

MARINE SCIENCE

What can I do with this major?

AREAS

BIOLOGICAL OCEANOGRAPHY

Ecology and evolution
 Conservation
 Consulting
 Environmental regulation/remediation/compliance
 Fisheries management
 Observing (fisheries/protected species)
 Marine biotechnology
 Molecular biology
 Data science
 Marine policy/Law
 Mariculture/Aquaculture
 Aquarium operations and husbandry
 Natural resource management
 Technical writing
 Science communication
 Research
 Coastal/Wetland and reef restoration
 Veterinary medicine and aquatic animal health

EMPLOYERS

State, city, and county government agencies for natural resources
 Tribal resource agencies
 Fishery management councils
 Federal government including:
 Fish and Wildlife Service
 National Oceanic and Atmospheric Administration
 Bureau of Ocean Energy Management
 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
 Coast Guard
 Centers for Disease Control and Prevention
 National Institutes of Health
 National Science Foundation
 Wildlife refuges/sanctuaries/reserves/preserves
 Environmental, conservation, and non-governmental organizations
 Zoos, aquariums, museums, and other collections of animals
 Stranding networks
 Universities and colleges
 Biotechnology and ocean technology firms
 Private fish farms and shellfish operations
 Government hatcheries
 Environmental consulting firms
 Non-profit research facilities
 Youth education organizations and camps
 Publishing companies
 Biological and environmental societies
 Educational and scientific software companies

STRATEGIES

Advanced degrees are often required, especially for research.
 Supplement curriculum with additional science and math courses (e.g., genetics, animal behavior, microbiology, differential equations).
 Seek internships, summer jobs, or volunteer positions to gain experience.
 Learn R or Python.
 Apply for NOAA Hollings and NSD REU programs; deadlines fall in winter.
 Consider observer work as a paid entry point.
 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, communication, and problem solving skills.
 Seek experience with data management, analysis, and statistical tools used in research.
 For law enforcement jobs, expect additional training and a background check.
 Attain experience with boat safety, laboratory and chemical safety, and first aid training. OSHA HAZWOPER training may be required for some positions.
 Attain SCUBA certification; research diving needs AAUS authorization.
 Apply across sectors; federal hiring has tightened.
 Be prepared to relocate for field-based work.
 Seek leadership roles in student organizations.
 For pre-vet, complete veterinary prerequisites and research programs early.

AREAS

MARINE GEOLOGY/PHYSICAL OCEANOGRAPHY

Environmental geology
Sedimentology and stratigraphy
Hydrogeology
Coastal geology and resilience
Geochemistry
Energy and mineral resources
Geophysics
Paleontology
Geologic mapping/remote sensing/hydrography
Natural hazards
Consulting
Natural resource management
Research
Coastal/Wetland restoration
Technical writing
Offshore renewables
Ocean modeling/forecasting
Ocean observing systems
Marine acoustics
Ocean data science

EMPLOYERS

Federal government agencies:
US Geological Survey
Army Corps of Engineers
Environmental Protection Agency
National Oceanic and Atmospheric Administration
Department of Defense
Coast guard
NASA
Bureau of Ocean Energy Management
Forest Service
Department of Interior
State, city, and county agencies for natural resources
State geological surveys
Water management districts
Universities and colleges
Environmental consulting firms
Survey and forecasting firms
Oceanographic research institutes
Civil engineering firms
Land use planning agencies
Mines, well services, and drilling companies
Chemical instrumentation companies
Petroleum industry
Catastrophe modeling firms
Nature centers and parks
Geological and environmental societies
Publishing companies
Educational and scientific software companies

STRATEGIES

Field work experience is important.
Seek internships, summer jobs, or volunteer positions to gain experience.
Supplement curriculum with courses in GIS, remote sensing, biology, and physics.
For physical oceanography, take math and physics beyond the minimum.
For geologic engineering, consider a minor in engineering.
Investigate Professional Geologist licensure; take the ASBOG exam senior year.
Learn to set up, operate, and maintain laboratory instruments and equipment, and monitor samples.
Develop public speaking, communication, and problem solving skills.
Exercise close attention to detail.
Seek experience with computer modeling, GIS, and Python or MATLAB.
Get sonar and survey experience; hydrography is a reliable entry point.
Investigate Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) certification.
Oil and gas work is often contract-based and location-dependent.
In mineralogy, specialize and build skill with computerized deposit models.
To work in publishing, take technical writing or journalism courses.

AREAS	EMPLOYERS	STRATEGIES
<u>MARINE CHEMISTRY/CHEMICAL OCEANOGRAPHY</u> Environmental testing and analysis Geochemistry Ocean acidification Water quality monitoring Consulting Research Environmental safety, health, and regulation Fuels and energy conversion Natural resource management Coastal/Wetland restoration Technical writing Carbon dioxide removal	Industries including: Chemical Pharmaceutical Biotechnology Food Environmental Petroleum and mining Energy State, city, and county government agencies for natural resources Water quality agencies Universities and colleges Environmental and engineering consulting firms Oceanographic research institutes Water testing and commercial environmental labs Mines, well services, and drilling companies Chemical instrumentation companies Publishing companies Chemical, oceanographic, and environmental societies	Seek internships, summer jobs, or volunteer positions to gain experience. Choose courses with lab components such as chromatography and spectroscopy. Track instruments you use; labs hire for named methods. Seek experimental design and analytical research chemistry experience. Learn R or Python for monitoring data. For environmental chemistry, add coursework such as biology, environmental science, water/soil chemistry, and geology. For geochemistry, build knowledge in analytical, physical, and environmental chemistry. Plus hydrology, toxicology, and oceanography. Maintain awareness of current environmental issues including policy, conservation, and industry trends for entry into environmental management or remediation. Seek leadership and project-management experiences.
<u>EDUCATION</u> 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 Sea Grant/Extension Science camps and field schools	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 with youth through tutoring, intern-ing, or volunteering. Learn to work well with all types of people. Join the National Marine Educators Association; see NOAA Teacher at Sea. 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.
- Build quantitative skills: statistics, R or Python, GIS.
- 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 improves competitiveness and autonomy in research; a Ph.D. is required for university teaching and senior research.
- Ph.D. degree is required for university teaching and advanced positions in management and research and development.
- Gain research experience through faculty labs and departmental programs.
- Postdoctoral experience may be required for research positions.
- Doctoral students in the U.S. typically receive tuition waivers and salaries as teaching assistants. Ask how funding is guaranteed before accepting.
- There is also federal and industrial monetary support available for research.
- Secure strong relationships and personal recommendations from professors and/or employers. Recommendation letters are needed for graduate and professional schools. Keep a strong science GPA.
- 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 associations and read related journals to network and stay current.
- Learn federal, state, and local government job application process. Use your career center. The federal government is the largest employer of scientists, but hiring has tightened in recent years; consider applying beyond federal roles to diversify your options.
- Consider the NOAA Corps for paid sea experience.
- Develop physical stamina to work and conduct field research, often in remote areas under various conditions.