

# MARINE SCIENCE

## What can I do with this major?

### AREAS

#### BIOLOGICAL OCEANOGRAPHY

Ecology and evolution  
Conservation  
Consulting  
Environmental protection/Regulation  
Environmental remediation/Compliance  
Fisheries management  
Marine biotechnology  
Molecular biology  
Marine policy/Law  
Mariculture/Aquaculture  
Hatchery operations management  
Aquarium operations management  
Natural resource management  
Technical writing  
Wildlife management  
Research  
Coastal/Wetland restoration  
Veterinary medicine

### EMPLOYERS

State, city, and county government agencies dealing with natural resources  
Federal government including:  
Fish and Wildlife Service  
National Oceanic and Atmospheric Administration  
US Geological Survey  
Park Service  
Forest Service  
Bureau of Land Management  
Natural Resources Conservation Service  
Environmental Protection Agency  
Department of Justice  
Army Corps of Engineers  
Centers for Disease Control and Prevention  
National Institutes of Health  
National Science Foundation  
Wildlife refuges, wildlife sanctuaries, and aquatic preserves  
National and international environmental and conservation organizations  
Zoos, aquariums, museums, and other collections of animals  
Universities and colleges  
Non-governmental organizations, e.g., Ocean Conservation, Nature Conservancy  
Biotechnology firms and industry  
Non-governmental organizations  
Private commercial fish farms  
Government hatcheries  
Shellfish operations  
Environmental consulting firms  
Non-profit research facilities, e.g., Mote Marine Laboratory, Bureau of Land Management

### STRATEGIES

Advanced degrees are often required in these positions, especially for research and to qualify for more advanced opportunities in marine science.  
Consider earning a master's degree to be more competitive for education and laboratory/field research positions.  
Earn a Ph.D. to teach in universities and colleges.  
Supplement curriculum with additional science and math courses in relevant areas, e.g., genetics, animal behavior, microbiology, differential equations.  
Pursue extensive laboratory and research experience by working in faculty laboratories through independent research classes, as a student employee, or through other departmental programs.  
Seek internships, summer jobs, or volunteer positions to gain experience. Some professionals in the field will begin their careers in temporary jobs.  
Develop physical stamina, outdoor skills, and comfort in being in water and working on a boat.  
Learn to set up, operate, maintain laboratory instruments and equipment, and monitor experiments.  
Develop public speaking skills through coursework or experience. Practice good communication and problem solving skills. Exercise close attention to detail.  
Seek experience with data management, analysis, and statistical tools used in research.  
For law enforcement jobs, be prepared to complete additional officer training and to go through a background check as part of the hiring process.  
Attain experience with boat safety, laboratory and chemical safety, and first aid training. OSHA HAZWOPER training may be required for some positions.

## AREAS

## EMPLOYERS

## STRATEGIES

### BIOLOGICAL OCEANOGRAPHY CONTINUED

Resource management agencies  
Parks and recreation departments  
Youth education organizations and camps  
Publishing companies: scientific magazines,  
professional journals, periodicals, textbooks,  
newspapers, online publishers  
Biological and environmental societies  
Educational and scientific software companies

Attain certification in SCUBA.  
Become familiar with government job application procedures and use your college career center for assistance.  
Be prepared to relocate to areas with abundant natural resources. Seek knowledge of technology used in natural resource management including software, geographical information systems, and global positioning systems.  
Seek leadership roles in student organizations.  
Maintain an excellent GPA, particularly in the sciences, and build relationships with faculty. Strong recommendations from professors are needed for graduate and professional schools.  
Marine Biology can serve as a pre-vet bachelor's degree. Research veterinary programs, take prerequisite courses to meet veterinary school requirements, and prepare for the application process.  
Join professional associations and environmental groups as way to learn about the field and network.

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### MARINE GEOLOGY/GEOLOGICAL OCEANOGRAPHY

Environmental geology  
Sedimentology  
Hydrogeology  
Shallow geophysics  
Coastal geology  
Geochemistry  
Energy  
Stratigraphy  
Sedimentology  
Structural geology  
Geophysics  
Geochemistry  
Economic geology  
Geomorphology

Federal government agencies:  
US Geological Survey  
Army Corps of Engineers  
Environmental Protection Agency  
National Oceanic and Atmospheric Administration (NOAA)  
Department of Defense  
Forest Service  
Department of Interior: Bureau of Reclamation, Office of Surface Mining, Bureau of Land Management  
State, city, and county government agencies dealing with natural resources and resource management

Consider earning a master's degree to be more competitive for education and laboratory/field research positions.  
Pursue extensive laboratory and research experience by working in faculty laboratories through independent research classes, as a student employee, or through other departmental programs.  
Field work experience is also very important. Seek internships, summer jobs, or volunteer positions to gain experience. Some professionals in the field will begin their careers in temporary jobs.

## AREAS

## EMPLOYERS

## STRATEGIES

### MARINE GEOLOGY/GEOLOGICAL OCEANOGRAPHY CONTINUED

Paleontology  
Fossil energy  
Geologic mapping and remote sensing  
Natural hazards  
Mineral mining  
Consulting  
Environmental remediation/Compliance  
Natural resource management  
Research  
Coastal/Wetland restoration  
Technical writing

Water management districts  
Universities and colleges  
Environmental consulting firms  
Oceanographic research institutes  
Civil engineering firms  
Land use planning agencies  
Mines, well services, and drilling companies  
Petroleum industry including oil and gas exploration, production, storage, and waste disposal facilities  
Nature centers and parks  
Geological and environmental societies  
Publishing companies: scientific and nature magazines, professional journals, periodicals, textbooks, newspapers, online publishers  
Educational and scientific software companies

Supplement curriculum with additional courses in relevant areas, e.g., environmental studies, GIS, remote sensing, biology, and physics to complement geology coursework.

For geologic engineering careers, consider an additional major or minor in physics, geophysics and/or engineering; knowledge of engineering is essential.

Learn to set up, operate, and maintain laboratory instruments and equipment, and monitor samples.

Develop public speaking skills through coursework or experience. Practice good communication and problem solving skills. Exercise close attention to detail.

Seek experience with data management, analysis, and statistical tools used in research. Gain experience with computer modeling and Global Positioning System (GPS). Both are used to locate geological deposits.

Gain a thorough understanding of federal and state government guidelines for the management of solid, liquid, and gaseous waste. Investigate certification programs for Hazardous Waste Operations and Emergency Response Standard (HAZWOPER).

Prepare to work with teams of scientists and other staff in the field for extended periods.

Many geologists who work in the oil and gas industry may work in the geographic areas where deposits are found including offshore sites and in overseas oil-producing countries. This industry is subject to fluctuations, so be prepared to work on a contract basis.

In mineralogy, consider specializing in a particular mineral or metal to build an area of expertise. Seek opportunities to develop strong technical skills, as mining geologists rely heavily on computerized models to learn about mineral deposits.

## AREAS

## EMPLOYERS

## STRATEGIES

### MARINE GEOLOGY/GEOLOGICAL OCEANOGRAPHY CONTINUED

Become familiar with government job application procedures and use your college career center.

Maintain an excellent GPA, particularly in the sciences, and build relationships with faculty. Strong recommendations from professors are needed for graduate and professional schools.

Join professional associations (e.g. Geological Society of America, Geophysical Union) and environmental groups as way to learn about the field and network.

To work in publishing fields, take advanced courses in technical writing or journalism classes or consider a minor in either. Research an advanced degree in a communications field to specialize, e.g., scientific journalism or public relations.

### MARINE CHEMISTRY/CHEMICAL OCEANOGRAPHY

Environmental testing and analysis  
Geochemistry  
Consulting  
Research  
Environmental safety and health  
Fuels and energy conversion  
Environmental regulation  
Environmental remediation/Compliance  
Natural resource management  
Coastal/Wetland restoration  
Technical writing

Industries including:  
Chemical  
Pharmaceutical  
Biotechnology  
Food  
Environmental  
Petroleum and mining  
Energy  
State, city, and county government agencies dealing with natural resources  
Universities and colleges  
Environmental and engineering consulting firms  
Oceanographic research institutes  
Water testing labs  
Mines, well services, and drilling companies  
Chemical instrumentation companies  
Petroleum industry including oil and gas exploration, production, storage, and waste disposal facilities

Consider earning a master's degree to be more competitive for education and laboratory/field research positions.

Earn a Ph.D. to teach in universities and colleges. Grant writing skills are essential in academia.

Pursue extensive laboratory and research experience by working in faculty laboratories through independent research classes, as a student employee, or through other departmental programs.

Seek internships, summer jobs, or volunteer positions to gain experience. Some professionals in the field will begin their careers in temporary jobs.

Choose courses with laboratory components to build experimental and instrumentation skills. Develop effective technical laboratory skills for work with instruments including chromatography and spectroscopy.

Seek experimental design and analytical research chemistry experience.

## AREAS

### MARINE CHEMISTRY/CHEMICAL OCEANOGRAPHY

## EMPLOYERS

Publishing companies: scientific magazines, professional journals, periodicals, textbooks, newspapers, online publishers  
Chemical, oceanographic, and environmental societies

## STRATEGIES

Knowledge of computer programs with 3D modeling capabilities may be advantageous along with knowledge of statistics.

For careers in environmental chemistry, pursue additional coursework in biology, environmental science, water chemistry, soil chemistry, geology, etc. to support understanding of environmental impact.

For careers in geochemistry, build a strong background in analytical, physical and environmental chemistry. Pursue courses in hydrology, sedimentology, toxicology, ecology, and oceanography for environmental work.

Maintain awareness of current environmental issues including policy, conservation, and industry trends for entry into environmental management or remediation.

Geochemists working with the oil industry may work in areas where deposits are found. The industry is subject to fluctuation making some work contractual.

Become familiar with government job application procedures and use your college career center for assistance.

Seek leadership roles through student organizations and obtain work experiences for project management positions.

Maintain an excellent GPA, particularly in the sciences, and build relationships with faculty. Strong recommendations from professors are needed for graduate and professional schools.

Join professional associations (e.g. American Chemical Society, Geophysical Union) and environmental groups as way to learn about the field and network.

## AREAS

## EMPLOYERS

## STRATEGIES

### EDUCATION

Elementary  
Secondary  
Post-secondary  
Non-classroom education

Public and private schools, K-12  
Two-year community colleges/technical institutes  
Four-year institutions  
Professional schools  
Zoos, aquariums, museums, and other collections of animals

For K-12 teaching, complete a teacher preparation program, which varies by state. Acquire multiple certifications for increased employability in secondary education.  
Earn a Ph.D. to teach in universities and colleges. Grant writing skills are essential in academia. Gain experience working with youth through tutoring, interning, or volunteering. Learn to work well with all types of people.  
Seek leadership roles in student organizations.

### GENERAL INFORMATION

- Within the many facets of marine science, there is often overlap of job functions. However, many marine scientists find advantages in becoming more specialized in one of the major subfields, e.g., marine geology, marine chemistry.
- As an undergraduate, seek laboratory experiences such as research projects, volunteering with professors, summer jobs, or internships. Learn laboratory procedures and become familiar with instrumentation.
- Participate in summer research programs. Submit research to local poster competitions or research symposia.
- A bachelor's degree will qualify one for work as a laboratory assistant, lab coordinator, technician, technologist, or research assistant in education, industry, government, museums, parks, and hatcheries.
- Combine an undergraduate degree with a degree in journalism, law, business, education, computer science, or other discipline to expand career opportunities. Become familiar with the specific entrance exam for graduate or professional schools in your area of interest.
- A master's degrees allow for greater specialization in marine science, and more opportunities and autonomy in research and administration. Some community colleges will hire master's level teachers.
- Ph.D. degree is required for university teaching and advanced positions in management and research and development. Postdoctoral experience may be required for research positions in industry, universities, and government.
- In the United States, doctoral students typically receive partial or full tuition waivers and annual salaries to attend graduate school because there is a strong need for teaching assistants in introductory science courses such as General Chemistry. There is also excellent federal and industrial monetary support available for research.
- Secure strong relationships and personal recommendations from professors and/or employers. Recommendation letters are needs for graduate and professional schools.
- Learn to work independently and as part of a team.
- Develop exceptional computer skills, learn how to make professional figures (graphs, tables), and use statistical software.
- Excellent verbal and written communication skills are essential. The ability to market your skills and write proposals is critical to maintain steady work. Grants may be necessary to start and continue projects.
- Join professional, environmental, and community organizations, and read related journals to stay abreast of current issues in the field and to develop contacts.
- Learn federal, state, and local government job application process. The federal government is the largest employer of scientists.
- Develop physical stamina to work and conduct field research, often in remote areas under various conditions.