

Degree granted: B.A.

Program Website: <http://admissions.ucsc.edu/discover/majors/EnvironmentalStudies.cfm>

Contact: envs@ucsc.edu

Earth Sciences

The study of Earth and Planetary Sciences encompasses a broad range of fields. Research and courses in this department include the study of planetary interiors and surfaces, the atmosphere, oceans, and biosphere, stretching from the birth of the solar system to the present to predictions about the future. Undergraduate courses integrate these sub-disciplines and applications, with a focus on modern frontiers and career opportunities in the field. Combined majors are available in Earth sciences/anthropology and environmental studies/Earth sciences. An internship program provides opportunities for undergraduate (and graduate) students to gain practical work experience, which may prove beneficial in the industrial and governmental Earth sciences job market.

Degree granted: B.S. with optional concentrations in Environmental Geology, Ocean Sciences, and Planetary Sciences; B.A. as a double or combined major; Undergraduate Minor; M.S.; Ph.D. with optional concentrations in Geochemistry, Geology, Geophysics, and Planetary Science

Facilities: On-campus research facilities at UC Santa Cruz include laboratories in seismology (the W. M. Keck Seismological Laboratory), crustal imaging/remote sensing, paleomagnetism, high-pressure and -temperature mineral physics, surface processes, high-performance computing for climate modeling and planetary sciences, isotope geochemistry, electron microscopy, and a wide variety of chemical analysis facilities for rock and water samples (XRF, ICP, and XRD spectrometry). Earth and Planetary Sciences at UC Santa Cruz is also associated with the Institute of Marine Sciences, a group of physical, biological, and chemical oceanographers with a graduate program of their own. Students often have opportunities to engage in seagoing research aboard a coastal research vessel, and occasionally on the larger research vessels of the nearby U.S. Geological Survey, Monterey Bay Aquarium Research Institute, or other oceanographic institutions. The Institute of Geophysics and Planetary Physics (IGPP), a multi-campus research institute, is located at UC Santa Cruz. Research scientists associated with IGPP greatly intensify tectonic investigation, adding significantly to the intellectual and teaching resources available in Earth and Planetary Sciences at UC Santa Cruz.

Program Website: <http://admissions.ucsc.edu/discover/majors/EarthSciences.cfm>

Contact: Cathy Smith, csmith@es.ucsc.edu

Earth Sciences: concentration in Ocean Sciences

The ocean sciences concentration is intended to provide quantitative preparation for career pathways that include ocean biogeochemistry. Additional biology and chemistry courses are required for this concentration, along with other distributions of upper-division requirements and electives. Students also complete the comprehensive requirement by writing a senior thesis with Ocean Sciences faculty and/or Earth & Planetary Sciences faculty sponsorship. A topic emphasizing ocean sciences is recommended. They may also substitute one of the other two options listed above.

Degree granted: B.S.

Program Website: http://www.es.ucsc.edu/undergrad/#ocean_bs

Contact: Kenneth W. Bruland, bruland@ucsc.edu

Ecology & Evolution

The ecology and evolution major provides students with interdisciplinary skills necessary for understanding and solving complex problems in behavior, ecology, evolution, and physiology. While some of these disciplines focus on molecular or chemical mechanisms, they all address questions on larger spatial and temporal scales that can be applied to important environmental problems, including genetic and ecological aspects for conservation biology and biodiversity. A suite of field courses provide students unique opportunities to learn and conduct research in a host of ecological systems.

Degree granted: B.S., M.A., and Ph.D.

Program Website: <http://admissions.ucsc.edu/discover/majors/EcologyandEvolution.cfm>

Contact: Susan Thuringer, susan@biology.ucsc.edu

Environmental Toxicology

The Environmental Toxicology program at UC Santa Cruz seeks to understand environmental poisons and pathogens that harm humans and other living things. Working within the highly collaborative environment of UC Santa Cruz, we use a systems-based approach in research and graduate training, seeking to understand the broad principles of toxicity and pathogenicity. Our faculty members are leaders in their disciplines and welcome collaborators throughout campus and beyond. Virtually all faculty are engaged in interdepartmental efforts. Chief among our partners are bioinformaticists, chemists, microbiologists, and earth and ocean scientists. Our educational program prepares students to take an interdisciplinary approach to solve pressing issues in environmental and human health. Graduate students benefit in the classroom and laboratory from the expertise of the program's faculty and strength of the UC Santa Cruz faculty as a whole.

Degree granted: M.S. and Ph.D.

Facilities: We are small department with a huge appetite for technology, which has led our faculty members to spearhead the acquisition of funding for major instrumentation facilities. Among the tools available: Finnigan Neptune multi-collector magnetic sector inductively coupled plasma mass spectrometer, 2-D DIGI/MALDI mass spectrometer, high-resolution inductively coupled plasma mass spectrometer with laser ablation, thermo electron LTQ-mass spectrometer, electron paramagnetic instrumentation.

Faculty: http://www.etox.ucsc.edu/fac_res/default.html

Program Website: <http://www.etox.ucsc.edu>

Contact: Claudia McClure, admin@etox.ucsc.edu
Phone: 831-459-4719

Marine Biology

The marine biology major is designed to introduce students to marine ecosystems, including the great diversity of marine organisms and their coastal and oceanic environments. The emphasis is on basic principles that help us to understand the processes that shape life in marine environments. The marine biology major is a demanding program that offers a B.S. degree and requires several more courses than the general biology B.A. major.

Degree granted: B.S.

Program Website: <http://admissions.ucsc.edu/discover/majors/MarineBiology.cfm>

Contact: bioadvise@biology.ucsc.edu

University of California, Santa Cruz

1156 High Street

Santa Cruz, CA 95064

University of Connecticut

Groton, CT

Physical Oceanography

A common thread of the various research interests of faculty in the physical oceanography group is an emphasis on understanding fluid dynamics in the coastal environment, but the collective expertise of the group touches on a wide range of physical oceanographic phenomena. As a result, M.S. and Ph.D. students in the department gain a broad exposure to the essential sub-disciplines of physical oceanography in addition to their in-depth research training. As well as continued seagoing observational work facilitated by the R/V Connecticut, our research techniques include numerical circulation simulations, inverse modeling, analytical and theoretical studies, laboratory experiments, the development of *in situ* instruments, and satellite data analysis. Graduate study in physical oceanography at UConn combines quality teaching in the comfortable and personalized setting of the Avery Point campus together with opportunities for involvement in a variety of outstanding research projects. Our integration with the other strengths of the department in biological and chemical oceanography gives us a unique flavor among physical oceanography graduate programs.

Degree granted: M.S. and Ph.D.

Faculty: Frank Bohlen, Heidi Dierssen, James Edson, Ed Monahan, Jim O'Donnell, and Mike Whitney.

Program Website: <http://www.marinesciences.uconn.edu/academic/physical.html>

Contact: James B. Edson, james.edson@uconn.edu

Coastal Studies

The Coastal Studies curriculum provides a solid foundation to prepare you for a rewarding career or further graduate studies. Mandatory classes and optional courses and programs will allow you plenty of opportunities for hands-on field and lab work, as well as chances to actively explore your individual interests and career goals.

Degree granted: B.S.

Program Website: <http://www.marinesciences.uconn.edu/MSCSS/degree.html>

Contact: coastal@uconn.edu.

Marine Biology

A minor in Marine Biology is at least 15 credits of 200-level course work in marine biology and related courses.

Degree granted: Minor

Program Website: <http://www.marinesciences.uconn.edu/academic/biologyminor.html>

Contact: Ann Bucklin, ann.bucklin@uconn.edu
Phone: 860-405-9208

Oceanography

A minor in Oceanography is at least 15 credits of 200-level course work in marine sciences.

Degree granted: Minor

Facilities: The Marine Sciences and Technology Center (MSTC) seeks to facilitate research and to provide facilities, logistical and technical support in the field of marine sciences and marine-related research at the University of Connecticut. The Marine Sciences and Technology Center facilities include the Marine Sciences Vessel Operations, Rankin Seawater Facility, Machine Shop, and Electronics Shop. In addition to these facilities, MSTC has an extensive diving program and also provides Information Technology and analytical laboratory support to the Department of Marine Sciences.

Program Website: <http://www.marinesciences.uconn.edu/academic/oceanographyminor.html>

Contact: Ann Bucklin, ann.bucklin@uconn.edu

Environmental Science: Marine Science concentration

The objectives of this concentration are to provide students with the fundamentals of biological, chemical, geological and physical oceanographic processes. Through lectures, laboratories and at-sea studies the student will be led to an understanding and appreciation of the multidisciplinary character of marine science, an interdisciplinary approach to problem formulation and problem solving, and the importance of the ocean in the modulation and enhancement of the earth's environment. The curriculum is designed to educate students in the problem-solving tools

of data analysis, critical thinking and communication of ideas as related to oceanographic science.

Degree granted: B.S.

Program Website: <http://www.envirosience.uconn.edu/envs.concentrations.html>

Contact: Ben Gahagan, envirosience@uconn.edu

Biological Oceanography

Our group contains scientists with a broad range of interests, including benthic population and community ecology, marine invasive species ecology, trophic relationships in the plankton, nutrient dynamics of coastal embayments and estuaries, effects of harmful algal blooms in coastal waters, biogeochemistry of microbial mats, gelatinous zooplankton ecology, ecology and biomechanics of shellfish feeding, algal physiology, and the role of marine protected areas in fish ecology. Marine Sciences biology faculty use both field observations and laboratory experiments to obtain insights into coastal zone processes. Field programs range from coastal Brazil to New Zealand and from Long Island Sound to the Irish Sea. Laboratory techniques include applications of image analysis, high-performance liquid chromatography, microelectrodes, video endoscopy, molecular biology, and fluorescence microscopy, along with traditional oceanographic methods for measuring materials and fluxes in the coastal environment.

Degree granted: M.S. and Ph.D.

Faculty: The biological oceanography/marine ecology group includes Ann Bucklin, Hans Dam, James Kremer, Senjie Lin, George McManus, Pieter Visscher, Evan Ward, and Robert Whitlatch, as well as in-residence professors Peter Auster, Pat Kremer, Paul Renaud, and Sandra Shumway. Charles Yarish and Eric Schultz are jointly appointed with Ecology and Evolutionary Biology, and Joe Crivello is jointly appointed with Physiology and Neurobiology.

Program Website: <http://www.marinesciences.uconn.edu/academic/biology.html>

Contact: Evan Ward, evan.ward@uconn.edu

Marine Chemistry

A common denominator for the chemistry faculty is a cross-disciplinary approach—all professors in the group use biology, geology, and physics to understand chemical processes in the complex natural environment. The research interests in the group include environmental chemistry and cycling of mercury, organic geochemistry, evaluation of the rates of transport and reaction in aqueous systems, geomicrobiology of mineral formation, trace gas production in microbial mats, modeling of organic matter distributions, and the effect of bubble cavitation on marine organic matter. Chemical oceanography includes both field and laboratory work. The group works in a range

of environments, from the cold of the Arctic to the heat of hydrothermal environments and tropical areas. Analytical techniques used include high-performance liquid-chromatography (HPLC), gas chromatography (GC), spectrophotometry, fluorometry, micro-electrodes, GC-mass spectrometry (GC-MS), and inductively coupled plasma with infra-red detection (ICP-IR). The group also uses many more pieces of chemical instrumentation belonging to the Suspended Matter Analysis Laboratory for Education and Research, an NSF-funded facility housed in the department. Five new clean rooms, ranging from class 10,000 to class 100, are other recent additions to the infrastructure available to the chemistry group. The clean rooms make it possible to carry out sensitive trace analysis of metals and organic materials.

Degree granted: M.S. and Ph.D.

Faculty: William Fitzgerald, Rob Mason, Annelie Skoog, Thomas Torgersen, and Pieter Visscher. In addition, Penny Vlahos is a professor in residence with the department.

Program Website: <http://www.marinesciences.uconn.edu/academic/chemistry.html>

Contact: Annelie Skoog, annelie.skoog@uconn.edu
University of Connecticut
1080 Shennecossett Road
Groton, CT 06340

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University of Delaware
Lewes, DE

Coastal and Marine Geoscience; Geology

The Department of Geological Sciences offers undergraduate majors including a Bachelor of Science in Geology with a concentration in Coastal and Marine Geoscience. The department also offers Master of Science and Doctor of Philosophy degrees in geology. Major research emphases include coastal and marine geology and hydrogeology among many others.

Degree granted: B.S., M.S., and Ph.D.

Facilities: The department has ready access to an x-ray diffractometer, Chirp marine profiler, gas and liquid chromatographs, ground penetrating radar, multichannel seismic equipment, a variety of coring and drilling equipment, tripod mounted lidar, an electronic total station, an Autonomous Underwater Vehicle equipped with sidescan sonar and other sensors, and a variety of boats, including a 25-ft. vessel outfitted for geological research in the Delaware Bay. Through its cooperative programs with several nearby institutions, including the Delaware Geological Survey, the department has ready access to nearly all other commonly used tools of geological and geophysical research.

Program Website: www.geosci.udel.edu

Contact: Dr. Susan McGeary, smcgeary@udel.edu
101 Penny Hall
Newark, DE 19716

Marine Biosciences

The Marine Biosciences Program at the College of Marine and Earth Studies (CMES) covers a broad spectrum of interests and approaches, ranging from molecular biosciences to ecology and ecosystem studies. Students in the program are exposed to the entire spectrum through classwork and by participating in research projects that cross the boundaries separating traditional disciplines. Ongoing research projects illustrate the diversity of topics covered by the program. Marine microbiologists and ecologists in the program use molecular techniques to examine symbiotic relationships between marine invertebrates and bacteria and how marine bacteria degrade naturally occurring organic matter in the oceans. A growing number of these research efforts are being conducted in our Center for Marine Environmental Genomics and at the Delaware Biotechnology Institute. Currently, our scientists are applying molecular markers to determine the genetic population structure of horseshoe crabs, oysters, and finfish along the East Coast. Other studies focus on the distribution and physiological ecology of larval and juvenile forms of marine fish and invertebrates and the impacts of human society on inland coastal bays.

Degree granted: M.S. and Ph.D.

Facilities: In addition to the sophisticated classroom and laboratory facilities available at CMES, our students and faculty enjoy ready access to a great variety of marine ecosystems near the Hugh R. Sharp Campus in Lewes. These systems include dunes, salt marshes, mudflats, estuaries, and the Atlantic Ocean. Frequently, marine biosciences research calls for CMES students and faculty to travel even farther afield to other states and countries and on oceanographic cruises in other seas.

Program Website: www.ocean.udel.edu/academics/departments/biology

Contact: Dr. Patrick M. Gaffney, pgaffney@udel.edu
115 Smith Laboratory
700 Pilottown Rd.
Lewes, DE 19958

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**You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.**

Marine Policy

The Marine Policy Program examines the economic, legal, political, and social aspects of the world ocean, the seabed, and the coastal zone. Students and faculty in the program analyze public issues regarding the law of the sea, ports and shipping, marine minerals, ocean and coastal zone management, fisheries, naval affairs, marine biotechnology, and the global environment, frequently making recommendations for policy at the regional, national, and international level. The master of marine policy, a two-year professional degree created at the University of Delaware, prepares students for careers in research, management, and administration in marine-oriented government agencies, private associations, and business firms. For a few highly qualified students who already hold an advanced degree in marine policy or a related subject and who generally have some experience in policy research or management, the Ph.D. in marine (policy) studies is available.

Degree granted: M.S. and Ph.D.

Facilities: The Gerard J. Mangone Center for Marine Policy, established in 1973 and named after its founder in 2003, was the first research center in the United States to study the legal, political, and economic issues facing the ocean, seabed, and coastal zone, and remains a leading force in the marine policy community to this day. In addition to offering students significant opportunities to pursue research and practical experience, the center conducts a broad range of studies, hosts visiting scholars, organizes conferences and publications, and provides policy advice to local, regional, national and international agencies.

Program Website: www.ocean.udel.edu/academics/departments/policy

Contact: Dr. James J. Corbett, jcorbett@udel.edu
305 Robinson Hall
Newark, DE 19716



Training ocean educators

Physical Ocean Science and Engineering

The Physical Ocean Science and Engineering (POSE) Program covers a wide range of research and educational topics. Common to all the research areas in the program is the application of fluid dynamics and wave mechanics. Students are able to use physics and engineering for the advanced study of contemporary research topics in coastal physical oceanography, coastal engineering, ocean acoustics, ocean observing, near shore processes, environmental fluid dynamics, air-sea interactions and estuarine dynamics.

Degree granted: M.S. and Ph.D.

Facilities: The University of Delaware College of Marine and Earth Studies offers world-class facilities for teaching, research, and public service on both UD's main campus in Newark and at the Hugh R. Sharp Campus on the shores of Delaware Bay in Lewes. Our Center for Remote Sensing is the focal point for cutting-edge research using satellites to study such problems as the impact of land-use changes on wetlands and estuarine health, to the effects of oceanic circulation on climate. Through the use of these space age tools as well as more traditional shipboard and laboratory techniques, our scientists are making important discoveries about the vast waters that cover more than 70% of the Earth's surface.

We've got great computing facilities, the world's only tiltable wind-wave-current tank, the brand-new 146-foot coastal research vessel, the R/V Hugh R. Sharp, and much more. The Physical Ocean Science and Engineering Program is committed to supplying exciting research opportunities, excellent facilities and a stimulating educational environment for students.

Program Website: <http://www.ocean.udel.edu/academics/departments/engineering>

Contact: Dr. Mohsen Badiy, badiy@udel.edu
107 A Robinson Hall
Newark, DE 19716

Oceanography

Students in the Oceanography Program work on physical, geological, biological, and chemical problems in a variety of ocean environments. Historically, our program's strength has been estuarine, coastal, and continental shelf studies. While this focus will undoubtedly continue, issues relating to global environmental change are of increasing interest and importance, particularly research on physical and chemical interactions between the atmosphere and the ocean.

Degree granted: M.S. and Ph.D.

Facilities: In addition to the sophisticated classroom and laboratory facilities available at CMES, our students and faculty enjoy ready access to a great variety of marine

ecosystems near the Hugh R. Sharp Campus in Lewes. These systems include salt marshes, mudflats, the Delaware Estuary, and the Atlantic Ocean. Frequently, oceanographic research calls for CMES students and faculty to travel even farther afield to other states and countries and on oceanographic cruises in other seas.

Program Website: <http://www.ocean.udel.edu/academics/departments/oceanography>

Contact: Dr. William J. Ullman, ullman@udel.edu
228 Cannon Laboratory
700 Pilottown Rd.
Lewes, DE 19958

Wildlife Conservation

Biodiversity is the theme of our program, meaning that we focus on the diversity of entire ecosystems rather than on just one species. Students learn about all wildlife—insects, fish, amphibians, reptiles, mammals and birds, as well as plants and soils. Beginning with basics like biology, chemistry and ecology, students move through a curriculum designed to give them a strong background in science with a special focus on conservation. Lectures, laboratories and field work expose Wildlife Conservation majors to a variety of educational experiences. Courses like Wildlife Habitat Management and Wildlife Research Techniques take students out to local wild areas to test their knowledge and skills. Ornithology students can be seen banding together in search of an evasive songbird, while students in Human Dimensions in Wildlife Conservation teach school kids about the impact we have on environmental quality. Because conservation has consequences beyond science, students are exposed to coursework in philosophy, ethics, economics and public policy. Additionally, we ensure diversity in the undergraduate experience by requiring courses in English, math, computers, communication, the arts, humanities, and the social sciences. An Honors Degree is available to students wishing to expand the rigor of their curriculum.

Degree granted: B.S.

Program Website: <http://ag.udel.edu/enwc/undergrad/wildlifeconserve.htm>

Contact: fanewt@udel.edu
Department of Entomology & Wildlife Ecology
250 Townsend Hall
Newark, DE 19716
302/831-2526

Find useful information on Internships,
Scholarships, and Professional Societies
in the appendices at the back of this Guide.

Environmental Science

A program leading to the Bachelor of Science (B.S.) degree in Environmental Science was established at the University of Delaware in 1991. This relatively demanding B.S. program was designed around a combination of courses in Geology, Biology, and Geography. In 2005, a fourth area of specialization, Marine Studies, was added. Our students learn about the underlying materials of the earth; how energy and moisture are transferred among the atmosphere, land surface, and oceans; and how life responds to and modifies its environment. Introductory science and mathematics courses provide scientific background and research techniques that can be used in later employment or graduate education. Some of the advanced courses in these areas are taught on an every-other-year basis, so early and regular contact with an academic advisor is essential for the timely completion of the B.S. in Environmental Science.

Degree granted: B.S.

Program Website: <http://www.udel.edu/Environmentsci/>

Contact: fanewt@udel.edu
700 Pilottown Rd.
Lewes, DE 19958

University of Georgia Athens, GA

School of Marine Programs

Coastal and Oceanographic Engineering

A joint program by the Marine Sciences and Engineering Departments focuses on the application of engineering principles to the marine environment, including marine instrumentation and coastal and near-shore modeling.

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.marsci.uga.edu/programs/coastal.htm>

Contact: William Miller, bmiller@uga.edu

Water Resources

The Water Resources Certificate Program prepares students for related careers in environmental science and management. Protecting the long-term ecologic health of our rivers and streams is an important national goal. Yet our society has ever-increasing demands for inexpensive supplies of high-quality water. The purpose of the program is to train students to manage our scarce water resources for the maximum benefit of the world's population, while at the same time preserving the ecologic integrity of our aquatic resources.

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://bulletin.uga.edu/bulletin/ind/degrees.html>

Contact: Jenny Yearwood, yearwood@uga.edu

Interdisciplinary Studies: Physical Marine Science focus

Formal entrance into the Franklin College Interdisciplinary Studies program is contingent upon the student completing a minimum of 27 hours with an overall grade point average of 3.0 or above; students must maintain this GPA to remain in the program. Students in the Interdisciplinary Studies program will have a three-member advisory committee to approve their program and oversee their progress. For a marine sciences emphasis, the committee will consist of the Marine Science Undergraduate Coordinator and two other faculty members within the Franklin College. The Interdisciplinary Studies major requires that students complete the Regents' core curriculum to fulfill all the basic science, humanities, language, and social science requirements of the Franklin College of Arts and Sciences. Students undertaking a marine sciences emphasis within the Interdisciplinary Studies program will select one of three tracks of study within Marine Sciences during their Sophomore or Junior year, either Biological Marine Science, Chemical Marine Science, or Physical Marine Science. Each track will have its own course requirements designed to provide the necessary expertise in one of the basic sciences. All students will also be required to complete a series of core courses in Geological/Physical Oceanography, Biological/Chemical Oceanography, Statistics, and an independent research program that culminates in a senior thesis. A sample curriculum to aid the student in course selection is available, but will be modified to suit the interests of the individual student with final approval by the student's three-member committee and the Coordinator of the Interdisciplin-



University of Georgia Marine Extension workshop

ary Studies Program. The program of study must contain a Senior Thesis (INTS 4990), which consists of an original project on a topic encompassed by the major.

Program Website: http://www.marsci.uga.edu/programs/undergrad_program.htm#interdis

Contact: William Miller, bmiller@uga.edu

Interdisciplinary Studies: Biological Marine Science focus

See description above.

Degree granted: B.S.

Program Website: http://www.marsci.uga.edu/programs/undergrad_program.htm#interdis

Contact: Merryl Alber, malber@uga.edu

Interdisciplinary Studies: Chemical Marine Science focus

See description above.

Degree granted: B.S.

Program Website: http://www.marsci.uga.edu/programs/undergrad_program.htm#interdis

Contact: James T. Hollibaugh, aquadoc@uga.edu

Marine Sciences

The Department of Marine Sciences at the University of Georgia invites applicants for graduate study in Ph.D. and M.S. programs. We are an interdisciplinary department of biological, chemical, and physical oceanography, with special emphasis on coastal and estuarine processes. Research interests of the faculty include broad thematic areas from marine ecology, global and regional carbon and nutrient cycling, the ecology, physiology, and genomics of marine microorganisms, coastal physical oceanography, ocean acoustics, to remote sensing. Our research sites spans the globe, from the high-latitudes to the equator, and often include computational or modeling components. Details of specific research projects and publications can be found at <http://www.marsci.uga.edu/>. Potential students are strongly encouraged to contact individual professors and the graduate coordinator.

Faculty: <http://www.marsci.uga.edu/directory/faculty.htm>

Student Support: Qualified candidates may be nominated for the University Presidential Award or other Graduate School Assistantships. In the absence of a University-level Assistantship, accepted students are supported by either a Teaching or Research Assistantship. All graduate assistantships include a tuition waiver. The university and the department also provide students with travel funds for attending scientific conferences.

Program Website: <http://www.marsci.uga.edu/>

Contact: Jayne Lackey, jlackey@uga.edu

M.S. in Marine Sciences

The M.S. program has two tracks, a traditional research track designed to prepare the student for further graduate training at the doctoral level, and an applied marine studies track, designed as a terminal and/or in-service degree for students whose career goals are management and policy positions with government or industry. The M.S. requires a minimum of 30 hours of graduate-level credit, of which 9 must consist of core courses in Biological Oceanography (MARS8010), Chemical Oceanography (MARS8020), and Physical Oceanography (8030). Additional graduate courses from Marine Sciences and other departments are available to complete each student's program. Students on either track will conduct an independent research project and submit and defend a thesis.

Degree granted: M.S.

Program Website: http://www.marsci.uga.edu/programs/grad_program.htm

Contact: James T. Hollibaugh, aquadoc@uga.edu

Ph.D. in Marine Sciences

Students develop a program of study in biological, chemical, or physical oceanography. Typical areas of research emphasis include marine biogeochemistry, coastal ecology, coastal ocean processes, microbial ecology, marine ecosystem modeling, and polar microbiology. The Ph.D. requires a minimum of 30 hours of graduate-level credit, of which 9 must consist of core courses in Biological Oceanography (MARS8010), Chemical Oceanography (MARS8020), and Physical Oceanography (8030). Additional graduate courses from Marine Sciences and other departments are available to complete each student's program. Students will also acquire field experience by participation in at least one major oceanographic cruise and one extended shore-based study. Students are also required to obtain teaching experience.

Degree granted: Ph.D.

Program Website: http://www.marsci.uga.edu/programs/grad_program.htm

Contact: James T. Hollibaugh, aquadoc@uga.edu
University of Georgia
School of Marine Programs
Athens, GA 30602-3636

University of Hawaii at Hilo Hilo, HI

Forestry and Natural Resource Management: Aquaculture specialization

The University of Hawaii at Hilo has unique potential for aquaculture education. As expected in a semi-tropical climate, warm seawater and freshwater are available. Additionally, cool fresh and salt water (20 degrees C) and cold (6 degrees C) seawater can be obtained from wells. This diversity of water supplies allows the culture of almost all aquaculture species including tropical fish, trout, salmon, carp, shrimp, various seaweeds, and shellfish throughout the year. Aquaculture students have access to the Pacific Aquaculture and Coastal Resources Center facilities including a freshwater aquaculture facility at the UH Hilo Agricultural Farm Laboratory and a coastal facility only four miles from campus. Students with an interest in aquaculture can obtain a B.S. in Agriculture with a specialization in Aquaculture or may take aquaculture courses as part of their Marine Science degree.

Degree granted: B.S.

Facilities: Coastal Facility: mollusk hatchery, fish hatchery, 4.5 m to 25 m in diameter outdoor tanks, seawater wells, brackish water well (9 ppt), water quality laboratory; Inland Facility: quarantine facilities for aquatic organisms, fish hatchery, controlled environment rooms (light & temperature), greenhouse with tanks, deep well for pure freshwater, water collection pond integrated with irrigation

2007 tuition: In-state residents: \$3,528; Out-of-State: \$11,064

Program Website: <http://www.uhh.hawaii.edu/academics/cafnrm/specializations/aqua.php>

Contact: Kevin Hopkins, hopkins@hawaii.edu
University of Hawaii at Hilo
200 West Kawili St
Hilo, HI 96720

Marine Science

The Marine Science Program offers two well-rounded and multi-disciplinary degrees which have been carefully designed to take full advantage of the unique variety of marine environments available for study around the island of Hawaii. In both the B.A. and B.S. degrees, introductory lecture and laboratory courses in oceanography and marine biology are followed by intermediate-level courses in marine ecology and evolution, statistics, and analytical methods and analysis. The most advanced level of the program is composed of specialized elective and required courses in marine biology and oceanography.

The program culminates in one of three capstone course sequences: (a) Senior Thesis, a research sequence involving proposal writing, library research, field data collection, laboratory work, computer analysis of data, report writing, and oral presentation; (b) Senior Internship, a sequence providing students the opportunity to apply their knowledge and skills in an agency or organization involved in marine science education or research; or (c) Senior Seminar, a sequence involving discussion, critique, and presentation of marine science-oriented seminars.

Degree granted: B.S., B.A. and Minor

Facilities: The Marine Science Department at UH Hilo is located in a small town setting, about 15 minutes from coastal field sites, including reefs and tide pools. The University operates a 53-foot catamaran used for Marine Science laboratories, as well as a number of small boats. SCUBA equipment and training are available. In-house facilities include analytical, biological, GIS and molecular laboratories, and a scanning electron microscope.

Faculty: Jason Adolf (Ph.D.), phytoplankton biology; Jim Beets (Ph.D.), biology of fishes and reef ecology; Michael Childers, Instructor and Captain of the R/V Four Winds; Marta deMaintenon (Ph.D.), marine invertebrate zoology; Walter Dudley (Ph.D.), geological oceanography; Brent Gallagher (Ph.D.), physical oceanography; Karla McDermid (Ph.D.), marine algae; Lisa Muehlstein (Ph.D.), marine microbial ecology; Lisa Parr (M.Env. Studies), Instructor; Misaki Takabayashi (Ph.D.), molecular biology of corals and symbionts; Jason Turner (Ph.D.), marine food web ecology; Jennifer Turner, lecturer; Tracy Wiegner (Ph.D.), chemical oceanography.

2007 tuition: In-state residents: \$1,764; Out-of-State: \$5,532

Program Website: <http://www.mare.uhh.hawaii.edu/>

Contact: Dr. Marta deMaintenon, demainte@hawaii.edu
University of Hawaii at Hilo
200 W. Kawili Street
Hilo, HI 96720
Phone: 808-933-3902



Pisces V submersible operated by the Hawaii Undersea Research Lab

University of Hawaii at Manoa Honolulu, HI

Marine Biology

The new B.S. in Marine Biology from the University of Hawaii at Manoa College of Natural Sciences is an interdisciplinary academic program that offers unique opportunities for hands-on learning. Extensive field experiences are integrated with traditional classroom and laboratory courses. Students will work with world-renowned faculty and have access to state-of-the-art facilities.

Degree granted: B.S.

Program Website: http://www.hawaii.edu/marine_biology/default.htm

Contact: marine_biology@hawaii.edu
University of Hawaii at Manoa, 2540 Dole St.,
Holmes Hall 402, Honolulu, HI 96822

Marine and Environmental Geology

Master and Doctoral programs in Geology and Geophysics are focused primarily on learning advanced methodologies and critical thinking by conducting focused research, supplemented by specialized elective course work in numerous topical areas. Degree programs are centered around one of 3 broad disciplinary cores that foster research reflecting the inter-disciplinary nature of the GG department and SOEST in general (geophysics and tectonics, marine and environmental geology, and volcanology/geochemistry/petrology). In addition, GG degrees focusing on planetary geology and mineral physics may be perused in conjunction with advisors in HIGP. Students have access to a wide array of field sites, and world-class laboratory and ship-based research facilities.

Degree granted: M.S. and Ph.D.

Program Website: http://www.soest.hawaii.edu/asp/GG/academics/degree_programs/graduate.asp

Contact: Leona Anthony, leonaa@hawaii.edu
University of Hawaii at Manoa, 2540 Dole St.,
Holmes Hall 402, Honolulu, HI 96822

Ocean and Resources Engineering

Our graduate program was established by Dr. Charles Bretschneider in 1966 and is one of the first of its kind in the United States. The Department offers an academic program leading to the Master of Science and Doctor of Philosophy degrees in three disciplines: coastal engineering, offshore engineering, and ocean resources engineering. The faculty members are known nationally and internationally for their research and educational work. Our students come from diverse cultural and academic backgrounds with the common objective to channel

their prior education and work experience to ocean-related engineering careers. On our website, you will find useful information related to our academic and research programs. Prospective students may obtain additional information and apply on-line at the Graduate Division website: <http://www.hawaii.edu/graduatestudies/>.

Degree granted: M.S. and Ph.D.

Facilities: *Environmental Fluid Dynamics Laboratory* focuses on the study of coastal marine processes including turbulent dispersal of pollutants and nutrients, wave dynamics, and sediment transport. In addition, the laboratory is home to the Environmental Fluid Dynamics Education Laboratory, which serves as a center for teaching of fluids phenomena in support of courses within ORE and SOEST and is available to the general University community. Laboratory instrumentation includes an acoustic doppler velocimeter (ADV) which obtains high-frequency, single-point, 3-component velocity measurements. A laser-based Particle Imaging Velocimetry (PIV) system obtains two-dimensional fluid velocity via laser imaging techniques. An Argon-Ion laser with digital still and video cameras is used for flow visualization and measurement. The EFDL currently houses four experiment tanks, which are used for both research and teaching demonstrations. These include a 10-meter long, 30 x 10 cm wave channel and a rotating table. The tanks allow demonstration of a range of fluid flow phenomena including wave breaking, down-slope currents, internal waves in stratified fluids along with rotational effects such as spin-up, Ekman flow and geostrophy. The *Kilo Nalo Oahu Reef Observatory*, on the south shore of Oahu, provides a window into the nearshore coral reef physical, biological and chemical environment. The setting for Kilo Nalu is the region offshore of Kakaako Waterfront Park, east of downtown Honolulu and west of Waikiki and Ala Moana. The observatory is managed and maintained by the University of Hawaii at Manoa's Department of Ocean and Resources Engineering (ORE), School of Ocean and Earth Science and Technology (SOEST). Kilo Nalu provides data and power connections to a suite of observational instruments that resolve waves, tides, currents and nearshore water quality. **Field Work and In-Ocean Experiment** The department maintains research facilities at Kewalo Basin and Snug Harbor for field work and in-ocean experiments. These facilities include field research equipment and instrumentation, access to a 17-ft motorboat and an 18-m coastal research vessel, as well as machine shop support. A 7-acre in-ocean test range off Kewalo Basin extends from 5 to 20 meters depth with test platforms equipped with land-based power supply outlets and data connections. Field equipment includes SCUBA diving gear, acoustic current profilers, current meters, wave gauges, anemometers, buoys and mooring equipment. The field research facilities

support study of ocean and coastal structures and materials, wave dynamics and sediment transport. The *Hawaii Undersea Research Laboratory* (HURL) is one of six national laboratories that make up the National Oceanic and Atmospheric Administration's National Undersea Research Program. HURL operates two deep diving (2000m) submersibles, the PISCES IV and PISCES V, and a remotely operated vehicle. The ROV and submersibles operate off the 225-foot research vessel, Kaimikai-O-Kanaloa, obtained for the university and largely supported by HURL. The submersibles, ROV and their mothership conduct a wide range of engineering and science research activities. Time on the submersibles and ROV is available to the faculty and students through submission of proposals. In addition, many students in the Ocean and Resources Engineering program find thesis projects, financial support and advisors studying various aspects of the dynamics of submersible and ROV operations as well as new instrumentation, control and equipment applications. HURL and the Department of Ocean and Resources Engineering have a very close working relationship at all levels. **Computing Facility:** The Department of Ocean and Resources Engineering and the faculty operate four AIX and five Linux systems and a network of Pentium-based PCs. All students are given computer accounts on at least one of the Unix systems and the PC network. All PCs are installed with Win NT and MS Office. The Department has a joint research project with the Maui High Performance Computing Center (MHPCC), which provides computer accounts to research assistants working on the project. The department maintains a number of software packages that are available to the students for coursework and research. These include AutoDesk Mech. AutoCAD, Automated Coastal Engineering System (ACES), Coastal Engineering Manual (CEM), COSMOS/M (finite element), Matlab, MathCAD, Mathematica (symbolic algebra), Microstation SE, Photoshop Tecplot (graphics), Visual Fortran. Students taking ORE 630 are also given access to the finite element package ANSYS, which is maintained by the Department of Mechanical Engineering.

Program Website: <http://oe.soest.hawaii.edu/ORE>

Contact: John C. Wiltshire, johnw@soest.hawaii.edu
admin@ore.hawaii.edu

University of Hawaii at Manoa, 2540 Dole St.,
 Holmes Hall 402, Honolulu, HI 96822

Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
 for up-to-date education and scholarship information,
 as well as a downloadable version of this Guide.

Global Environmental Science

The ultimate objective of the program is to produce a student informed in the environmental sciences at a rigorous level who is able to go on to graduate or professional school; enter the work force in environmental science positions in industry, business, or government; enter or return to teaching with knowledge of how the Earth system works; or enter the work force in another field as an educated person with the knowledge required to enable us to become wise environmental stewards of the planet.

Degree granted: B.S.

Facilities: There is a wealth of tools and facilities available at the school, including the 222-foot oceanographic vessel R/V Ka'imikai-o-Kanaloa and its deep-sea manned submersible, Pisces V, and the R/V Kilo Moana, the newest U.S. oceanographic research vessel. The Kilo Moana's small waterplane area, twin hull (SWATH) form is designed to provide a comfortable, stable platform allowing general purpose oceanographic research in coastal and deep-ocean areas, even in high-sea conditions. The school is home to the Departments of Oceanography, Geology and Geophysics, Meteorology, and Ocean and Resources Engineering, as well as the Hawaii Institutes of Geophysics and Planetology, Marine Biology (located on Coconut Island in the center of a spectacular coral reef ecosystem), and Natural Energy. The Hawaii Undersea Research Laboratory, the Joint Institute for Marine and Atmospheric Research, the International Pacific Research Center, and the Sea Grant and Space Grant College Programs are also part of the school. Other innovative educational programs within the school include the NSF Research Experience for Undergraduates and the Edwin W. Pauley Summer Program in Marine Biology. The Bachelor Of Science Degree Program in Global Environmental Science is administered by the Department of Oceanography.

2007 tuition: In-state residents: \$2,695.20; Out-of-State: \$7,327.20

Program Website: <http://www.soest.hawaii.edu/oceanography/GES/index.html>

Contact: Dr. Jane Schoonmaker, ges@soest.hawaii.edu
University of Hawaii at Manoa
1000 Pope Road
Marine Science Building, #205
Honolulu, HI 96822
Phone: 808-956-9937

Oceanography: specialization in Marine Biology

Students who apply to the graduate programs in botany, microbiology, oceanography, or zoology at the University of Hawaii may choose to specialize in marine biology. The

marine biology specialization allows students to interact with an interdisciplinary group of faculty in the above programs rather than with the faculty from only one or two of these areas. The purpose of the specialization is therefore to give the student greater flexibility in choosing the faculty who will serve as mentors on his/her M.S. or Ph.D. committee. Areas of expertise of the marine biology graduate faculty include aquaculture, behavior, biosystematics, botany, cognition, ecology, genetics, microbiology, molecular biology, biological oceanography, fisheries, coral reef biology and zoology. Students who wish to specialize in marine biology must apply to and be accepted by either the botany, microbiology, oceanography, or zoology fields of study. Applications from students who have been accepted by one of these programs and who have indicated a desire to specialize in marine biology are reviewed by the Marine Biology Admissions Committee, which decides which students will be accepted into the area of specialization. Coursework required for completion of the student's graduate degree is determined by the requirements of the student's graduate field of study. This required coursework may be supplemented by courses specific to marine biology, the particular selection of courses being determined by the student in consultation with his/her advisory committee. All of the programs include seminars, colloquia, field research and/or laboratory studies as part of the student's graduate education. Students are expected to complete an original research project and present a thesis or dissertation based on that research.

Degree granted: M.S. and Ph.D.

Facilities: Graduate student research is carried out in the research laboratories of the graduate faculty. These laboratories are located in Edmondson Hall, Snyder Hall, the St. John Laboratory of Botanical Sciences, the marine Science Building, the Hall Institute of Marine Biology (located on Coconut Island in Kaneohe Bay), and the Kewalo Laboratory of the Pacific Biomedical Research Center. These laboratories are well equipped for the specialized research of the faculty and include capabilities for state-of-the-art DNA sequencing using PCR technology; video and acoustic recording for ecological and behavioral studies of coral reef and planktonic organisms; electron, ultraviolet, and light microscopy; electrophoretic analysis; flow cytometry; and radioisotope tracer work. There is a university-wide centralized computer database, biotechnology center, and excellent library facilities.

Program Website: <http://www.soest.hawaii.edu/oceanography/marbiol.html>

Contact: ocean@soest.hawaii.edu
University of Hawaii at Manoa, 2540 Dole St.,
Holmes Hall 402, Honolulu, HI 96822

Oceanography

The Oceanography Department offers M.S. and Ph.D. programs in four sub-disciplines—physical, chemical, geological, and biological oceanography. The programs are designed to prepare students for challenging careers in academia, industry, and government. Consequently, they are academically demanding, with high standards and expectations. All degrees require independent research as well as basic and specialized courses. Entering students are assigned three-person Advisory Committees to assist them in planning their degree programs and to help monitor progress toward their degree. Ultimately, the roles of these committees are taken over by formal thesis or dissertation committees selected by the students to complement their unique research and career objectives. The breadth and interdisciplinary nature of the Oceanography field of study is emphasized in its core course and distribution requirements. All advanced degree students must take three core courses and at least one advanced course outside of their subdiscipline, in addition to the specific requirements of their major discipline. Students can advance to M.S. candidacy upon successful completion of the core courses, and most complete the requirements for the M.S. degree en route to the Ph.D. However, with Advisory Committee approval, a student may petition to be examined for direct advancement to Ph.D. candidacy. Ph.D. candidates must also pass a Comprehensive Examination within 18 months of admission to the Ph.D. program. Both M.S. and Ph.D. degrees require a minimum of 36 semester credit hours, including 24 credits of course work and 12 credits of thesis or dissertation research, demonstrated competence in computer programming, and 30 days of field experience. Reading knowledge of a foreign language is required only for the Ph.D. All requirements for the M.S. and Ph.D. degrees should usually be completed within three and six years of admission, respectively.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.soest.hawaii.edu/oceanography/graddegrees.html>

Contact: ocean@soest.hawaii.edu.

University of Hawaii at Manoa, 2540 Dole St.,
Holmes Hall 402, Honolulu, HI 96822

Center for Microbial Oceanography: Research and Education

The Center for Microbial Oceanography: Research and Education (C-MORE) is a recently established (August 2006) NSF-sponsored Science and Technology Center designed to facilitate a more comprehensive understanding of the diverse assemblages of microorganisms in the sea, ranging from the genetic basis of marine microbial

biogeochemistry including the metabolic regulation and environmental controls of gene expression, to the processes that underpin the fluxes of carbon, related bioelements and energy in the marine environment. Stated holistically, C-MORE's primary mission is: Linking Genomes to Biomes.

Degree granted: Courses for working professionals

Facilities: The Center's partner institutions include: Massachusetts Institute of Technology, Woods Hole Oceanographic Institute, Monterey Bay Aquarium Research Institute, University of California at Santa Cruz, and Oregon State University.

Faculty: Faculty involved in C-MORE are drawn from six participating institutions and offer expertise in all aspects of microbial oceanography.

Program Website: cmore.soest.hawaii.edu

Contact: Paul Kemp, paul.kemp@hawaii.edu

University of Hawaii at Manoa

Center for Microbial Oceanography: Research and Education (C-MORE)

1000 Pope Road, MSB 629

Honolulu, HI 96822

University of Maine

Orono, ME

School of Marine Sciences

Aquaculture

Come to the University of Maine to "immerse" yourself in aquaculture, the science and business of producing aquatic organisms useful to humans. Students majoring in aquaculture learn to apply biological, physical and business management principles to solve problems encountered with the production, processing, marketing, and management of aquatic plants and animals. Students from CT, MA, and VT who major in Aquaculture at the University of Maine may be eligible for reduced tuition through the New England Regional Student Program.

Degree granted: B.S.

Facilities: On campus in Orono, Maine we have the Aquaculture Research Center (ARC) with recirculating, artificial seawater. Research projects at this facility have included lobsters, tropical fish, shellfish and Cod (to name a few). In Franklin, Maine the University owns the Center for Cooperative Aquaculture Research (CCAR). This facility currently focuses on Halibut, Atlantic Salmon, Sea Urchins, marine worms and algae. The Darling Marine Center (<http://www.dmc.maine.edu/>) is the marine laboratory of the University of Maine and the site of world-renowned marine research. Located in the small

town of Walpole, 60 miles northeast of Portland and 100 miles south of the University's Orono campus, the DMC functions year-round to support University of Maine faculty and students, as well as visiting investigators from across the country and around the world. DMC faculty belong to the University of Maine's School of Marine Sciences where over 50 faculty represent the largest group of marine scientists in Maine. Current research directions at the DMC include: invertebrate biology, invertebrate taxonomy, marine ecology, deep-sea biology, optical oceanography, phytoplankton physiology, remote sensing, microbial ecology, biogeochemistry, marine archaeology, and shellfish aquaculture. The Darling Marine Center has a fleet of small boats for sampling and SCUBA-related research. Our coastal research vessel is the 42-ft *Ira C.* The *Ira C.* is equipped with an eleven-foot articulating A-frame, extensive sampling gear, and can carry up to 24 students. The DMC has a cascade system for filling SCUBA tanks and a full-time dive safety officer. AAUS standards are followed at the DMC. The Darling Marine Center is also where we offer our in-residence Semester-by-the-Sea program (<http://www.dmc.maine.edu/sbs.html>).

Program Website: <http://www.umaine.edu/marine>

Contact: Dr. William Ellis, william.ellis@umit.maine.edu

Marine Science-Marine Biology concentration ***Marine Science- Physical Marine Sciences concentration***

The B.S. in Marine Science offers excellent preparation for a broad range of careers and a solid foundation for entry into graduate programs. Students receive an interdisciplinary education in marine sciences and specialize in either Marine Biology or Physical Marine Sciences (oceanography). B.S. students in their junior or senior year are encouraged to participate in the Semester-by-the-Sea program at the Darling Marine Center. Students also conduct independent research projects under the supervision of University faculty as a "capstone" experience. Students from CT and VT who major in marine sciences at the University of Maine may qualify for reduced tuition through the New England Regional Student Program.

Degree granted: B.S.

Facilities: See facilities description above.

Program Website: <http://www.umaine.edu/marine>

Contact: Dr. William Ellis, william.ellis@umit.maine.edu

Oceanography

Students in both degree programs complete four core courses in physical, chemical, biological and geological aspects of the marine system, and supplementary courses based on the students' needs and interests. Most of the course work is taken in Orono, especially during the student's first year, while the thesis research may be carried

out either at Orono or the University of Maine's marine laboratory, the Ira C. Darling Marine Center. Graduate Course Offerings Research is a vital part of graduate education and its scope is limited only by the imagination of students and faculty. Oceanography students are in the midst of some of the most exciting ocean research being conducted today. To match your research interests with a faculty member, we invite you to explore our research clusters and the web pages of individual faculty.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.umaine.edu/marine>

Contact: Dr. William Ellis, william.ellis@umit.maine.edu

Marine Biology

It is the intention of this degree program to provide the student with a broad knowledge base in marine biology, including but not restricted to emphases in taxonomy/systematics, comparative morphology, evolution, genetics, physiology, cell and molecular biology, and ecology. Due to the wide variety of curricular possibilities that can be pursued by the student, there are three course requirements: one semester of biological oceanography, to set the environmental background, one semester of statistics at the graduate level, and one semester of seminar (currently SMS 691).

Degree granted: M.S. and Ph.D.

Program Website: <http://www.umaine.edu/marine>

Contact: Dr. William Ellis, william.ellis@umit.maine.edu

Marine Policy

The Master of Science degree in Marine Policy in the School of Marine Sciences is designed to take advantage of the strong interdisciplinary nature of the School. All students in the program will receive training in the social science aspects of marine resource management, in oceanography, in marine biology and other marine sciences, in marine law, and in empirical methods. In addition, students will be expected to gain expertise in either living natural resources or coastal zone management. Each student will have an advisory committee of three faculty members. (Students in the marine policy program may



Photo courtesy of COSEE:Central Gulf of Mexico

also be enrolled in the dual degree program, see below. These students will have an advisory committee of four faculty, two in the natural sciences and two in the social sciences.) The program offers both a thesis and a non-thesis option. Students selecting the thesis option will write a master's thesis that combines theoretical work and practical experience applied to pressing problems. A student's advisory committee must approve a thesis plan in the second semester of the student's enrollment in the program. Students selecting the non-thesis option will undertake an internship with a government agency, a non-governmental organization in the marine area, or a private firm directly concerned with management of marine natural resources. An internship involves working for the equivalent of three months full-time with the organization. Students in internships write a final paper linking their internship experience with the theoretical and practical literature on institutional management of marine resources. A student's advisory committee must approve internship plans prior to beginning the internship.

Degree granted: M.S.

Program Website: <http://www.umaine.edu/marine>

Contact: Dr. William Ellis, william.ellis@umit.maine.edu

Marine Policy and Marine Science

The School of Marine Sciences offers a unique, strongly interdisciplinary dual-degree program in marine policy and science. The program was initiated in part with a generous grant from the Kendall Foundation. The dual-degree program is intended for students interested in the application of science and policy in government agencies, non-governmental organizations, or industry. The program is intended to provide terminal degrees but does not rule out continuation to a Ph.D. The course of study is normally three years. It leads to two master's degrees: one in marine science (specializing in oceanography or marine biology or aquaculture) and one in marine policy. The marine science and policy program is based on the idea that good conservation requires: 1. A sophisticated understanding of the role and limits of science in the policy process; 2. An equally sophisticated understanding of the institutional processes necessary to resolve collective action dilemmas; and 3. The wide dissemination of this knowledge among resource users and others concerned with the management of marine resources.

Degree granted: M.S.

Program Website: <http://www.umaine.edu/marine>

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University of Maine
360 Aubert Hall
Orono, ME 04469-5706
Phone: 207-581-4360

■■■■■ **University of Maryland** College Park and Cambridge, MD

Marine Estuarine Environmental Sciences Graduate Program

Oceanography

In the past decade, the University System of Maryland has emerged as a nationally and internationally recognized center for oceanographic research. The Horn Point Laboratory and the Chesapeake Biological Laboratory of the University of Maryland Center for Environmental Studies, and the Meteorology Department at the University of Maryland, College Park (UMCP) are most active in this field, with the research of at least 25 faculty focusing on oceanography. Expertise in oceanography in the University System of Maryland lies in the sub-fields of Biological and Physical Oceanography and cross-disciplinary studies of marine biogeochemistry. The expertise in biological oceanography includes water column nutrient cycling and trophic dynamics (comprising the entire pelagic food web and fishes), benthic ecology, and theoretical ecosystem analysis. The expertise in physical oceanography at HPL is in estuarine and coastal circulations, mixing, transport, and numerical modeling. The expertise in physical oceanography at the Department of Meteorology at UMCP is in large-scale flows and global circulation problems.

Degree granted: M.S. and Ph.D.

Program Website: http://www.mees.umd.edu/aos_ocean.html

Contact: mees@umd.edu

Fisheries Science

Fisheries Science is multidisciplinary, drawing expertise from the biological, physical, and social sciences. Fisheries scientists study populations and communities of aquatic resources, their responses to exploitation, and changes in environmental conditions, and their management. Research is quantitative and may be either basic or applied. A diversity of faculty talent exists within the University System of Maryland to provide graduate students with a strong education in ecology, biology, and management of fish and invertebrate resources. The multidisciplinary nature of fisheries science requires broad training in areas that may include ecology, oceanography, aquaculture, economics, mathematics, seafood technology, pathology and diseases, and management science. Students will select a curriculum, with assistance from their Research Advisory committees, to best achieve their academic and professional goals. The faculty recognizes that flexible, yet rigorous, curriculum choices are important for students in fisheries science.

Degree granted: M.S. and Ph.D.

Program Website: http://www.mees.umd.edu/aos_fish.html

Contact: mees@umd.edu

Environmental Chemistry

The objective of the Environmental Chemistry Area of Specialization (AOS) is to train scientists to apply basic chemical principles to the study of the environmental behaviors of natural and anthropogenic chemicals. Environmental chemistry includes interdisciplinary studies which integrate across subjects such as geochemistry, analytical chemistry, transport processes, and toxicology to determine the cycling and impact of chemicals in the natural environment. Excellent research facilities equipped with state-of-the-art analytical instrumentation are available at several of our campuses, including dedicated environmental chemistry laboratories at the Chesapeake Biological Laboratory (CBL) in Solomons, Maryland. As both the Master's and Ph.D. are research-oriented programs, emphasis is placed on learning and applying the scientific method, employing strong quantitative approaches, and developing effective scientific writing skills. Students graduating from MEES through this AOS will find professional positions in federal, state, and local government agencies (such as EPA, FDA, NIH), private chemical and manufacturing industries, academic institutions, and consulting firms.

Degree granted: M.S. and Ph.D.

Program Website: http://www.mees.umd.edu/aos_envchem.html

Contact: mees@umd.edu

Biological Oceanography

Biological oceanography is concerned with the role of estuarine and marine organisms in biogeochemical processes and food web dynamics. At Horn Point Laboratory, we have a large, integrated group specializing in the study of bacteria, phytoplankton, protistan microzooplankton, zooplankton, seagrasses, marsh plants, and bivalves. Horn Point scientists are leaders in their respective fields, but as a group, our strength lies in collaborative studies organized around central research themes such as food web ecology & modeling, harmful algal blooms, seagrass bed and marshland ecology, and the impacts of eutrophication. Our research extends from analysis of intracellular molecular processes to watershed-scale ecosystem studies using an array of techniques including molecular and phylogenetic analysis of biomarkers, cultivation and examination of organisms, experimental mesocosms and eco-flumes, field and ship-based observation and experimentation, automated sampling and observing systems, GIS, and modeling. We work in environments located all around the world; however,

much of our effort is focused on the Chesapeake Bay, its watershed, and the mid-Atlantic coastal ocean.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.hpl.umces.edu/bioocean/index.htm>

Contact: mees@umd.edu

Aquaculture Restoration Ecology Program

Ecological restoration of marine and estuarine systems is a complex process involving an understanding of the many biological, chemical and physical interactions within an ecosystem, establishing achievable goals and developing well-integrated, practical approaches and measures that integrate principles of conservation ecology to achieve goals. Horn Point Laboratory has a multi-disciplinary team of scientists that specialize in aquaculture of fish and shellfish, marsh and seagrass ecology, marine macrophyte tissue culture, and water quality of coastal systems and are actively involved in the science to support holistic and proactive restoration of oysters, submerged aquatic vegetation (SAV), fish, and wetlands. Research emphasis of the aquaculture restoration ecology group extends from shoreline erosion and remediation impact on SAV, ecosystem responses to nutrient management, estuarine macrophyte production, effect of turbidity and light on SAV, oyster culture and restoration technology and evaluation, fish culture technology, sturgeon enhancement, and aquatic plant nutrient management applications. Projects address both basic and applied issues primarily within the Chesapeake Bay, its tributaries and mid-Atlantic area coastal bays and actively involve partners and stakeholders and include diverse educational programs.

Degree granted: Ph.D.

Program Website: <http://www.hpl.umces.edu/resecol/index.htm>

Contact: mees@umd.edu



Training ocean educators.

Physical Oceanography

The Physical Oceanography group at Horn Point Laboratory spans a diverse range of interests and research. Generally physical oceanographers are concerned with the motion of the ocean. This includes waves, currents, movement and erosion of sediments, pollutants and biology, interactions of the ocean with the atmosphere and the land surface, and the interactions of the ocean with climate variability. The scales of these processes are diverse, ranging from dynamics in rivers and harbors, to the Chesapeake Bay, to the coastal and global oceans. However, much of our effort is focused on issues of interest to Chesapeake Bay, ranging from basic science to applied restoration programs.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.hpl.umces.edu/po/index.htm>

Contact: mees@umd.ed

Nutrient and Biogeochemical Cycles

The Chemical Oceanography group at Horn Point Laboratory has expertise in both water column and sedimentary chemistry. Although much of the work is concentrated in Chesapeake Bay, our research spans the globe. Similarly our research interests include a wide variety of topics ranging from basic to applied research including instrument development. Much of our focus is on nutrients that in excess lead to eutrophication and oxygen deficiency, and that may promote harmful algal blooms. A particular interest is the processes that control fixed-nitrogen concentration over regional to global space scales, and hourly to geologic time-scales. We have a particular expertise in nitrogen transformations under suboxic and anoxic conditions and how these processes alter fixed-nitrogen concentrations, and the ocean's ability to absorb carbon dioxide. Our applied research includes the development of autonomous sampling systems, mass spectrometric techniques for studying nitrogen transformations, and the effects of dredging on nutrient balances. Because of the interdisciplinary nature of our research, we participate in collaborative research with several UMCEs/HPL colleagues and a large number of U.S. and international colleagues. Collaborative projects with Horn Point Laboratory colleagues include investigations of harmful algal blooms and studies of how the drastic decrease in oysters may have exacerbated anthropogenic nutrient additions. Students in our laboratories have investigated water column nutrient uptake and recycling, wetland cycling of nutrients and sulfur, suboxic diagenesis in estuarine sediments, denitrification in estuarine sediments, the influence of benthic microalgae on nutrient cycles, and the deposition of nutrients and contaminants in Chesapeake waterways. We welcome students with interests in problems that are 1) either basic or applied in

nature, 2) located in shallow water, deep water, sediments or wetlands and, 3) that have a geological, biological or physical interface with biogeochemistry.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.hpl.umces.edu/geo/index.htm>

Contact: mees@umd.ed

University of Massachusetts Amherst Amherst, MA

Five College Coastal & Marine Sciences

Degree granted: General marine science courses

Program Website: <http://www.fivecolleges.edu/sites/marine>

Contact: Cindy Bright, Coordinator, marinesci@email.smith.edu

University of Massachusetts Boston Boston, MA

Environmental Sciences

The University of Massachusetts Boston is "The Environmental Campus" of the five-campus University of Massachusetts system, and the Environmental, Earth and Ocean Sciences Department (EEOS) is the campus' premier interdisciplinary environmental department. EEOS was officially established in September of 2004, from the merger of Environmental, Coastal and Ocean Sciences (ECOS), Earth and Geographic Sciences (E&GS) and the undergraduate Environmental Studies Program (uESP). EEOS, together with another newly-formed entity, the campus-wide Center for Environmental Health, Science and Technology (CEHST), are the two cornerstones of the University's vision for national preeminence in environmental research and academic programs. The Environmental, Earth and Ocean Sciences Department (EEOS) integrates the natural and social sciences to generate and apply new knowledge about the quality of our environment and the sustainable use of its resources. It focuses on promoting integrated science, planning, policy, and education for understanding earth-system processes and managing the impacts of urbanization on linked watershed and coastal marine systems. The department's strong interdisciplinary makeup (natural and social sciences within the same department) and its focus on linked watershed-coastal systems are unique in the country.

Degree granted: M.S. and Ph.D.

Facilities: Department facilities include the Applied Geographical Information Science (GIS) Center, the Center for Estuarine and Coastal Observation (CECO), the Trace Element analysis Facility, and the Laboratory of Theoretical, Computational and Observational Oceanography. In addition, the Department houses specialized laboratories for earth, ocean and environmental sciences, including state-of-the-art facilities for GC/MS, CHN analysis, forensic environmental analysis, hydrogeology, coastal geology, environmental toxicology, stable isotope sample preparation, benthic ecology and zooplankton analysis, as well as inshore/near shore research vessels.

Program Website: <http://www.es.umb.edu/graduate/eeosphd.html>

Contact: Steve Rudnick, steven.rudnick@umb.edu

Geographic Information Technologies

The Certificate Program in Geographic Information Technologies, administered through the EEOS Undergraduate Programs, offers a number of courses teaching the concepts, principles, techniques, and applications of geographic information systems (GIS), computer cartography, remote sensing and digital image processing, global positioning systems (GPS), and digital photogrammetry.

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.geog.umb.edu/GITWebsite.htm>

Contact: Jack Looney, jack.looney@umb.edu

Earth and Geographic Sciences with focus in Oceanography

The department offers undergraduate degrees in the earth and geographic sciences as well as the specialized undergraduate certificate programs in Geographic Information Technologies and Hydrogeology. Course offerings reflect faculty expertise in the physical and cultural earth and geographic sciences, environmental research and resource management, and urban and regional geography.

The fields of geography and earth science are broad-based and multi-faceted disciplines, which are sometimes referred to as the spatial sciences because they involve the study of the location, distribution, and causes of the features of the earth, both at the surface and below. Studies concentrate on the physical or natural environment, and more human aspects of the sciences. However, all studies are ultimately concerned with the interrelationships between human beings and their environment.

Degree granted: B.S. and Certificate

Program Website: <http://www.geog.umb.edu/Demo.htm>

Contact: Jack Looney, jack.looney@umb.edu

Hydrogeology

Hydrology is the science dealing with the waters of the earth, their occurrence, distribution, and circulation, their chemical and physical properties, and their interaction with the environment. This course presents students the physical science of hydrology in the context of its application to real-world problems. Emphasis is placed on understanding the physical processes (precipitation, evapotranspiration, runoff, soil water, and groundwater) that form the hydrologic cycle at global, regional, and watershed scales.

Degree granted: Certificate-Bachelor's degree not required

Program Website: <http://www.geog.umb.edu/hydrofinal.htm>

Contact: Weston Dripps, weston.dripps@umb.edu

University of Massachusetts School of Marine Sciences

Amherst, Boston, Dartmouth and Lowell, MA

Marine Sciences and Technology: concentration in Integrated Coastal Management

Integrated coastal management (ICM) is a management strategy that has evolved over the past decade to embrace a broader, more systemic approach to the management of coastal environments. Recognizing the "reality of interdependence" of seemingly disjunct physical environments, such as coastal ecosystems and inland watersheds, and their anthropogenic influences, the goal of ICM is to integrate all levels of government (local, national, and international), natural and social scientific disciplines, appropriate spatial and temporal dimensions within natural systems, and broad sets of representative stakeholders to foster the sustainable development of coastal areas. It is a policy process that is information driven, inclusive of all factors that impact the coastal environment, and readily adaptive to changes in scientific information and social values and goals. Courses in the ICM concentration are drawn from both the natural and social sciences but build upon a foundation of coursework in environmental and natural resource management and policy; environmental, coastal, and ocean law (including international marine resource regimes); and environmental and marine resource economics.

Degree granted: M.S. and Ph.D.

Program Website: http://www.umassmarine.net/courses/showconcentrations.cfm?concentration_ID=1

Contact: Bob Bowen, bob.bowen@umb.edu

Marine Sciences and Technology: focus in Coastal Systems Science

Human society reaps large economic and recreational benefits from the land/sea margin, which often results in adverse environmental impacts. Understanding and remediating these impacts must begin with the realization that coastal marine ecosystems in effect extend well inland, encompassing their watersheds and estuaries. Freshwater inputs not only affect salinity distributions and circulation patterns but are also sources of nutrients and contaminants. The land/sea boundary is the home of unique ecosystems—marshes, shallow embayments, shelf environments, for example—that are critical for the life-cycles of many economically and recreationally important finfish and shellfish species. However, the complex ecology and multiple interconnections of these systems are not sufficiently understood to predict the outcome of present and future human impacts. The CSS concentration provides a fundamental understanding of aquatic ecology in the coastal zone and its dependence on physical, chemical, and geological processes and phenomena. Since this area often requires synthesis of diverse, spatially distributed data, competency in using geographic information systems is encouraged. Students are also expected to become familiar with the scientific issues that influence coastal resource management and policy.

Degree granted: M.S. and Ph.D.

Program Website: http://www.umassmarine.net/courses/showconcentrations.cfm?concentration_ID=6

Contact: Greg Beck, greg.beck@umb.edu

Marine Sciences and Technology: focus in Living Marine Resources Science and Management

Living marine resource science and management deals with the interactions between marine organisms (organisms that occupy the marine environment for at least a portion of their life cycle) and their living and non-living environment, and with humans. This is a heterogeneous and comprehensive approach and includes a wide range of categories including examination of the individual, species (population biology), and the ecosystem. Studies of individuals examine their climatic tolerance, life cycle, resource requirements and survival. Studies of the population or species, defined as a reproductively isolated group of individuals occupying a specific area, examine spatio-temporal density of organisms (number of individuals per unit area at certain spatial coordinates at a certain point in time), the rate of increase or decrease of a population and the parameters that end emigration. Presently, management strategies for many marine species use this perspective and examine how fished populations respond to different harvest strategies. With

the recent increase in our knowledge of marine ecology, resulting from our understanding of the physical processes underlying some of the large-scale biological phenomena and our ability to make continuous fine-scale biological measurements plus the urgency to apply this knowledge in a way that preserves and enhances our use of the ocean's living resources, studies examining the marine ecosystem and their implementation into management strategies are becoming increasingly important. These studies attempt to examine the whole system of associated organisms together with the physical factors of their environment and then examine the influence of harvesting on that system. Further, the economics driving human activity and the social impact of different management strategies must be considered. The development of aquaculture and concern for habitat in the form of marine protected areas add another aspect to studies in living marine resource science and management. The student enrolling in the living marine resource science and management option will be undertaking a truly interdisciplinary endeavor. Core courses in biological, physical and chemical oceanography as well as in policy provide the foundation for this option. Students can then select courses allowing them to focus on their area of interest. A strong foundation in mathematics/statistics is recommended.

Degree granted: M.S. and Ph.D.

Program Website: http://www.umassmarine.net/courses/showconcentrations.cfm?concentration_ID=3

Contact: Kevin Stokesbury, kstokesbury@umassd.edu

Marine Sciences and Technology: focus in Marine and Atmospheric System Modeling and Analysis

The inherent variability of marine and atmospheric systems is a result in part of the complexity of nonlinear interactions that occur in a coupled ocean/atmosphere system. Analytical and numerical models, particularly those that use multi-dimensional numerical simulations, have become powerful tools for analysis of such systems. Applications of such models range from optimizing environmental remediation and restoration to coastal and watershed development to fisheries management. Models of marine systems have traditionally emphasized physical components including fluid motions; energy, heat and salinity budgets; interactions with atmospheric forcing; and paleoclimatic changes. More modern, state-of-the-art models now also include primary and secondary production, biomass distribution, hydrological cycling, air/sea gas exchange, and nutrient and contaminant distributions. Global scale models are used to understand past, present, and future global changes

in the ocean-atmosphere system. Data assimilation has become an essential element of state-of-the-art models that are used for system forecasting. Observational data are used for establishing initial and boundary conditions and updating model fields in many cases in real time. Historical and real-time data is obtained from remote and *in situ* sensors that are deployed in operational and experimental configurations. The MASMA Option will provide a framework in which students can learn the skills required to develop and implement interdisciplinary models, as well as use them for the analysis of marine and/or atmospheric systems. MASMA students will be expected to become familiar with basic concepts in physical, biological, and chemical oceanography; atmospheric sciences, and measurements. MASMA student research will focus in one or more of the following areas: atmosphere-ocean coupling, oceanic modeling, atmospheric modeling, weather/climate variability, ecosystem modeling/analysis, environmental modeling/analysis, spatial/temporal variability in marine and/or atmospheric systems, realistic simulation and prediction, chemical, biological, and physical process modeling, data assimilation techniques, model/data synthesis, numerical/analytical synthesis, theoretical/numerical synthesis, interdisciplinary/integrative modeling, data acquisition and modeling, data systems development, and information management systems development.

Degree granted: M.S. and Ph.D.

Program Website: http://www.umassmarine.net/courses/showconcentrations.cfm?concentration_ID=5

Contact: Wendell Brown, wbrown@umassd.edu

Marine Sciences and Technology: focus in Marine Biogeochemistry and Environmental Change

The production, consumption, and alteration of chemical species by aquatic organisms are central to the function and regulation of marine systems. In particular, the supply, recycling, and export of carbon, nutrients, and trace metals are tightly coupled to plant productivity, ecosystem activity, and ecosystem structure. While a wide variety of organisms participate in essential biogeochemical transformations, microbes receive special attention due to their dominant role. Natural environmental change is often a consequence of climatic forcing of biogeochemical processes. Anthropogenic environmental change is typically mediated through both perturbation of biogeochemical cycles, as in the case of coastal eutrophication or increasing atmospheric CO₂, as well as through the introduction of contaminants, such as toxic organic compounds (e.g. PCBs) and heavy metals. These impacts can be both local and global in scale. Reconstructing the history of environmental change usually employs

the use of a wide variety of chemical markers preserved in sedimentary or other archives such as mollusk shells. Such reconstructions provide important insight into the full dynamic range of marine environmental processes and functions as well as to the events causing past and current observed states. The MBCEC concentration provides the student a fundamental understanding of major marine biogeochemical cycles and their interactions with physical and biological components of marine systems. Emphasis is on the role of biogeochemical cycles on natural and anthropogenic environmental change across a variety of settings from coastal to open ocean environments. Technical skills employed may include use and/or development of state-of-the-art trace chemical analyses and interdisciplinary numerical modeling

Degree granted: M.S. and Ph.D.

Program Website: http://www.umassmarine.net/courses/showconcentrations.cfm?concentration_ID=4

Contact: Cynthia Pilskaln, cpilskaln@umassd.edu

Marine Sciences and Technology: focus in Marine Observation Technologies

Increasingly sophisticated and interdisciplinary marine science has required a refocusing of engineering and applied science into the development of tools and techniques that support Marine Observational Technology. In particular there has been increased emphasis on novel techniques in the development of sensors, platforms, and signal processing tools. Modern marine observation systems are routinely microprocessor controlled, can now be autonomous, and frequently have the ability of real-time communication. Advances in the supporting scientific disciplines of acoustical, optical, and radio oceanography are providing unique insight into the marine environment. In addition, data obtained by the new generation of observational tools and techniques require increasingly sophisticated signal processing and image analysis. The Marine Observation Technology option is a broad discipline, which encompasses the following sub-disciplines: Acoustical Oceanography, Algorithm Development, Autonomous Underwater Vehicle Science & Technology, Instruments & Platform Technology, Optical Oceanography, Radio Oceanography, Sensor Development Technology, Signal & Image Processing, Remote Sensing Science & Technology. Students in this option will be encouraged to take a holistic view of Marine Observational Technology, which can address the modern problems of Marine Science and Technology

Degree granted: M.S. and Ph.D.

Program Website: http://www.umassmarine.net/courses/showconcentrations.cfm?concentration_ID=7

Contact: Louis Goodman, lgoodman@umassd.edu

Marine Sciences and Technology: focus in Ocean and Human Health

In most areas of the world, ocean and coastal areas continue to experience extensive environmental stresses. The consequential risks imposed by these stresses affect not only the health of marine systems but human health as well. Human exposure to these risks derives from a variety of vectors, including the consumption of contaminated seafood and direct contact from recreational bathing. Several recent international conferences have focused on the threats from persistent organic pollutants (such as DDT and PCBs), metals (such as methyl mercury and cadmium), algal toxins, cholera and other pathogens, pharmaceuticals introduced by aquaculture operations and possibly, genetically modified organisms. Recent estimates place the number of annual marine originated disease cases in the range of tens of millions worldwide. Research and management of these issues has generally been characterized by a sector-driven approach lacking interdisciplinary effort and comprehensive understanding. Effective mitigation of these risks, however, requires the integration of a broad range of disciplines, including: marine biology and chemistry, fisheries science and management, integrated coastal management, public health, epidemiology, aquatic toxicology, and science and human nutrition.

Degree granted: M.S.

Program Website: http://www.umassmarine.net/courses/showconcentrations.cfm?concentration_ID=2

Contact: Curtis Olsen, Curtis.Olsen@umb.edu
University of Massachusetts School of Marine Sciences
265 Riverside Street
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University of Memphis Memphis, TN

Water Resources Engineering

The department of Civil Engineering offers a graduate program leading to a Master of Science degree with a major in Civil Engineering (concentrations in Environmental Engineering, Geotechnical Engineering, Structural Engineering, Transportation Engineering, and Water Resources Engineering) and a Ph.D. degree with a major in Engineering (concentration in Civil Engineering). Program objectives are: (1) ability to apply advanced knowledge of mathematics, physical sciences, and engineering principles to the solution of practical engineering problems; (2) meet or exceed the needs and expectations of public and private sector employers for M.S. graduates; and (3) preparation to pursue additional advanced studies if so desired.

Degree granted: M.S.

Program Website: http://www.ce.memphis.edu/grad/grad_program.html

Contact: Roger Meier, Ph.D., rwmeier@memphis.edu
University of Memphis
Memphis, TN 38152

University of Miami **Rosenstiel School of Marine** **and Atmospheric Science** Miami, FL

The Rosenstiel School has a faculty of over 100 scientists who conduct sponsored research while offering studies leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees. The School offers curricula in applied marine physics, marine affairs and policy, marine and atmospheric chemistry, marine biology and fisheries, marine geology and geophysics, and meteorology and physical oceanography. With the College of Arts and Sciences, the School has developed undergraduate programs leading to the Bachelor of Science degree in marine science and meteorology or the Bachelor of Arts degree in marine affairs and policy. Land has been allocated by the City of Miami and Metropolitan Dade County for the development of a major world center for oceanographic research on Virginia Key. Now located adjacent to the Rosenstiel School are laboratories of the Department of Commerce National Oceanic and Atmospheric Administration, the Atlantic Oceanographic and Meteorological Laboratories and the Southeast Fisheries Center of the National Marine Fisheries Service. The Cooperative Institute for Marine and Atmospheric Studies links NOAA and the University of Miami. Also on Virginia Key is the Miami Seaquarium.

Facilities: *Research and Laboratory Facilities:* The School's basic and applied research interests have grown to encompass virtually all of the marine-related sciences in all oceans: marine and atmospheric chemistry, marine geology and geophysics, ocean acoustics, ocean engineering, applied marine physics, physical oceanography, satellite oceanography, meteorology, marine biology and fisheries, biochemistry, marine biomedicine, marine biotechnology, and marine affairs and management. The Rosenstiel School is now one of the five largest oceanographic facilities in the United States and boasts one of the broadest research agendas in the global oceanographic community. The Gilbert Hovey Grosvenor Laboratory complex houses modern scientific instruments for radiation detection, optical spectroscopy atomic absorption, electron microscopy,

chromatography, and spectrometry. Also located here is the Marine Invertebrate Museum, an internationally recognized research facility for Atlantic tropical marine invertebrates. The collections, which have few rivals as to number, geographic and vertical range of Atlantic tropical species, are of exceptional value as research, teaching, reference and data resources because of their comprehensive nature and the fact that the major portion of the material has been and continues to be identified by leading specialists from around the world.

The Alfred C. Glassell Laboratory has a new Air-Sea Interaction Salt Water Tank (ASIST) designed for studies relevant to air-sea interaction including remote sensing, turbulence, gas transfer, wave dynamics, surface chemistry, spray and aerosol generation, and interfacial thermodynamics. The 15-meter-long ASIST is equipped with a wind tunnel (0-30 m/s), programmable wavemaker, water temperature control, water current control, turbulence and wave instrumentation. The unique Tritium Laboratory is equipped for the global monitoring of tritium, a radioactive hydrogen isotope important as a tracer in the environment, and Helium-3, a stable isotope produced by the decay of tritium. The Remote Sensing Laboratory is an interdisciplinary group engaged in research and graduate instruction in the techniques of satellite oceanography and their application to problems in physical, biological and chemical oceanography. Current efforts range from analysis of satellite observations to theoretical radiative transfer modeling of the earth-atmosphere system. The Ocean Prediction Experimental Laboratory uses numerical models to study the circulation of the coastal ocean (and atmosphere) plus marginal and semi-enclosed seas. The focus is on model and experimental nowcast/forecast systems with applications to oil spill trajectory calculations, sediment transport, water quality, and marine ecosystem calculations. The Comparative Sedimentology Laboratory, an extension of the School's Division of Marine Geology and Geophysics, conducts field-oriented research and teaching, concentrating on seafloor sediments and coral reefs. The Henry L. Doherty Marine Science Center includes an auditorium, computer center, classrooms, a teaching laboratory, and dining room. The Experimental Fish Hatchery allows researchers at the School to investigate marine fish propagation and stocking techniques, with an emphasis on subtropical and tropical species, and has greatly enhanced our ability to study the early life history of fishes. The National Resource Center for *Aplysia*—funded by the National Institute of Health—is an example of the successful rearing and maintenance of a marine animal life through all stages of its life cycle. Each year the facility ships thousands of individuals to research institutions around the

world, which are used for research on the neurobiology of learning and memory. With the administration building, the Rosenstiel School has a total of 200,000 square feet of laboratory, office, classroom, and library space.

Centers: The Pew Institute for Ocean Science is dedicated to conducting, sponsoring, disseminating and promoting world-class scientific activity aimed at protecting the world's oceans and the species that inhabit them. The Institute is headed by 2000 Pew Fellow and renowned marine scientist, Dr. Ellen Pikitch. The NIEHS Marine and Freshwater Biomedical Sciences Center plays a leading role in research on natural seafood toxins (e.g., ciguatera toxins, brevetoxins, etc.). The Center trains young post-doctoral colleagues in toxicology and environmental health sciences, and develops therapies and tests for marine intoxications. Marine models of human disease are under development, and alternatives to mammalian bioassays are being characterized by center scientists. The National Center for Caribbean Coral Reef Research (NCORE) works to foster greater organization and collaboration within the U.S. scientific community. Leading the efforts to better understand the processes and environmental conditions necessary for the establishment, survival and sustainable use of coral reef ecosystems, NCORE also assists in the transfer of this information to managers and the general public. The Cooperative Institute for Marine and Atmospheric Studies (CIMAS) is one of seven Cooperative Institutes sponsored by NOAA's Environmental Research Laboratories, to provide academic support to NOAA's mission. Housed in CIMAS is also the Cooperative Unit for Fisheries Education and Research, which provides a link to NOAA's national Marine Fisheries Service. The Center for Air-Sea Interaction houses the operation of a unique Air-Sea Interaction Saltwater Tank (ASIST) for the study of air-sea interaction in fresh and saltwater over a variety of wind-water wave, salinity and temperature ranges. The Center for Southeastern Tropical Advanced Remote Sensing (CSTARS) is a new regional satellite data collection, processing, and analysis facility for the southeastern U.S., Caribbean, Central America and



Zooplankton sampling, University of Miami Rosenstiel School of Marine and Atmospheric Science

the northern coast of South America. The Oceans and Human Health Center at the University of Miami Rosenstiel School, one of four such Centers in the World, brings together medical and ocean researchers to investigate how humans affect oceans and how oceans affect humans in tropical and subtropical environments. Research includes identifying sources of pollution and developing new monitoring tools, ultimately making beaches safer, and identifying the environmental conditions in which algae bloom and produce harmful toxins, and ultimately predict the blooms and protect and educate the susceptible human population. The South Florida and Caribbean Cooperative Ecosystems Studies Unit (SFC CESU) is one of the second round of CESUs created by the federal government under the leadership of the Department of the Interior to provide assistance to managers in federal land management, environmental and research agencies.

Faculty: A complete list of Rosenstiel faculty can be found at <http://www.rsmas.miami.edu/faculty-index.html>

2007 tuition: In-state residents: \$24,300; Out-of-State: \$24,300

Program Website: <http://www.rsmas.miami.edu>

Contact: Otis B. Brown, obrown@rsmas.miami.edu
University of Miami Rosenstiel School of Marine and Atmospheric Science
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Email: gso@rsmas.miami.edu
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Marine Affairs and Policy

The Division of Marine Affairs and Policy undertakes basic and applied research and training activities that contribute to policy development and management of marine resources. The Marine Affairs and Policy (MAF) academic program offers a broad curriculum that links core areas of Marine Affairs (natural resource economics, political ecology and marine anthropology, underwater archaeology, ocean and coastal law and policy) with the marine sciences. MAF also offers academic tracks in aquaculture management and underwater marine cultural resources. Marine Affairs and Policy students tailor their course selections to match their individual career objectives. MAF offers the Master of Arts (M.A.) and Master of Science (M.S.) degrees. The M.A. degree requires completion of 27 course credits and 3 internship credits. The M.S. degree requires completion of 30 course credits and 6 thesis credits. The Master degree programs are for those wishing to pursue careers in marine policy and management. The M.A. can also lead into Ph.D. specialization in marine policy, environmental law, maritime business, economics, anthropology, or environmental education. The M.S. can lead into Ph.D. in pure sciences. The University of Miami School of Law and the Rosenstiel School of Marine

and Atmospheric Science offer a Joint degree program in law and marine affairs and policy. Upon completion of this program, a student earns a Juris Doctor degree from the School of Law and the Master of Arts degree in Marine Affairs and Policy from Rosenstiel. A student may complete requirements of both degrees within three and one-half years in an intensive program of six semesters and two full summers. This program is geared toward students who want a career in the field of law with a specialization in marine and environmental issues. Applicants to the M.A. program must possess a B.S. or B.A. in any relevant academic field. Those who apply for the M.S. program must possess a B.S. in natural and physical sciences. Applicants for the M.A. must take the GRE. For M.S. applicants, in addition to GRE, the required subject GRE should also be taken. Those whose first language is not English must pass the Test of English as a Foreign Language (TOEFL) with a score of at least 550.

Degree granted: M.A. and M.S.

Facilities: The Division of Marine Affairs manages an underwater archeological and ecological preserve at Little Salt Spring, in North Port, a site located in southern Sarasota County, Florida, about 5 miles from the Gulf of Mexico. Donated to the University in 1982, the spring is surrounded by undisturbed native hardwood hammock containing several rare and endangered plant and animal species. RSMAS has a strong and well-funded academic and R&D program in sustainable aquaculture. The Aquaculture Program within the Division of Marine Affairs has developed a solid, widely recognized and popular academic track supported by an innovative research and development program at the leading edge of sustainable aquaculture science, technology, management and environmental issues. A state-of-the-art hatchery and laboratory infrastructure supports aquaculture courses and engages students in ongoing research projects. Limited funding is available for students who want to pursue a career in aquaculture. The Boating Research Center is a research arm of the Division of Marine Affairs and Policy at the University of Miami Rosenstiel School of Marine and Atmospheric Science. It primarily conducts research that deals with boating and boating-related activities in South Florida, and their environmental, economic, and social impacts to the South Florida communities. In addition, division personnel have ready access to the NOAA Atlantic Oceanographic and Meteorological Laboratories (AOML), the National Marine Fisheries Service (NMFS) Southeast Fisheries Center (SEFC), the relatively nearby National Florida Keys Marine Sanctuary, and the various associated research disciplines within the University of Miami.

Program Website: <http://www.rsmas.miami.edu/divs/maf>

Contact: Maria Luisa E. Villanueva, maf@rsmas.miami.edu

Physical Oceanography

Meteorology

The Division offers M.S. and Ph.D. degrees in Meteorology and Physical Oceanography. There are currently 35 students enrolled in the program. Students come from a variety of educational backgrounds (marine science, meteorology, physics, mathematics, engineering, etc.) A strong background in physics and mathematics is recommended. Applicants are required to take the GRE examinations, and applicants whose first language is not English must pass the Test of English as a Foreign Language (TOEFL).

Degree granted: M.S. and Ph.D.

Student Support: Financial support for tuition and living expenses is offered to all accepted students. Further information and application details are available on the RSMAS Graduate Studies Homepage.

Program Website: <http://www.rsmas.miami.edu/divs/mpo/Academics/Graduate/>

Contact: Otis B. Brown, obrown@rsmas.miami.edu

Marine Geology and Geophysics

The Division of Marine Geology and Geophysics (MGG) has broad research interests in understanding the geology, geophysics and geochemistry of the earth system, beneath, within, and above the oceans. MGG faculty and students emphasize cross-divisional cooperation in which geological phenomena interact with or are influenced by processes generally studied in other disciplines, such as ocean currents, climate, and biological evolution. They are pioneering remote sensing techniques to assess the earth's crustal movement and sedimentation in coastal zones. The Division is at the forefront of understanding carbonate deposit systems, and paleoclimate researchers are using stromatolites and reefs to learn more about past climate change by studying the interaction between biological and geological processes. Ocean observing systems, such as hydrological observatories, are playing prominently in research efforts as well.

Degree granted: M.S. and Ph.D.

Facilities: The Division has many well-equipped modern laboratories, such as a SEM & TEM lab (with Drs. Patricia Blackwelder and Pamela Reid), rock properties (Dr. Gregor Eberli), and stable isotope and geochemistry laboratories (Dr. Peter Swart).

Program Website: <http://www.rsmas.miami.edu/divs/mgg/>

Contact: Dr. Peter Swart, pswart@rsmas.miami.edu

Marine Biology and Fisheries

The Division of Marine Biology and Fisheries (MBF) focuses its efforts in a wide range of field, laboratory, and theoretical research with particular interest in areas such as the biochemistry of marine toxins, coral reef studies, biological oceanography and marine biology, fisheries biology and aquaculture, and the biology and behavior of marine vertebrates. Through various Rosenstiel School research centers and groups, such as the Marine and Freshwater Biomedical Science Center, the experimental hatchery, the Pew Institute for Ocean Science, the National Science Foundation/National Institute of Environmental Health Science Center for Oceans and Human Health, the world-renowned NIH/University of Miami National Resource for Aplysia facility, and many others, division faculty, students, and their many international collaborators participate in multi-institutional, multi-disciplinary, and cross-divisional programs. Graduate students in MBF are able to choose from a diversity of subject areas for their research and courses with such a wide variety of experts.

Degree granted: M.A., M.S., and Ph.D.

Facilities: A modern fleet of research vessels, small boats, excellent computer facilities, scanning electron microscope and other sophisticated laboratory instruments, a highly technical field capability, an extensive library, research invertebrate museum, and an experimental fish hatchery provide the perfect research environment for both the budding and accomplished marine biologist. Combined with the other on-campus divisions of Meteorology and Physical Oceanography, Marine and Atmospheric Chemistry, Marine Geology and Geophysics, Applied Marine Physics, and Marine Affairs, the School offers opportunities in marine science available at few other institutions.

Program Website: <http://www.rsmas.miami.edu/divs/mbf/>

Contact: Professor Robert K. Cowen, mbf@rsmas.miami.edu

Marine & Atmospheric Chemistry

The 14 faculty members of the Division of Marine and Atmospheric Chemistry (MAC) carry out research on the chemistry of the atmosphere and marine and ground waters, evaluating processes within and between those spheres. Much of the work is directed at understanding the impact of man's activities on the earth/ocean system, particularly as it relates to global change. There are currently 12 students enrolled in the program. Students come from a variety of educational backgrounds (marine science, chemistry, biology, physics, engineering, etc.)

Degree granted: M.S. and Ph.D.

Facilities: The Division has a wide variety of modern chemical laboratory instrumentation, including a state-of-the-art laser facility to study rapid gas and liquid phase

chemical reactions and radiochemical labs that measure a broad spectrum of isotopes. We have wide analytical capabilities for the major elements, including carbon and the nutrients, and for organic chemistry. One unique laboratory is on a tourist cruise ship, the Royal Caribbean Explorer of the Seas, which efficiently collects marine and atmospheric data. Additionally, the school's 90-foot research catamaran, the R/V WALTON SMITH, spends more than half of the year at sea on research missions.

Program Website: <http://www.rsmas.miami.edu/divs/mac/>

Contact: Dennis A. Hansell, mac@rsmas.miami.edu

Applied Marine Physics

The Division of Applied Marine Physics (AMP) focuses on research and education in fundamental and applied fluid mechanics in the ocean, especially near the air-sea interface and in coastal regions, and the study and application of acoustic and electromagnetic ocean remote-sensing techniques. Research in AMP involves theory, numerical modeling, field and laboratory experiments, instrument development, and data analysis. The academic program within AMP is built on the core disciplines of fluid and wave mechanics, including elastic and electromagnetic waves, as well as acoustic, surface gravity and other types of waves in fluid.

Degree granted: Ph.D.

Facilities: AMP has a unique set of resources that begin with its Center for Air-Sea Interaction Saltwater Tank, a state-of-the-art facility for teaching and research on the air-sea interface. Additionally, the School's Ocean Acoustic Observatory off Dania beach, its Radar Ocean Sensing Laboratory, the Ocean Surface Current Radar system, the Ocean Prediction Experimental Laboratory, the Geoacoustic Laboratory, and the Center for Southeast Tropical Advanced Remote Sensing offer School researchers the latest in technology to better understand marine physics.

Program Website: <http://www.rsmas.miami.edu/divs/amp/>

Contact: Prof. Hans Graber, hgraber@rsmas.miami.edu

Meteorology

Degree granted: B.S.

Program Website: <http://www.meteorology.miami.edu/>

Contact: Prof. Bruce Albrecht, balbrecht@rsmas.miami.edu

Marine Science with focus in Geology

Degree granted: B.S.

Program Website: <http://msc.cox.miami.edu/pages/programs/geology.html>

Contact: Daniel DiResta, Ph.D., marsci@miami.edu

Marine Science with focus in Physics

Physical oceanography encompasses the study of the temporal and spatial variability in the ocean and atmosphere. Data collected by current meters, profilers and satellite are used to compile models of oceanic circulation, water and heat transport by currents, and effects of circulation patterns on ocean distributions of biotic and abiotic constituents. Areas of Study include physical properties of seawater, light and sound in the ocean, tides and waves, how water and energy are circulated by currents, the interaction of the ocean and the atmosphere, and the ocean's effects on weather and climate.

Degree granted: B.S.

Program Website: <http://msc.cox.miami.edu/pages/programs/physics.html>

Contact: marsci@miami.edu

Marine Sciences with focus in Biology

Degree granted: B.S.

Program Website: <http://msc.cox.miami.edu/pages/programs/biology.html>

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University of Miami

4600 Rickenbacker Causeway, Miami, FL 33149-1098

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University of Michigan

Ann Arbor, MI

Department of Atmospheric, Oceanic and Space Science

Physical Oceanography

This is an interdisciplinary program that combines classes in atmospheric and oceanic science within the Atmospheric, Oceanic and Space Science department with classes in coastal oceanography and water waves in the department of Naval Architecture and Marine Engineering, estuarine and river flows in the department of Civil and Environmental Engineering, and paleo-oceanography and marine geology in the department of geological sciences.

Degree granted: M.S. and Ph.D.

Facilities: Two-hundred-foot-long towing tank in the Marine Hydrodynamics Laboratory. One-hundred-and-fifty-processor massively parallel computer; Small water wave experimental tanks

Faculty: John P. Boyd (AOSS): theory, nonlinear waves, computational fluid dynamics; Nikolaos Katopodes (CEE): numerical modeling of river and estuarine flows, control theory; Steven Wright (CEE): river and estuarine flows, hydrology; Aline Cotel (CEE): experimental fluid mechanics; Guy Meadows (AOSS): coastal oceanography, experimental fluid mechanics; Chris Ruf (AOSS): remote sensing

of the ocean; Allison Steiner (AOSS): air-sea interaction;
Person to be hired (AOSS): ice modeling

2007 tuition: In-state residents: \$12,000; Out-of-State: \$22,000

Program Website: <http://www.rackham.umich.edu/Programs/physical.sci/aoss.html#degrees>

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University of Michigan
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Email: margreid@umich.edu

Geoscience and Remote Sensing with focus in Physical Oceanography

The Geoscience and Remote Sensing Graduate Program leads to a combined Master of Science degree in Electrical Engineering and in Atmospheric, Oceanic and Space Sciences, or to a Doctor of Philosophy degree with combined specialties in Electrical Engineering and in Atmospheric, Oceanic and Space Sciences. All students in the Program choose one of three sub-fields: Electrical Engineering, Atmospheric and Space Sciences, or Physical Oceanography. Those who choose the electrical engineering sub-field will take at least 50% of their courses in the EECS Department. Those who choose either Atmospheric and Space Sciences or Physical Oceanography will take at least 50% of their courses in the AOSS Department.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.rackham.umich.edu/Programs/physical.sci/georem.html>

Contact: Xianglei Huang, xianglei@umich.edu

Natural Resources and Environment

Natural Resources and Environment is a professional school dedicated to preparing the next generation of practitioners for leadership positions in the management of resources so that they may meet the full range of human needs on a sustainable basis. The school offers two master's degrees, an M.S. in natural resources and environment and an M.L.A. in landscape architecture. Students in the M.S. program may specialize in one of eight fields of study: Aquatic Sciences: Research and Management, Behavior, Education and Communication, Conservation Biology, Environmental Informatics: GIS and Modeling, Environmental Justice, Environmental Policy and Planning, Sustainable Systems, Terrestrial Ecosystems.

Degree granted: M.S.

Program Website: http://www.snre.umich.edu/degree_programs/environmental_policy.php

Contact: snre.admissions@umich.edu

Environmental Policy

Changing the world requires new public policies and visionary plans, along with innovative decision-making processes and well-managed organizations. The Environmental Policy and Planning field of study builds students' professional skills to design and implement effective policies and plans while considering the human and institutional behaviors that underlie environmental problems. In addition, students develop the ability to create decision-making processes that are scientifically credible, involve a diverse set of interests and lead to the development of organizations that can move society in a more sustainable direction. Those who are interested in planning also acquire a familiarity with spatial analysis and design in rural or urban settings.

Degree granted: M.S.

Program Website: http://www.snre.umich.edu/degree_programs/environmental_policy.php

Contact: snre.admissions@umich.edu

Environmental Informatics: GIS and Modeling

Environmental research, impact assessment, planning and management have grown increasingly reliant on computer-based approaches in the past few decades. Geographic information systems (GIS), remote sensing, dynamic-simulation modeling and statistics, for example, are utilized in a variety of scientific and professional endeavors, ranging from forestry, landscape mapping and watershed ecology to archaeology, pollution detection and geology. As a result, the need for professionals trained in technical and applied aspects of these approaches has risen dramatically. Environmental informatics, also called eco-informatics, addresses this need by focusing on analytical and computer-based methods in the study and management of natural resources and the environment.



South Broward High School (Florida) launches its ROV above the International Space Station during MATE's 2005 international ROV competition.

Faculty in this field of study encourage students to pursue either an M.S. thesis, M.S. project, or a course-only degree by taking advantage of the wide array of relevant courses available at SNRE.

Degree granted: M.S.

Program Website: http://www.snre.umich.edu/degree_programs/environmental_informatics/overview

Contact: snre.admissions@umich.edu

Conservation Biology

Biodiversity loss has been identified as one of the great challenges of our time. The potential demise of one-fourth or more of the Earth's species before the end of this century represents an irreversible loss of nature and may significantly undermine the sustainable use of nature's services. The continuing expansion of populations and economies and the urgent need to improve human well-being also place increasing pressures on biological diversity. The need for new understanding and novel approaches to the management of wildlands and protected areas has never been greater. Scientists and practitioners within the field of Conservation Biology need specialized knowledge of their sub-discipline—forest management, endangered species policy or wildlife ecology, for example. They also need the integrative perspective of a broadly educated scholar-practitioner who is equipped to understand interactions between natural systems and human influences. This field of study combines basic knowledge from the ecological sciences and other disciplines to drive environmental problem solving.

Degree granted: M.S.

Facilities: University of Michigan Biological Station; Dana Building: with fish, water, GIS, soils, and other labs; Matthaei Botanical Gardens: with 350 acres of varied habitats and an indoor conservatory, the Bot Gardens make a great recreational destination, and an excellent living classroom; Nichols Arboretum: a "living museum," with an extensive collection of plants that includes Michigan endemics and species from around the world; Saginaw Forest and Stinchfield Woods are owned by the University and operated by the School of Natural Resources and Environment for research and laboratory excursions.

Faculty: We have 50 faculty trained in 18 disciplines. Please visit our website to learn more about our faculty and their research and teaching areas. <http://www.snre.umich.edu/faculty-research/overview>

2007 tuition: In-state residents: \$16,000; Out-of-State: \$31,500

Program Website: http://www.snre.umich.edu/degree_programs/conservation_biology/overview

Contact: snre.admissions@umich.edu

Environmental Justice

Broadly construed, the Environmental Justice field of study is concerned with the processes through which inequalities arise from social, political and environmental actions and policies. As an EJ student you will develop a historical understanding of the factors that launched the environmental justice movement in the United States and around the world and study the mechanisms that give rise to class, gender and racial disparities. You will study affected constituents—communities, industry, government, environmental activists, policymakers and scholars—and learn the causes and consequences of inequitable distributions of environmental benefits and hazards, methods for researching environmental justice issues and strategies for formulating policies in order to achieve a just and sustainable society.

Degree granted: M.S.

Program Website: http://www.snre.umich.edu/degree_programs/environmental_justice/overview

Contact: snre.admissions@umich.edu

Aquatic Sciences: Research and Management

More than two-thirds of the Earth's surface is covered with water, so it is not surprising that the planet's oceans, lakes, rivers, streams and wetlands are considered valuable natural resources and, increasingly, focal points for concerns about usage, pollution and depletion. Humans' ever-growing encroachment on aquatic ecosystems has created a strong demand for scientists trained in the sustainable management of these resources. The Aquatic Sciences field of study provides training in basic and applied sciences relevant to the world's growing water crisis and the management of aquatic ecosystems. Faculty includes professors and research scientists from a number of disciplines and departments, with interests covering a wide range of subjects, such as fisheries science, aquatic entomology and ecosystem modeling.

Degree granted: M.S.

Program Website: http://www.snre.umich.edu/degree_programs/aquatic_sciences/overview

Contact: snre.admissions@umich.edu

Earth System Science & Engineering: Climate Physics

The ESSE Climate Physics concentration prepares you for skilled positions in the modeling and "value added" industries that increasingly provide the water resource, agricultural, seasonal recreation and transportation industries with near-term climate analyses and predictions. Positions in government agencies that serve to make policy or federal laboratories that do climate research are open to you and you'll also be prepared for graduate studies involving the technologies that enable weather and climate prediction.

Degree granted: B.S.

Program Website: <http://aoss.engin.umich.edu/go/?id1=11&id2=1&id3=4>

Contact: Professor Christianne Jablonowski, cjablono@umich.edu, 734-763-6238

Engineering Sustainable Systems - Sustainable Water Resources

The dual degree confers a Master of Science (M.S.) degree from SNRE and a Master of Science in Engineering (M.S.E.) from the College of Engineering (CoE). Global climate change, energy security, ecological degradation, environmental threats to human health, and resource scarcity are critical sustainability challenges for the 21st century. Sustainability is based upon our ability to meet societal needs within the context of economical and ecological constraints. This dual degree provides the tools necessary to help meet those needs. The program trains graduate students to protect, restore, and create engineered and natural systems that are socially, environmentally, and economically sustainable. Graduates of this dual degree program will have both the engineering and sustainability foundations to command jobs domestically and internationally with engineering consulting firms, research and development labs in the private and public sectors (e.g. Fortune 500 corporations), government agencies, and NGOs. There are three initial tracks or specializations in ESS—Sustainable Energy Systems, Sustainable Design and Manufacturing, and Sustainable Water Resources. The dual degree in Natural Resources and Civil and Environmental Engineering provides the tools needed to help protect, conserve, and manage water resources as well as the ecosystems and societies that depend on them. Integrating CEE course work in engineering principles of quantitative analysis and modeling with NRE course work in natural and social system dynamics will provide students with the tools and skills demanded by both public and private institutions dedicated to sustainable water resources as well as the ecosystem goods and services they provide.

Degree granted: M.S.

Facilities: Within the School of Natural Resources and Environment, our faculty have labs in the building as well as connections to NOAA, Institutes for Fisheries Research, Cooperative Institute for Limnology and Ecosystems Research, Michigan Sea Grant—not to mention proximity to the Great Lakes. Please read more about our Centers: http://www.snre.umich.edu/faculty-research/centers_of_excellence

Faculty: School of Natural Resources and Environment: <http://www.snre.umich.edu/faculty-research/overview>; College of Engineering: <http://cee.engin.umich.edu/current/grad/index.html>

2007 tuition: In-state residents: \$16,000; Out-of-State: \$31,500

Program Website: http://www.snre.umich.edu/degree_programs/engineering

Contact: essdualdegree@umich.edu

University of Michigan, School of Natural Resources and Environment

440 Church St., Room 1520 Dana

Ann Arbor, MI 48109-1041

Phone: 734-764-6453

University of Minnesota

St. Paul, MN

Conservation Biology

Conservation Biology emerged as a discipline as it became increasingly clear that preserving, managing and restoring biological diversity was hindered by a lack of fundamental knowledge to drive decision-making. Determining how much land to set aside to preserve a particular species or ecosystem, assessing the risks of proposed technologies or land uses on biodiversity, and developing management strategies for populations are the kinds of problems that conservation biologists address. Most conservation biology problems are inherently interdisciplinary, requiring integration of natural and social sciences to be solved. The University of Minnesota established one of the first graduate programs in the country in 1990. With strengths in ecology, natural resources, fisheries, aquatic biology and environmental social sciences, we have been ideally situated to pioneer scholarly work in Conservation Biology. Our graduate program is the most comprehensive in the country, offering M.S., Ph.D., and joint J.D. degrees, and a minor. Our faculty and students work on terrestrial and aquatic ecosystems in the U.S. and around the world. The conservation biology program has two complementary objectives leading to a unique multidisciplinary program. The first is to provide students with sound graduate training in the biological sciences relevant to the global conservation of plants, animals, and ecosystems. The second objective promotes the study of social, political, and economic sciences that relate to recognition and solution of conservation problems. Students may select a named track, fisheries and aquatic biology, which offers an aquatic specialization. Students may also pursue a joint degree in law and conservation biology through the joint law degree program. The overall goal of the program is to prepare students to develop solutions or approaches to address problems that are scientifically and environmentally sound and likely to be acted upon or implemented within their social and political context.

Degree granted: M.S. and Ph.D.

Facilities: Fisheries and aquatic biology research is conducted in the many lakes, rivers, and streams that Minnesota is famous for and in 13,000 feet of wet-lab space on the St Paul campus with dedicated wells and water conditioning equipment. The program is strongly linked with on-campus institutes such as the Institute for Social, Economic, and Ecological Sustainability and the Interdisciplinary Center for the Study of Global Change.

Faculty: http://www.grad.umn.edu/faculty_rosters/faculty.html

Program Website: <http://www.catalogs.umn.edu/grad/programs/g043.html>

Contact: Ira R. Adelman, ira@umn.edu
Conservation Biology Graduate Program
University of Minnesota
187 McNeal Hall, 1885 Buford Avenue
St. Paul, MN 55108, 612-624-7751
Website: <http://www1.umn.edu/twincities/index.php>

Joint Degree in Conservation Biology and Law

Degree granted: M.S.

Program Website: <http://www.consbio.umn.edu/>

Contact: consbio@umn.edu

Conservation Biology with a Fisheries and Aquatic Biology Track

Degree granted: M.S. and Ph.D.

Program Website: <http://www.consbio.umn.edu/about/fabdegree.php>

Contact: consbio@umn.edu

University of Mississippi University, MS

Biology

Degree granted: Ph.D.

Facilities: The department occupies a five-story building on the main Oxford campus, and includes the Pullen Herbarium and a greenhouse facility. Research is supported by the University Library, the computer center, which houses three supercomputers; and collaborating units including the Geoinformatics Center, National Center for Physical Acoustics, the Research Institute for Pharmaceutical Sciences, Center for Development of Natural Products, the School of Pharmacy Environmental Toxicology Program, and the Center for Computational Hydrodynamics. Within 11 miles of campus, The University of Mississippi Field Station, and the Center for Water and Wetland Research, encompasses over 700 acres and over 200 experimental ponds, streams, and wetlands. The Holly

Springs National Forest and the Tallahatchee Experimental Forest are located within an easy drive of campus. The Department has ongoing collaboration with scientists at the National Sedimentation Laboratory; Department of Wildlife, Fisheries, and Parks; Gulf Coast Research Laboratory, and other universities.

Program Website: <http://www.olemiss.edu/depts/biology/>

Contact: Dr. Paul K. Lago, plago@olemiss.edu

University of Mobile Mobile, AL

Marine Science

The University of Mobile offers a major and a minor in Marine Science. UM is a member of the Marine Environmental Sciences Consortium, a statewide group of 22 colleges and universities that use the Dauphin Island Sea Lab (DISL) as their marine science education facility (not a degree-granting institution). The University of Mobile offers the proven benefits of small class sizes, personalized instruction, and direct contact with faculty focused on teaching. Yet as a member of the consortium, UM offers the resources and education and research opportunities normally possible only in larger programs. Students reap the benefits of both for their education.

Degree granted: Minor and B.S.

Program Website: <http://www.umobile.edu/acad/artandscience/naturalScience.asp>

Contact: Dr. Thomas Bilbo, tbilbo@mail.umobile.edu
University of Mobile
Mobile, AL 36613



Classroom science teacher inspects a plankton sample in a University of New Hampshire lab.

University of New Hampshire

Durham, NH

Natural Resources and Earth System Science with an Oceanography Option

Concentration in the oceanography option may be placed on chemical, geological, or physical oceanography. Although the broad scope of oceanography will be presented, the program emphasizes estuarine, coastal, continental margin processes and environments, and mid-ocean ridges.

Degree granted: Ph.D.

Program Website: <http://www.gradschool.unh.edu/catalog/programs/esci.html>

Contact: natural.resources@unh.edu

Earth Science with Ocean Mapping Option

Graduate programs in Earth Sciences provide a unique opportunity to study earth and environmental sciences at the local, regional, and global scale. The University of New Hampshire is geographically well situated for studies in the earth sciences. The Atlantic Ocean is a 30-minute drive from campus, the Great Bay Estuary tidal waters reach within one-half mile of the campus, and the White Mountains are only a 90-minute drive to the north. Superimposed on this natural backdrop are the challenges created by a growing U.S. population and resulting pollution threats to the environment. In addition to these local opportunities, UNH faculty and students conduct research throughout the world, traveling to remote areas such as Antarctica, Greenland, the Pacific and Indian Oceans, Mexico, China, the Himalayas, Indonesia, Pakistan, and the Western United States. Research areas cover all the earth system components: lithosphere, hydrosphere, atmosphere, biosphere, and cryosphere. The faculty of the Department of Earth Sciences maintain offices and laboratories, and other facilities in four buildings on campus, and interact regularly with several established campus research centers. Department facilities include a suite of computational, geophysical, geochemical, and field mapping equipment as well as local field sites for instruction and research. Additional facilities are available through cooperation with other departments and research centers. Many Earth Sciences faculty members are affiliated with one of several research centers in the Institute for the Study of Earth, Oceans, and Space (EOS). We also have affiliations and ongoing collaborations with the Center for Coastal and Ocean Mapping, the Jackson Estuarine Laboratory, and the Environmental Research Group. Graduates of graduate degree programs in earth sciences have been very successful in pursuing employment, particularly in education, research at national

laboratories and universities, environmental consulting companies with emphases in groundwater remediation and water supply, and local, state, and federal agencies in areas of the environment and natural resources.

Degree granted: Ph.D.

Program Website: <http://marine.unh.edu/gradoverview.html>

Contact: Robert Griffin, rob.griffin@unh.edu

Ocean Engineering

Ocean Engineering (OE) offers programs leading to the master of science and an option in the doctor of philosophy degree program in engineering. Programs in OE are by definition interdisciplinary and require the students to interact with the ocean science community as well as the traditional engineering disciplines. Students are exposed to the broad-based issues of working engineering problems in the ocean environment, as well as discipline specifics. In these programs they will be trained to develop responsible solutions to problems that will lead to sustainable activity and life in the ocean. A master of science in ocean engineering option in ocean mapping is also available. There is a more structured path through this program, which incorporates all aspects of hydrography as required by the International Hydrographic Organization (IHO) and is approved by the IHO. Focus is on the engineering aspects of hydrography. The general purpose of these programs is to prepare engineering students for professional careers in ocean-related fields.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.gradschool.unh.edu/catalog/programs/oe.html>

Contact: ocean.engineering@unh.edu

Ocean Engineering

The ocean engineering minor allows undergraduate engineering students to acquire a nucleus of knowledge about engineering pertaining to the ocean and the coastal zone.

Degree granted: Minor

Program Website: <http://www.undergradcat.unh.edu/programs.cfm?id=8&page=programs&program=114>

Contact: M. Robinson Swift, mrsswift@cisunix.unh.edu

Ocean Engineering with an Ocean Mapping Option

See Ocean Engineering M.S. and Ph.D. program description above.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.gradschool.unh.edu/catalog/programs/oe.html>

Contact: ocean.engineering@unh.edu

Earth Science with Oceanography option

The Department of Earth Sciences offers the master of science in Earth sciences with options in geology, oceanography, ocean mapping, and a specialization in geochemical systems. The department also offers the master of science degree in hydrology. Graduate students in the department may conduct research through the Institute for the Study of Earth, Oceans, and Space and the Center for Coastal and Ocean Mapping.

Degree granted: M.S.

Program Website: <http://www.gradschool.unh.edu/catalog/programs/esci.html>

Contact: earth.sciences@unh.edu

Earth Sciences with Oceanography option

The Bachelor of Arts in Earth Sciences, Oceanography Option, is offered by the Department of Earth Sciences. This program provides students an opportunity to obtain a broad education and a general background in the earth sciences, as well as the flexibility to choose electives in the area of oceanography. A clear, comprehensive understanding of the ocean environment will prepare students for graduate school or for employment opportunities available on our coasts in ocean-related fields such as aquaculture, fishing, tourism, environmental protection, shipping, construction, government regulation, and education.

Degree granted: B.A.

Contact: earth.sciences@unh.edu

Oceanography

The minor in oceanography is available to all students in the University interested in obtaining a broad background in oceanography and is offered through the Department of Earth Sciences.

Degree granted: Minor

Program Website: <http://www.undergradcat.unh.edu/programs.cfm?id=8&page=programs&program=114>

Contact: Molly Lutcavage, molly.lutcavage@unh.edu

Marine Biology

The minor is designed to provide a foundation in marine biology and related sciences to any UNH undergraduate student with the exception of students enrolled in the MFB option of the Biology Program. It is offered through the Zoology Department. The minor consists of 20 credits with grades of C- or better and no pass/fail courses. No more than 8 major requirement credits may be used towards the minor. All courses in the program are selected in consultation with the minor adviser.

Degree granted: Minor

Program Website: <http://www.undergradcat.unh.edu/programs.cfm?id=8&page=programs&program=114>

Contact: Stephen Jones, shj@cisunix.unh.edu, or Dr. Larry Harris, 603-862-3897, Department of Zoology, for more information.

Biology - Marine & Freshwater Option

The marine and freshwater biology (MFB) option provides broad-based training in the aquatic biological sciences for students who prefer to take additional courses in the area of marine and freshwater biology. Students interested in aquaculture and fisheries may also choose this option by taking appropriate courses in consultation with their adviser. Students must choose eight courses in addition to the biology core curriculum courses to fulfill the requirements of this option.

Degree granted: B.S.

Program Website: <http://www.undergradcat.unh.edu/programs.cfm?id=3&page=programs&program=67>

Contact: Thomas L. Foxall, tf@christa.unh.edu

University of New Hampshire

Kingsbury Hall

Durham, NH 03824

University of New Orleans New Orleans, LA

Naval Architecture and Marine Engineering

The University of New Orleans (UNO) Naval Architecture and Marine Engineering (NAME) program is one of the fastest growing programs in the United States. UNO-NAME graduates are employed as engineers, project managers, and business executives throughout the world. UNO offers the Bachelor of Science in Naval Architecture and Marine Engineering (NAME), the Master of Science in Engineering, and the Ph.D. in Engineering and Applied Science. The first UNO Master's of Engineering degree (MSE) in NAME was awarded in 1984. Since then, a large number of UNO-NAME students have earned advanced degrees and entered employment in government R&D laboratories, naval architecture and offshore engineering design firms, as well as regulatory agencies and shipyards. Through UNO's Gulf Coast Region Maritime Technology Center, the National Biodynamics Laboratory, and the UNO-Avondale Maritime Technology Center of Excellence, there are a number of joint government-industry-UNO research projects available to qualified graduate research students. A UNO graduate student research assistant receives a full tuition waiver plus a modest living allowance. This, along with graduate scholarships, have enabled increasing numbers of UNO-NAME students to complete their graduate educations and begin their careers in the marine field.

Degree granted: B.S., M.S. and Ph.D.

Facilities: The School of Naval Architecture and Marine Engineering is located in a modern, state-of-the-art, nine-story engineering building. This building houses specialized laboratory facilities which include: A 128-ft-long towing tank with a 15-ft x 7-ft cross section for model tests of 8–12-ft-long models of ships and offshore structures in calm water and in waves, as well as in shallow water with current; A Model Shop for projects and for towing tank model and experiment manufacture; The UNO Structural Test System, a 20-ft x 20-ft-wide and 10-ft-high space frame with computer controlled hydraulic actuators for testing aluminum, steel and composite ship structural components; A Computer-Aided Ship Design Laboratory with an array of software packages for marine design and analysis; Linux High-Performance Computing Cluster—a modern 82 processor parallel computer for numerical analysis and simulation; A Marine Engineering Laboratory with programs on ship safety, operations, reliability, maintenance, and performance simulation of propulsion systems. Other prominent off-site facilities include: The UNO-Avondale Maritime Technology Center of Excellence: this building houses the Simulation Based Design Center, which promotes the use of electronic visualization, numerical simulation, and virtual reality in marine design and construction; The National Biodynamics Laboratory, for evaluation and improvement of human response factors to a sea environment.

Program Website: <http://www.name.uno.edu>

Contact: William S. Vorus, wworus@cox.net

Engineering and Applied Sciences- Research in Applied Mechanics

Degree granted: Ph.D.

Facilities: See description above.

Program Website: <http://www.name.uno.edu/graduate/overview.aspx#sec:phddegree>

Contact: William S. Vorus, wworus@cox.net

Engineering, Concentration in Marine Engineering

Degree granted: M.S.

Facilities: See description above.

Program Website: <http://www.name.uno.edu/graduate/overview.aspx>

Contact: William S. Vorus, wworus@cox.net

Engineering, Concentration in Naval Architecture

Degree granted: M.S.

Facilities: See description above.

Program Website: <http://www.name.uno.edu/graduate/overview.aspx#sec:nameatuno>

Contact: William S. Vorus, wworus@cox.net

University of New Orleans

911 Engineering Building

New Orleans, LA 70148

University of North Alabama

Florence, AL

Geography with a Geographic Information Science focus

Degree granted: B.S.

Program Website: <http://www2.una.edu/geography/program.htm>

Contact: Greg Gaston Ph.D., gggaston@una.edu

Marine Biology

The marine biology major is designed for students who wish to prepare for positions in the area of marine or aquatic biology or who plan graduate study in these fields. The standard courses for the major are offered on the university campus, with the specialized courses being taken through the Dauphin Island Sea Laboratory (DISL) near Mobile, Alabama. Students interested in this major should consult early with the chair of the department concerning courses, prerequisites, special arrangements, and costs. Requirements include a prescribed minor in chemistry and ancillary course work in computer science, mathematics, and physics.

Degree granted: B.S.

Program Website: <http://www2.una.edu/biology/programs/marine.html>

Contact: Paul D. Kittle, pdkittle@una.edu

University of North Alabama

Florence, AL 35632-0001

Find useful information on Internships,
Scholarships, and Professional Societies
in the appendices at the back of this Guide.

**University of North Carolina
at Chapel Hill**
Chapel Hill, NC

Marine Sciences (B.S.)

Although it emphasizes graduate training, the Department of Marine Sciences has offered an undergraduate minor to juniors and seniors since 1990. Requirements are rigorous, and students in the minor program tend to be among the university's best-performing undergraduates. Some have written research-based senior honors theses and published their results in professional journals. Others have won undergraduate research fellowships that have allowed them to take time off from their regular studies to pursue individual projects, sometimes in exotic locations (e.g., the Great Barrier Reef off Australia). Nearly all have chosen to work with faculty and/or staff scientists in the laboratory and field settings. Most undergraduate minors are science majors who go on to pursue advanced degrees. However, some non-science majors have used the minor as a way to explore the relationship between marine sciences and their respective major fields. Journalists interested in covering the environment as a "beat," political scientists wanting to study marine policy/law, and aspiring public school teachers who may one day teach oceanography are among those who can benefit from the program. All interested undergraduates, regardless of whether they plan to carry a minor, are encouraged to take introductory marine sciences courses and to participate in faculty-directed laboratory and field activities where possible. Opportunities may be found both on campus and at the coast. Summer internships at the Institute of Marine Sciences in Morehead City are especially popular.

Degree granted: B.S.

Program Website: <http://www.marine.unc.edu/students/ug/>

Contact: Carol Arnosti, arnosti@email.unc.edu

Marine Sciences (M.S. and Ph.D.)

Degree requirements include: participation in introductory courses in all four sub-disciplines and an interdisciplinary seminar, a period of study or research at a marine station or on an oceanographic cruise, a thesis or dissertation based on original research, and presentation of a satisfactory research seminar. Thirty semester hours of coursework are required for the M.S.; no specific coursework requirement is set for the Ph.D. Knowledge of a foreign language is desirable, but not mandatory. A faculty committee, chaired by the student's advisor, oversees his/her degree program.

Degree granted: M.S. and Ph.D.

Program Website: <http://www.marine.unc.edu/students/grad/>

Contact: Carol Arnosti, arnosti@email.unc.edu

**University of North Carolina
at Wilmington**
Wilmington, NC

Marine Science

The UNCW Master of Science in marine science program is an interdisciplinary program in which students take courses in several core areas and conduct research in an aspect of marine science. Students write and present a research-based thesis. A marine policy concentration is available. UNCW also offers a Bachelor of Science, Master of Science and Ph.D. in marine biology, and Master of Science programs with marine research in chemistry and geology. Cape Fear Community College, also located in Wilmington, offers two-year programs in marine technology.

Degree granted: M.S.

Facilities: The M.S. marine science program is located in the Center for Marine Science and also in several academic buildings including Dobo Hall, DeLoach Hall, Friday Hall as well as in the Wrightsville Beach Aquaculture Facility. The Center for Marine Science operates a fleet of small boats as well as the 68-foot RV Cape Fear. <http://www.uncw.edu/cmsr/facilities/index.html>

Faculty: Please see the web page <http://www.uncw.edu/mms>

2007 tuition: In-state residents: \$4,700; Out-of-State: \$14,565

Program Website: <http://www.uncwil.edu/mms/>

Contact: Dr. Joan D. Willey, willeyj@uncw.edu
University of North Carolina at Wilmington
Chemistry, UNCW
601 S. College Road, Wilmington, NC 28403
Phone: 910-962-3459

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You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

Marine Science - Marine Geology focus**Degree granted:** M.S.

Facilities: The M.S. marine science program is located in the Center for Marine Science and also in several academic buildings including Dobo Hall, DeLoach Hall, Friday Hall as well as in the Wrightsville Beach Aquaculture Facility. The Center for Marine Science operates a fleet of small boats as well as the 68 foot RV Cape Fear. Research conducted in the Coastal and Marine Geophysics Laboratory (CMGL) at UNCW's Center for Marine Science is global in scope and involves the collection and analysis of a broad range of geophysical data. Major research focus areas include marine tectonics (mid-ocean ridge and subduction zone processes), seabed classification (estuarine and coastal ocean benthic habitats), and geohazards (active faults, submarine landslides and tsunamis, volcanic eruptions). Ongoing research programs include investigations of the morphology, structure and tectonics of the Southwest Indian Ridge, and the northeastern Caribbean-North American plate boundary (Puerto Rico Trench) using multibeam bathymetry, sidescan sonar, gravity, magnetics and single-channel seismic data. Multichannel seismic data and deep-sea scientific drilling are being utilized to investigate the tectonic, volcanic, sedimentary history and paleoclimate of the Caribbean basin and western Pacific. Coastal aspects of the program include the use of a ground-penetrating radar system for archeologic investigations of Tambora volcano in Indonesia, and beach and coastal plain stratigraphy in North Carolina. In addition, high-resolution sidescan sonar and sub-bottom profiler systems are being used to monitor storm-driven sediment dynamics and to characterize the seabed habitats in the near-shore and mid-continental shelf off the SE North Carolina and Florida coasts, and to identify active faults on the western and southern insular shelf of Puerto Rico.

Faculty: Dr. Lewis Abrams: use of physical/chemical properties of subsurface marine sediments to detect paleoclimatic and volcanic cycles; tectonic, volcanic and sedimentary history of the Caribbean basin and western Pacific. Dr. William J. Cleary: inlet morphology; shoreface sediment dynamics. Dr. Doug Gamble: Climatology, hydrology. Dr. Nancy Grindlay: morphology and tectonics of submarine transform, convergent, and divergent plate boundaries using high-resolution swathmapping and geophysical instrumentation. Dr. Joanne Halls: Geographic Information Systems. Dr. Eric Henry: Coastal hydrology, water resources. Dr. Patricia Kelley: evolution and paleoecology of Coastal Plain molluscs, including escalation of predator-prey relationships from the Cretaceous through Recent. Dr. Richard A. Laws: biology and paleontology of marine phytoplankton and microphytobenthos. Dr. Lynn

A. Leonard: dissolved and particulate fluxes in estuarine systems; depositional processes and evolution of tidal wetlands; sediment dynamics in estuarine systems. Dr. Craig Tobias: fate and transport of macroelements (e.g. carbon, nitrogen, and oxygen) in a variety of aquatic and near-shore marine habitats

Program Website: <http://www.uncwil.edu/mms/>

Contact: Dr. Joan D. Willey, willeyj@uncw.edu
University of North Carolina at Wilmington
Chemistry, UNCW
601 S. College Road, Wilmington, NC 28403
Phone: 910-962-3459

Marine Science - Chemical Oceanography focus**Degree granted:** M.S.**Facilities:** See description above.

Faculty: Dr. G. Brooks Avery, Jr.: biogeochemical cycling in sediments, the water column, and the atmosphere; use of ^{13}C and ^{14}C isotopes of carbon to study sources and fluxes of globally important organic carbon compounds. Dr. Daniel G. Baden: distribution, composition, toxicity and structure of marine toxins. Dr. Robert J. Kieber: marine geochemistry, photochemistry and air-sea exchange processes; global carbon cycling, acid rain and nutrient dynamics. Dr. Pamela J. Seaton: structure: activity relationships in bioactive marine natural products; structural analysis and function of algal, fish and dolphin lipids. Dr. Stephen A. Skrabal: geochemistry and biogeochemistry of trace metals (titanium, silver, copper and iron) in estuarine and marine environments. Dr. Joan D. Willey (Associate Director for Education, CMS): impacts of rainwater on surface seawater chemistry and biological productivity; rainwater dissolved organic carbon as a part of the global carbon cycle, redox chemistry of trace metals in rainwater. Dr. Jeffery Wright: Bioorganic chemistry (isolation and identification of bioactive compounds from marine organisms); identification and analysis of naturally occurring marine toxins

Program Website: <http://www.uncwil.edu/mms/>

Contact: Dr. Joan D. Willey, willeyj@uncw.edu
University of North Carolina at Wilmington
Chemistry, UNCW
601 S. College Road, Wilmington, NC 28403
Phone: 910-962-3459

Marine Science - Physical Oceanography focus**Degree granted:** M.S.**Facilities:** See description above.

Faculty: Dr. Frederick M. Bingham: large scale ocean circulation, distribution of water mass properties, western boundary current dynamics. Dr. Wei Feng: reaction-diffusion systems; mathematical modeling in biology and

ecology. Dr. Russell L. Herman: nonlinear wave equations, dynamical systems and chaos, general relativity, generalized transforms (including wavelets). Dr. John Morrison: Descriptive physical oceanography, general ocean circulation, air-sea interaction and climate, Ocean Observing Systems.

Program Website: <http://www.uncwil.edu/mms/>

Contact: Dr. Joan D. Willey, willeyj@uncw.edu
University of North Carolina at Wilmington
Chemistry, UNCW
601 S. College Road, Wilmington, NC 28403
Phone: 910-962-3459

Ph.D. in Marine Biology

The graduate programs in marine biology and biology are designed (1) to prepare students for further graduate work leading to a Ph.D.; (2) to provide professional biologists with advanced research and educational opportunities; (3) to prepare students as managers of coastal and marine resources, trained to deal with contemporary problems in the environment; and (4) to provide students with a broad-based graduate program allowing for specialization in the diverse fields of inquiry represented by the faculty of the department.

Degree granted: Ph.D.

Facilities: The Department of Biology and Marine Biology is located in the Dobo Hall and in Friday Hall, which house modern research and teaching facilities. Additional faculty research laboratories are located in the nearby Center for Marine Science (CMS), an integral part of the university that promotes basic and applied research in the fields of oceanography, coastal and wetlands studies, marine biomedical and environmental physiology, and marine biotechnology and aquaculture. The university's laboratories contain modern equipment that enables study in disciplines as diverse as molecular and cellular biology, light and electron microscopy, organismal biology and behavior, and ecology. Boats ranging from 13 to 25 feet are available through CMS for coastal research. CMS also operates the 63-foot R/V Cape Fear. Larger vessels for offshore work are available through a consortium of North Carolina universities that support the 135-foot research vessel Cape Hatteras. The university is also the host organization for one of the NOAA-sponsored National Undersea Research Centers (NURC). This program supports fisheries management research, studies of ocean floor processes, and other shelf research from the Gulf of Maine to the Gulf of Mexico. NURC facilities include remote operated vehicles and the undersea habitat, Aquarius. Undeveloped barrier islands are located within a short distance of the university, as are two estuarine sanctuaries that provide broad expanses of coastal

marsh. Locally, Wilmington and the surrounding area contain large wetland ecosystems, as well as an expansive tidal swamp associated with the Cape Fear estuary.

Faculty: <http://www.uncw.edu/bio/grad-facultystaff.html>

Program Website: <http://www.uncw.edu/bio/grad-phd.html>

Contact: Ann Pabst, Pabsta@uncw.edu

Phone: 910-962-7266

M.S. in Marine Biology

See description above.

Degree granted: M.S.

Facilities and Faculty: See description above.

Program Website: <http://www.uncw.edu/bio/grad-ms.html>

Contact: Ann Pabst, Pabsta@uncw.edu

Phone: 910-962-7266

University of North Dakota Grand Forks, ND

Fisheries and Wildlife Biology

The department offers a four-year program leading to the degree of Bachelor of Science in Fisheries and Wildlife Biology. Students completing this program are qualified to obtain positions with state, federal and private fisheries and wildlife organizations.

Degree granted: B.S.

Program Website: http://www.und.edu/dept/biology/fisheries_and_wildlife.htm

Atmospheric Science

To master the science of weather, we need to gain an understanding of physical sciences and how they apply to the atmosphere. The curriculum at the University of North Dakota provides students with a strong background in the basic physical sciences including physics, chemistry and applied mathematics. These are prerequisites for rigorous study of atmospheric processes. Students also have the opportunity for hands-on experience in computer methods and access to both traditional and new technologies for atmospheric data processing and analysis.

Degree granted: Minor

Program Website: http://www.atmos.und.edu/f4_Undergraduate/index.php

Contact: atmos@aero.und.edu

Phone: 701-777-2184, Fax: 701-777-5032

Check the appendices at the back of this Guide for higher education program listings by Location and Subject.

Atmospheric Science

The Department of Atmospheric Sciences takes pride in promoting experiential (or “hands-on”) learning opportunities for undergraduate students. The department has state-of-the-art research facilities that include a dual-polarization Doppler radar, a highly instrumented atmospheric and hydrologic ground research facility, and a surface transportation field research site. Students frequently work with faculty on current research projects. We have also been very successful at promoting internship opportunities for students. The proximity of a National Weather Service Weather Forecast Office allows students to gain experience in operational meteorology.

Degree granted: B.S.

Program Website: http://www.atmos.und.edu/f4_Undergraduate/index.php

Contact: atmos@aero.und.edu

Phone: 701-777-2184, Fax: 701-777-5032

Geographic Information Science

The Geography Department offers a graduate-level certificate in Geographic Information Sciences (GISc). Students wishing to enroll in the certificate program must apply to the UND Graduate School. The certificate option is open to students pursuing graduate degrees in departments other than Geography, or to any other interested person who holds a bachelor's degree from an accredited university.

Degree granted: Certificate

Program Website: <http://www.und.edu/dept/Geog/gradcert.html>

Contact: Dr. Bradley C. Rundquist, bradley_rundquist@und.nodak.edu

Phone: 701-777-4589

Biology with focus in Fisheries Biology

The Department of Biology offers graduate studies designed to prepare students for academic teaching and research, research in government service, research and developmental opportunities in industry, and functioning as a professional biologist.

A reputation for excellence in the area of “Ecology of the Northern Great Plains” has been developed, and the Ph.D. program has been designated by the Western Interstate Commission for Higher Education (WICHE) as a Western Regional Graduate Program because of its uniqueness and strength. It is open to residents of the 13 western states at resident tuition rates.

Degree granted: M.S. and Ph.D.

Facilities: The department is located in Starcher Hall which was completed in 1981. This structure contains greenhouse facilities, herbarium, controlled environment chambers, animal

rooms for terrestrial and aquatic organisms, observation rooms for behavioral studies, vertebrate and invertebrate research museums, tissue culture, isotope, chromatography, DNA sequencing, data analysis rooms, molecular biology laboratories, and a darkroom. The department operates two field stations for research and class use. The Forest River Biology Area consists of 160 acres and is 40 miles from the campus. It includes habitats suitable for studies in aquatic and woodland biology: spring brook, swamp, moist and dry woods, and a section of the Forest River. The Oakville Prairie Station consists of 950 acres of virgin lowland prairie and is located 12 miles from the campus. The Biology Department and the North Dakota Game and Fish Department have a history of cooperative research involving the management of sport and commercial fisheries and wildlife.

Program Website: <http://www.und.nodak.edu/dept/Registrar/catalogs/catalog/graddept/depts/biol.htm>

Contact: Isaac Schlosser, isaac.schlosser@und.nodak.edu

University of North Dakota
Grand Forks, ND 58202-9006

University of Oregon

Eugene, OR

Marine Biology

The biology department has a formal program leading to a master's degree in the areas of Ecology and Evolution and Marine Biology. The degree is offered in both “course-only” and “thesis” programs. Students admitted to the Master's program in marine biology are expected to pursue the “thesis” option. (See *Oregon Institute of Marine Biology*.)

Degree granted: M.S.

Program Website: <http://biology.uoregon.edu/graduate/Master's.php>

Contact: Nora Terwilliger, nterwill@uoregon.edu

Marine Biology

The course of study for the Ph.D. culminates in the oral public defense of a dissertation that is a significant contribution to the field of study. In order to choose a research topic for the dissertation, students participate in a rotation program during their first year of study. The rotation program provides an opportunity to carry out research in a different laboratory each term, thereby obtaining direct experience with both thinking about and participating in a variety of research problems. Students generally select a laboratory in which to conduct their dissertation research at the end of the first year.

Degree granted: Ph.D.

Program Website: <http://biology.uoregon.edu/graduate/phd.php>

Contact: Richard Emlet, remlet@uoregon.edu

Phone: 541-346-4502, Fax: 541-346-6056

Ecology and Evolutionary Biology

The Center for Ecology and Evolutionary Biology (CEEB) promotes and facilitates research and graduate education in ecology and evolutionary biology. The center encourages scientific interactions among its members and between members and the wider academic community. It fosters a collegial and stimulating intellectual environment; supports the development of shared research facilities; and sponsors seminars, workshops, and colloquiums.

Because the varied expertise of its members is focused on related problems, researchers with specialties ranging from molecular evolution to the study of ecosystems directly benefit from interacting with one another. Active research programs use several approaches in the laboratory or in the field to investigate questions related to molecular evolution, evolutionary genetics, evolution of development, microbial ecology, pathogen-host interactions, global change, biogeochemistry, population biology, community dynamics, and ecosystem ecology.

Degree granted: M.S.

Program Website: <http://evolution.uoregon.edu/>

Contact: Brendan Bohannon, bohannon@uoregon.edu

Center for Ecology & Evolutionary Biology

335 Pacific Hall, 5289 University of Oregon

Eugene, OR 97403-5289

541-346-4532

Environmental and Natural Resource Law

The University of Oregon was the first public law school in the nation to establish an environmental law program, and our professors, students and alumni have played leading roles in the public environmental movement. We draw a tremendously talented and committed student body, with many individuals engaging in environmental work during their time in law school. Our program is part of a world-class research institution with a focus on environmental studies. Our faculty members are some of the nation's leading scholars in the field of environmental law. Academic life is enriched by extra-curricular activities that immerse students in scholarship and service opportunities in the environmental area.

Degree granted: M.A.

Program Website: <http://www.law.uoregon.edu/org/enr/>

Contact: enr@uoregon.edu, 541-346-1395

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University of Oregon

Oregon Institute of Marine Biology

Charleston, OR

OIMB offers access to an unusual range of habitat diversity. All along the Oregon coast, the American Plate is overriding the Juan de Fuca Plate. The resulting coastline is steep, with rugged sea cliffs and headlands leading sharply up to the Coastal Ranges. In comparison to the passive margin of the east coast of the United States, estuaries and sand beaches are rare along the active margin of the west coast. OIMB's site, however, provides access to a wide variety of coastal and upland habitats. To the south, a typical west coast system of rocky headlands, rocky intertidal zones, and a few protected sandy coves are contained within State Parks. To the north, the Oregon Dunes System of high-energy sandy beaches, shifting coastal dunes and permanent and temporary lakes extends for 40 miles and is protected as the Oregon National Dunes Recreation Area. Coos Bay itself, like most west coast estuaries, is a drowned river mouth resulting from sea-level rise following the end of the last ice age. It is the largest estuary entirely within Oregon, and contains an extensive network of tidal channels, sand bars, mud flats, eelgrass beds, and salt marshes.

Program Website: <http://darkwing.uoregon.edu/~oimb/>

Contact: oimb@uoregon.edu

Phone: 541-888-2581, Fax: 541-888-3250

B.S. or B.A. in Biology with Marine Biology emphasis

Degree granted: B.S. and B.A.

Program Website: <http://www.uoregon.edu/~oimb/Academics/emphasismb.html>

Contact: oimb@uoregon.edu

Phone: 541-888-2581, Fax: 541-888-3250

Marine Biology

The University of Oregon has recently approved a new Baccalaureate Degree (B.S. or B.A.) in Marine Biology, one of only a handful of such degrees offered on the Pacific Coast. Undergraduate students accepted into this exciting new major will receive the same solid background in modern Biology (including cell biology, molecular biology, evolutionary biology, physiology and ecology) as a U. of O. Biology major, but will also experience several terms of the hands-on field-based learning for which marine laboratories, including O.I.M.B., are renowned. Career options for Marine Biology graduates include jobs in state and federal government, advanced training for research and teaching in the marine sciences and most other careers available to broadly

trained biologists. The background offered by this major is entirely appropriate for medical, dental or veterinary school. The first class of marine biology majors was accepted in Fall Term of 2004.

Students in the marine biology major spend time on the Eugene campus and at the Oregon Institute of Marine Biology. In Eugene, students take introductory biology courses and fulfill chemistry, mathematics, physics, and general education requirements. Upper division biology courses are taken at OIMB and the marine biology major requires students to spend a minimum of three terms at the OIMB campus in Charleston. Courses are offered at OIMB during spring, summer and fall terms. The OIMB campus has dorms and a dining hall to accommodate students

Degree granted: B.S. and B.A.

Program Website: <http://darkwing.uoregon.edu/~oimb/Academics/marinebiomajorone.html>

Contact: Richard Emlet, remlet@uoregon.edu
Phone: 541-888-2581, Fax: 541-888-3250

University of Rhode Island Narragansett, RI

College of Engineering

Ocean Engineering

The Department of Ocean Engineering provides a challenging and diverse intellectual environment offering academic programs leading to B.S., M.S., and Ph.D. degrees. Our graduate program in ocean engineering was established in 1966 and was the first of its type in the United States. The more recently established undergraduate program is one of a limited number of ABET-accredited programs in the country. As a student in URI's ocean engineering program, you'll learn from faculty who are internationally recognized for their contributions in research and education.

Degree granted: B.S., M.S. and Ph.D.

Facilities: The Department of Ocean Engineering is located in the Sheets Building on the Narragansett Bay Campus, which also houses a marine geomechanics laboratory, a wave/tow tank facility, and faculty offices. The adjacent Middleton building contains office space, a machine shop, an acoustic test tank, an electronics laboratory, and an equipment staging area. The department also has computational facilities on the Bay Campus which include personal computers and SUN workstations. These computers are connected by high speed network to the rest of the Bay Campus, Kingston campus and the Internet. Over 3,000 square feet of laboratory space is available, with equipment specially designed for research and the testing



Aerial view of the University of Rhode Island Graduate School of Oceanography; photo by Don Bousquet and Son Aerial Photography.

of marine sediments in the Marine Geomechanics Laboratory. State-of-the-art geotechnical equipment is used for tests and studies on direct simple shear; anisotropic triaxial compression; drained creep; acoustic velocity; and special flow-pump systems for triaxial, permeability, and compressibility studies. The vessel also has a multi-sensor core logging system. Other associated facilities include X-ray diffraction equipment, a scanning electron microscope, and devices for seafloor sampling. The department maintains and operates a wave and tow tank that is 30 m long, 3.5 m wide, and 1.5 m deep. It is equipped with a flapper-type wave maker that generates both sinusoidal and random waves. A specially designed vertical multi-plate porous wave absorber is employed to damp waves. The tow carriage is equipped with a strain gauge system and is capable of making force and angular measurements of heave, roll, and yawing motions. The wave maker and data acquisition system are computer controlled and are capable of random or regular wave generation. Wave measurements are made using custom-designed wave height and pressure gauges. The tank has been used for a wide variety of experiments including ship resistance and propulsion, wave kinematics and dynamics, diver drag measurements, fishing trawl dynamics, buoy dynamics, and underwater vehicle drag. In the Middleton Building on the Narragansett Bay Campus, the department maintains and operates an acoustics test facility that is 4 m wide, 7.6 m long, and 3.6 m deep. It has two towers, with manual control in the horizontal direction and electrical control in the vertical. The towers can be rotated about the vertical axis with an accuracy of one degree. A third carriage, which is independent of the towers, is mounted on a separate track. A computer data acquisition system processes the data. The tank is filled with fresh water, which is cleansed by a standard filtration system. This facility has been used for extensive experiments including

beam pattern measurements of acoustic transducers and arrays, studies of acoustic parametric sources, and the development of subbottom profiling sonar systems and underwater diver communication systems.

Faculty: http://www.oce.uri.edu/faculty_pages/Faculty.htm

Program Website: <http://www.oce.uri.edu/graduate.html>

Contact: grilli@oce.uri.edu

Ocean Engineering with specialization in Coastal and Offshore Structures

Degree granted: B.S., M.S. and Ph.D.

Facilities: See preceding description of Department of Ocean Engineering.

Faculty: http://www.oce.uri.edu/faculty_pages/Faculty.htm

Program Website: <http://www.oce.uri.edu/graduate.html>

Contact: Christopher D. P. Baxter, baxter@oce.uri.edu

Ocean Engineering with specialization in Marine Geomechanics

Marine geomechanics is directed toward development of a broad background in the theory and practice of geotechnics in the ocean environment. The research includes experimental and modeling studies to understand and predict properties and behavior of the seabed. Recent sponsored research has included studies on: sediment stress-strain and strength properties; anchor systems; seabed disposal of dredge materials; cable and pipeline siting and burial; instrument development for sediment sampling and *in situ* testing; seabed processes including sediment erosion, slope stability, creep deformations, and dynamic processes; foundations for offshore and coastal structures; ice-sediment interactions; dynamic soil properties; and microstructure of sediments. Current research projects, sponsored by four different agencies, focus on downslope processes of slope and rise sediments, coastal benthic boundary-layer processes and properties, ocean disposal of contaminated dredged materials, and geoacoustic properties of the seabed related to mine detection. Modern geotechnical laboratory facilities have up-to-date and specially designed equipment for research on marine sediments.

Degree granted: B.S., M.S. and Ph.D.

Facilities: See preceding description of Department of Ocean Engineering.

Faculty: Each faculty member is a specialist in one or a few of the major areas of ocean engineering, and the faculty as a whole is thus able to prepare students for entry into the broad range of ocean engineering jobs in academia, industry, and government. http://www.oce.uri.edu/faculty_pages/Faculty.htm

Program Website: <http://www.oce.uri.edu/graduate.html>

Contact: Christopher D. P. Baxter, baxter@oce.uri.edu (Ph.D.) or grilli@oce.uri.edu (M.S.)

Ocean Engineering with specialization in Coastal and Nearshore Modeling

Coastal and nearshore modeling deals with the physical and numerical modeling of coastal and nearshore processes. Models are developed, applied, and verified with field and laboratory measurements. Wind-wave generation, wave refraction, diffraction, shoaling and breaking, surf-zone dynamics and littoral transport, pollutant and oil spill transport, harbor oscillations, tidal and wind-driven circulation in coastal and estuarine waters, and tidal inlet and barrier-island-related problems are studied. Finite difference, finite element, and boundary elements numerical methods are used. The department is also leading in the development of shell-based PC models, with advanced user-friendly graphic interface, model grid generation tools, envision mental management tools, and geographic information systems.

Degree granted: B.S., M.S. and Ph.D.

Facilities: See preceding description of Department of Ocean Engineering.

Faculty: http://www.oce.uri.edu/faculty_pages/Faculty.htm

Program Website: <http://www.oce.uri.edu/graduate.html>

Contact: grilli@oce.uri.edu

Ocean Engineering with specialization in Marine Hydrodynamics and Water-Wave Mechanics

Degree granted: M.S. and Ph.D.

Program Website: <http://www.oce.uri.edu/graduate.html>

Contact: baxter@oce.uri.edu

Ocean Engineering with specialization in Underwater Acoustics and Data Analysis

Degree granted: B.S., M.S. and Ph.D.

Facilities: See preceding description of Department of Ocean Engineering.

Faculty: http://www.oce.uri.edu/faculty_pages/Faculty.htm

Program Website: <http://www.oce.uri.edu/graduate.html>

Contact: miller@uri.edu

Ocean Engineering with specialization in Ocean Instrumentation and Seafloor Mapping

Degree granted: B.S., M.S. and Ph.D.

Facilities: See preceding description of Department of Ocean Engineering.

Faculty: http://www.oce.uri.edu/faculty_pages/Faculty.htm

Contact: tyce@oce.uri.edu

University of Rhode Island

215 Sheets Building

Narragansett Bay Campus

Narragansett, RI 02882

Graduate School of Oceanography

The Graduate School of Oceanography grants the M.S. and Ph.D. in Oceanography. Students may specialize in Archaeological Oceanography, Biological Oceanography, Chemical Oceanography, Geological Oceanography and Physical Oceanography.

Contact: Dr. David Smith, Assoc. Dean for Academic Affairs, assoc_dean@gso.uri.edu

Program Website: www.gso.uri.edu for additional information.

Archaeological Oceanography

In conjunction with the Institute of Archaeological Oceanography, URI is now offering an Archaeological Oceanography joint degree program in which students simultaneously take an M.A. in History (Anthropology and Archaeology Option) and a Ph.D. in Oceanography. Six credits from each degree may be counted toward the degree requirements of the other, thus reducing the total requirements by 12 credits (i.e., $24+66 = 90$ credits total). Students wishing to enroll in the Archaeological Oceanography Joint Degree Program must apply to be admitted both to the History Department's M.A. program (Anthropology and Archaeology Option) and to one of the four disciplines of the GSO Ph.D. program. They must therefore have strong preparation in both the Humanities and the Sciences.

Degree granted: M.A. in History and Ph.D.

Contact: Prof. Lawrence Juda, ljuda@uri.edu
University of Rhode Island
9 Alumni Avenue
Kingston, RI 02881

Biological Oceanography

Biological oceanographers study the relationship between living organisms in the ocean and their environment. Students may choose from a wide variety of courses specializing in specific organism groups such as microbes, phytoplankton, zooplankton, and fish, as well as courses in the ecology of organism groups or ecosystems. Students with many different undergraduate backgrounds have successfully completed an M.S. or Ph.D. degree in biological oceanography at GSO. However, an undergraduate student should be prepared for our graduate program if they have an undergraduate major in botany, zoology or biology (including marine biology) and in addition, their undergraduate program includes mathematics through calculus and one semester each of physics and chemistry. Organic chemistry, biochemistry, geology, statistics, a second semester of calculus and physics, and computer literacy are recommended.

Degree granted: M.S. and Ph.D.

Facilities: Because of the wide range of research activities conducted at GSO, an extensive and specialized array of scientific and technical equipment and services is required. Most of the laboratories and instrument facilities are state-of-the-art and unique to GSO.

Faculty: Jeremy S. Collie, quantitative marine ecology; Edward G. Durbin, marine planktonic food chains, zooplankton, and fish ecology; Scott W. Nixon, estuarine and wetland ecosystems; Stephen B. Olsen, coastal management; Candace A. Oviatt, marine ecology; Charles T. Roman, coastal ecosystems, ecology of estuaries and salt marshes; Theodore J. Smayda, phytoplankton ecology and physiology; David C. Smith, marine microbial ecology; Jennifer Specker, fish endocrinology, adaptation and development; Karen Wishner, marine zooplankton ecology, deep-sea biology.

Chemical Oceanography

Chemical oceanographers study the chemical composition of seawater and how it is affected by physical mixing processes and by interactions with the atmosphere, the biosphere, and the sediments and rocks which form the seafloor. The most basic courses include chemical oceanography and the distribution of chemical species in seawater. Students may also specialize in the organic chemistry of seawater and sediments, physical chemistry of seawater, geochemistry of natural and artificial radionuclides, photochemical reactions in seawater, air-sea chemical interactions, and the chemical cycling of elements important to biological systems such as carbon, sulfur, and nitrogen.

Degree granted: M.S. and Ph.D.

Facilities: Because of the wide range of research activities conducted at GSO, an extensive and specialized array of scientific and technical equipment and services is required. Most of the laboratories and instrument facilities are state-of-the-art and unique to GSO. A number of research laboratories at the Graduate School of Oceanography can provide analytical services on a per-sample basis or by arrangement. In addition, GSO has a machining and fabrication facility, seawater facilities, and a pressure test facility that can be used, by arrangement, by persons outside of the University of Rhode Island. In addition to facilities and specific analytical services, arrangements may be made with individual or teams of researchers to test materials, equipment, etc.

Faculty: Brian Heikes, atmospheric chemistry, atmospheric oxidants, heterogeneous processes; Rainer Lohmann, organic geochemistry of organic pollutants and black carbon-atmospheric and marine fluxes; John T. Merrill, atmospheric transport, atmospheric waves; S. Bradley Moran, trace element and radionuclide geochemistry,

oceanic particle dynamics; Rebecca Robinson, paleoceanography, global biogeochemical cycles.

Program Website: <http://www.gso.uri.edu/academics/index.html#grad>

Contact: Brian Heikes, bheikes@gso.uri.edu
University of Rhode Island
9 Alumni Avenue
Kingston, RI 02881

Geological Oceanography

Research Groups: *Marine Geophysics and Geodynamics:* Computational and laboratory modeling of the physics of the solid earth, including plate tectonics, mantle convection, mantle flow at subduction zones and mid-ocean ridges, mid-ocean ridge morphology, evolution of the oceanic crust, seismology, seismic tomography, magnetic reversal stratigraphy, and mantle plumes. *Volcanology and Geochemistry:* Our scientists study subaerial and submarine volcanoes from a variety of tectonic settings including island arcs, back-arc basins, mid-ocean ridges, and oceanic islands associated with mantle plumes. Igneous petrology, high temperature geochemistry, and volcanoclastic sedimentation are all current areas of research. *Paleoceanography and Paleoclimatology:* Paleoenvironmental research focuses on paleo and environmental magnetism of deep-sea and lake sediments, extinction and recovery of marine plankton across the Cretaceous/Tertiary boundary, and the geochemistry and mineralogy of deep-sea sediments. *Coastal Physical Oceanography:* Research focuses on coastal circulation, primarily in and around Narragansett Bay.

Degree granted: M.S. and Ph.D.

Facilities: Because of the wide range of research activities conducted at GSO, an extensive and specialized array of scientific and technical equipment and services is required. Most of the laboratories and instrument facilities are state-of-the-art and unique to GSO.

Faculty: Robert D. Ballard, geology of continental margins, volcanic, and hydrothermal processes at the mid-ocean ridge, development of ROV systems; Steven N. Carey, volcanology and marine volcanoclastic sedimentation; Steven D'Hondt, geobiology; John Farrell, paleoceanography, paleoclimatology, low-temperature stable isotope geochemistry; Christopher Kincaid, solid-earth geophysics; John King, paleomagnetism, rock magnetism, palynology; Kate Moran, marine geotechnics; Yang Shen, marine geophysics, seismology; Arthur Spivack, geochemistry, dynamics and evolution of the chemistry of the ocean atmosphere and sediments; Tatiana Rynearson, marine genomics and population genetics.

Physical Oceanography

Physical oceanographers seek to understand the physical processes that govern the circulation of the ocean and the coupled atmosphere-ocean system. PO students obtain a broad background from courses in the physical circulation of the ocean, the nature of wave motion, and geophysical fluid dynamics. Advanced courses reflect theoretical modeling/observational strengths at GSO/URI: air-sea interaction; large-scale ocean circulation; eddies, waves, and instabilities; small-scale mixing and turbulent processes; ocean heat-fluxes and storage; climate change. Research opportunities exist for students to apply state-of-the-art techniques in: satellite remote sensing; computer modeling of atmosphere and ocean processes; laboratory modeling of geophysical fluid dynamics; observational studies in air-sea interaction, mixing processes, or large-scale circulation—often using unique instruments developed at GSO/URI. We attempt to engage students in ongoing research as soon as they arrive.

Degree granted: M.S. and Ph.D.

Facilities: URI operates one of the finest deep-ocean research ships in the world. We have a machine shop, electronics engineers, and a marine technician support group. We are leaders in ocean-instrument development: state-of-the-art equipment includes moored current meter arrays, subsurface RAFOS neutral-buoyancy floats tracked using moored sound sources, free-fall Lagrangian velocity profilers, Inverted Echo Sounders (IES, acoustic probes of ocean thermal structure), including bottom pressure recorders (PIES), and the latest shipboard hydrographic survey electronics. In the laboratory we study experimental rotating and stratified fluid motions, as well as problems on convection of viscous fluids, using a variety of flow visualization techniques. The Physical Oceanography Group operates and manages resources for high-performance computing and communication, scientific visualization, and computer graphics. These facilities include a supercomputer and an ever-evolving suite of networked workstations. The comprehensive marine library includes the U.S. National Sea Grant Depository. Opportunities exist for close interaction with staff in other oceanographic disciplines and at the adjacent National Marine Fisheries Service, the Environmental Protection Agency, and the nearby Navy laboratories.

Faculty: Peter Cornillon, remote sensing oceanography; Kathleen Donohue, ocean circulation; David Farmer, stratified flow past topography, acoustical oceanography; Isaac Ginis, structure and dynamics of the coupled ocean-atmosphere system; Tetsu Hara, surface waves, air-sea interaction; David L. Hebert, small-scale mixing processes; H. Thomas Rossby, ocean circulation and instrumentation; Lewis Rothstein, geophysical fluid dynamics, equatorial dynamics; D. Randolph Watts, dynamics of ocean currents and fronts; Mark Wimbush, turbulence, tides and waves.

(Boston); Prof. Lawrence Juda, Ph.D., Political Science/International Relations, Columbia University; Prof. Seth Macinko, Ph.D., Environmental Science, Policy, Management, University of California (Berkeley); Prof. Bruce Marti, Ph.D., Geography, University of Florida; Prof. Dennis Nixon, J.D., University of Cincinnati Law School; Prof. Richard Pollnac, Ph.D., Anthropology, University of Missouri; Prof. Robert Thompson, J.D./Ph.D., Community Planning, University of California (Berkeley).

Program Website: <http://www.uri.edu/cels/acaddept/coastmarpolmgt.html>

Contact: Dr. Lawrence Juda, LJUDA@uri.edu

Oceanography/Marine Affairs

The Graduate School of Oceanography and the Department of Marine Affairs of the College of Environment and Life Sciences offer a Joint Degree Program in which students simultaneously take an Oceanography Ph.D. and a Master of Marine Affairs (M.M.A.) degree. The program in Marine Affairs focuses on ocean/coastal management, policy, and law and the joint degree program will prepare scientists with policy knowledge and skills needed in many contemporary professional positions, in government agencies and elsewhere. At the discretion of the cognizant Major Professor, up to six credits from each degree may be counted toward the degree requirements of the other, thus, reducing the total requirements by up to 12 credits (to 66 + 24 = 90). Students wishing to enroll in the Joint Degree Program must be admitted to both the Marine Affairs Department's M.M.A. program and the GSO Ph.D. degree program. To ensure adequate marine experience, a student in the program may not be nominated for the M.M.A. degree until the comprehensive examinations in the oceanography doctoral program are successfully completed.

Degree granted: M.M.A. and Ph.D.

Facilities and Faculty: See Department of Marine Affairs description above.

Program Website: <http://www.gso.uri.edu/academics/index.html#ma>

Contact: Prof. Lawrence Juda, ljuda@uri.edu

Department of Fisheries, Animal & Veterinary Science

Aquaculture and Fisheries Technology

The Aquaculture and Fisheries Technology major offers a number of aquatic and marine-related subjects with opportunities for developing both conceptual and practical skills. Laboratory training is supplemented with instruction on board the department's teaching and research vessel.

Degree granted: B.S.

Program Website: <http://www.uri.edu/cels/acaddept/aqfishtech.html>

Contact: Dr. David Bengtson, bengtson@uri.edu

Department of Environmental & Natural Resource Economics

Resource Economics and Commerce

Environmental Economics and Management

Resource economists study interactions between economic and natural systems, with the goal of developing a sustainable and efficient economy. Our department focuses on issues related to the spectrum of natural resource and environmental management, with particular strengths in fisheries, the marine environment, associated coastal watersheds and terrestrial systems, and international trade.

Degree granted: B.S.

Facilities: The program is housed in the Coastal Institute Building on the Kingston campus. The facility houses one of the nation's few state-of-the-art experimental economics laboratories (The SimLab).

Faculty: Anderson, James, Ph.D., UC Davis, Fisheries, Aquaculture, Markets & Trade; Anderson, Chris, Ph.D., CTech, Experimental markets, fisheries, wetlands; Gates, John, Ph.D., UC Berkeley, Fisheries Mgt.; Grigunus, Tom, Ph.D., UMD, Marine Pollution, Ports; Opaluch, James, Ph.D., UC Berkeley, Marine pollution, invasive species; Roheim, Cathy, Ph.D., Davis, Seafood Demand, Ecolabeling, Trade; Schnier, Kurt, Ph.D., Arizona, Spatial Modelling, Fisheries Mgt., Marine reserves; Sutinen, Jon, Ph.D., U Washington, Fisheries Mgt.; Swallow, Stephen, Ph.D., Duke, Land Use, Wetlands, Ecosystem valuation; Uchida, Emi, Ph.D., UC Davis, Land use, development, ecosystem valuation; Uchida, Hiro, Ph.D., UC Davis, Fishery Mgt.

Program Website: <http://www.uri.edu/cels/enre>

Contact: Cathy Rohiem, crw@uri.edu

University of Rhode Island

Coastal Institute

1 Greenhouse Rd

Kingston, RI 02881

Department of Natural Resources Science

Water and Soil Science

Water and soil are the foundation and structure of every ecosystem. Studies of soil and water provide the framework for understanding environmental quality, resource management, terrestrial ecology, and the fate and transport of pollutants in the environment. The Water & Soil Science major integrates classroom and hands-on experiences in the field of watershed science, pedology, hydrology, land use, wetlands, geomorphology, and surficial geology. This major is designed to meet the growing demand for training in the science and management of land and water resources. Course tracks in soil science and water resources provide in-depth training in specific, career-related disciplines. With proper course selection,

students are eligible for professional certification by the American Society of Agronomy and the Soil Science Society of America. The water and soil science major provides a strong background for work in state and federal regulatory agencies or consulting firms that address land use or environmental contamination issues.

Degree granted: B.S.

Program Website: <http://www.uri.edu/cels/acaddept/wtrsoil.html>

Contact: Dr. Mark Stolt, mstolt@uri.edu
University of Rhode Island
9 Alumni Avenue
Kingston, RI 02881

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University of San Diego San Diego, CA

Marine Science (Ph.D.)

Degree granted: Ph.D.

Program Website: http://www.sandiego.edu/mars_envi/

Contact: Hugh I. Ellis, ellis@SanDiego.edu

Marine Science (M.S.)

USD's Department of Marine Science and Environmental Studies offers graduate work leading to the degree of Master of Science in Marine Science. This degree is based largely on research and is intended to provide graduate students with an opportunity to design experiments or observations that test hypotheses; to contribute new information to a knowledge base; and to learn to write in a way that facilitates scientific exchange. The program, which combines coursework and research, culminates in a written thesis. The program utilizes not only the excellent facilities at the University of San Diego's Shiley Center for Science and Technology, but those of some other nearby institutions, such as the Southwest Fisheries Science Center (National Marine Fisheries, NOAA), the Hubbs-Sea World Research Institute, and the Leon R. Hubbard Hatchery. Thesis committee members are drawn from the Marine Science faculty at USD, other science departments at USD, and senior research scientists at Southwest Fisheries Science Center and Hubbs-Sea World Research Institute. Students are encouraged to have one

outside member on their thesis committee in order to take advantage of San Diego's rich community of ocean specialists. USD faculty currently are involved in research in marine geochemistry, climatology, paleoclimatology, hydrology, oceanography, marine biology, locomotion and fluid dynamics, physiology, ecology and population genetics. Affiliated science faculty work in the areas of bioacoustics, aquaculture, molecular genetics, ecology and physiology. Although there are opportunities for graduate students who are interested in biology to work with a variety of invertebrate and vertebrate animals, as well as a more limited number of plants, applicants should think carefully about the functional areas of biology they wish to work in. Whether in the life sciences or physical sciences, local research opportunities abound: from the coasts and estuaries of San Diego County to off-shore and island environments. The deserts of southern California, which include inland water bodies and former ocean basins, offer additional research possibilities. In some instances, research may focus on more distant areas. More information about faculty interests, graduate student thesis titles, and facilities is available through our Web site. The Master of Science in Marine Science degree can serve as a terminal graduate degree prior to entry into the work force, an enhancement of skills for an existing job in a technical area or in education, or a step toward a Ph.D.

Degree granted: M.S.

Program Website: <http://www.sandiego.edu/about/gradbulletin/as/msms.php>

Contact: Ronald S. Kaufmann, kaufmann@SanDiego.edu

Marine Science (B.A.)

The Marine Science major, offered by the Department of Marine Science and Environmental Studies, is intended for students interested in the natural sciences as well as the marine world. It provides a rigorous curriculum that is intended to prepare students to go on to either graduate studies or directly into oceanographic work. A core of oceanography courses unifies the Marine Science major. In addition, the student elects curriculum from a pathway in Biology or Earth Systems Science. The student majoring in Marine Science is encouraged to select an advisor from his or her area of concentration as soon as possible. A list of advisors is available from the chair of the Department of Marine Science and Environmental Studies.

Degree granted: B.A.

Program Website: http://www.sandiego.edu/bulletin/as/marine_science.php

Contact: Michel A. Boudrias, boum@SanDiego.edu
University of San Diego
San Diego, CA 92110

You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.

University of South Alabama

Mobile, AL

See also Dauphin Island Sea Lab

Biology with focus in Marine Biology

Degree granted: B.S.

Program Website: <http://www.southalabama.edu/biology/program.html>

Contact: John Freeman, jafreema@jaguar1.usouthal.edu

Physical Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://www.southalabama.edu/marinesciences/programs.html>

Contact: nmerrill@usouthal.edu

Geological Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://www.southalabama.edu/marinesciences/programs.html>

Contact: nmerrill@usouthal.edu

Chemical Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://www.southalabama.edu/marinesciences/programs.html>

Contact: nmerrill@usouthal.edu

Biological Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://www.southalabama.edu/marinesciences/programs.html>

Contact: nmerrill@usouthal.edu

University of South Alabama

Mobile, AL 36688-0002



Ocean education training

University of South Carolina

Columbia, SC

Marine Science Program

The Marine Science Program in the College of Arts and Sciences at the University of South Carolina, Columbia, SC (USC-Columbia) is an interdisciplinary educational program offering curricula which lead to the Bachelor of Science, Master of Science and Doctor of Philosophy degrees. Ranked fifth of 115 such programs by The Gourman Report, and named one of the top 10 programs in the country by the Chronicle of Higher Education, it is one of the premier educational programs in the nation, with prominent research affiliations, competitively awarded research grants and an interdisciplinary academic curriculum. The Marine Science Program is designed to be interdisciplinary; that is, to draw upon subject matter in many different fields of scientific endeavor. By being flexible, the Marine Science Program allows students, under the direction of a faculty advisor, to select courses from many areas in order to fulfill specific educational goals. Only in a program such as this, can courses be combined from Geology, Biology, Chemistry, Mathematics, Physics, Engineering, Environmental Health and Social Sciences into an individually-tailored curriculum. Students in Marine Science may choose to specialize in biological, chemical, geological or physical oceanography or coastal resource management/marine affairs.

Facilities: In addition to the cutting edge facilities located at USC, the Marine Science Program works closely with the Belle W. Baruch Institute for Marine & Coastal Sciences. The Baruch Marine Field Laboratory is located on the Historical Hobcaw Barony property in Georgetown, SC. The main building (19,872 sq ft) of the complex comprises 18 air-conditioned research laboratories, a computer center, seminar room, conference/dining room, archived-sample room, classroom, site library, teaching lab, walk-in refrigerators and freezers, large screened work areas, and running seawater with technical and administrative support offices. An observation deck, piers, floating docks, boat ramps and a marsh boardwalk provide access to a variety of marine coastal habitats. Housing for researchers and students is available at the Kimbel Living & Learning Center. Boats and trucks and other resources are also available.

Faculty: Benitez-Nelson, Claudia, Ph.D., Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, Biogeochemistry, Chemical Oceanography; Benner, Ronald, Ph.D., University of Georgia, Biogeochemistry and Microbial Ecology; Bulusu, Subrahmanyam, Ph.D., University of Southampton, Satellite Oceanography; Feller,

Robert J., Ph.D., School of Oceanography, University of Washington, Benthic Ecology, Food Web Interactions, Biological Oceanography, Shrimp Farming, Marine Science Education. Fletcher, Madilyn, Ph.D., University College of North Wales, Marine Biology, Microbial Ecology, Coastal Ecology, Coastal Ocean Observing Programs. Pinckney, James L., Ph.D., University of South Carolina, Marine Ecology, Microbial Ecology, Phycology, Biometry, Marine and Microbial Ecology, Biological Oceanography, Biometry and Statistics; Quattro, Joseph M., Ph.D., Rutgers University, Population and Conservation Genetics, Molecular Evolution; Richardson, Tammi, Ph.D., Dalhousie University, Biological Oceanography, Phytoplankton Physiology and Ecology including primary production, carbon and nitrogen cycling; Shaw, Timothy J., Ph.D., Scripps Institute of Oceanography, Trace Element Geochemistry, Environmental Analytical Chemistry; Stancyk, Stephen E., Ph.D., University of Florida, Marine Ecology, Invertebrate Zoology, Reproductive Ecology; Styles, Richard, Ph.D., Rutgers University, Coastal Physical Oceanography and Coastal Wetlands Physics; Voulgaris, George, Ph.D., University of Southampton, Oceanography. Coastal Processes and Sediment Dynamics; Williams, Douglas F., PhD, Graduate School of Oceanography, University of Rhode Island, Geological Oceanography, Geochemistry; Yankovsky, Alexander (Sasha), Ph.D., Marine Hydrophysical Institute, Sevastopol, USSR (Ukraine), Coastal Physical Oceanography, Wave Dynamics.

Marine Science Graduate Program

Marine Science and Oceanography with specialization in Marine Science Education

Marine Science and Oceanography with specialization in Marine Affairs

Marine Science and Oceanography with specialization in Ocean Policy

Marine Science and Oceanography with specialization in Geological Oceanography

Marine Science and Oceanography with specialization in Physical Oceanography

Marine Science and Oceanography with specialization in Chemical Oceanography

Marine Science and Oceanography with specialization in Biological Oceanography

Degree granted: M.S. and Ph.D.

Program Website: <http://www.msci.sc.edu/Programs/Graduate/aboutGrad.html>

Contact: Dr. Ron Brenner, benner@biol.sc.edu

Marine Science Undergraduate Program

Marine Science with specialization in Chemical Oceanography

Marine Science with specialization in Physical Oceanography

Marine Science with specialization in Marine Biology

Marine Science with specialization in Marine Geology

Marine Science with emphasis in Marine Biology and Biological Oceanography

Marine Science with emphasis in Coastal Resource Management and Marine Affairs

Degree granted: B.S.

2007 tuition: In-state residents: \$3,973; Out-of-State: \$10,616

Program Website: <http://www.msci.sc.edu/Programs/UnderGrad/aboutUgrad.html>

Contact: Dr. Claudia Benitez-Nelson, cbnelson@geol.sc.edu

University of South Carolina

EWS 603, 712 Main Street

Columbia, SC 29208

Email: msci@msci.sc.edu

Phone: 803-777-2692

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University of South Florida

St. Petersburg, FL

College of Marine Science

The College of Marine Science (CMS) at the University of South Florida (USF) is a research-based graduate program offering the Master's of Science (M.S.) and the Doctorate of Philosophy (Ph.D.) in Marine Science with concentrations in four core disciplines: geological, biological, chemical, and physical oceanography. The CMS aims to improve the understanding of how the oceans work, enhance the way research is carried out, and offer real world solutions to coastal management issues of regional and global concern. Situated on the USF St. Petersburg campus, the CMS is strategically located on a waterfront peninsula within the largest concentration of local, state, and federal marine science organizations in the southeastern United States, including: the Fish and Wildlife Research Institute (FWRI), the United States Geological Survey (USGS), and the National Marine Fisheries Services (NMFS). CMS students have access to the scientists and facilities of these partnering organizations. Additionally unique to the college is the Center for Ocean Technology,

which provides onsite development engineering expertise and at-sea support to the faculty and researchers at USF. The CMS is a national leader in educational outreach initiatives, enriching the graduate student experience through community engagement and involvement. Over the past decade CMS students and faculty have conducted research in the Pacific, Atlantic, Indian and Antarctic oceans and the Mediterranean, Norwegian, Arabian and Bering seas as part of several national and international programs supported by the National Science Foundation and other federal agencies. For more information about the USF College of Marine Science please visit: <http://www.marine.usf.edu>

Marine Science

Concentrations: Biological Oceanography, Chemical Oceanography, Geological Oceanography, and Physical Oceanography

Degree granted: M.S. and Ph.D.

Biological oceanographers study the plant and animal life of the oceans and the environmental conditions affecting them. Chemical oceanographers are concerned with the chemical composition of the ocean water and sediments, along with chemical reactions that occur in the sea. Geological oceanographers and geophysicists study all aspects of the seafloor from the mid-ocean ridge to the coastal ocean including the Continental margin, coral reefs, paleoshorelines, modern coastlines, sediment transport, as well as the behavior of past oceans and climate. Physical Oceanographers study the physical properties of the ocean, its motion, and relationship between the sea and the atmosphere. In addition to these traditional research areas, increasing numbers of interdisciplinary projects are rapidly evolving. For more information about these areas of research please visit: <http://www.marine.usf.edu/research>.

Degree Requirements: The requirements for Master's degree are: 32 credits hours, including four core courses, a written thesis, and successful oral defense. The requirements for the Ph.D. are 90 credit hours beyond the baccalaureate degree, including the four core courses, passing performance on a comprehensive qualifying written and oral examination, a written dissertation and successful oral defense. For more information about our academic programs, please visit: <http://www.marine.usf.edu/prospective-students>

Facilities: The CMS is part of the C.W. Bill Young Marine Science Complex. The college's state-of-the art facilities were constructed through model partnerships with state and national marine research organizations. The Marine Science Laboratory, built in 1941, is a two story, 89,370 square foot building, containing research labs, class-



University of South Florida College of Marine Science

rooms, and offices. The Knight Oceanographic Research Center, built in 1994, is part of a 140,000 square foot high-tech research and classroom facility built in partnership with the Florida Department of Environmental Protection's Marine Research Institute. The specialized laboratories within these buildings are equipped for studies in: Scanning and transmission electron microscopy; Trace metal analysis; Water quality; Organic and isotope geochemistry, Physical chemistry, Optical oceanography, Satellite imagery; Sedimentology; Geophysics; Physical oceanography; Micropaleontology; Physiology; Benthic ecology; Microbiology; Planktology and Ichthyology. Additionally, the complex includes the CMS Marine Shop, which provides manufacturing and prototyping support to the faculty, students and engineers. The college has access to 5 research vessels in conjunction with the Florida Institute of Oceanography (FIO) and the U.S. Geological Survey: the RV Suncoaster (110 ft), the RV Bellows (71ft), the RV Gilbert (42ft), the RV Subchaser (37ft), and the RV Price (24ft).

Faculty: There are approximately 30 full-time faculty members within the college and an additional 50 research and courtesy faculty. To learn more about CMS faculty visit: <http://marine.usf.edu/faculty>.

Student Support: Graduate student support is available through research assistantships, teaching assistantships and fellowships. The CMS has more than 20 endowed fellowships available for students, totaling nearly \$400,000 in financial support. College-specific financial aid information can be found at: <http://www.marine.usf.edu/prospective-students/financial-aid.shtml>

Program Website: <http://www.marine.usf.edu>

Contact: Dawna Ishler, Academic Services Administrator, dishler@admin.usf.edu, phone: 727-553-3944
College of Marine Science, University of South Florida
140 7th Avenue
St. Petersburg, FL 33701.

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University of Southern California

Los Angeles, CA

Ocean Sciences

Degree granted: M.S. and Ph.D.

Program Website: <http://www.usc.edu/dept/publications/cat2006/schools/college/os.html#Master's>

Contact: waite@earth.usc.edu

Mechanical Engineering (Petroleum Engineering)

Degree granted: B.S.

Program Website: http://www.usc.edu/dept/publications/cat2006/schools/engineering/petroleum_engineerin

Contact: peteng@usc.edu

Petroleum Engineering

Degree granted: Minor and M.S.

Program Website: http://www.usc.edu/dept/publications/cat2006/schools/engineering/petroleum_engineering/index.html

Contact: peteng@usc.edu

Environmental Engineering

Degree granted: Ph.D.

Program Website: http://www.usc.edu/dept/publications/cat2006/schools/engineering/civil/degree_requirements.html#phd

Contact: civileng@usc.edu

University of Southern California
Los Angeles, CA 90089

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University of Southern California— Wrigley Institute

Los Angeles, CA

Environmental Studies

The University of Southern California created the USC Wrigley Institute for Environmental Studies to unify and advance USC efforts in environmental education and research. The Wrigley Institute supports a range of research in the environmental sciences, including special initiatives focused on the genetic makeup of marine life and the relationship of microbes to the marine environment. The Wrigley Institute has strong ties to academic departments that offer undergraduate and graduate programs in marine science, such as the Marine Environmental Biology program in the Department of Biological Sciences, and it supports several programs aimed at K-12 students and other informal audiences. These include sci-



Wrigley Marine Science Center on Catalina Island

ence camps for boys in middle school and girls in middle school and high school. These camps, along with special teacher-training programs, are held at the Wrigley Marine Science Center on Catalina Island, about 20 miles off the Southern California coast.

Degree granted: B.S.

Facilities: The Wrigley Institute for Environmental Studies is located on the USC campus three miles south of downtown Los Angeles. The Wrigley Marine Science Center is located on the middle of Catalina Island near the community of Two Harbors. The center has apartment and dormitory facilities for as many as 40 students and teachers, and it can be reached by ferry from San Pedro.

Faculty: A listing of USC faculty who work with the Wrigley Institute can be found at the Wrigley website: <http://wrigley.usc.edu/faculty.html>

Program Website: <http://wrigley.usc.edu/>

Contact: Ann Close, close@usc.edu

University of Southern California—Wrigley Institute
3616 Trousdale Parkway
Los Angeles, CA 90089-0371
Phone: 213-740-6705

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University of Southern Mississippi

Stennis Space Center, MS

B.S. in Marine Science

The University of Southern Mississippi's Department of Marine Science offers the only Bachelor of Science in Marine Science degree program in the state of Mississippi. This program will educate students in the multidisciplinary field of marine science and provide a basic understanding of the underlying principles and processes of the oceans. Initially, the program course work will focus on marine technology and ocean observing, which are broadly applicable across the various disciplines in the

field of marine science. It is anticipated that the scope of the degree program will expand into other areas in the future. The educational objectives of a marine science curriculum are to provide students with both knowledge of fundamental and technical marine science concepts and with the problem-solving skills that need to be applied to this field. Even though this marine science degree program will prepare graduates who can readily enter into marine science graduate programs of study, it will primarily be aimed at preparing students for careers in private industry or government agencies after completion of their undergraduate studies. This program will produce graduates who will meet industry demands for individuals who understand the science behind marine science and the technologies that make this science possible. The Department of Marine Science is part of USM's College of Science and Technology. The marine sciences are represented within the college by faculty and staff members from the Department of Marine Science; the Department of Coastal Sciences, located at the Gulf Coast Research Laboratory in Ocean Springs; the Department of Biological Sciences in Hattiesburg; and the J.L. Scott Marine Education Center in Biloxi. DMS faculty also interact with other USM faculty in the College of Science and Technology on the main Hattiesburg campus.

Degree granted: B.S.

Facilities: The B.S. in marine science undergraduate courses are taught at USM's Gulf Coast Student Service Center in Gulfport, MS. Additional information can be found at www.usm.edu/gc/. All DMS graduate courses are taught at USM's Stennis Space Center facilities. Additional information can be found at www.usm.edu/marine.

Faculty: Dr. Vernon Asper (Geological oceanography; marine particle fluxes; marine technology); Dr. Charlotte Brunner (Geological oceanography; biostratigraphy; paleoceanography; taphonomy of foraminifers); Dr. Jerald Caruthers (Acoustical oceanography; acoustical scattering; ocean acoustic tomography); Dr. David Dodd (Coordinator of the Hydrographic Science Program; real-time kinematic global position systems; marine surveying and navigation); Dr. Laodong Guo (Marine chemistry; biogeochemical cycling of natural organic carbon and nutrients in aquatic systems; aquatic colloids/nanoparticles and their role in governing the fate/transport/bioavailability of chemical species; isotope geochemistry); Dr. Stephan D. Howden (Physical oceanography & hydrographic science; coastal circulation processes; remote sensing); Dr. Vladimir Kamenkovich (Physical oceanography; ocean circulation); Dr. Steven Lohrenz (Biological oceanography; marine bio-optics; remote sensing; carbon and nutrient cycling in marine ecosystems); Mr. Charles Meador (Hydrographic and nautical science; undergraduate educa-

tion); Dr. Scott Milroy (Ecosystem modeling; dynamics of harmful algal blooms; undergraduate education); Dr. Dmitri Nechaev (Physical oceanography; data assimilation into numerical ocean models); Dr. Karen Orcutt (Biological Oceanography; phytoplankton molecular ecology, nanostructured probes, marine nitrogen fixation); Dr. Don Redalje (Biological oceanography; marine phytoplankton ecology; physiology; bio-optics; primary production; taxonomy); Dr. Alan Shiller (Aquatic biogeochemistry & chemical oceanography; trace elements in natural waters; marine and estuarine chemistry; geochemistry of rivers and weathering); Dr. David Wells (Hydrographic science; multibeam echo sounding; mapping and surveying, global positioning systems); Dr. Jerry Wiggert (Large scale ocean and ecosystem modeling; coupled physical-biological modeling; high performance computing); Dr. Kevin Yeager (Geological oceanography: sediment sourcing and transport dynamics in rivers, lakes, estuaries and the ocean; human impacts on surficial processes; fates and impacts of terrestrial and aquatic contaminants).

Program Website: <http://www.usm.edu/gulfcoast/gcscitech/marine-science/index.php>

Contact: Dr. Steven Lohrenz, Steven.Lohrenz@usm.edu

M.S. and Ph.D. in Marine Science

The primary facilities of the Department of Marine Science are located at the National Aeronautics and Space Administration's John C. Stennis Space Center (SSC), approximately 75 miles south of The University of Southern Mississippi (USM) main campus in Hattiesburg, MS. SSC is on the Mississippi-Louisiana border near the coast and is the site of a variety of federal, state and commercial research agencies. SSC is one of the nation's largest rocket engine testing facilities and is also home to a variety of federal marine and environmental operations including the Naval Oceanographic Office, the Naval Research Laboratory, the Naval Meteorology and Oceanography Command, the Environmental Protection Agency's Gulf



Undergraduate student in University of Southern Mississippi-COSEE: Central Gulf of Mexico program.

of Mexico Program and Office of Pesticide Programs, and the National Oceanic and Atmospheric Administration's National Data Buoy Center, National Coastal Data Development Center, and National Marine Fisheries Service. The proximity of DMS to these programs enriches the curriculum and research programs at DMS and has often provided employment opportunities for graduates. Students at DMS enjoy all the rights and privileges accorded to their counterparts on the main campus. This includes the use of libraries and computer centers, low-price admission to sporting and theater events, and other such common student services. The Department of Marine Science is part of USM's College of Science and Technology. The marine sciences are represented within the college by faculty and staff members from the Department of Marine Science; the Department of Coastal Sciences, located at the Gulf Coast Research Laboratory and J.L. Scott Marine Education Center in Ocean Springs; and the Department of Biological Sciences in Hattiesburg. DMS faculty also interact with other USM faculty in the College of Science and Technology on the main Hattiesburg campus.

Degree granted: M.S. and Ph.D.

Facilities: All DMS graduate courses are taught at USM's Stennis Space Center facilities. Additional information can be found at www.usm.edu/marine.

Faculty: See B.S. in Marine Science faculty above.

Program Website: <http://www.usm.edu/marine>

Contact: Dr. Steven Lohrenz, Steven.Lohrenz@usm.edu
University of Southern Mississippi
1020 Balch Blvd.

Stennis Space Center, MS 39529

Email: marine.science@usm.edu

Phone: 228-688-3177

Hydrographic Science

Hydrographic Science is the science of measuring and depicting those parameters necessary to describe the precise nature and configuration of the seabed, its geographical relationship to the land mass, and the characteristics and dynamics of the sea. These parameters include bathymetry, tides, currents, waves, physical properties of sea water, geology and geophysics. The Department of Marine Science (DMS) is one of the few programs in the country to offer a graduate degree in the field of hydrographic science. This demanding and intensive curriculum covers all aspects of geodesy and hydrographic

science leading to a Masters of Science degree. This is the only accredited academic program in Hydrographic Science in the United States that is certified at the Category A-level by the Fédération Internationale des Géomètres/International Hydrographic Organization (FIG/IHO) International Advisory Board. Stennis Space Center is the home of the Naval Oceanographic Office (NAVOCEANO), a U.S. Naval Research Laboratory (NRL) detachment, and NOAA's National Data Buoy Center. NAVOCEANO, primarily an operational data collection and production center, additionally hosts the Navy's Supercomputing and Visualization Center, the Warfighting Support Center, and the Matthew Fontaine Maury Oceanographic Library, the world's largest military oceanographic library. In addition, NAVOCEANO presents a well-established, certified FIG/IHO Category B-level course. The USM Department of Marine Science maintains various academic and research activities that focus on interdisciplinary and multidisciplinary aspects of the marine sciences in coastal to offshore environments. The unique aggregation of academic faculty, hydrographers, oceanographers, and facilities at the Stennis Space Center provides an ideal location for this program. The proximity of DMS to these programs enriches the curriculum and research at DMS and has often provided employment opportunities for graduates. Students at DMS enjoy all the rights and privileges accorded to their counterparts on the main campus. This includes the use of libraries and computer centers, low-price admission to sporting and theater events, and other such common student services. The Department of Marine Science is part of USM's College of Science and Technology. The marine sciences are represented within the college by faculty and staff members from the Department of Marine Science; the Department of Coastal Sciences, located at the Gulf Coast Research Laboratory and J.L. Scott Marine Education Center in Ocean Springs; and the Department of Biological Sciences in Hattiesburg. DMS faculty also interact with other USM faculty in the College of Science and Technology on the main Hattiesburg campus.

Degree granted: M.S.

Facilities: All DMS graduate courses are taught at USM's Stennis Space Center facilities. Additional information can be found at www.usm.edu/marine.

Faculty: See B.S. in Marine Science faculty above.

Program Website: <http://www.usm.edu/marine>

Contact: David Dodd, David.Dodd@usm.edu
University of Southern Mississippi
1020 Balch Blvd.,

Stennis Space Center, MS 39529
Phone: 228-688-3177

Visit the Marine Technology Society Website at
<http://www.mtsociety.org>
for up-to-date education and scholarship information,
as well as a downloadable version of this Guide.

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University of Tampa

Tampa, FL

Marine Science-Chemistry

Degree granted: B.S.

Program Website: <http://static.ut.edu/academics/biology/index.cfm>

Contact: Kevin S. Beach, kbeach@ut.edu

Marine Science-Biology

Degree granted: B.S.

Program Website: http://static.ut.edu/academics/liberalarts_sciences/biology/index.cfm

Contact: Kevin Beach, kbeach@ut.edu

University of Tampa

Tampa, FL 33606-1490

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University of Tennessee at Martin

Martin, TN

Center for Environmental Conservation and Education Online

Degree granted: Courses for working professionals

Program Website: <http://www.utm.edu/departments/ed/cece/cece.html>

Contact: mfield@utm.edu

Environmental Biology

Degree granted: B.S.

Program Website: <http://www.utm.edu/departments/cens/biology/index.php>

Contact: Dr. David W. Sammons, salemond@utm.edu

Natural Resources Management-Fisheries Science

Degree granted: B.S.

Program Website: <http://www.utm.edu/departments/caas/anr/programs.php>

Contact: Dr. Craig S. Darroch, cdarroch@utm.edu

University of Tennessee at Martin

Martin, TN 38238

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You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.



Teachers participating in a University of Southern Mississippi-CO-SEE:Central Gulf of Mexico Sea Scholars Program.

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University of Texas, Austin

Port Aransas, TX

Marine and Freshwater Biology

Degree granted: B.S.

Program Website: <http://www.utmsi.zo.utexas.edu/academics/bs.htm>

Contact: Dr. Mike Raney, mraney@mail.utexas.edu

Marine Science

Degree granted: Ph.D.

Program Website: <http://www.utmsi.zo.utexas.edu/academics/gradprog.htm>

Contact: Dr. Mike Raney, mraney@mail.utexas.edu

Petroleum Engineering

Degree granted: M.S. and Ph.D.

Program Website: <http://www.pge.utexas.edu/>

Contact: Dr. Larry Lake, larry_lake@mail.utexas.edu

Petroleum Engineering

Degree granted: B.S.

Program Website: <http://www.pge.utexas.edu/prospective/edgoals.cfm>

Contact: Dr. Larry Lake, larry_lake@mail.utexas.edu

Geosystems Engineering & Hydrogeology**Degree granted:** B.S.**Program Website:** <http://www.pge.utexas.edu/prospective/gehedgoals.cfm>**Contact:** Ken Gray, ken_gray@mail.utexas.edu**Electrical Engineering with option in Robotics & Control****Degree granted:** B.S.**Program Website:** <http://www.ece.utexas.edu/undergrad/>**Contact:** Tony Ambler, ambler@ece.utexas.edu**Marine and Freshwater Biology****Degree granted:** M.S.**Program Website:** <http://www.utmsi.zo.utexas.edu/academics/bs.htm>**Contact:** Dr. Mike Raney, mraney@mail.utexas.edu

University of Texas, Austin

750 Channel View Dr.

Port Aransas, TX 78373-5015

University of the District of Columbia

Washington, DC

Water Quality and Marine Science**Degree granted:** A.A.S.**Program Website:** http://www.udc.edu/programs/arts_sciences/associates/water_marine.htm**Contact:** Freddie Dixon, fdixon@udc.edu

University of the District of Columbia

4200 Connecticut Ave. NW

Building 44, Room 103

Washington, DC 20008

University of Washington

Seattle, WA

School of Oceanography

The School of Oceanography provides excellent instructional and research opportunities at the graduate level in all areas of oceanography: Biological Oceanography, Chemical Oceanography, Marine Geology and Geophysics, and Physical Oceanography. Emerging areas of cooperative research such as coupled ocean/atmosphere physics and chemistry, global biogeochemistry, and volcano systems are emphasized. Advanced degrees emphasize independent research in conjunction with basic and specialized courses in oceanography. The courses

are planned to provide the knowledge and experience needed for careers that involve independent scientific investigation. Research opportunities allow students to design scientific programs that often include considerable experience at sea. Graduates are well prepared for teaching, research, and administration in colleges, universities, and government; and for positions in research institutions, laboratories, and industry.

The School has 60 full-time teaching and research faculty, 20 affiliate and adjunct faculty, 90 technical and administrative staff members, and 200 undergraduate and graduate students.

Located by Portage Bay on the University of Washington campus, the School of Oceanography is housed in four major buildings. A state-of-the-art, 60,000 square-foot building was completed in 1999. Offices for students are grouped in proximity to their research supervisors in order to foster close working relationships. The Portage Bay location provides for easy staging of cruises on the two research vessels operated by the School.

The School operates the latest addition to the nation's fleet of university research vessels, the 274-foot R/V Thomas G. Thompson. The first of a new class, the vessel features extensive laboratory space, unparalleled station-keeping ability, and a state-of-the-art computing and data acquisition system. Graduate students are involved in all of the cruises, most often for their thesis research. A unique opportunity is provided by the school's support of forty-five days of ship time for instructional uses. Studies of estuarine dynamics, shallow-water geochemistry, and productivity of inshore waters are carried out from the 65-foot R/V Clifford A. Barnes, which undertakes short cruises into Lake Washington and Puget Sound, usually of a week or less.

The school operates extensive laboratories for research and teaching which include laboratories for paleomagnetism, sea-ice, geophysical fluid dynamics, archaeobacteria, and marine molecular biotechnology; and facilities such as controlled-environment rooms and the satellite remote sensing data processing center. Specialized laboratory instruments such as ratio and quadrupole mass spectrometers, scanning electron microscopes, and seawater sediment transport flumes are routinely used in graduate thesis research. The Electronics, Machine, and Student/Faculty Shops are staffed by highly-skilled persons to assist in the design and construction of specialized instruments required for research projects. Other facilities and instruments, such as a Fourier-transform infrared laser spectroscope, wind tunnels, and X-ray diffractometers are available on the campus.

Computing plays a key role in graduate research, with uses ranging from computation intensive activities like numerical modeling, time series analysis, geophysical

data inversion, and image processing, to instrument control and data acquisition in both the field and laboratory, to routine tasks such as word processing and communication. Over 40 high-performance Unix-based Sun and Digital workstations are widely used for modeling, interpreting and visualizing oceanographic processes. Personal computers are ubiquitous. Nearly all of these systems are linked to the UW Ethernet. This network provides ready access to departmental systems and peripherals, centralized campus services (such as information systems and bibliographic data bases) and computers (a variety of Unix-based hosts) and, through Internet, to myriad remote systems including supercomputing facilities at the University of California at San Diego and National Center for Atmospheric Research (NCAR).

The College of Ocean and Fishery Sciences has its own national caliber library with 60,000 volumes and subscriptions to over 1,300 primary and review journals. The UW Libraries Catalog, a bibliographic search system devoted to the oceanographic sciences, and a myriad other information resources are accessible on PCs from home or office.

The School of Oceanography offers courses each year at the University's Friday Harbor Laboratories on San Juan Island at the northern end of Puget Sound. Due to polar emergence and the constant cold water of Puget Sound there are unique opportunities for the study of benthic processes more commonly observed only at bathyal depths. Specialized courses in new areas of oceanography are offered each summer. Friday Harbor facilities are also utilized throughout the year for oceanographic research.

A weekly seminar series is sponsored by the School of Oceanography, featuring renowned scientists from around the world. Each oceanography option also offers a weekly series of lectures and discussions on more specialized topics. In addition, seminars sponsored by NOAA's Pacific Marine Environmental Laboratory, the Applied Physics Laboratory, the School of Fisheries, and other University departments are often of interest.

Established in 1930 as the University's Oceanographic Laboratories, Oceanography became a degree-granting department in 1951 and conferred its first Ph.D. in 1955. The School of Oceanography is a major unit of the College of Ocean and Fishery Sciences which also includes the School of Fisheries and School of Marine Affairs and two non-degree granting units, the Applied Physics Laboratory and Washington Sea Grant Program. The College maintains a Home Page describing its history and educational and research units, which may be visited at <http://www.cofs.washington.edu>.

The school's research program is comprised of more than 135 projects covering a broad range of oceanographic investigations, ranging from individual research studies to multidisciplinary, multi-university, and cooperative international projects. Annual expenditures exceed \$21 million. Major sources of support include NSF, ONR, NOAA, NASA, DoE, EPA, and various state and local government agencies and private organizations.

The projects span the globe from the polar seas to the tropics, and range from studies of the abyssal ocean to local inlets and estuaries. Cooperative studies are currently underway with nations around the world, such as India, Brazil, Pakistan, Greenland, Norway, Oman, Japan, Russia, France, Israel, China, Australia, Indonesia and the Netherlands.

The faculty of the School, their research interests and recent publications can be found at <http://www.ocean.washington.edu/2004/people/list.jsp?category=faculty>.

FOR ADDITIONAL INFORMATION:

Visit the School of Oceanography on the World Wide Web at <http://www.ocean.washington.edu>. Our Home Page contains additional information on our faculty and students and their email addresses, and detailed descriptions of some of our major research projects.

Applicants are encouraged to contact directly faculty members whose areas of expertise and research activities correspond to their own. Current students or recent graduates are excellent sources of frank and independent advice, which should be obtained before the all-important choice of a graduate school is made.

For further information, please contact the school's Graduate Student Services Office at 206-543-5039 or by email at: student@ocean.washington.edu.

Biological Oceanography

The goal of biological oceanography is to understand what controls the abundance, kinds, and temporal variation of organisms in the sea. Our research and teaching programs are oriented toward a mechanistic understanding of processes. Our strengths are a core of modern summary courses ensuring an up-to-date overview of the discipline combined with a research program having the flexibility and resources to advance in virtually any direction.

Degree granted: B.S., M.S. and Ph.D.

Program Website: <http://www.ocean.washington.edu/2004/academics/options/biology/biological.html>

Contact: Phone: 206-543-5039 or email: student@ocean.washington.edu

Chemical Oceanography

Chemical oceanography is the study of the mechanisms that control the distribution of elements and compounds in the ocean. Following the exploration of the 1960s and 70s, chemical oceanography is now focused on specific processes and their rates distributed throughout the world's oceans. Our school takes pride in being a leader in an interdisciplinary approach to the study of the chemical distribution of inorganic and organic, stable, and radioactive elements.

Degree granted: B.S., M.S. and Ph.D.

Program Website: <http://www.ocean.washington.edu/2004/academics/options/chemical/chemical.html>

Contact: Phone: 206-543-5039 or email: student@ocean.washington.edu

Marine Geology and Geophysics

Marine Geology and Geophysics is involved with understanding the structure and mechanics of the Earth's crust that is overlain by world's oceans. Students learn about the history of the seabed and the processes (physical, chemical and biological) that shape its surficial and internal structure. Research is based upon *in situ* observations, and the development of physical and numerical models to describe them. Historical strengths within the option include ridge-crest processes and continental-margin sediment transport

Degree granted: B.S., M.S. and Ph.D.

Program Website: <http://www.ocean.washington.edu/2004/academics/options/mgg/mgg.html>

Contact: Phone: 206-543-5039 or email: student@ocean.washington.edu

Physical Oceanography

Physical oceanography focuses on describing and understanding the evolving patterns of ocean circulation and fluid motion, along with the distribution of its properties such as temperature, salinity and the concentration of dissolved chemical elements and gases. The ocean as a dynamic fluid is studied at a wide range of spatial scales, from the centimeter scales relevant to turbulent microstructure through the many thousand kilometer scales of the ocean gyres and global overturning circulation. Approaches include theory, direct observation, and computer simulation. Our research frequently takes place in the context of important multidisciplinary issues including the dynamics and predictability of global climate and the sustainability of human use in coastal and estuarine regions.

Degree granted: B.S., M.S. and Ph.D.

Program Website: <http://www.ocean.washington.edu/2004/academics/options/physical/physical.html>

Contact: Phone: 206-543-5039 or email: student@ocean.washington.edu

Find this Guide online at: <http://www.mtsociety.org/publications/>



Submersible operated by the Texas A&M University Institute for Nautical Archaeology

School of Aquatic and Fisheries Science

Aquatic and Fisheries Science

Degree granted: Minor, B.S., M.S. and Ph.D.

Program Website: <http://www.fish.washington.edu>

Contact: safs@u.washington.edu

Marine Biology

Degree granted: Minor

Program Website: <http://depts.washington.edu/marbio/>

Contact: marbiol@u.washington.edu

University of Washington

3707 Brookland Ave. NE

Seattle, WA 98105-6715

School of Marine Affairs

Marine Affairs

Degree granted: M.S.

Program Website: http://www.sma.washington.edu/students/admissions/MS_program.html

Contact: uwsma@u.washington.edu

University of Washington

3707 Brookland Ave. NE

Seattle, WA 98105-6715

University of West Alabama

Livingston, AL

Marine Biology Environmental Science

Degree granted: B.S.

Program Website: <http://nsm.uwa.edu/bio/default.asp>

Contact: Dr. John McCall, jmccall@uwa.edu

University of West Alabama

Livingston, AL 35470

University of Wisconsin

Milwaukee, WI

Aquatic Science

Degree granted: Ph.D.

Program Website: <http://www.glwi.uwm.edu/education/>

Conservation and Environmental Science with concentration in Water Resources

Degree granted: B.S.

Program Website: <http://www.uwm.edu/Dept/CES/program.html>

Contact: Glen Fredlund, fredlund@uwm.edu

University of Wisconsin - Milwaukee

600 East Greenfield Ave.

Milwaukee, WI 53204

University of Wisconsin - Madison

Madison, WI

Atmospheric and Oceanic Sciences

Degree granted: M.S.

Program Website: <http://www.meteor.wisc.edu/education/graduate/master.html>

Contact: Jonathan Martin, jemarti1@wisc.edu

Atmospheric and Oceanic Sciences

Degree granted: Ph.D.

Program Website: <http://www.meteor.wisc.edu/education/graduate/PhD.html>

Contact: Jonathan Martin, jemarti1@wisc.edu

Atmospheric and Oceanic Sciences

Degree granted: B.S.

Program Website: <http://www.meteor.wisc.edu/education/undergrad/bachelor.html>

Contact: Jonathan Martin, jemarti1@wisc.edu

Aquatic Chemistry

Degree granted: M.S. and Ph.D.

Program Website: <http://www.engr.wisc.edu/interd/ect/>

Contact: mcpossin@wisc.edu

Geosciences

The Department of Geosciences offers graduate work emphasizing applied aspects of the hydrologic, geological, and geophysical sciences. The geological sciences concentration prepares students for careers in such areas as engineering and environmental geology, hydrogeology, geophysical exploration, mining and petroleum geology. The M.S. degree program trains students equally for professional practice and continued graduate study. The typical course of study takes two years to complete. The Ph.D. degree program, with interwoven components in lithospheric and hydrospheric science, is problem-oriented rather than specialty-oriented: this program is designed to produce scholars and practitioners capable of applying their training to achieve sound and pragmatic solutions to real problems in the earth sciences. Students in the doctoral program will normally spend a minimum of two years of formal course work, not including dissertation research.

Degree granted: M.S. and Ph.D.

Facilities: The Department has a variety of geological and geophysical field equipment including a drill rig, portable water-sampling and analytical systems, and marine and land-based seismic and electrical resistivity systems. In addition, the Department maintains the following equipment directly or through its association with the UWM Center for Great Lakes Studies: x-ray diffractometer and spectrometer, atomic absorption unit, gas and ion chromatographs, liquid scintillation counter, cold region environmental chambers, operating well field, seismograph, Paleomagnetism laboratory, and recirculating flume. Supporting facilities in the University include a computing center, scanning electron microscope, a cartographic laboratory, the Saukville Field Station 50 km north of the campus, the Center for Great Lakes Studies, and the Urban Research Center. The Department also maintains the extensive geological collections of the Greene Geological Gallery and cooperates actively with the Milwaukee County Public Museum.

Program Website: <http://www.graduateschool.uwm.edu/students/prospective/areas-of-study/geosciences/>
Contact: Christopher Maury, cmmaury@uwm.edu

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University of Wisconsin - Stevens Point

Stevens Point, WI

Fisheries & Water Resources with concentration in Watershed Management

The watershed management option prepares you for a career or graduate study in land conservation, water resources management, and hydrology. Watershed management graduates frequently gain employment with environmental consulting firms and state, federal, tribal, and local resource management agencies and are involved in land planning, resource protection, and civil works.

Degree granted: B.S.

Program Website: <http://www.uwsp.edu/cnr/Water/index.aspx>

Contact: Stan Szczytko, sszczytk@uwsp.edu

Fisheries & Water Resources with concentration in Water Resources

In the water resources option you develop a flexible program of courses with your adviser to prepare you for one or more career paths. You can emphasize the physical, chemical or biological aspects of water resource management or combinations thereof. The breadth of electives allows you to complete a minor in such areas as chemistry, soil science, geographic information systems and spatial analysis, or land-use planning that will enhance and focus your career opportunities. Graduates are normally employed by environmental consulting firms, or by county, state, tribal or federal resource management agencies that are involved in protecting and managing the quality and quantity of water resources.

Program Website: <http://www.uwsp.edu/cnr/Water/index.aspx>

Contact: Stan Szczytko, sszczytk@uwsp.edu



Submersible operated by the Harbor Branch Oceanographic Institution

Fisheries & Water Resources with concentration in Fisheries

The fisheries option prepares you for employment in consulting firms or state, tribal or federal resource management agencies where you would be involved in manipulating fishery resources through regulating human use, managing aquatic habitat, and stocking. With a B.S. degree in fisheries you will likely begin your professional employment as a limited-term employee. An M.S. degree will greatly increase employment potential and job responsibilities in fisheries. If you complete the requirements for the fisheries option with a grade of C or better in all required courses, you will have completed the minimum course requirements for certification by the American Fisheries Society as a Certified Fisheries Professional. For more information about certification see <http://www.fisheries.org/html/Certification/shtml>.

Degree granted: B.S.

Program Website: <http://www.uwsp.edu/cnr/Water/index.aspx>

Contact: Stan Szczytko, sszczytk@uwsp.edu

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University of Wisconsin-Superior

Superior, WI

Biology with Aquatic Biology focus

Degree granted: B.S.

Program Website: <http://www.uwsuper.edu/admissions/factsheets/biologyaquatic.htm>

Contact: admissions@uwsuper.edu

Water Resource Management

Degree granted: Minor

Program Website: <http://www.uwsuper.edu/admissions/factsheets/geology.htm>

Contact: admissions@uwsuper.edu

Physical Environmental Science

Degree granted: B.S.

Program Website: <http://www.uwsuper.edu/admissions/factsheets/geology.htm>

Contact: admissions@uwsuper.edu

Biology with Fisheries Science focus

Degree granted: B.S.

Program Website: <http://www.uwsuper.edu/admissions/factsheets/biologyaquatic.htm>

Contact: admissions@uwsuper.edu

University of Wisconsin-Superior
Superior, WI 54880-4500

Virginia Institute of Marine Sciences
Gloucester Point, VA

Marine Sciences

Degree granted: M.S. and Ph.D.

Program Website: <http://www.vims.edu/>

Contact: John T. Wells, wells@vims.edu

Wesleyan University
Middletown, CT

Department of Earth & Environmental Sciences

Earth & Environmental Sciences

The Department of Earth and Environmental Sciences (E&ES) offers a program leading to the degree of Master of Arts in E&ES. Graduate students are provided with a unique opportunity for accelerated and personal instruction in a small department setting that is well equipped, with strengths in Geology, Volcanology, Geochemistry, Paleoclimatology, Coastal Studies, Planetary Science, and Environmental Science.

Degree granted: M.A.

Faculty: <http://www.wesleyan.edu/ees/people/faculty.html>

Program Website: <http://www.wesleyan.edu/ees/grad/>

Contact: Virginia Harris, vharris@wesleyan.edu

Earth Sciences

Broadly speaking, the environmental studies certificate program is an interdisciplinary certificate program that includes, but is not restricted to, Natural Science, Public Policy, Philosophy and Economics. The 'Certificate Program' is similar to a 'minor' at some other institutions and implies that one chooses a major and then takes a set of additional courses in areas concerned with Environmental Studies. A certificate is given upon graduation and completion of the assigned courses. The Environmental Studies Program at Wesleyan University forges links among a number of academic programs, such as Biology, Earth & Environmental Sciences, Economics, Government and History, Science and Society.

Degree granted: Certificate-Bachelor's degree required

Program Website: <http://www.wesleyan.edu/ees/grad/>

Contact: Dr. Barry Chernoff, bchernoff@wesleyan.edu

Wesleyan University
265 Church St
Middletown, CT 06459
Phone: 860-685-2244

West Virginia University
Morgantown, WV

Department of Geology & Geography

Environmental Geoscience

The B.A. in Environmental Geosciences is a joint Geology/Geography program for students interested in geological and geographical approaches to environmental issues. Emphasis is placed on the physical, human, and spatial aspects of Earth and its environment. The broad and interdisciplinary nature of the degree program is designed to produce geoscientists who can identify environmental problems, apply a variety of approaches to their remediation, and be conversant among the wide range of disciplines for which the environment is of special concern.

Degree granted: B.A.

Program Website: <http://www.geo.wvu.edu/academicprograms/environmentalgeoscience/index.htm>

Contact: Hope Stewart, hope.stewart@mail.wvu.edu

West Virginia University
P.O. Box 6300
Morgantown, WV 26506
Phone: 304-293-5603

Western Washington University
Bellingham, WA

Department of Biology

Biology - Marine Emphasis

All biology programs allow students to develop a broad field of study or focus in a specific area. Biology students take an array of advanced courses that enable them to build an interest into a strength. The Marine Emphasis allows students to specialize in marine biology.

Degree granted: B.S.

Facilities: Shannon Point Marine Center

2007 tuition: In-state residents: \$5,000; Out-of-State: \$16,000

Program Website: <http://www.biol.wvu.edu/biology/programs.html>

Contact: Joann Otto, Joann.Otto@wwu.edu

Western Washington University
516 High Street
Bellingham, WA 98225
Phone: 360-650-3627

Department of Environmental Science

Environmental Science

Degree granted: M.S.

Program Website: <http://www.ac.wvu.edu/~mesp/>

Contact: Brian L. Bingham, Brian.Bingham@wvu.edu

Marine and Estuarine Science Program

The purpose of the Marine and Estuarine Science Program (MESP) is to provide a coherent program of study in coastal marine and estuarine sciences at the Master of Science level. The MESP focuses resources of the Biology Department and Huxley College of the Environment at Western Washington University to shape a high-quality, research-oriented program in the marine and estuarine sciences. Human impact on coastal marine and estuarine systems cannot be properly evaluated without a scientific understanding of their fundamental physical, chemical, and biological processes. The goal of the Marine and Estuarine Science program is to produce well-trained specialists qualified to study fundamental features of these systems and the relationship between natural processes and perturbations from human activity. Graduates will be qualified for entry-level positions in the profession and will be competitive in pursuit of the doctorate.

Degree granted: M.S.

Facilities: The MESP brings together resources of the Biology Department, the Department of Environmental Sciences, the Shannon Point Marine Center, and other University programs such as Wilson Library and Scientific Technical Services. The University's location provides an extraordinary opportunity for coastal marine and estuarine research. The coastal inland waters of Washington State, bounded by Puget Sound to the south, the mainland to the east, and Vancouver Island to the north and west, harbor a rich diversity of marine habitats and biota. The mainland and islands of the San Juan Archipelago provide rocky shoreline, protected lagoons, and high-energy intertidal beaches. The nearby Padilla Bay National Estuarine Research Reserve encompasses 11,000 acres of wetlands, seagrass beds, and mudflats. The channels and straits of the region provide muddy, rocky, and sandy flats, as well as trenches of depths up to 100 meters. The State ferry system provides ready access to the San Juan Islands and the Olympic Peninsula, with its spectacular alpine, temperate rain forest, and open ocean beach environments. The wide variety of macroalgae, crustaceans, echinoderms, and molluscs, as well as other invertebrates and fish, will be of special interest to marine biologists. Diverse avian and marine mammal fauna also characterize the region. These living marine resources support a variety of opportunities for marine biological research. Opportunities for process-oriented research are

equally attractive. Local estuaries are characterized by small spatial scales, providing rapid transition from fresh to saline waters and are subject to impact by small urban areas, logging and other dramatic land use transformations, as well as aluminum and petroleum refining. These natural systems, combined with outstanding analytical facilities, permit study and research on nutrient cycling, productivity, biogeochemistry, microbial ecology and water quality issues. The Shannon Point Marine Center (SPMC), located in Anacortes, WA, about 40 miles south of the main campus, is an important facility supporting the Marine and Estuarine Science Program. The Marine Center occupies an 87-acre campus with 3,000 feet of beachfront on Guemes Channel. The 24,000-square-foot Marine Education Center/Sundquist Laboratory complex houses teaching labs, administrative offices, and research laboratories. Research space includes a wet room with tanks fed by a running seawater system and laboratories assigned to live animal and plant research. The seawater system includes a diversified seawater tank facility, in-line water quality analytical capabilities and running seawater tanks exposed to natural sunlight. Additional laboratories include one 600-square-foot and two 1,200-square-foot analytical chemistry laboratories, a radioisotope laboratory, a laboratory dedicated to image analysis and research microscopy and a quarantine laboratory. Also available are two walk-in environmental chambers. A standard array of laboratory equipment is available. SPMC's analytical capacity supports oceanographic studies (Turner fluorometer; autoanalyzer, Hydrolab system, liquid scintillation counter, and FLOWCAM), chemical analyses (diode array spectrophotometers, HPLC's, gas chromatographs, CHNS Analyzer), plankton studies (image analysis, epifluorescence scope, inverted scope) and general laboratory support needs (refrigerated centrifuge, ultrafreezer, freeze dryer, microbalances). Other support equipment includes a complete video recording system (with underwater capacity), including a small ROV. Our database provides a continuous 33-year weekly record of water-quality parameters, including DO, temperature, salinity, and pH; a 17-year record of chlorophyll a, phaeopigments, orthophosphate, nitrate, and ammonium; and the recent addition of silicates and photosynthetically active radiation (PAR). The SPMC fleet includes the RV FAUNA, a 26-ft aluminum hull with 175-hp outboard motor equipped with a pilot house and hand crank winch; the RV FLORA (19-ft), powered by a 125-hp outboard and equipped with a diving platform; and our new 32-ft inboard powered RV ZOEA, with A-frame and hydraulic winch.

Faculty: <http://www.ac.wvu.edu/~mesp/faculty.html>

2007 tuition: In-state residents: \$6,607.50; Out-of-State: \$16,843.50

Program Website: <http://www.ac.wvu.edu/~mesp/>
Contact: Brian L. Bingham, Brian.Bingham@wvu.edu
Western Washington University
Bellingham, WA 98225
Phone: 360-650-7400

Wilkes University
Wilkes-Barre, PA

Department of Biology

***Earth and Environmental Sciences,
concentration in Marine Science***

As a student of Wilkes University—a member of the Marine Science Consortium on Wallops Island—you can spend the summer learning by living and working in a pristine coastal environment in southeastern Virginia. The Consortium is an association of 22 state and private undergraduate institutions that oversees the operation of a marine field station and offers educational programs that support classroom, laboratory, and field activities. The full-time instructional staff works with professors to provide you with a high-quality, interdisciplinary experience in the oceanographic sciences that will help you meet your educational and research goals. Additional resources within the area include Chincoteague National Wildlife Refuge, Assateague National Seashore, and NASA Wallops Island Flight Facility. Nearby barrier islands are biologically diverse and geologically dynamic and many of the islands and marshes remain undeveloped, and area waters have sustained fishing, crabbing, and oystering for generations.

Degree granted: B.A.

Facilities: The R.V. Philip Parker, a 45-foot vessel for offshore classroom and research work; Small craft for inshore work in the marsh channels and bays; General oceanographic, environmental collection, and monitoring equipment; 10 laboratory classrooms with microscopes and salt-water aquaria; Dormitory housing (400 beds).

Program Website: <http://www.wilkes.edu/pages/492.asp>

Contact: Dr. Mike Case, mcase@wilkes.edu

**Department of Environmental Engineering
& Earth Sciences**

Earth and Environmental Sciences

Degree granted: B.A.

Program Website: <http://www.wilkes.edu/pages/492.asp>

Earth and Environmental Sciences

Degree granted: B.S.

Contact: Mr. Brian Oram, brian.oram@wilkes.edu

Environmental Engineering

Degree granted: B.S.

Facilities: *Center for Geographic Information Systems:* Wilkes is a regional leader in the use of geospatial technologies as applied to environmental problems. Students learn how to use modern spatial tools such as GIS (Geographic Information Systems), GPS (Global Positioning System), and Remote Sensing (satellite-based imagery). *Center for Environmental Quality:* Multiple laboratories offer our students hands-on, learn-by-doing opportunities. Our state-certified Water Quality Laboratory performs comprehensive analyses of drinking water. Other laboratories conduct indoor and outdoor air sampling and testing; environmental and field-testing of soil samples; and preparation of rocks and minerals. *Ratchford Field Station:* A 150-acre “natural laboratory” is used for field-based training, research and recreation. Our field station supports the study of natural and modeled processes of rocks, water, soils, air, life, and the interactions among them.

Program Website: <http://www.wilkes.edu/pages/492.asp>

Contact: Mr. Bill Toothill, bill.toothill@wilkes.edu

Wilkes University
84 West South Street
Wilkes-Barre, PA 18766
Phone: 1-800-WILKES-U

Williams College and Mystic Seaport
Mystic, CT

***The Maritime Studies Program of
Williams College and Mystic Seaport***

Maritime Studies is an interdisciplinary program that examines the literature, history, policy issues, and science of the sea. Each semester, every student must also learn a traditional maritime skill, including shipsmithing, celestial navigation, demonstration squad, boat building, shanty singing, or boat handling. Students can be of any major and have represented over 100 different colleges and universities since 1977. All share, however, a deep respect for the world's oceans. Additionally, students go sailing offshore on a tallship, explore the Pacific coast, and travel to the Gulf of Mexico and Mississippi Delta. Students receive a semester worth of credit from Williams College.

Degree granted: Minor

Facilities: Our campus is Mystic Seaport, the Museum of America and the Sea, which includes over 60 buildings and 4 tallships. In Fall 2007 we opened a new marine science center for studies in marine ecology and oceanography with a wave tank and 24 water-monitoring and research laboratories. Students have access to

the Museum's collections for their humanities research. Students have several small boats to take out for use in field research.

Faculty: Director and Marine Ecology Professor, Dr. James T. Carlton; Oceanography Professor, Dr. Lisa Gilbert; Dr. Glenn Gordinier, Maritime History; Katy Robinson Hall, J.D., Marine Policy; Dr. Dan Brayton, Literature of the Sea.

Program Website: <http://www.williams.edu/williamsmystic>

Contact: Megan Dobyns, admissions@williamsmystic.org
Williams College and Mystic Seaport
75 Greenmanville Ave
Mystic, CT 06355
Phone: 860-572-5359

**Wisconsin Indianhead
Technical College**
Ashland, WI

Marine Repair Technician

Degree granted: A.A.S.

Program Website: <http://www.witc.tec.wi.us/pgmpages/marinetech/index.htm>

Contact: Todd Larson, tlarson@witc.edu
Wisconsin Indianhead Technical College
2100 Beaser Ave
Ashland, WI 54806

Wittenberg University
Springfield, OH

Marine Biology

Degree granted: Minor and B.S.

Program Website: <http://www4.wittenberg.edu/academics/biol/specialprograms/marine.html>

Contact: Dr. Timothy L. Lewis, tlewis@wittenberg.edu
Wittenberg University
Springfield, OH 45501

**Woods Hole Oceanographic
Institution**
Woods Hole, MA

Applied Ocean Science and Engineering
Marine Geology and Geophysics
Biological Oceanography
Chemical Oceanography
Physical Oceanography

The Woods Hole Oceanographic Institution is dedicated to research and education to advance understanding of the ocean and its interaction with the Earth system, and to communicating this understanding for the benefit of society. The MIT/WHOI Joint Program is a graduate degree granting program focused on the oceans and oceanographic engineering. Most students enter the program to earn a doctoral degree, although master's degrees are also granted. Much information about the MIT/WHOI Joint Program can be found on the website at <http://web.mit.edu/mit-who/ww/>

Degree granted: Ph.D.

Facilities: The MIT/WHOI Joint Program consists of two premier institutions: Massachusetts Institute of Technology in Cambridge, MA and Woods Hole Oceanographic Institution in Woods Hole, MA. <http://web.mit.edu/mit-who/ww/overview/parent.html>

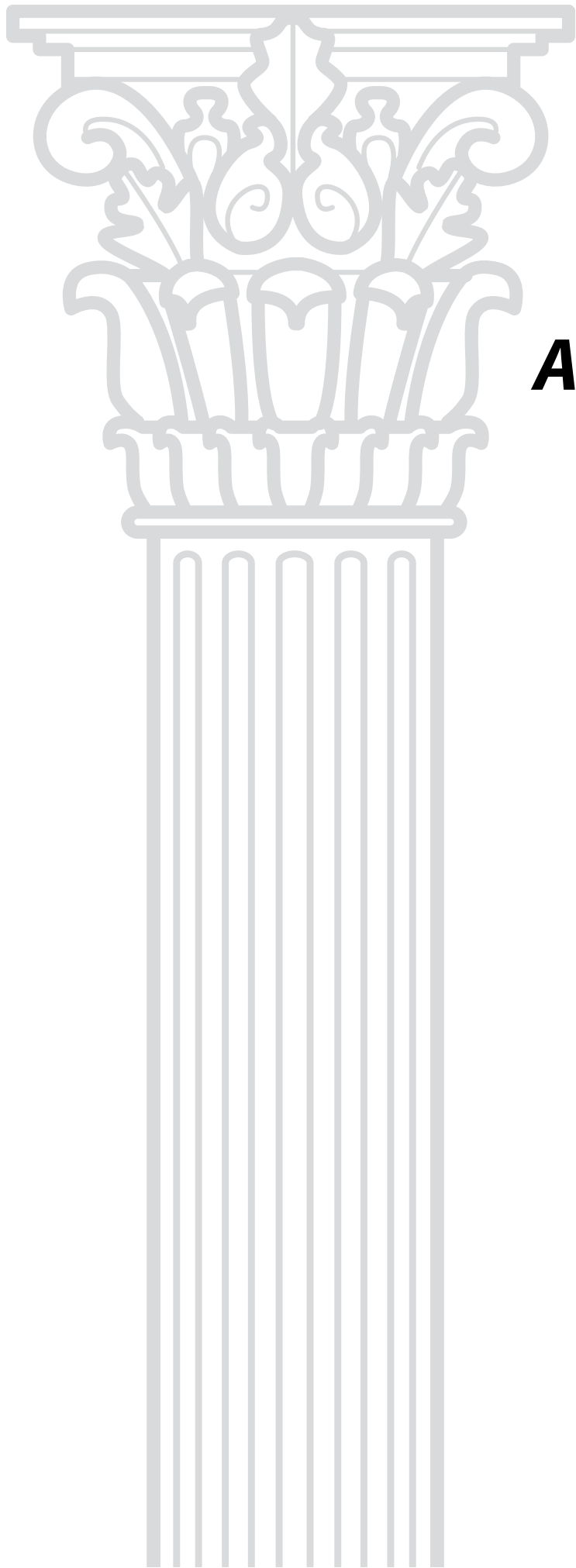
Faculty: Faculty from both MIT and WHOI involved in the MIT/WHOI Joint Program can be found at <http://web.mit.edu/mit-who/ww/community/faculty.html>

Program Website: <http://web.mit.edu/mit-who/ww/>

Contact: James Yoder, jyoder@who.edu
Woods Hole Oceanographic Institution
360 Woods Hole Rd., MS 31
Woods Hole, MA 02543
E-mail: mit-who-www.mit.edu

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You can find a complete version of
*The Guide to Marine Science and
Technology Programs in Higher Education*
along with other current educational resources and links
at the MTS Website: <http://www.mtsociety.org>.





Appendices



Geographic Index of Programs

ALABAMA

Alabama State University, Montgomery	3
Auburn University, Auburn	4
Auburn University at Montgomery, Montgomery.....	4
Dauphin Island Sea Lab, Dauphin Island.....	18
Jacksonville State University, Jacksonville	34
Samford University, Birmingham	71
Troy University, Troy	86
Tuskegee University, Tuskegee	87
University of Alabama, Tuscaloosa	91
University of Alabama at Birmingham, Birmingham	92
University of Alabama at Huntsville, Huntsville.....	92
University of Mobile, Mobile.....	132
University of North Alabama, Florence.....	135
University of South Alabama, Mobile.....	148
University of West Alabama, Livingston	158

ALASKA

Alaska Vocational Technical Center, Seward	3
Prince William Sound Community College, Valdez	66
University of Alaska, Anchorage, Anchorage.....	92
University of Alaska, Fairbanks, Fairbanks.....	92
University of Alaska, Southeast, Juneau	94

ARKANSAS

University of Arkansas at Little Rock, Little Rock.....	95
---	----

CALIFORNIA

California Maritime Academy, Vallejo	8
California State Polytechnic University, Pomona	8
California State Polytechnic University, San Luis Obispo, San Luis Obispo.....	8
California State University – California Maritime Academy, Vallejo	9
California State University, East Bay, Hayward.....	10
California State University, Fullerton, Fullerton.....	10
California State University, Hayward, Hayward	11
California State University, Long Beach, Long Beach	11
California State University, Monterey Bay, Seaside	11
California State University, Northridge, Northridge	11
California State University, San José, San José	11
California State University, Stanislaus, Stanislaus.....	12
California State University, Stanislaus, Turlock	12
Coastal School of Deep Sea Diving, Oakland	14
College of the Redwoods, Fort Bragg.....	15
Cuesta Community College, San Luis Obispo	17
Humboldt State University, Arcata	31
Humboldt State University Marine Lab, Trinidad	32
Long Beach City College, Long Beach.....	36
Maritime Institute, Inc., San Diego.....	42

Monterey Peninsula College, Monterey	48
Moss Landing Marine Laboratories, Moss Landing	49
National Polytechnic College of Engineering and Oceanering, Wilmington.....	49
Naval Postgraduate School, Monterey.....	50
Occidental College, Los Angeles	55
Orange Coast College, Costa Mesa.....	57
Saddleback Community College, Mission Viejo	69
San Diego State University, San Diego.....	71
San Francisco State University, San Francisco	72
San José State University, San José	73
Santa Barbara City College, Santa Barbara	73
Scripps Institution of Oceanography, La Jolla	73
Seamen's Training Center, Sausalito.....	74
Stanford University, Stanford	78
University of California, Berkeley, Berkeley.....	95
University of California, Davis, Davis	96
University of California, Irvine, Irvine	98
University of California, Los Angeles, Los Angeles.....	98
University of California, San Diego, La Jolla.....	99
University of California, San Diego—Scripps Institution of Oceanography, La Jolla	99
University of California, Santa Barbara, Santa Barbara ..	102
University of California, Santa Cruz, Santa Cruz.....	104
University of San Diego, San Diego.....	147
University of Southern California, Los Angeles.....	151
University of Southern California—Wrigley Institute, Los Angeles.....	151

CANADA

Dalhousie University, Halifax, Nova Scotia.....	17
DiveSafe International, Campbell River	19
Memorial University of Newfoundland, St. John's, Newfoundland.....	44

CONNECTICUT

University of Connecticut, Groton	106
Wesleyan University, Middletown	160
Williams College and Mystic Seaport, Mystic	162

DELAWARE

University of Delaware, Lewes	108
-------------------------------------	-----

DISTRICT OF COLUMBIA

University of the District of Columbia, Washington, DC	155
---	-----

FLORIDA

Barry University, Miami Shores	4
Brevard Community College, Cocoa	6
Chapman School of Seamanship, Stuart	13
Eckerd College, St. Petersburg	23
Florida Atlantic University, Boca Raton	24
Florida Atlantic University, Dania Beach	25
Florida Atlantic University, Davie	25
Florida Institute of Technology, Melbourne	25
Florida Keys Community College, Key West	26
Florida State University, Tallahassee	26
Harbor Branch Oceanographic Institution	29
Hillsborough Community College, Tampa	30
Marine Mechanics Institute of the Universal Technical Institute, Orlando	42
Nova Southeastern University, City of Dania Beach	53
Palm Beach Atlantic College, West Palm Beach	64
Perry Institute for Marine Science, Jupiter	66
Quality Maritime Training, LLC, St. Petersburg	66
Rosenstiel School of Marine and Atmospheric Science, Miami	124
University of Miami, Miami	124
University of South Florida, St. Petersburg	149
University of Tampa, Tampa	154

GEORGIA

Savannah State University, Savannah	73
University of Georgia, Athens	110

HAWAII

Hawaii Pacific University, Honolulu	30
Honolulu Community College, Honolulu	31
University of Hawaii at Hilo, Hilo	112
University of Hawaii at Manoa, Honolulu	113

LOUISIANA

Louisiana State University, Baton Rouge	36
Louisiana Tech University, Ruston	37
Louisiana Technical College, Morgan City	38
Louisiana Universities, Chauvin	38
University of New Orleans, New Orleans	134

MAINE

Bowdoin College, Brunswick	5
College of the Atlantic, Bar Harbor	15
Loeb-Sullivan School of International Business & Logistics, Castine	35
Maine Maritime Academy, Castine	39
Shoals Marine Laboratory, Appledore Island	75
Southern Maine Community College, South Portland	77
University of Maine, Orono	116

MARYLAND

Johns Hopkins University, Baltimore	34
Maritime Institute of Technology and Graduate Studies, Linthicum	43
Salisbury University, Salisbury	71
United States Naval Academy, Annapolis	90
University of Maryland, College Park and Cambridge...	118

MASSACHUSETTS

Amherst College, Amherst	3
Boston University, Boston	5
Bristol Community College, Fall River	7
Five Colleges, Inc., Amherst	24
Hampshire College, Amherst	28
Harvard University, Cambridge	29
Massachusetts Institute of Technology, Cambridge	43
Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, Cambridge	43
Mount Holyoke College, South Hadley	49
Northeast Maritime Institute, Fairhaven	52
Northeastern University, Boston	52
Northeastern University Three Seas Program, Nahant	52
Salem State College, Salem	70
Sea Education Association, Woods Hole	73
Smith College, Northampton	76
University of Massachusetts, Amherst	120
University of Massachusetts Boston, Boston	120
University of Massachusetts School of Marine Sciences, Amherst, Boston, Dartmouth, Lowell	121
Woods Hole Oceanographic Institution, Woods Hole	163

MICHIGAN

Great Lakes Maritime Academy/Northwestern Michigan College, Traverse City	28
Lake Superior State University, Sault Ste. Marie	35
University of Michigan, Ann Arbor	128

MINNESOTA

Alexandria Technical College, Alexandria	3
University of Minnesota, St. Paul	131

MISSISSIPPI

Gulf Coast Research Laboratory – University of Southern Mississippi, Ocean Springs	28
Jackson State University, Jackson	33
Mississippi State University, Mississippi State	48
Rust College, Holly Springs	68
University of Mississippi, University	132
University of Southern Mississippi, Stennis Space Center	151

MISSOURI

Northwest Missouri State University, Kirksville.....53

NEW HAMPSHIRE

University of New Hampshire, Durham 133

NEW JERSEY

Brookdale Community College, Lincroft..... 7
 Cumberland County College, Vineland 17
 Fairleigh Dickinson University, Teaneck.....23
 Monmouth College, West Long Branch.....48
 New Jersey Institute of Technology, Newark51
 New Jersey Marine Sciences Consortium, Fort Hancock51
 Princeton University, Princeton66
 Rider University, Lawrenceville67
 Rowan College of New Jersey, Glassboro67
 Rutgers University, New Brunswick.....68
 Saint Peters College, Jersey City.....70
 Stevens Institute of Technology, Hoboken.....79

NEW YORK

Columbia University, New York..... 15
 Columbia University, Palisades 16
 Cornell University, Ithaca 16
 Friday Harbor Laboratories, University of Washington
 Cornell University, Ithaca26
 Hofstra University, Hempstead31
 Ithaca College, Ithaca33
 Kingsborough Community College of the City University
 of New York, Brooklyn34
 Long Island University, Southampton.....36
 State University of New York - Maritime College, Bronx78
 State University of New York - Morrisville, Morrisville79
 Stony Brook University, Stony Brook80
 United States Merchant Marine Academy, Kings Point ...87

NORTH CAROLINA

Cape Fear Community College, Wilmington 12
 Carteret Community College, Morehead City..... 13
 College of The Albemarle, Elizabeth City 14
 Duke University Nicholas School Marine Laboratory,
 Beaufort 19
 Duke University Nicholas School of the Environment and
 Earth Sciences, Durham.....21
 East Carolina University, Greenville.....22
 North Carolina State University, Raleigh51
 University of North Carolina at Chapel Hill, Chapel Hill 136
 University of North Carolina at Wilmington,
 Wilmington 136

NORTH DAKOTA

University of North Dakota, Grand Forks 138

OHIO

Bowling Green State University, Bowling Green 6
 Hocking College, Nelsonville30
 Oberlin College, Oberlin.....55
 Wittenberg University, Springfield 163

OKLAHOMA

Northeastern State University, Tahlequah52

OREGON

Clatsop Community College, Astoria.....13
 Oregon Coast Community College, Newport57
 Oregon Health and Science University Coastal Margin
 Observation & Prediction Program, Beaverton.....57
 Oregon State University, Corvallis58
 Oregon State University College of Oceanic and
 Atmospheric Science, Corvallis60
 The Center for Coastal Margin Observation & Prediction,
 Beaverton86
 University of Oregon, Eugene 139
 University of Oregon – Oregon Institute of Marine
 Biology, Charleston 140

PENNSYLVANIA

Bloomsburg University of Pennsylvania, Bloomsburg 5
 California University of Pennsylvania, California 12
 Drexel University, Philadelphia 19
 Kutztown University of Pennsylvania, Kutztown.....35
 Lock Haven University of Pennsylvania, Lock Haven35
 Millersville University of Pennsylvania, Millersville.....47
 Pennsylvania State University, University Park.....65
 Shippensburg University of Pennsylvania,
 Shippensburg74
 Slippery Rock University of Pennsylvania, Slippery
 Rock.....76
 Wilkes University, Wilkes-Barre 162

RHODE ISLAND

Brown University, Providence 7
 Community College of Rhode Island, Warwick.....16
 New England Institute of Technology, Warwick51
 Roger Williams University, Bristol.....67
 University of Rhode Island, Narragansett 141
 University of Rhode Island College of the Environment
 and Life Sciences, Kingston..... 145

SOUTH CAROLINA

Coastal Carolina University, Conway	14
College of Charleston, Charleston	14
Furman University, Greenville	27
Medical University of South Carolina, Charleston	44
University of South Carolina, Columbia.....	148

SOUTH DAKOTA

South Dakota State University, Brookings	77
--	----

TENNESSEE

Lincoln Memorial University, Harrogate.....	35
Tennessee Technological University, Cookeville	82
Union University, Jackson.....	87
University of Memphis, Memphis.....	124
University of Tennessee at Martin, Martin	154

TEXAS

Southwest Texas State University, San Marcos	78
Texas A&M University, College Station.....	83
Texas A&M University at Galveston, Galveston.....	84
University of Texas, Austin, Port Aransas	154

VIRGINIA

College of William & Mary, Williamsburg	15
Hampton University, Hampton.....	28
Marine Science Consortium, Inc., Wallops Island	42
Old Dominion University, Norfolk.....	56
Virginia Institute of Marine Sciences, Gloucester Point	160

WASHINGTON

Bellingham Technical College, Bellingham	4
Everett Community College, Everett	23
Grays Harbor College, Aberdeen.....	27
Peninsula College, Port Angeles.....	65
Seattle Central Community College, Seattle.....	74
Skagit Valley College, Whidbey Island Campus, Oak Harbor.....	76
University of Washington, Seattle.....	155
Western Washington University, Bellingham	160

WEST VIRGINIA

West Virginia University, Morgantown.....	160
---	-----

WISCONSIN

Ripon College, Ripon	67
University of Wisconsin, Milwaukee.....	158
University of Wisconsin - Madison, Madison	158
University of Wisconsin - Stevens Point, Stevens Point.....	159
University of Wisconsin-Superior, Superior.....	159
Wisconsin Indianhead Technical College, Ashland.....	163

Subject Index of Marine Science and Technology Programs ¹

Aquaculture

Auburn University, Auburn, AL, 4
Bristol Community College, Fall River, MA, 7
Carteret Community College, Morehead City, NC, 13
Florida Institute of Technology, Melbourne, FL, 25
Grays Harbor College, Aberdeen, WA, 27
Hocking College, Nelsonville, OH, 30
Humboldt State University, Arcata, CA, 31
Mississippi State University, Mississippi State, MS, 48
North Carolina State University, Raleigh, NC, 51
Saddleback Community College, Mission Viejo, CA, 69
Salem State College, Salem, MA, 70
University of Alaska, Fairbanks, Fairbanks, AK, 92
University of Hawaii at Hilo, Hilo, HI, 112
University of Rhode Island, Narragansett and Kingston, RI, 141

Aquarium Science/Technology

Oregon Coast Community College, Newport, OR, 57
Saddleback Community College, Mission Viejo, CA, 69

Atmospheric Studies/Meteorology

Dalhousie University, Halifax, Nova Scotia, Canada, 17
Florida Institute of Technology, Melbourne, FL, 25
Maritime Institute of Technology and Graduate Studies, Linthicum, MD, 43
Naval Postgraduate School, Monterey, CA, 50
North Carolina State University, Raleigh, NC, 51
Oregon State University, Corvallis, OR, 58
Pennsylvania State University, University Park, PA, 65
Princeton University, Princeton, NJ, 66
State University of New York Maritime College, Bronx, NY, 78
Stony Brook University, Stony Brook, NY, 80
University of California, Los Angeles, Los Angeles, CA, 98
University of Georgia, Athens, GA, 110
University of Hawaii at Manoa, Honolulu, HI, 113
University of Massachusetts School of Marine Sciences, Amherst, Boston, Dartmouth and Lowell, MA, 121
University of Miami Rosenstiel School of Marine and Atmospheric Science, Miami, FL, 124
University of Michigan, Ann Arbor, MI, 128

University of North Dakota, Grand Forks, ND, 138
University of South Alabama, Mobile, AL, 148
University of Wisconsin - Madison, Madison, WI, 158

Boat Maintenance

Alexandria Technical College, Alexandria, MN, 3
Cape Fear Community College, Wilmington, NC, 12
Honolulu Community College, Honolulu, HI, 31
Maine Maritime Academy, Castine, ME, 39

Coastal Resource Management (also see Marine Resource Management)

Bowdoin College, Brunswick, ME, 5
California State University, Monterey Bay, Seaside, CA, 11
Coastal Carolina University, Conway, SC, 14
College of William & Mary, Williamsburg, VA, 15
Duke University Nicholas School Marine Laboratory, Beaufort, NC, 19
Duke University Nicholas School of the Environment and Earth Sciences, Durham, NC, 21
Florida Institute of Technology, Melbourne, FL, 25
Grays Harbor College, Aberdeen, WA, 27
Lake Superior State University, Sault Ste. Marie, MI, 35
Louisiana State University, Baton Rouge, LA, 36
Memorial University of Newfoundland, St. John's, Newfoundland, Canada, 44
Mississippi State University, Mississippi State, MS, 48
North Carolina State University, Raleigh, NC, 51
Nova Southeastern University, City of Dania Beach, FL, 53
Smith College, Northampton, MA, 76
Stevens Institute of Technology, Hoboken, NJ, 79
Texas A&M University at Galveston, Galveston, TX, 84
University of Arkansas at Little Rock, Little Rock, AR, 95
University of Connecticut, Groton, CT, 106
University of Delaware, Lewes, DE, 108
University of Georgia, Athens, GA, 110
University of Maryland, College Park and Cambridge, MD, 118
University of Massachusetts School of Marine Sciences, Amherst, Boston, Dartmouth and Lowell, MA, 121
University of Michigan, Ann Arbor, MI, 128
University of South Carolina, Columbia, SC, 148
University of Washington, Seattle, WA, 155
University of Wisconsin - Stevens Point, Stevens Point, WI, 159
University of Wisconsin - Superior, Superior, WI, 159

(Footnote)

¹ The editors apologize for any inaccuracies or omissions in this index. Our goal for presenting this listing of programs by subject category—as it is for the entire Guide—is to provide a useful first step in locating programs of interest to the reader. Please send corrections to www.oceancareers.com/comments.

Conservation Science (marine-related)

Duke University Nicholas School Marine Laboratory,
Beaufort, NC, 19
Duke University Nicholas School of the Environment and
Earth Sciences, Durham, NC, 21
Louisiana Tech University, Ruston, LA, 37
North Carolina State University, Raleigh, NC, 51
Northwest Missouri State University, Kirksville, MO, 53
Peninsula College, Port Angeles, WA, 65
University of California, San Diego, Scripps Institution of
Oceanography, La Jolla, CA, 99
University of Delaware, Lewes, DE, 108
University of Michigan, Ann Arbor, MI, 128
University of Minnesota, St. Paul, MN, 131
University of Tennessee at Martin, Martin, TN, 154
University of Wisconsin, Milwaukee, WI, 158

Diving Technology

Barry University, Miami Shores, FL, 4
DiveSafe International, Campbell River, Canada, 19
National Polytechnic College of Engineering and
Oceaneering, Wilmington, CA, 49
Santa Barbara City College, Santa Barbara, CA, 73

Earth Science

Brookdale Community College, Lincroft, NJ, 7
Brown University, Providence, RI, 7
California State University, Monterey Bay, Seaside, CA, 11
Columbia University, New York, NY, 15
Columbia University, Lamont-Doherty Earth Observatory,
Palisades, NY, 16
Community College of Rhode Island, Warwick, RI, 16
Dalhousie University, Halifax, Nova Scotia, Canada, 17
Duke University Nicholas School of the Environment and
Earth Sciences, Durham, NC, 21
Furman University, Greenville, SC, 27
Harvard University, Cambridge, MA, 29
Johns Hopkins University, Baltimore, MD, 34
Monterey Peninsula College, Monterey, CA, 48
North Carolina State University, Raleigh, NC, 51
Pennsylvania State University, University Park, PA, 65
Tennessee Technological University, Cookeville, TN, 82
University of Alabama, Tuscaloosa, AL, 91
University of California, Berkeley, Berkeley, CA, 95
University of California, Irvine, Irvine, CA, 98
University of California, San Diego—Scripps Institution of
Oceanography, La Jolla, CA, 99
University of California, Santa Barbara, Santa Barbara, CA, 102
University of California, Santa Cruz, Santa Cruz, CA, 104
University of Delaware, Lewes, DE, 108
University of Hawaii at Manoa, Honolulu, HI, 113
University of Michigan, Ann Arbor, MI, 128
University of New Hampshire, Durham, NH, 133

University of Rhode Island, Narragansett and
Kingston, RI, 141
University of Wisconsin, Milwaukee, WI, 158
Wesleyan University, Middletown, CT, 160
West Virginia University, Morgantown, WV, 160
Wilkes University, Wilkes-Barre, PA, 162

Ecotourism and Recreation

Hocking College, Nelsonville, OH, 30
North Carolina State University, Raleigh, NC, 51

Electrical Engineering (marine-related)

Brevard Community College, Cocoa, FL, 6
California State Polytechnic University, Pomona, CA, 8
Community College of Rhode Island, Warwick, RI, 16
Hillsborough Community College, Tampa, FL, 30
Lock Haven University of Pennsylvania, Lock Haven, PA, 35
Long Beach City College, Long Beach, CA, 36
Memorial University of Newfoundland, St. Johns Canada, 44
Naval Postgraduate School, Monterey, CA, 50
Oregon Health and Science University-CMOP,
Beaverton, OR, 57
San Diego State University, San Diego, CA, 71
State University of New York Maritime College, Bronx, NY, 78
University of California, Santa Cruz, Santa Cruz, CA, 104
University of Texas, Austin, Port Aransas, TX, 154

Electronics Technology (marine-related)

Community College of Rhode Island, Warwick, RI, 16
Hillsborough Community College, Tampa, FL, 30
Honolulu Community College, Honolulu, HI, 31
Lock Haven University of Pennsylvania, Lock Haven, PA, 35
Long Beach City College, Long Beach, CA, 36
Memorial University of Newfoundland, St. Johns Canada, 44
Prince William Sound Community College, Valdez, AK, 66
Southern Maine Community College, South Portland, ME, 77
State University of New York Maritime College, Bronx, NY, 78
Wisconsin Indianhead Technical College, Ashland, WI, 163

Environmental Engineering (marine-related)

California State Polytechnic University, San Luis Obispo,
San Luis Obispo, CA, 8
Humboldt State University, Arcata, CA, 31
New Jersey Institute of Technology, Newark, NJ, 51
North Carolina State University, Raleigh, NC, 51
Oregon Health and Science University-CMOP,
Beaverton, OR, 57
Princeton University, Princeton, NJ, 66
San Diego State University, San Diego, CA, 71
Stevens Institute of Technology, Hoboken, NJ, 79
University of Michigan, Ann Arbor, MI, 128
University of Southern California, Los Angeles, CA, 151
Wilkes University, Wilkes-Barre, PA, 162

Environmental Monitoring Technology

Florida Keys Community College, Key West, FL, 26
Hillsborough Community College, Tampa, FL, 30
Lake Superior State University, Sault Ste. Marie, MI, 35
North Carolina State University, Raleigh, NC, 51
Peninsula College, Port Angeles, WA, 65

Environmental Response

Hampshire College, Amherst, MA, 28
Prince William Sound Community College, Valdez, AK, 66
Southern Maine Community College, South Portland, ME, 77

Environmental Science

Barry University, Miami Shores, FL, 4
Bristol Community College, Fall River, MA, 7
Brookdale Community College, Lincroft, NJ, 7
California University of Pennsylvania, California, PA, 12
Columbia University, New York, NY, 15
Columbia University, Lamont-Doherty Earth Observatory, Palisades, NY, 16
Drexel University, Philadelphia, PA, 19
Duke University Nicholas School of the Environment and Earth Sciences, Durham, NC, 21
Furman University, Greenville, SC, 27
Hampton University, Hampton, VA, 28
Hillsborough Community College, Tampa, FL, 30
Jackson State University, Jackson, MS, 33
Johns Hopkins University, Baltimore, MD, 34
Lake Superior State University, Sault Ste. Marie, MI, 35
Medical University of South Carolina, Charleston, SC, 44
Mississippi State University, Mississippi State, MS, 48
Monmouth College, West Long Branch, NJ, 48
North Carolina State University, Raleigh, NC, 51
Nova Southeastern University, City of Dania Beach, FL, 53
Oregon Health and Science University-CMOP, Beaverton, OR, 57
Princeton University, Princeton, NJ, 66
Roger Williams University, Bristol, RI, 67
Salisbury University, Salisbury, MD, 71
Southern Maine Community College, South Portland, ME, 77
State University of New York Maritime College, Bronx, NY, 78
Stevens Institute of Technology, Hoboken, NJ, 79
Stony Brook University, Stony Brook, NY, 80
Troy University, Troy, AL, 86
University of California, Davis, Davis, CA, 96
University of California, Irvine, Irvine, CA, 98
University of California, Los Angeles, Los Angeles, CA, 98
University of California, Santa Cruz, Santa Cruz, CA, 104
University of Connecticut, Groton, CT, 106
University of Delaware, Lewes, DE, 108
University of Maryland, College Park and Cambridge, MD, 118
University of Massachusetts Boston, Boston, MA, 120

University of Massachusetts School of Marine Sciences, Amherst, Boston, Dartmouth and Lowell, MA, 121
University of Southern California—Wrigley Institute, Los Angeles, CA, 151
University of Tennessee at Martin, Martin, TN, 154
University of West Alabama, Livingston, AL, 158
University of Wisconsin, Milwaukee, WI, 158
University of Wisconsin, Superior, Superior, WI, 159
Wesleyan University, Middletown, CT, 160
West Virginia University, Morgantown, WV, 160
Western Washington University, Bellingham, WA, 160
Wilkes University, Wilkes-Barre, PA, 162

Environmental Toxicology

North Carolina State University, Raleigh, NC, 51
Stevens Institute of Technology, Hoboken, NJ, 79
University of California, Santa Cruz, Santa Cruz, CA, 104
University of Maryland, College Park, MD, 118

Hydrographic Surveying

University of New Hampshire, Durham, NH, 133
University of Rhode Island, Narragansett, RI, 141
University of Southern Mississippi, Stennis Space Center, MS, 151

Marine Archaeology

East Carolina University, Greenville, NC, 22
University of Rhode Island, Narragansett and Kingston, RI, 141

Marine Biology

Auburn University, Auburn, AL, 3
Barry University, Miami Shores, FL, 4
Bloomsburg University of Pennsylvania, Bloomsburg, PA, 5
Boston University, Boston, MA, 5
Bowling Green State University, Bowling Green, OH, 6
California State Polytechnic University, San Luis Obispo, San Luis Obispo, CA, 8
California State University, Fullerton, Fullerton, CA, 10
California State University, Long Beach, Long Beach, CA, 11
California State University, Northridge, Northridge, CA, 11
California State University, San José, San José, CA, 11
California State University, Stanislaus, Turlock, CA, 12
College of Charleston, Charleston, SC, 14
Community College of Rhode Island, Warwick, RI, 16
Dalhousie University, Halifax, Nova Scotia, Canada, 17
Fairleigh Dickinson University, Teaneck, NJ, 23
Florida Atlantic University, Davie, FL, 25
Florida Institute of Technology, Melbourne, FL, 25
Florida State University, Tallahassee, FL, 26
Grays Harbor College, Aberdeen, WA, 27
Hofstra University, Hempstead, NY, 31
Humboldt State University, Arcata, CA, 31

Ithaca College, Ithaca, NY, 33
Kingsborough Community College of the City University of New York, Brooklyn, NY, 34
Lock Haven University of Pennsylvania, Lock Haven, PA, 35
Maine Maritime Academy, Castine, ME, 39
Millersville University of Pennsylvania, Millersville, PA, 47
Mississippi State University, Mississippi State, MS, 48
Monmouth College, West Long Branch, NJ, 48
Moss Landing Marine Laboratories, Moss Landing, CA, 49
North Carolina State University, Raleigh, NC, 51
Northeastern University, Boston, MA, 52
Northeastern University Three Seas Program, Nahant, MA, 52
Northwest Missouri State University, Kirksville, MO, 53
Nova Southeastern University, City of Dania Beach, FL, 53
Occidental College, Los Angeles, CA, 55
Old Dominion University, Norfolk, VA, 56
Orange Coast College, Costa Mesa, CA, 57
Oregon State University, Corvallis, OR, 58
Palm Beach Atlantic College, West Palm Beach, FL, 64
Princeton University, Princeton, NJ, 66
Roger Williams University, Bristol, RI, 67
Saint Peters College, Jersey City, NJ, 70
Salem State College, Salem, MA, 70
San Diego State University, San Diego, CA, 71
San Francisco State University, San Francisco, CA, 72
Southern Maine Community College, South Portland, ME, 77
Southwest Texas State University, San Marcos, TX, 78
Stanford University, Stanford, CA, 78
State University of New York Maritime College, Bronx, NY, 78
Stony Brook University, Stony Brook, NY, 80
Texas A&M University, College Station, TX, 83
Texas A&M University at Galveston, Galveston, TX, 84
Troy University, Troy, AL, 86
Tuskegee University, Tuskegee, AL, 87
Union University, Jackson, TN, 88
University of Alabama, Tuscaloosa, AL, 91
University of Alabama at Birmingham, Birmingham, AL, 92
University of Alaska, Fairbanks, Fairbanks, AK, 92
University of Alaska, Southeast, Juneau, AK, 94
University of California, Davis, Davis, CA, 96
University of California, Los Angeles, Los Angeles, CA, 98
University of California, San Diego - Scripps Institution of Oceanography, La Jolla, CA, 99
University of California, Santa Barbara, Santa Barbara, CA, 102
University of California, Santa Cruz, Santa Cruz, CA, 104
University of Connecticut, Groton, CT, 106
University of Delaware, Lewes, DE, 108
University of Hawaii at Manoa, Honolulu, HI, 113
University of Miami, Miami, FL, 124
University of Minnesota, St. Paul, MN, 131
University of New Hampshire, Durham, NH, 133
University of North Alabama, Florence, AL, 135

University of North Carolina at Wilmington, Wilmington, NC, 136
University of Oregon, Eugene, OR, 139
University of Rhode Island, Narragansett and Kingston, RI, 141
University of South Alabama, Mobile, AL, 148
University of South Carolina, Columbia, SC, 148
University of South Florida, St. Petersburg, FL, 149
University of Southern Mississippi, Stennis Space Center, MS, 151
University of Tampa, Tampa, FL, 154
University of Texas, Austin, Port Aransas, TX, 154
University of West Alabama, Livingston, AL, 158
University of Wisconsin - Superior, Superior, WI, 159
Western Washington University, Bellingham, WA, 160
Wittenberg University, Springfield, OH, 163

Marine Biomedical

Maritime Institute of Technology and Graduate Studies, Linthicum, MD, 43
Medical University of South Carolina, Charleston, SC, 44
Texas A&M University at Galveston, Galveston, TX, 84
University of Massachusetts School of Marine Sciences, Amherst, Boston, Dartmouth and Lowell, MA, 121

Marine Botany

University of California, Santa Cruz, Santa Cruz, CA, 104

Marine Chemistry

Dalhousie University, Halifax, Nova Scotia, Canada, 17
North Carolina State University, Raleigh, NC, 51
University of Alabama, Tuscaloosa, AL, 91
University of California, San Diego - Scripps Institution of Oceanography, La Jolla, CA, 99
University of Connecticut, Groton, CT, 106
University of Georgia, Athens, GA, 110
University of Miami, Miami, FL, 124
University of South Florida, St. Petersburg, FL, 149
University of Tampa, Tampa, FL, 154
University of Wisconsin - Madison, Madison, WI, 158

Marine Ecology

California State Polytechnic University, San Luis Obispo, San Luis Obispo, CA, 8
California State University, Monterey Bay, Seaside, CA, 11
Louisiana State University, Baton Rouge, LA, 36
Louisiana Universities, Chauvin, LA, 38
Moss Landing Marine Laboratories, Moss Landing, CA, 49
North Carolina State University, Raleigh, NC, 51
Nova Southeastern University, City of Dania Beach, FL, 53
Peninsula College, Port Angeles, WA, 65
Rider University, Lawrenceville, NJ, 67
University of Alabama at Birmingham, Birmingham, AL, 92

University of Alaska, Fairbanks, Fairbanks, AK, 92
University of California, Davis, Davis, CA, 96
University of California, San Diego, La Jolla, CA, 99
University of California, Santa Barbara, Santa Barbara, CA, 102
University of California, Santa Cruz, Santa Cruz, CA, 104
University of Maryland, College Park and
Cambridge, MD, 118

Marine Engineering

Alexandria Technical College, Alexandria, MN, 3
California State University, California Maritime Academy,
Vallejo, CA, 9
Florida Keys Community College, Key West, FL, 26
Great Lakes Maritime Academy/Northwestern Michigan
College, Traverse City, MI, 28
Louisiana Technical College, Morgan City, LA, 38
Maine Maritime Academy, Castine, ME, 39
Memorial University of Newfoundland, St. Johns, Canada, 44
North Carolina State University, Raleigh, NC, 51
Seattle Central Community College, Seattle, WA, 74
State University of New York Maritime College, Bronx, NY, 78
United States Merchant Marine Academy, Kings Point, NY, 87
University of New Orleans, New Orleans, LA, 134

Marine Food Safety

Memorial University of Newfoundland, St. John's,
Newfoundland, Canada, 44
North Carolina State University, Raleigh, NC, 51
University of Alaska, Fairbanks, Fairbanks, AK, 92

Marine Geology

Brown University, Providence, RI, 7
Coastal Carolina University, Conway, SC, 14
Dalhousie University, Halifax, Nova Scotia, Canada, 17
Massachusetts Institute of Technology, Cambridge, MA, 43
North Carolina State University, Raleigh, NC, 51
Old Dominion University, Norfolk, VA, 56
Oregon State University, Corvallis, OR, 58
Pennsylvania State University, University Park, PA, 65
San Diego State University, San Diego, CA, 71
Tennessee Technological University, Cookeville, TN, 82
University of California, Davis, Davis, CA, 96
University of California, San Diego—Scripps Institution
of Oceanography, La Jolla, CA, 99
University of California, Santa Barbara, Santa Barbara, CA, 102
University of Delaware, Lewes, DE, 108
University of Hawaii at Manoa, Honolulu, HI, 113
University of Massachusetts School of Marine Sciences,
Amherst, Boston, Dartmouth and Lowell, MA, 121
University of Miami, Miami, FL, 125
University of North Carolina at Wilmington, Wilmington,
NC, 136

University of Rhode Island, Narragansett and
Kingston, RI, 141
University of South Carolina, Columbia, SC, 148
University of South Florida, St. Petersburg, FL, 149
University of Washington, Seattle, WA, 155
Woods Hole Oceanographic Institution, Woods Hole,
MA, 163

Marine Licenses

Chapman School of Seamanship, Stuart, FL, 13
Clatsop Community College, Astoria, OR, 13
Great Lakes Maritime Academy/Northwestern Michigan
College, Traverse City, MI, 28
Louisiana Technical College, Morgan City, LA, 38
Maritime Institute, Inc, San Diego, CA, 42
Maritime Institute of Technology and Graduate Studies,
Linthicum, MD, 43
Northeast Maritime Institute, Fairhaven, MA, 52
Quality Maritime Training, LLC, St. Petersburg, FL, 66
Seamen's Training Center, Sausalito, CA, 74
Seattle Central Community College, Seattle, WA, 74
State University of New York Maritime College, Bronx, NY, 78
Texas A&M University at Galveston, Galveston, TX, 84
United States Merchant Marine Academy, Kings Point, NY, 87

Marine Mechanics

Honolulu Community College, Honolulu, HI, 31
University of Alaska, Southeast, Juneau, AK, 94

Marine Microbiology

University of Maryland, College Park and
Cambridge, MD, 118

Marine Policy

Dalhousie University, Halifax, Nova Scotia, Canada, 17
University of Delaware, Lewes, DE, 108
University of Maine, Orono, ME, 116
University of Miami, Miami, FL, 124
University of Michigan, Ann Arbor, MI, 128
University of Rhode Island, Narragansett and
Kingston, RI, 141
University of South Carolina, Columbia, SC, 148

Marine Resource Management (also see Coastal Resource Management)

Auburn University at Montgomery, Montgomery, AL, 4
California State University, California Maritime Academy,
Vallejo, CA, 9
California State University, Monterey Bay, Seaside, CA, 11
Dalhousie University, Halifax, Nova Scotia, Canada, 17
Duke University Nicholas School of the Environment and
Earth Sciences, Durham, NC, 21
East Carolina University, Greenville, NC, 22

Grays Harbor College, Aberdeen, WA, 27
Memorial University of Newfoundland, St. John's,
Newfoundland, Canada, 44
Mississippi State University, Mississippi State, MS, 48
Oregon State University, College of Oceanic and
Atmospheric Science, Corvallis, OR, 60
Texas A&M University at Galveston, Galveston, TX, 84
University of Arkansas at Little Rock, Little Rock, AR, 95
University of Hawaii at Manoa, Honolulu, HI, 113
University of Maine, Orono, ME, 116
University of Massachusetts School of Marine Sciences,
Amherst, Boston, Dartmouth and Lowell, MA, 121
University of Michigan, Ann Arbor, MI, 128
University of Rhode Island, Narragansett and
Kingston, RI, 141

Marine Safety

Alaska Vocational Technical Center, Seward, AK, 3
Chapman School of Seamanship, Stuart, FL, 13
Great Lakes Maritime Academy/Northwestern Michigan
College, Traverse City, MI, 28
Louisiana Technical College, Morgan City, LA, 38
Maritime Institute of Technology and Graduate Studies,
Linthicum, MD, 43
Memorial University of Newfoundland, St. John's,
Newfoundland, Canada, 44

Marine Sciences

California State University, East Bay, Hayward, CA, 10
California State University, Stanislaus, Stanislaus, CA, 12
Coastal Carolina University, Conway, SC, 14
College of The Albemarle, Elizabeth City, NC, 14
College of the Atlantic, Bar Harbor, ME, 15
College of the Redwoods, Fort Bragg, CA, 15
College of William & Mary, Williamsburg, VA, 15
Duke University Nicholas School Marine Laboratory,
Beaufort, NC, 19
Eckerd College, St. Petersburg, FL, 23
Everett Community College, Everett, WA, 23
Florida Institute of Technology, Melbourne, FL, 25
Hampton University, Hampton, VA, 28
Jackson State University, Jackson, MS, 33
Kutztown University of Pennsylvania, Kutztown, PA, 35
Long Island University, Southampton, NY, 36
Louisiana State University, Baton Rouge, LA, 36
Maine Maritime Academy, Castine, ME, 39
Memorial University of Newfoundland, St. John's,
Newfoundland, Canada, 44
Monterey Peninsula College, Monterey, CA, 48
Moss Landing Marine Laboratories, Moss Landing, CA, 49
New Jersey Marine Sciences Consortium, Fort Hancock,
NJ, 51

North Carolina State University, Raleigh, NC, 51
Nova Southeastern University, City of Dania Beach, FL, 53
Orange Coast College, Costa Mesa, CA, 57
Pennsylvania State University, University Park, PA, 65
Rider University, Lawrenceville, NJ, 67
Rutgers University, New Brunswick, NJ, 68
Saddleback Community College, Mission Viejo, CA, 69
Samford University, Birmingham, AL, 71
San Francisco State University, San Francisco, CA, 72
Savannah State University, Savannah, GA, 73
Slippery Rock University of Pennsylvania, Slippery Rock,
PA, 76
Smith College, Northampton, MA, 76
State University of New York Maritime College, Bronx, NY, 78
Stony Brook University, Stony Brook, NY, 80
Texas A&M University at Galveston, Galveston, TX, 84
University of Alabama, Tuscaloosa, AL, 91
University of Alabama at Birmingham, Birmingham, AL, 92
University of California, Berkeley, Berkeley, CA, 95
University of California, Davis, Davis, CA, 96
University of California, San Diego—Scripps Institution of
Oceanography, La Jolla, CA, 99
University of California, Santa Barbara, Santa Barbara, CA, 102
University of California, Santa Cruz, Santa Cruz, CA, 104
University of Connecticut, Groton, CT, 106
University of Georgia, Athens, GA, 110
University of Hawaii at Hilo, Hilo, HI, 112
University of Maine, Orono, ME, 116
University of Massachusetts School of Marine Sciences,
Amherst, Boston, Dartmouth and Lowell, MA, 121
University of Miami, Miami, FL, 124
University of Mobile, Mobile, AL, 132
University of North Carolina at Chapel Hill, Chapel Hill,
NC, 136
University of North Carolina at Wilmington, Wilmington,
NC, 136
University of San Diego, San Diego, CA, 147
University of South Carolina, Columbia, SC, 148
University of Southern California, Los Angeles, CA, 151
University of Southern Mississippi, Stennis Space Center,
MS, 151
University of Texas, Austin, Port Aransas, TX, 154
University of the District of Columbia, Washington, DC, 155
University of Washington, Seattle, WA, 155
University of Wisconsin, Milwaukee, WI, 158
Virginia Institute of Marine Sciences, Gloucester Point,
VA, 160
Wilkes University, Wilkes-Barre, PA, 162
Woods Hole Oceanographic Institution, Woods Hole,
MA, 163

Marine Technology

Alexandria Technical College, Alexandria, MN, 3
Bristol Community College, Fall River, MA, 7
Cape Fear Community College, Wilmington, NC, 12
Clatsop Community College, Astoria, OR, 13
College of the Redwoods, Fort Bragg, CA, 15
Great Lakes Maritime Academy/Northwestern Michigan College, Traverse City, MI, 28
Memorial University of Newfoundland, St. Johns, Newfoundland, Canada, 44
Monterey Peninsula College, Monterey, CA, 48
National Polytechnic College of Engineering and Oceaneering, Wilmington, CA, 49
New England Institute of Technology, Warwick, RI, 51
North Carolina State University, Raleigh, NC, 51
Saddleback Community College, Mission Viejo, CA, 69
Seattle Central Community College, Seattle, WA, 74
United States Merchant Marine Academy, Kings Point, NY, 87
University of California, Berkeley, Berkeley, CA, 95
Wisconsin Indianhead Technical College, Ashland, WI, 163

Marine Transportation Technology

California State University, California Maritime Academy, Vallejo, CA, 9
Cape Fear Community College, Wilmington, NC, 12
Carteret Community College, Morehead City, NC, 13
Chapman School of Seamanship, Stuart, FL, 13
Clatsop Community College, Astoria, OR, 13
Great Lakes Maritime Academy/Northwestern Michigan College, Traverse City, MI, 28
Kingsborough Community College of the City University of New York, Brooklyn, NY, 34
Louisiana Technical College, Morgan City, LA, 38
Maine Maritime Academy, Castine, ME, 39
Seattle Central Community College, Seattle, WA, 74
State University of New York Maritime College, Bronx, NY, 78
Stevens Institute of Technology, Hoboken, NJ, 79
United States Merchant Marine Academy, Kings Point, NY, 87
University of Alaska, Southeast, Juneau, AK, 94

Marine-Related Law

Duke University Nicholas School of the Environment and Earth Sciences, Durham, NC, 21
University of Alaska, Anchorage, Anchorage, AK, 92
University of Michigan, Ann Arbor, MI, 128
University of Minnesota, St. Paul, MN, 131
University of Oregon, Eugene, OR, 139

Maritime Studies

California State University, California Maritime Academy, Vallejo, CA, 9
Memorial University of Newfoundland, St. Johns, Newfoundland, Canada, 44
Williams College and Mystic Seaport, Mystic, CT, 162

Mechanical Engineering (marine-related)

California State University, California Maritime Academy, Vallejo, CA, 9
Maine Maritime Academy, Castine, ME, 39
Massachusetts Institute of Technology, Cambridge, MA, 43
Naval Postgraduate School, Monterey, CA, 50
State University of New York Maritime College, Bronx, NY, 78
University of California, Berkeley, Berkeley, CA, 95
University of Southern California, Los Angeles, CA, 151

Naval Science

Clatsop Community College, Astoria, OR, 13
Hampton University, Hampton, VA, 28
Massachusetts Institute of Technology, Cambridge, MA, 43
Memorial University of Newfoundland, St. Johns, Newfoundland, Canada, 44
State University of New York Maritime College, Bronx, NY, 78
Stevens Institute of Technology, Hoboken, NJ, 79
University of California, Berkeley, Berkeley, CA, 95
University of New Orleans, New Orleans, LA, 134

Navigation and Charting Technology

Alaska Vocational Technical Center, Seward, AK, 3
Chapman School of Seamanship, Stuart, FL, 13
Great Lakes Maritime Academy/Northwestern Michigan College, Traverse City, MI, 28
Maritime Institute, Inc, San Diego, CA, 42
United States Merchant Marine Academy, Kings Point, NY, 87

Ocean Engineering

California State Polytechnic University, Pomona, CA, 8
Florida Atlantic University, Boca Raton, FL, 24
Florida Atlantic University, Davie, FL, 25
Florida Institute of Technology, Melbourne, FL, 25
Massachusetts Institute of Technology, Cambridge, MA, 43
Oregon State University, Corvallis, OR, 58
Stevens Institute of Technology, Hoboken, NJ, 79
Texas A&M University, College Station, TX, 83
United States Naval Academy, Annapolis, MD, 90
University of California, Berkeley, Berkeley, CA, 95
University of California, San Diego, La Jolla, CA, 99
University of California, San Diego—Scripps Institution of Oceanography, La Jolla, CA, 99
University of Delaware, Lewes, DE, 108
University of Georgia, Athens, GA, 110

University of Hawaii at Manoa, Honolulu, HI, 113
University of Memphis, Memphis, TN, 124
University of Miami, Miami, FL, 124
University of New Hampshire, Durham, NH, 133
University of New Orleans, New Orleans, LA, 134
University of Rhode Island, Narragansett and
Kingston, RI, 141
Woods Hole Oceanographic Institution, Woods Hole,
MA, 163

Ocean Observing Technology

Oregon Health and Science University - CMOP,
Beaverton, OR, 57
Rutgers University, New Brunswick, NJ, 68
Texas A&M University, College Station, TX, 83
University of Massachusetts School of Marine Sciences,
Amherst, Boston, Dartmouth and Lowell, MA, 121
University of Michigan, Ann Arbor, MI, 128
University of Rhode Island, Narragansett and
Kingston, RI, 141

Oceanography

Dalhousie University, Halifax, Nova Scotia, Canada, 17
Florida Institute of Technology, Melbourne, FL, 25
Florida State University, Tallahassee, FL, 26
Friday Harbor Laboratories, University of Washington
Cornell University, Ithaca, NY, 26
Humboldt State University, Arcata, CA, 31
Humboldt State University Marine Lab, Trinidad, CA, 32
Johns Hopkins University, Baltimore, MD, 34
Louisiana State University, Baton Rouge, LA, 36
Massachusetts Institute of Technology/Woods Hole
Oceanographic Institution, Cambridge, MA, 43
Monterey Peninsula College, Monterey, CA, 48
Moss Landing Marine Laboratories, Moss Landing, CA, 49
Naval Postgraduate School, Monterey, CA, 50
North Carolina State University, Raleigh, NC, 51
Nova Southeastern University, City of Dania Beach, FL, 53
Old Dominion University, Norfolk, VA, 56
Oregon Health and Science University - CMOP,
Beaverton, OR, 57
Palm Beach Atlantic College, West Palm Beach, FL, 64
Perry Institute for Marine Science, Jupiter, FL, 66
Princeton University, Princeton, NJ, 66
Rider University, Lawrenceville, NJ, 67
Rutgers University, New Brunswick, NJ, 68
Seattle Central Community College, Seattle, WA, 74
Southern Maine Community College, South Portland, ME, 77
State University of New York Maritime College, Bronx, NY, 78
Stony Brook University, Stony Brook, NY, 80
Texas A&M University, College Station, TX, 83
University of Alaska, Fairbanks, Fairbanks, AK, 92
University of California, Davis, Davis, CA, 96

University of California, Los Angeles, Los Angeles, CA, 98
University of California, San Diego—Scripps Institution of
Oceanography, La Jolla, CA, 99
University of California, Santa Barbara, Santa Barbara, CA, 102
University of California, Santa Cruz, Santa Cruz, CA, 104
University of Connecticut, Groton, CT, 106
University of Delaware, Lewes, DE, 108
University of Hawaii at Manoa, Honolulu, HI, 113
University of Maine, Orono, ME, 116
University of Massachusetts Boston, Boston, MA, 120
University of Massachusetts School of Marine Sciences,
Amherst, Boston, Dartmouth and Lowell, MA, 121
University of New Hampshire, Durham, NH, 133
University of Rhode Island, Narragansett and
Kingston, RI, 141
University of South Alabama, Mobile, AL, 148
University of South Carolina, Columbia, SC, 148
University of Southern California, Los Angeles, CA, 151
University of Wisconsin - Madison, Madison, WI, 158
Woods Hole Oceanographic Institution, Woods Hole,
MA, 163

Biological Oceanography

Cornell University, Ithaca, NY, 16
Dalhousie University, Halifax, Nova Scotia, Canada, 17
Friday Harbor Laboratories, University of Washington/
Cornell University, Ithaca, NY, 26
Massachusetts Institute of Technology, Cambridge,
MA, 43
North Carolina State University, Raleigh, NC, 51
Old Dominion University, Norfolk, VA, 56
Oregon State University, Corvallis, OR, 58
Texas A&M University, College Station, TX, 83
University of California, San Diego—Scripps
Institution of Oceanography, La Jolla, CA, 99
University of Connecticut, Groton, CT, 106
University of Hawaii at Manoa, Honolulu, HI, 113
University of Maryland, College Park and
Cambridge, MD, 118
University of Rhode Island, Narragansett and
Kingston, RI, 141
University of South Alabama, Mobile, AL, 148
University of South Carolina, Columbia, SC, 148
University of Texas, Austin, Port Aransas, TX, 154
University of Washington, Seattle, WA, 155
Woods Hole Oceanographic Institution, Woods Hole,
MA, 163

Chemical Oceanography

Chapman School of Seamanship, Stuart, FL, 13
Coastal Carolina University, Conway, SC, 14
Dalhousie University, Halifax, Nova Scotia, Canada, 17
Massachusetts Institute of Technology, Cambridge, MA, 43
North Carolina State University, Raleigh, NC, 51
Old Dominion University, Norfolk, VA, 56
Oregon State University, Corvallis, OR, 58
Texas A&M University, College Station, TX, 83
University of California, San Diego—Scripps Institution of Oceanography, La Jolla, CA, 99
University of Georgia, Athens, GA, 110
University of Maryland, College Park and Cambridge, MD, 118
University of Massachusetts School of Marine Sciences, Amherst, Boston, Dartmouth and Lowell, MA, 121
University of North Carolina at Wilmington, Wilmington, NC, 136
University of Rhode Island, Narragansett and Kingston, RI, 141
University of South Alabama, Mobile, AL, 148
University of South Carolina, Columbia, SC, 148
University of Washington, Seattle, WA, 155
Woods Hole Oceanographic Institution, Woods Hole, MA, 163

Geological Oceanography

North Carolina State University, Raleigh, NC, 51
Texas A&M University, College Station, TX, 83
University of Alaska, Fairbanks, Fairbanks, AK, 92
University of California, Davis, Davis, CA, 96
University of California, Santa Barbara, Santa Barbara, CA, 102
University of Rhode Island, Narragansett and Kingston, RI, 141
University of South Alabama, Mobile, AL, 148
University of South Carolina, Columbia, SC, 148
University of Southern California, Los Angeles, CA, 151

Physical Oceanography

Dalhousie University, Halifax, Nova Scotia, Canada, 17
Humboldt State University, Arcata, CA, 31
Humboldt State University Marine Lab, Trinidad, CA, 32
Johns Hopkins University, Baltimore, MD, 34
Massachusetts Institute of Technology, Cambridge, MA, 43
North Carolina State University, Raleigh, NC, 51
Nova Southeastern University, City of Dania Beach, FL, 53
Old Dominion University, Norfolk, VA, 56
Oregon State University, Corvallis, OR, 58

Texas A&M University, College Station, TX, 83
University of California, San Diego—Scripps Institution of Oceanography, La Jolla, CA, 99
University of Connecticut, Groton, CT, 106
University of Delaware, Lewes, DE, 108
University of Georgia, Athens, GA, 110
University of Maryland, College Park and Cambridge, MD, 118
University of Miami, Miami, FL, 124
University of Michigan, Ann Arbor, MI, 128
University of North Carolina at Wilmington, Wilmington, NC, 136
University of Rhode Island, Narragansett and Kingston, RI, 141
University of South Alabama, Mobile, AL, 148
University of South Carolina, Columbia, SC, 148
University of South Florida, St. Petersburg, FL, 149
University of Washington, Seattle, WA, 155
Woods Hole Oceanographic Institution, Woods Hole, MA, 163

Petroleum Engineering

University of Southern California, Los Angeles, CA, 151
University of Texas, Austin, Port Aransas, TX, 154

Propulsion/Power Generation

California State University, California Maritime Academy, Vallejo, CA, 9
Carteret Community College, Morehead City, NC, 13
Great Lakes Maritime Academy/Northwestern Michigan College, Traverse City, MI, 28
Honolulu Community College, Honolulu, HI, 31
Maine Maritime Academy, Castine, ME, 39
Memorial University of Newfoundland, St. Johns, Newfoundland, Canada, 44
Prince William Sound Community College, Valdez, AK, 66
Stevens Institute of Technology, Hoboken, NJ, 79
United States Merchant Marine Academy, Kings Point, NY, 87
University of Alaska, Southeast, Juneau, AK, 94

Seamanship

Alaska Vocational Technical Center, Seward, AK, 3
Chapman School of Seamanship, Stuart, FL, 13
Clatsop Community College, Astoria, OR, 13
Great Lakes Maritime Academy/Northwestern Michigan College, Traverse City, MI, 28
Louisiana Technical College, Morgan City, LA, 38
Maritime Institute, Inc., San Diego, CA, 42
Maritime Institute of Technology and Graduate Studies, Linthicum, MD, 43
Memorial University of Newfoundland, St. Johns, Newfoundland, Canada, 44

Quality Maritime Training, LLC, St. Petersburg, FL, 66
Saddleback Community College, Mission Viejo, CA, 69
Seamen's Training Center, San Luis Obispo, CA, 74
State University of New York Maritime College, Bronx, NY, 78
United States Merchant Marine Academy, Kings Point, NY, 87

Shipyard Operation

Louisiana Technical College, Morgan City, LA, 38
United States Merchant Marine Academy, Kings Point, NY, 87

Small Engine Technology

Alexandria Technical College, Alexandria, MN, 3
Honolulu Community College, Honolulu, HI, 31
Marine Mechanics Institute of the Universal Technical
Institute, Orlando, FL, 42

Structural Engineering (marine-related)

Memorial University of Newfoundland, St. Johns,
Newfoundland, Canada, 44
North Carolina State University, Raleigh, NC, 51
Stevens Institute of Technology, Hoboken, NJ, 79
University of Alaska, Anchorage, Anchorage, AK, 92
University of Georgia, Athens, GA, 110
University of Rhode Island, Narragansett and
Kingston, RI, 141
University of Texas, Austin, Port Aransas, TX, 154

Submersible Technology

Coastal School of Deep Sea Diving, Oakland, CA, 14
Louisiana Technical College, Morgan City, LA, 38
Memorial University of Newfoundland, St. Johns,
Newfoundland, Canada, 44

Underwater Welding Technology

National Polytechnic College of Engineering and
Oceaneering, Wilmington, CA, 49
Santa Barbara City College, Santa Barbara, CA, 73

Water Treatment Technology

California State Polytechnic University, San Luis Obispo,
San Luis Obispo, CA, 8
Hillsborough Community College, Tampa, FL, 30
Memorial University of Newfoundland, St. John's,
Newfoundland, Canada, 44
Princeton University, Princeton, NJ, 66

Watershed/Hydrology

California State University, Monterey Bay, Seaside, CA, 11
Duke University Nicholas School of the Environment
and Earth Sciences, Durham, NC, 21
Grays Harbor College, Aberdeen, WA, 27
North Carolina State University, Raleigh, NC, 51
Princeton University, Princeton, NJ, 66
Stevens Institute of Technology, Hoboken, NJ, 79
University of California, Santa Barbara, Santa Barbara, CA, 102
University of Georgia, Athens, GA, 110
University of Massachusetts Boston, Boston, MA, 112
University of Memphis, Memphis, TN, 124
University of Michigan, Ann Arbor, MI, 128
University of Rhode Island, Narragansett and
Kingston, RI, 141
University of Texas, Austin, Port Aransas, TX, 154
University of the District of Columbia, Washington, DC, 155
University of Wisconsin, Milwaukee, WI, 158
University of Wisconsin - Stevens Point, Stevens Point,
WI, 159
University of Wisconsin - Superior, Superior, WI, 159

Wetland Science

Coastal Carolina University, Conway, SC, 14
College of William & Mary, Williamsburg, VA, 15
Louisiana State University, Baton Rouge, LA, 36
Louisiana Tech University, Ruston, LA, 37
North Carolina State University, Raleigh, NC, 51
Stevens Institute of Technology, Hoboken, NJ, 79
University of Delaware, Lewes, DE, 108
University of Wisconsin, Milwaukee, WI, 158
University of Wisconsin - Stevens Point, Stevens Point,
WI, 159

Wildlife and Fisheries Science

Bellingham Technical College, Bellingham, WA, 4
Bristol Community College, Fall River, MA, 7
California State Polytechnic University, San Luis Obispo,
San Luis Obispo, CA, 8
California University of Pennsylvania, California, PA, 12
Grays Harbor College, Aberdeen, WA, 27
Hocking College, Nelsonville, OH, 30
Humboldt State University, Arcata, CA, 31
Lake Superior State University, Sault Ste. Marie, MI, 35
Lincoln Memorial University, Harrogate, TN, 35
Louisiana State University, Baton Rouge, LA, 36
Memorial University of Newfoundland, St. John's,
Newfoundland, Canada, 44
Mississippi State University, Mississippi State, MS, 48
Moss Landing Marine Laboratories, Moss Landing, CA, 49
North Carolina State University, Raleigh, NC, 51
Northeastern State University, Tahlequah, OK, 52

Northwest Missouri State University, Kirksville, MO, 53
 Oregon State University, Corvallis, OR, 58
 Peninsula College, Port Angeles, WA, 65
 Pennsylvania State University, University Park, PA, 65
 Rutgers University, New Brunswick, NJ, 68
 South Dakota State University, Brookings, SD, 77
 Tennessee Technological University, Cookeville, TN, 82
 Texas A&M University at Galveston, Galveston, TX, 84
 University of Alaska, Fairbanks, Fairbanks, AK, 92
 University of Alaska, Southeast, Juneau, AK, 94
 University of Arkansas at Little Rock, Little Rock, AR, 95
 University of California, Davis, Davis, CA, 96
 University of Delaware, Lewes, DE, 108
 University of Maryland, College Park and
 Cambridge, MD, 118
 University of Miami, Miami, FL, 124
 University of Minnesota, St. Paul, MN, 131
 University of North Dakota, Grand Forks, ND, 138
 University of Rhode Island, Narragansett and
 Kingston, RI, 141
 University of Tennessee at Martin, Martin, TN, 154
 University of Washington, Seattle, WA, 155
 University of Wisconsin - Stevens Point, Stevens Point,
 WI, 159
 University of Wisconsin - Superior, Superior, WI, 159

Marine Science and Technology Internship Programs

Biological Sciences Internships

<http://www.yale.edu/necuse/N96-BS.HTM>

Blue Ocean Society

<http://www.blueoceansociety.org/intern.htm>

CALFED Fellowship Program

http://www-csgc.ucsd.edu/EDUCATION/CALFED/CALFED_Fellows.html

Camp Adventure Internship

<http://www.seaworld.org/career-resources/internship/index.htm>

Career Services Network—Internships

<http://careers.syr.edu/internships.htm>

Clearwater Marine Aquarium—Volunteer Opportunities

<http://www.cmaquarium.org/volunteer.htm>

Department of Commerce Student Opportunities

<http://ohrm.doc.gov/jobs/Student/info.htm>

Dolphin Quest Internship Program

<http://www.dolphinquestinternship.htmlplanet.com>

Environmental Internships Page

<http://www.geocities.com/RainForest/8974/env7.htm>

EPA Fellowships

<http://es.epa.gov/ncer/fellow>

Harbor Branch Oceanographic Institute—

Jobs and Volunteer Opportunities

<http://www.hboi.edu/news/jobs.html>

Intercultural Center for the Study of Deserts and Oceans—Internships

<http://www.cedointercultural.org/internship.htm>

Intern.net

<http://www.intern.net>

K–Adult Summer Activities

<http://www.vims.edu/bridge/summer.html>

Careers, Jobs, Internships

<http://www.marinetech.org/careers/index.php>

Marine Education and Internships

<http://www.blueoceansociety.org/intern.htm>

Marine Technology Society, San Diego Section

<http://www.mts-sandiego.org/internship.php>

MarineCareers.net

<http://www.marinecareers.net>

National Institute of Health—Training Opportunities

<http://www.training.nih.gov>

National Wildlife Federation—Jobs, volunteers, and internships

<http://www.nwf.org/careergateway/index.cfm>

Nationwide Internship Listing

<http://www.internships.com>

New England Aquarium—Volunteer

<http://www.neaq.org/community/vol/index.php>

NOAA—Office of Education

http://www.oesd.noaa.gov/internships_opps.html

NOAA Seagrant Fellowship Opportunities

<http://www.seagrant.noaa.gov/funding/knauss/knauss.html>

National Ocean Sciences Bowl Coastal and Ocean Science Training Program (COAST)

<http://www.nosb.org/?anchor=coast>

Smithsonian Internship in Environmental Studies

http://www.serc.si.edu/pro_training/internships/internships.jsp

The Bridge – Student Internship Opportunities

http://www.vims.edu/bridge/student_opp.html

The Environmental Careers Organization—Intern Opportunities

<http://eco.org>

The National Academy Fellowship Program

<http://www7.nationalacademies.org/policyfellows>

University of Georgia Internships in Marine Science

<http://www.uga.edu/aquarium/interns/internapp.html>

Whale Field Research Internship

<http://whalecenter.org/intern.htm>

Marine Science- and Technology-Related Professional Societies and Trade Associations

Acoustical Society of America

<http://asa.aip.org>

Alliance of Pile Testing Laboratory Engineers

<http://www.insitutech.com/apinfo.html>

American Academy of Environmental Engineers

<http://www.aaee.net>

American Academy of Underwater Sciences

<http://www.aaus.org>

American Association of Community Colleges

<http://www.aacc.nche.edu>

American Association of Drilling Engineers

<http://www.aade.org>

American Association of Engineering Societies

<http://www.aaes.org>

American Association of Petroleum Geologists

<http://www.aapg.org>

American Association of Port Authorities

<http://www.aapa.org>

American Association of Zoological Parks and Aquariums

<http://www.aza.org>

American Boat and Yacht Council

<http://www.abycinc.org>

American Boatbuilders and Repairers Association

<http://www.abbra.org>

American Bureau of Shipping

<http://www.eagle.org>

American Coastal Coalition

<http://www.coastalcoalition.org>

American Congress on Surveying and Mapping

<http://www.survmap.org>

American Consulting Engineers Council

<http://www.acec.org>

American Fisheries Society

<http://www.fisheries.org>

American Gas Association

<http://www.aga.org>

American Geographical Society

<http://www.amergeog.org>

American Geological Institute

<http://www.agiweb.org>

American Geophysical Union

<http://www.agu.org>

American Institute of Chemical Engineers

<http://www.aiche.org>

American Institute of Chemists

<http://www.theaic.org>

American Institute of Hydrology

<http://www.aihydro.org>

American Institute of Mining Metallurgical & Petroleum Engineers

<http://www.aimeny.org>

American Institute of Professional Geologists

<http://www.aipg.org>

American Littoral Society

<http://www.americanlittoralsoc.org>

American Maritime Congress

<http://www.americanmaritime.org>

American Maritime Officers

<http://www.amo-union.org>

American Meteorological Society

<http://www.ametsoc.org>

American National Standards Institute

<http://www.ansi.org>

American Petroleum Institute

<http://www.api.org>

American Public Works Association

<http://www.pubworks.org>

American Shipbuilding Association

<http://www.americanshipbuilding.com>

American Shore and Beach Preservation Association

<http://www.asbpa.org>

American Society for Engineering Education

<http://www.asee.org>

American Society for Photogrammetry and Remote Sensing

<http://www.asprs.org>

American Society for Testing and Materials

<http://www.astm.org>

American Society of Certified Engineering Technicians

<http://www.ascet.org>

American Society of Civil Engineers

<http://www.asce.org>

American Society of Engineering Management

<http://www.asem.com>

American Society of Engineering Technology

<http://pegasus.cc.ucf.edu/~aset>

American Society of Heating Refrigerating and Air-Conditioning Engineers

<http://www.ashrae.org>

American Society of Limnology and Oceanography

<http://www.aslo.org>

American Society of Mechanical Engineers

<http://www.asme.org>

American Society of Naval Engineers

<http://www.navalengineers.org>

American Society of Petroleum Operations Engineers

<http://www.aspoe.org>

American Society of Safety Engineers

<http://www.asse.org>

American Technical Education Association

<http://www.ndscs.nodak.edu/atea>

American Water Resources Association

<http://www.awra.org>

American Water Works Association

<http://www.awwa.org>

American Waterways Operators

<http://www.americanwaterways.com>

American Welding Society

<http://www.aws.org>

Aquacultural Engineering Society

<http://www.cals.cornell.edu/dept/aben/aes>

ASFE: Professional Firms Practicing in the Geosciences

<http://www.asfe.org>

Association for Career and Technical Education

<http://www.acteonline.org>

Association for Electronic Manufacturing-SME

<http://www.sme.org/em>

Association for Unmanned Vehicle Systems International

<http://www.auvsi.org>

Association of American Geographers

<http://www.aag.org>

Association of Commercial Diving Educators

<http://diverlink.com>

Association of Diving Contractors International

<http://www.adc-int.org>

Association of Energy Engineers

<http://www.aeecenter.org>

Association of Engineering Geologists

<http://www.aegweb.org>

Association of Exploration Geochemists

<http://www.aeg.org>

Center for Occupational Research and Development

<http://www.cord.org>

Coastal Society

<http://www.thecoastalsociety.org>

Computer Oriented Geological Society

<http://www.cogsnet.org>

Consortium for Ocean Leadership

<http://oceanleadership.org>

Deep Foundations Institute

<http://www.dfi.org>

Diving Equipment and Marketing Association

<http://www.dema.org>

Dredging Contractors of America

<http://www.dredgingcontractors.org>

Drilling Engineering Association

<http://www.dea.main.com>

Ecological Society of America

<http://www.esa.org>

Electromagnetic Energy Association

<http://www.elecenergy.com>

Electronic Industries Alliance

<http://www.eia.org>

Electronics Technicians Association International

<http://www.eta-sda.com>

Environmental and Engineering Geophysical Society

<http://www.eegs.org>

Estuarine Research Federation

<http://www.erf.org>

Geological Society of America

<http://www.geosociety.org>

Geoscience and Remote Sensing Society-IEEE

<http://www.ieee.org/society/grs>

Geospatial Information Technology Association

<http://www.gita.org>

Hydrographic Society of America

<http://www.thsoa.org>

IEEE Computer Society

<http://www.computer.org>

Independent Liquid Terminals Association

<http://www.ilta.org>

Independent Petroleum Association of America

<http://www.ipaa.org>

Industrial Research Institute

<http://www.iriinc.org>

Industrial Safety Equipment Association

<http://www.safetycentral.org>

Inland Rivers Ports and Terminals

<http://www.irpt.net>

Inland Seas Education Association

<http://www.schoolship.org>

**Institute for Interconnecting and Packaging
Electronic Circuits**

<http://www.ipc.org>

Institute of Gas Technology

<http://www.igt.org>

Institute of Industrial Engineers

<http://www.iienet.org>

Institute of Marine Engineering, Science and Technology

<http://www.imarest.org>

Institute of Nautical Archaeology

<http://nautarch.tamu.edu>

Institute of Navigation

<http://www.ion.org>

Instrument Society of America

<http://www.isa.org>

International Association for Great Lakes Research

<http://www.iaglr.org>

**International Association for Physical Sciences
of the Ocean**

<http://www.olympus.net/IAPSO>

International Association of Drilling Contractors

<http://www.iadc.org>

International Association of Geophysical Contractors

<http://www.iagc.org>

International Association of Theoretical and Applied Limnology

<http://www.limnology.org>

International Communications Association

<http://www.icanet.com>

International Loran Association

<http://www.loran.org>

International Navigation Association

<http://www.pianc-aipcn.org>

International Oceanographic Foundation

<http://www.rsmas.miami.edu>

International Organization of Masters, Mates & Pilots

<http://www.bridgedeck.com>

International Society for Optical Engineering

<http://www.spie.org>

International Society of Certified Electronics Technicians

<http://www.iscet.org>

International Society of Offshore and Polar Engineers

<http://www.iso-pe.org>

International Technology Education Association

<http://www.iteawww.org>

Jobs for the Future

<http://www.jff.org>

Lake Carriers Association

<http://www.lcaships.com>

Marine Engineer Beneficial Association

<http://www.d1meba.org>

Marine Firemen's Union

<http://www.mfowww.org/>

Marine Machinery Association

<http://www.marmach.org>

Marine Technology Society

<http://www.MTSociety.org>

Materials Research Society

<http://www.mrs.org>

Minerals Metals and Materials Society

<http://www.tms.org>

National Aquaculture Association

<http://www.natlaquaculture.org>

National Aquaculture Council

<http://www.nfi.org>

National Aquarium Society

<http://www.aqua.org>

National Association for Industry Education Cooperation

<http://www2.pcom.net/naiec>

National Association for Research in Science Teaching

<http://www2.educ.sfu.ca/narstsite>

National Association for the Marine Assistance Industry

<http://www.c-port.org>

National Association of Corrosion Engineers

<http://www.nace.org>

National Association of Environmental Professionals .

<http://www.naep.org>

National Association of Marine Laboratories

<http://www.mbl.edu/html/NAML/NAML.html>

National Association of Marine Surveyors

<http://www.namsurveyors.org>

National Association of Maritime Educators

<http://www.maritimeusa.com>

National Association of Underwater Instructors

<http://www.nauui.org>

National Coalition of Advanced Technology Centers

<http://www.ncatc.org/ncatc>

National Council for Occupational Education

<http://www.ncoeonline.org>

National Council of Teachers of Mathematics

<http://www.nctm.org>

National Drilling Association

<http://www.nda4u.com>

National Electric Contractors Association

<http://www.neca.org>

**National Institute for Certification in
Engineering Technologies**

<http://www.nicet.org>

National Marine Educators Association

<http://www.marine-ed.org>

National Marine Electronics Association

<http://www.nmea.org>

National Marine Manufacturers Association

<http://www.nmma.org>

National Safety Council

<http://www.nsc.org>

National Science Teachers Association

<http://www.nsta.org>

National Shellfisheries Association

<http://www.shellfish.org>

National Society of Professional Engineers

<http://www.nspe.org>

National Water Resources Association

<http://www.nwra.org>

National Waterways Conference

<http://www.waterways.org>

North American Lake Management Society

<http://www.nalms.org>

Ocean Offshore and Arctic Engineering Division

<http://www.ooae.org>

Ocean Society

<http://www.oceansociety.org>

Oceanic Engineering Society-IEEE

<http://www.oceanicengineering.org>

Oceanic Society

<http://www.oceanic-society.org>

Oceanography Society

<http://www.tos.org>

Offshore Marine Service Association

<http://www.offshoremarine.org>

Optical Society of America

<http://www.osa.org>

Pacific Maritime Association

<http://www.pmanet.org>

Pacific Telecommunications Council

<http://www.ptc.org>

Petroleum Equipment Suppliers Association

<http://www.pesa.org>

Petroleum Technology Transfer Council

<http://www.pttc.org>

Propeller Club of the United States

<http://propellerclubhq.com>

Robotic Industries Association

<http://www.robotics.org>

Safety Equipment Institute

<http://www.seinet.org>

Sailors' Union of the Pacific

<http://www.sailors.org>

Sea Education Association

<http://www.sea.edu>

Sea Grant Association

<http://www.sga.seagrant.org>

Sea Research Society

<http://www.searesearch.org>

Seafarers International Union

<http://www.seafarers.org>

Shipbuilders Council of America

<http://www.shipbuilders.org>

Signal Processing Society-IEEE

<http://www.ieee.org/society/sp/index.html>

Society for Industrial and Applied Mathematics

<http://www.siam.org>

Society for Mining Metallurgy and Exploration

<http://www.smenet.org>

Society for the Advancement of Material and Process Engineering

<http://www.sampe.org>

Society for Underwater Exploration

<http://www.underwaterdiscovery.org>

Society of Accredited Marine Surveyors

<http://www.marinesurvey.org>

Society of Exploration Geophysicists

<http://www.seg.org>

Society of Manufacturing Engineers

<http://www.sme.org>

Society of Marine Consultants

<http://www.marineconsultants.org>

Society of Marine Port Engineers

<http://www.smpe.org>

Society of Naval Architects and Marine Engineers

<http://www.sname.org>

Society of Petroleum Engineers

<http://www.spe.org>

Society of Wetland Scientists

<http://www.sws.org>

Software Engineering Society

<http://www.sesnet.org>

Specialized Carriers and Rigging Association

<http://www.scranet.org>

System Safety Society

<http://www.system-safety.org>

Transportation Institute

<http://www.trans-inst.org>

United Engineering Foundation

<http://www.engfnd.org>

Water Environment Federation

<http://www.wef.org>

Waterkeeper Alliance

<http://www.waterkeeper.org>

Welding Research Council

<http://www.forwelders.org>

Western Dredging Association

<http://www.wesda.org>

World Aquaculture Society

<http://www.was.org>

Scholarship Resources

American Meteorological Society

<http://www.ametsoc.org/amsstudentinfo/scholfeldocs/index.html>

Graduate fellowships and undergraduate scholarships help further the education of outstanding students pursuing a career in the atmospheric and related oceanic or hydrologic sciences.

Aquatic Network

<http://www.aquanet.com>

[index.php?option=com_content&task=category§ionid=5&id=70&Itemid=43](http://www.aquanet.com/index.php?option=com_content&task=category§ionid=5&id=70&Itemid=43)

Central California Council of Diving Clubs (Cen Cal)

offers the California Diving & Aquatic Studies Scholarship.

This award of **\$1,000** is to support a student engaging in studies of underwater habitats. Aquatic-related programs in the disciplines of biology, physical sciences, marine education, maritime archaeology, historical and social aspects of marine resources, or the science of diving are relevant for consideration.

<http://www.cencal.org/scholarship.html>

Florida Sea Grant Scholarships,

http://www.flseagrant.org/students/real_deal/private.htm

General Scholarship Search sites:

<http://www.scholarships.com/Main.aspx>;

<http://www.fastweb.com>;

<http://www.collegescholarships.com>;

<http://www.campuscareercenter.com/scholarships/scholarships.asp>

Hispanic College Fund, NASA Motivating Undergraduates in Science and Technology (MUST) Scholarship Program.

<http://scholarships.hispanicfund.org/applications/subsectionID.1,pagelD.139/default.asp>.

Humboldt State University, Scholarship Opportunities for Oceanography Students.

<http://www.humboldt.edu/~ocn/students/scholarships.html>

KAUST Discovery Scholarship is the general scholarship program of King Abdullah University of Science and Technology (KAUST). This program is designed to ensure that any highly talented student who is qualified and eligible to enroll in KAUST will receive full financial support while at the University. Those who receive a Discovery Scholarship will receive full tuition support, a living stipend, and summer and career enrichment

programs. KAUST will offer a pre-enrollment version of this general scholarship program to students attending first-university or bachelor's degree programs, providing financial support to pre-enrollment Discovery Scholarship recipients at their home institutions prior to the University's opening. Upon graduation, these students will enter KAUST as master's degree students in September 2009 and 2010 to complete their graduate studies on a fully-funded scholarship.

<http://www.kaust.edu.sa/students/discovery-scholarships.aspx?CFID=1580883&CFTOKEN=72689998>

Marine Technology Society

<http://www.mtsociety.org/education/>

?fa=student_scholarships

Charles H. Bussmann Undergraduate Scholarship.

Open only to MTS student members; undergraduate students enrolled full-time in a marine-related field.

Charles H. Bussmann Graduate Scholarship.

Open only to MTS student members; graduate students enrolled full-time in a marine-related field.

The MTS Student Scholarship for Graduate and Undergraduate Students.

Open to MTS student members and non-MTS members; graduate or undergraduate students enrolled full-time in a marine-related field.

The MTS Student Scholarship for Two-Year Technical, Engineering and Community College Students.

Open to MTS student members and non-MTS members enrolled in a two-year technical, engineering or community college in a marine-related field.

The MTS Student Scholarship for Graduating High School Seniors.

Open to MTS student members and non-MTS members who are high school seniors who have been accepted into a full-time undergraduate program.

John C. Bajus Scholarship, \$1,000. Open only to MTS student members; undergraduates and graduate students enrolled full-time in a marine-related field who have shown a commitment to community service and/or volunteer activities.

Marine Technology Society Scholarships, (cont.)

The Paros-Digiquartz Scholarship, \$2,000. Open to students with an interest in marine instrumentation; MTS student members and non-MTS members; undergraduates and graduate students enrolled full-time in an academic institution; high school seniors who have been accepted into a full-time undergraduate program.

Dieter Family Travel Scholarship: Full student registration and up to \$500 for travel-related expenses at specified conferences. Open to MTS student members only; undergraduate and graduate students enrolled full-time in a marine-related field.

ROV Scholarship, up to \$10,000. Open to MTS student members and non-MTS members; students interested in remotely operated vehicles (ROVs) or underwater work that furthers the use of ROVs; graduates, undergraduates and high school students. Additional scholarship opportunities are available through the MTS Houston Section: <http://www.mtshouston.org/scholarships.htm>.

NOAA Dr. Nancy Foster Scholarship Program, recognizes outstanding scholarship and encourages independent graduate-level research—particularly by female and minority students—in oceanography, marine biology and maritime archaeology. <http://fosterscholars.noaa.gov>.

NOAA Educational Partnership Program, Undergraduate Scholars Program. The goal of the program is to increase the number of students who undertake course work and graduate with degrees in targeted academic fields integral to NOAA's mission. This program targets students who have completed their sophomore or junior year, attending minority serving institutions (MSIs), and have recently declared, or about to declare a major in atmospheric, oceanic, or environmental disciplines that support these sciences. http://epp.noaa.gov/undergrad_scholar/welcome.html.

NOAA Ernest F. Hollings Undergraduate Scholarship Program, provides up to \$8,000 of academic assistance per academic year for full-time study during the junior and senior years. Includes a required, 10-week, paid (\$650/week) internship during the summer between the junior and senior years at NOAA or a NOAA-approved facility; a housing subsidy (\$137.50/week) if the summer internship location is greater than 60 miles from their home location, and travel expenses to the Hollings scholarship program orientation and conference at the

completion of the internship. Open to undergraduates studying oceanic, environmental, biological, and atmospheric sciences, mathematics, engineering, remote sensing technology, physical and social sciences including geography, physics, hydrology, geomatics, or teacher education that support NOAA's programs and mission. <http://www.orau.gov/noaa/HollingsScholarship>.

National Science Foundation (NSF) Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM). Makes grants to institutions of higher education to support scholarships for academically talented, financially needy students, enabling them to enter the workforce following completion of an associate, baccalaureate, or graduate-level degree in science and engineering disciplines. The program does not make scholarship awards directly to students; students should contact their institution's Office of Financial Aid for this and other scholarship opportunities. <http://www.nsf.gov/pubs/2006/nsf06527/nsf06527.htm>

National Ocean Sciences Bowl (NOSB) National Ocean Scholar Program, \$3,000 a year for the first two years of undergraduate studies, totaling \$6,000. Program provides tuition assistance for NOSB® students who have an interest in pursuing an ocean- or a marine-related topic area in their post-high school education. Applicants must have participated in the National Ocean Sciences Bowl at least once in their high school career, have a career goal in an ocean science or marine-related career, demonstrated academic success in high school and be scheduled to graduate in the spring of the application year. <http://www.nosb.org/?anchor=nosp>

Ocean Foundation, Surfrider Foundation Scholarship Program. \$10,000 available to grantees enrolled in an accredited college or university in the U.S. or internationally; awards may be made at the undergraduate, Master's and Ph.D. levels, and are available to qualified applicants pursuing studies in a wide range of fields deemed compatible and consistent with the Surfrider Foundation's Mission Statement and Guiding Principles. <http://www.oceanfdn.org/index.php?tg=articles&topics=82>

Oceanography scholarships list, <http://www.nextstudent.com/directory-of-scholarships/Major/0168/Academic-Oceanography-scholarships.aspx>.

SEASPACE, Inc. Scholarships are open to undergraduate students entering their junior or senior years and graduate students with an overall GPA of at least 3.3/4.0 and demonstrating financial need. Students must be en-

Scholarship Resources

rolled or accepted full-time in an accredited U.S. college or university; majors have included marine sciences, marine biology, wildlife and fisheries, environmental toxicology, biological oceanography, genetics, ocean engineering, aquaculture and zoology with marine mammal applications. <http://www.seaspace.org/schship.htm>

University of South Carolina Scholarships in Marine Science, <http://www.msci.sc.edu/Programs/UnderGrad/scholarships.html>

Women Divers Hall of Fame. Awards three scholarships and eight training grants that provide financial and educational support to individuals of all ages, particularly those who are preparing for professional careers that involve scuba diving. <http://www.wdhof.org/scholarships/scholarships.shtml>



The updated ***Guide to Marine Science and Technology Programs in Higher Education*** is the portal to connecting with marine education programs nationwide. Students, parents, and career/education counselors will find this comprehensive catalogue to be an invaluable resource for the next generation of marine scientists and technologists.

This ***Guide*** contains:

- Over 1,000 listings for undergraduate, graduate, certificate and professional technical programs
- Contact information for more than 300 colleges, universities, and other marine science and technology education institutions
- Easy-to-use indexes of programs organized geographically by state and by subject category
- Extensive listings with online links to Internships in Marine Science and Technology and Scholarship Resources
- Links to Professional Societies and Trade Associations



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