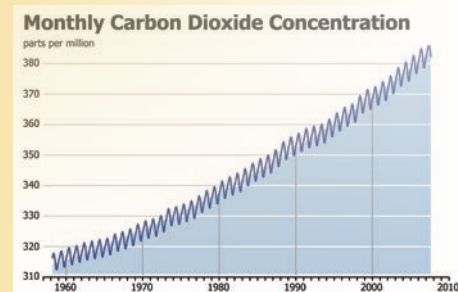




**HOW SCRIPPS IS MAKING A DIFFERENCE:** Groundbreaking discoveries at Scripps inspire solutions to some of the greatest environmental challenges we face today.



*For more than 100 years, Scripps Institution of Oceanography has been the world leader in ocean, earth, and climate sciences. Today, Scripps has hundreds of research projects under way in more than 60 nations, on every continent, and in every ocean. Its unparalleled resources include more than 300 top scientists, a modern research fleet that traverses the globe, the world's largest academic oceanographic collections, more than 240 of the best and brightest graduate students, the world's foremost oceanographic library, and direct access to the extraordinary educational and research resources of UC San Diego.*

**FULL STEAM AHEAD**

*In 2010, the U.S. Navy awarded Scripps a new Ocean Class research vessel to commence operations in 2016. Its delivery starts yet another era of ocean exploration for Scripps, building on the institution's distinguished 107-year history of ocean-going science.*

## Climate Change

Scripps has been at the forefront of climate change research for more than 50 years, beginning with the discovery by Charles Keeling of rising levels of carbon dioxide in the atmosphere. Scripps scientists not only monitor the oceans and atmosphere to forecast climate changes and their impacts. They also provide governments with the information they need to create climate policy.

## Energy Alternatives

Scripps researchers are working with corporate partners to develop clean and renewable biofuels from marine algae to replace fossil fuels for jet aircraft and other modes of transportation. Algae can create energy more effectively and efficiently than crop-based fuels with less need for freshwater.

## Natural Disasters

Scripps researchers are studying the dramatic changes taking place on the planet to better understand and predict natural disasters such as earthquakes, tsunamis, volcanoes, El Niños, wildfires, and hurricanes, including why they occur and when and where they are most likely to strike.



## Water Shortages

Scripps scientists have pioneered hydrological studies detailing changes in snow and rainfall that could lead to severe water shortages. They are now working with government agencies to refine forecasts and develop strategies to cope with less water.

## Ocean Acidification

Scripps is establishing a major center for ocean acidification research in the U.S. to understand how carbon dioxide from the atmosphere is changing ocean chemistry and its potential risks to marine life. This newest and potentially most devastating result of burning fossil fuels threatens the millions of marine organisms that form shells and skeletons of calcium carbonate, potentially disrupting the entire ocean food web.

## Drug-Resistant Diseases

Scripps researchers are pioneering the use of drugs from the sea to combat cancer, autoimmune diseases, and infectious diseases. Several Scripps-discovered marine compounds are now in clinical trials. A special focus is on the development of new antibiotics from marine microbes to help battle drug-resistant infections.

## Saving Marine Life

Scripps is a leader in studying marine ecosystems including coral reefs, kelp forests, the open ocean, the California Current, polar regions, and the deep sea. Scripps scientists are investigating why marine ecosystems and fish populations are collapsing, what can be done to preserve and restore them, and how to improve fisheries management. Scripps scientists are also monitoring the impacts of oil pollution on natural populations and marine communities.



## Air Pollution

Scripps scientists have extensively studied the phenomenon of seasonal pollution haze in Asia known as the Atmospheric Brown Cloud. They study how the black carbon-filled haze affects cloud formation, monsoon patterns, and atmospheric heating and cooling and have initiated programs to study the climatic effects when households in South Asia switch to using cleaner energy.

## Robotic Exploration

Scripps scientists are experts in conceptualizing, designing, and building robots for use in ocean discovery and exploration. These unmanned floats and gliders take measurements of the ocean's "vital signs," such as temperature, salinity, and current velocity. In response to the 2010 Gulf of Mexico oil leak, Scripps researchers diverted a Spray glider to the gulf to assess the dimensions of the mass of oil spreading throughout the gulf.



## Training the Next Generation

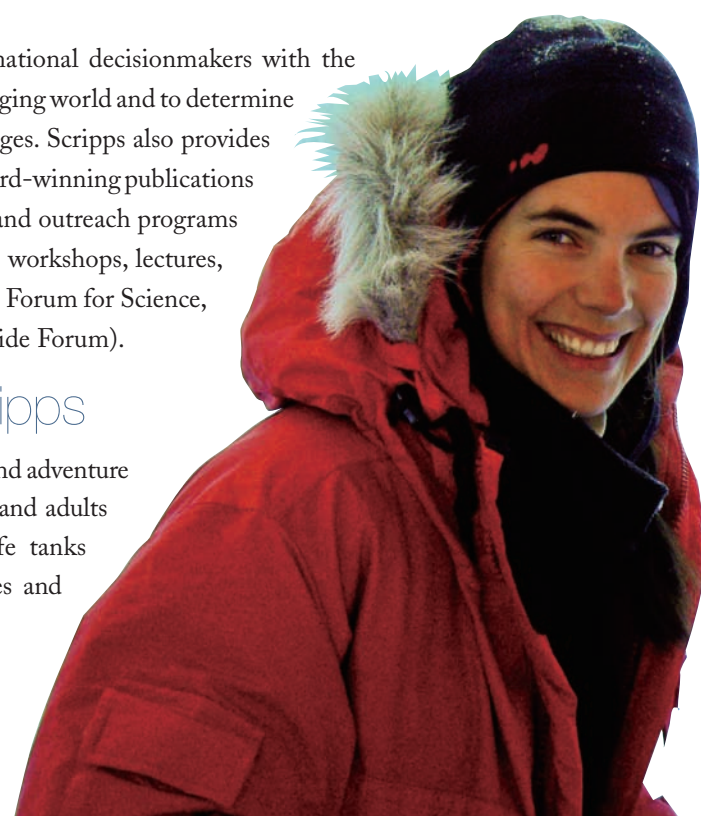
Scripps Oceanography graduates are founders and leaders in ocean and earth sciences programs throughout the world. Scripps is continuing this tradition by preparing the next generation of scientists to help society face environmental challenges and an ever-growing demand for dwindling resources.

## Outreach

Scripps provides local, national, and international decisionmakers with the knowledge they need to understand our changing world and to determine effective solutions to environmental challenges. Scripps also provides this information to the public through its award-winning publications and websites, through the many education and outreach programs of Birch Aquarium at Scripps, and through workshops, lectures, and conferences at the Robert Paine Scripps Forum for Science, Society and the Environment (Scripps Seaside Forum).

## Birch Aquarium at Scripps

At Birch Aquarium at Scripps, the wonders and adventure of oceanography are introduced to children and adults alike. Exhibits include colorful marine life tanks and hands-on displays about ocean sciences and Scripps research.



## Private Support Makes a Difference

From its founding more than a century ago, Scripps Institution of Oceanography has relied on private gifts and grants to sustain its scientific excellence and its outstanding students. With so many possibilities and challenges ahead, private support is more meaningful than ever. In recent years, private support has funded:

- Graduate student fellowships
- Postdoctoral fellowships
- Career development awards for early career scientists
- Endowed faculty chairs in climate change, marine biodiversity and conservation, and natural history
- Research on coral reef restoration, ocean pollution, fisheries, the California Current, climate change, and more
- The award-winning *Feeling the Heat* exhibit at Birch Aquarium at Scripps
- The Perspectives on Ocean Science lecture series at Birch Aquarium at Scripps
- The Robert Paine Scripps Forum for Science, Society and the Environment (Scripps Seaside Forum)
- Scripps Oceanographic Collections sponsorships



## The Need for Private Support

Scripps Institution of Oceanography receives less than 14 percent of its budget from the state of California. We must rely on private gifts for new buildings, student fellowships, endowments, seed funding for new programs, and matching funds. Birch Aquarium at Scripps receives no state appropriation. Income from admissions and rentals must be supplemented by gift income to support the aquarium's programs.



*"Scripps is helping answer some of the most important questions we as a human race are facing right now. It's exciting to be able to support that and to be a part of it."*

—BRYCE RHODES,  
SCRIPPS DIRECTOR'S CABINET