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SEARCH FOR SCRIPPS OCEANOGRAPHY

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THE SCRIPPS MISSION

To seek, teach, and communicate scientific understanding of the oceans, atmosphere, and Earth for the benefit of society and the environment.

THE SEARCH FOR KNOWLEDGE at Scripps Institution of Oceanography at UC San Diego continues a more than century-long endeavor to fully investigate the oceans, land, and atmosphere. Scripps scientists have sailed to tropical islands and ventured under polar ice, observing environments and their inhabitants, collecting specimens and samples, and recording voluminous data for laboratory analysis.

Scripps Oceanography was founded in 1903 largely through the efforts of William E. Ritter, a UC Berkeley professor, and it became part of the University of California in 1912. At that time, it was named Scripps Institution for Biological Research in recognition of the support of philanthropist Ellen Browning Scripps and her half-brother E. W. Scripps, the noted newspaper publisher. The research programs expanded to include all aspects of the oceans, and the name was changed to Scripps Institution of Oceanography in 1925.

Today, Scripps is part of UC San Diego and has become one of the world’s oldest, largest, and most important centers for ocean, earth, and climate science research, graduate training, and public service. Scripps’ preeminence in many scientific fields reflects its continuing commitment to excellence in research, modern facilities, distinguished faculty, and outstanding students — and the vision continues to grow.
SCIENTIFIC INVESTIGATIONS AT SCRIPPS OCEANOGRAPHY span the realms of sea, air, land, and life in efforts to determine how Earth systems work and interact. Among the hundreds of research programs under way at Scripps, many are multidisciplinary, linking discoveries in one subject to advances in other studies. This approach to basic science is now being applied to how the physical environment affects life systems and to aspects of global change, ocean pollution, and marine resources. At Scripps, observation, measurement, and collection of samples and data are accomplished on a global scale by extensive shipboard, ground, and aerial operations, including remote sensing by satellite and the use of wide-ranging instrument networks.
**RESEARCH ACTIVITIES**

**AIR-SEA INTERACTIONS**
High-altitude aircraft, research ships, and computer modeling techniques are used to measure the exchange of energy and matter among the atmosphere, clouds, and oceans.

**CLIMATE CHANGE**
Historical climate records and earlier evidence found in samples from such diverse areas as glacial ice packs and tropical coral reefs are critical to interpreting long-range global climate changes, improving seasonal forecasts, and predicting El Niño events.

**COASTAL PROCESSES**
Conducting coastal surveys, deploying instrument networks, and designing new technologies are among the approaches used to conserve seashore habitats, manage beach erosion, and forecast coastal conditions.

**EARTHQUAKES**
The strength, causes, and locations of earthquakes are investigated by exploring the physics of the earth and monitoring seismic activity with local, regional, and global instrument networks.

**GEOLOGY**
Observational, experimental, and theoretical methods of the basic sciences are used to understand the processes that alter Earth’s crust and to determine the long-term history of the lithosphere, hydrosphere, atmosphere, and biosphere.

**GEOPHYSICS**
New techniques of seafloor mapping, geological sampling, and remote sensing are yielding a better understanding of the processes involved in seafloor spreading, volcanism, and the formation of minerals.

**MARINE BIODIVERSITY & CONSERVATION**
The diversity, distribution, and protection of marine life in the world’s oceans are studied through field and lab research and the use of historical data and museum specimens.

**MARINE BIOLOGY**
The molecular, biochemical, and ecological characteristics of marine bacteria, plants, and animals are examined from the shore to the deep sea.

**MARINE CHEMISTRY**
Investigations range from analyzing human impacts on the oceans and processes such as ocean acidification to finding natural marine chemicals that can fight disease.

**MARINE FOOD WEB**
The cycling of nutrients in the oceans, from microplankton to large fish, is examined to understand how species interrelate and to assess what causes populations to vary over years and decades.

**MARINE GENOMICS**
Genetic analysis of marine life is increasing our understanding of how organisms have evolved and the roles they play in marine ecosystems, helping scientists analyze the health of the oceans and discover potential pharmaceuticals from the sea.

**OCEAN ENGINEERING**
The development of new technologies and instrumentation for underwater research, including autonomous profilers and laser-based sound-imaging devices, is greatly extending capabilities to work and gather data in the oceans and on the seafloor.

**PHYSICAL OCEANOGRAPHY**
Measurements of currents and ocean mixing from the sea surface to great depths are giving a clearer account of the cycling of nutrients, chemicals, and heat in the oceans, factors that affect many global environmental systems.
THE SCRIPPS CAMPUS is situated on 170 acres of shore and hillside along the California coast in La Jolla, 15 miles north of downtown San Diego. Other specialized facilities, including the institution’s ship facility on San Diego Bay, are located throughout San Diego County and Southern California.

The campus resources supporting research and teaching are the most advanced available for marine-related sciences, ranging from an extensive hydraulics laboratory with wind, wave, and flow channels to modern labs with state-of-the-art instruments. Virtually every office and lab at Scripps connects to the campus computer network, which supplies a high-speed data link to the San Diego Supercomputer Center.

In addition, Scripps houses the world’s largest oceanographic collections that serve as geological resources and biological specimens for researchers around the world.

Scripps staff totals about 1,600, including about 100 faculty, 400 other scientists, and nearly 250 graduate students who actively participate in lab studies and fieldwork. There are ship crews, technicians, various specialists, and visitors from many nations involved in research and educational programs.

The institution’s annual expenditures total more than $170 million. Most funding comes as contracts and grants for basic research from federal agencies, primarily the National Science Foundation, the Department of the Navy, the National Oceanic and Atmospheric Administration, NASA, and the Department of Energy. The state of California provides about 14 percent of the Scripps budget. Private gifts and endowments furnish funds critical to launching new areas of research, supporting students, purchasing equipment, and constructing new facilities.
RESEARCH AT SCRIPPS

California Sea Grant College Program
Center for Clouds, Chemistry, and Climate
Center for Marine Biodiversity and Conservation
Center for Marine Biotechnology and Biomedicine
Center for Observations, Modeling, and Prediction at Scripps
Climate, Atmospheric Science, and Physical Oceanography
Cooperative Institute on Marine Ecosystems and Climate
Geosciences Research Division
Institute of Geophysics and Planetary Physics
Integrative Oceanography Division
Joint Center for Observational Systems Science
Marine Biology Research Division
Marine Physical Laboratory
Scripps Genome Center

STUDIES AT SCRIPPS are generally grouped into the three basic academic sections of Biology, Earth Science, and Oceans and Atmosphere, with major research areas in:

- Applied Ocean Sciences
- Biological Oceanography
- Climate Sciences
- Geosciences
- Geophysics
- Marine Biology
- Marine Chemistry and Geochemistry
- Physical Oceanography

In addition, there are several interdisciplinary groups, specialized research units, and university institutes.
EDUCATION AT SCRIPPS

GRADUATE STUDIES

SCRIPPS OCEANOGRAPHY OFFERS educational instruction leading to graduate degrees in oceanography, marine biology, and earth sciences. Graduate students participate in a significant part of Scripps research. The interdisciplinary nature of research in marine and earth sciences is emphasized in Ph.D. curricular areas: applied ocean science, biological oceanography, climate sciences, geosciences, geophysics, marine biology, marine chemistry and geochemistry, and physical oceanography. Scripps students are the scientists who will break new ground and make discoveries in areas such as climate change, biodiversity and conservation, and ocean engineering. Educational offerings at the Master’s and Ph.D. levels continue to expand at Scripps.

UNDERGRADUATE STUDIES

SCRIPPS OFFERS UNDERGRADUATE COURSES covering a wide breadth of earth and marine sciences on several different levels. In addition to formal coursework, dozens of UC San Diego undergraduates, from a wide variety of majors, benefit each year from individual and group research projects with Scripps faculty and researchers.

SHIP OPERATIONS

SCRIPPS SHIPS HAVE STEAMED more than seven million nautical miles from local coastal waters into all the world’s oceans. With four research vessels and the 355-foot platform FLIP, Scripps has one of the largest academic fleets in the United States. Trips vary from one-day cruises to months-long expeditions that sometimes venture into remote areas. Home port is Scripps’ Nimitz Marine Facility on San Diego Bay.
OUTREACH

ON ANY GIVEN DAY, Scripps personnel may be plying the oceans or working in a lab, but frequently they are found outside the academic research world. They might be talking to elementary school classes or working with high school teachers to develop new science curricula. They may be testifying at a government hearing on scientific policies, advising a federal agency on environmental issues, or consulting with an industrial company on new biotechnologies. Much of the basic science done at Scripps has applications that go well beyond the search for general knowledge, and Scripps places an increasing emphasis on its role as a regional, national, and international resource.

THE WONDERS AND ADVENTURE of oceanography are introduced to children and adults alike at Birch Aquarium at Scripps. Exhibits include outdoor tide pools, colorful marine life tanks, and hands-on displays about ocean sciences and Scripps research. Visitors of all ages can participate in guided tours, discovery labs, ocean-related classes, field activities, and expeditions. Birch Aquarium hosts about 400,000 visitors a year, including tens of thousands of schoolchildren. The aquarium’s outreach van, the Planet Earth Express, takes educational programs to schools and community events throughout Southern California and beyond.