

THE MARINE ENVIRONMENT
(WITH NAUTICAL OPTION)
Group Contract, Spring 1983

Program Description

The Marine Environment program was about the sea and its living inhabitants. Two options were offered. Both options featured introductions to general oceanography and marine biology, and practical experience with field methods. The "marine biological" option also included marine ecological field experience and a survey of marine organisms. The "nautical" option included, instead, an introduction to seamanship, piloting, sailing and small-boat handling, using the 38-foot motor-sailer Seawulff, the college's marine research vessel. A seven-day field trip to the Friday Harbor Laboratories (University of Washington's marine field station) on San Juan Island, April 26-May 2, was a highlight for both options. It considerably reinforced the field and laboratory experiences in all subjects of the program. The faculty-instructors were Dr. Peter B. Taylor (marine biology) and Dr. John R. Filmer (oceanography and nautical subjects).

OCEANOGRAPHY (Filmer): The section on general oceanography made use of the book Oceanography: A View of the Earth by M.G. Gross. Topics covered by the text, lectures, films and field trips included: history of oceanography, ocean resources, plate tectonics, wave theory, physical and chemical properties of seawater, littoral zone, continental shelf and pelagic zones and their characteristics and main features, tides and currents, and ocean basins. Sections on biological oceanography were integrated into the program through lectures and field work in marine ecology. Students were expected to write responses to review questions in the text.

MARINE BIOLOGY (Taylor): The texts for marine biology were An Introduction to the Biology of Marine Life (J.L. Sumich), Pacific Seashores: A Guide to Intertidal Ecology (T. Carefoot), and biological chapters in Oceanography: A View of the Earth (M.G. Gross). The readings, supplemented with lectures and films, covered the ecology of life in the open ocean, but emphasized coastal marine ecology. Students were expected to write responses to review questions about the texts.

Students in both options gained field exposure to marine ecology during field trips to intertidal sites at the college's waterfront, on San Juan Island, and to The Seattle Aquarium. Additional opportunities were provided during use of the Seawulff for experience with field methods, described below. Each student was expected to record field notes for the scheduled field trips and individual field studies.

FIELD METHODS (Taylor and Filmer): Methods of collecting and sampling marine organisms from a small vessel were demonstrated, with student participation, from on board the Seawulff, which has a winch for oceanographic work from the stern. The biological gear used was plankton nets, otter trawl, bottom-grab sampler, and naturalist's triangle dredge. Also demonstrated were the secchi disc (to measure water clarity), Van Dorn water sampling bottles, and a Hydrolab instrument for in situ measurements of temperature, salinity, and dissolved oxygen.

SURVEY OF MARINE ORGANISMS (Taylor): Students in the marine biological option read chapters on the major groups of marine invertebrates in the text Invertebrate Zoology (R.D. Barnes). They wrote responses to review questions on most of the assigned chapters. The taxonomic groups emphasized were Protozoa, Cnidaria, Mollusca, Annelida (Polychaeta), Arthropoda (Crustacea), and Echinodermata. Four scheduled laboratory sessions featured studies of living and preserved specimens representing these groups. The use of taxonomic keys was also introduced. Marine algae and marine vertebrates were presented in less detail by means of the reading and lectures, which

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were part of the marine biology section already described for both options. All groups of organisms were encountered during the field trips, and some students concentrated on seaweeds or fishes for individual lab and field studies.

MARINE ECOLOGY (Taylor): Students in the marine biological option went on additional field trips for further observations of marine ecology and marine organisms to Grays Harbor and Ocean Shores (bay, lagoon and ocean beach - one day) and Rialto Beach (Olympic National Park seashore, rocky coast - two days). Each student in this option was expected to record rigorous field notes using a two-part system consisting of a field journal and separate "species accounts" in which the field observations are written concurrently in a coordinated format. It is a "naturalist's" field journal modeled after one developed by Joseph Grinnell. In addition, each student was required to compile three "species resumes" which are brief summaries of information obtained from references for individual species. Each student gave an oral presentation based on one species resume.

A field project was assigned to be done during the final three weeks. Each student, individually or in small groups, was expected to select a marine field site for methodical descriptive study, do the observational work, prepare a written report, and give an oral presentation to the class about the study.

PILOTING AND SEAMANSHIP (Filmer): Piloting and seamanship included use of tidal and tidal current tables, charts, navigation aids, dead reckoning, fix, running fix, speed curves, doubling the angle on the bow, advancing lines of position and the Rule of Sixty, trip planning, night piloting, itineraries, and participation in the crewing of the 38-foot motor-sailer Seawulff. The text used was Piloting by Graves.

Under boat handling, the topics included first aid, CPR, hypothermia prevention and treatment, boating safety, docking, leaving the dock for single crew vessels, anchoring maneuvering with way on, maneuvering with prop wash, rowing and skiff handling, use of dock lines and spring lines, and rules of the road.

SAILING (Filmer): For the sailing portion, the text used was Sail and Power by Henderson and Good Sailing by the editors of Rudder magazine. Topics covered included: standing and running rigging, nomenclature, wind forces, tacking and leeway, jibing, points of sail, care and use of equipment, and helmsmanship under sail. Students in this option participated in weekly day trips through local waters and several trips through less familiar waters. Each student experienced a two-day cruise enroute to or from San Juan Island, Northern Puget Sound, in conjunction with a seven-day field trip (for both options) to the Friday Harbor Laboratories.