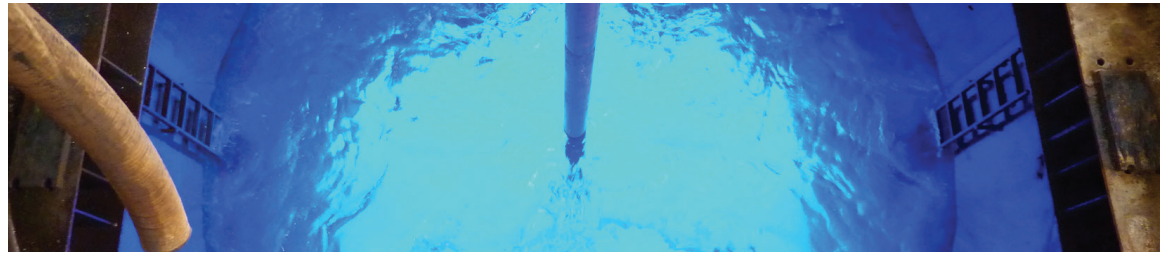




EXPLORING THE DEEP



FAST FACTS

60

Number of years NSF has been supporting scientific discoveries in the ocean.

18

Number of ships NSF supports in the U.S. Academic Research Fleet.

8,000

Approximate number of scientists the U.S. Academic Research Fleet supports annually.

15,000 ft

Depth at which the submersible *Alvin* can descend below the ocean's surface.

6 miles

The depth at which the *JOIDES Resolution* can drill from the ocean surface into the seafloor.

830

Number of instruments aboard 83 ocean platforms comprising the NSF-funded Ocean Observatories Initiative.

The ocean covers the majority of the Earth's surface, yet more than 80% of it remains unexplored. The National Science Foundation is committed to enhancing our understanding of the ocean, which plays a role in everything from regulating the global climate and supporting life on Earth to global trade and sustaining a prosperous ocean economy. NSF-supported researchers investigate the ocean system, from beneath the sea floor and from the deepest waters to the ocean surface. NSF also **supports ocean research vessels**, deep sea submersibles, autonomous gliders and other ocean-faring vessels that allow researchers to probe the ocean's mysteries in different ways.

FLOATING LABS

Researchers use different types of vessels to study the ocean system and at different depths.

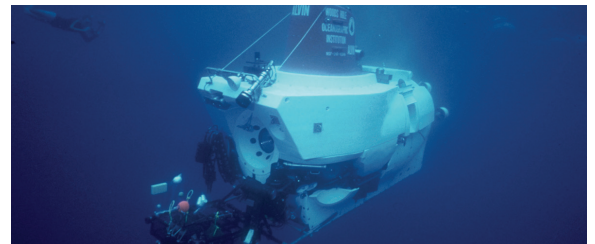
R/V *Sikuliaq*

An ice-capable research vessel, the *Sikuliaq* allows researchers in the Arctic Ocean to collect sediment samples directly from the seafloor, host remotely operated vehicles and conduct surveys throughout the water column and sea bottom and below using state-of-the-art instrumentation.



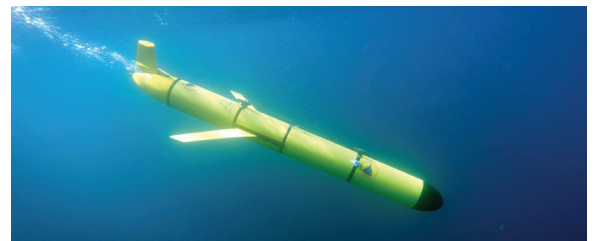
Alvin

The *Alvin*, a human-occupied submersible, can carry two scientists and a pilot to a depth of nearly 15,000 feet. The *Alvin* allows researchers to observe and collect data for more than two-thirds of the ocean floor. It is one of only five deep-sea research submersibles in the world.



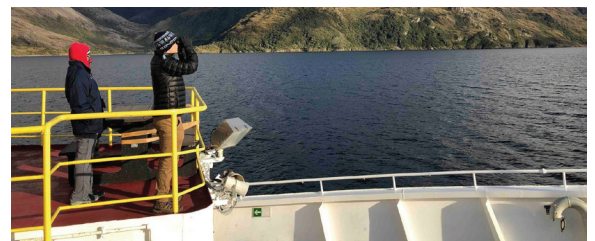
Polar Sentinel

Researchers are developing robotic technologies such as this autonomous underwater glider to be used for long-term, unattended under-ice observation and data collection in vast regions like the Arctic and Antarctic.



JOIDES Resolution

The *JOIDES Resolution* is a scientific ocean drilling vessel that recovers core samples and collects measurements from under the ocean floor, giving scientists a glimpse into Earth's geologic and climatic history. It is the primary vessel of the International Ocean Discovery Program, an international marine research collaboration.



CONNECT WITH US ONLINE



NSF OCEAN RESEARCH HIGHLIGHTS



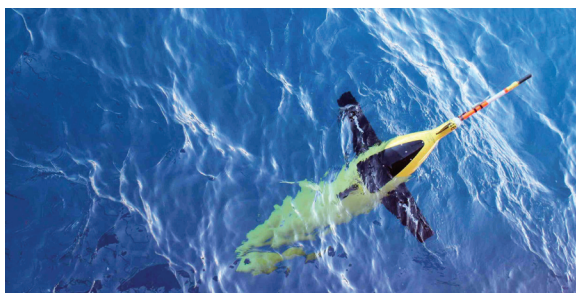
Mapping coastlines

NSF-supported marine geology geophysics is helping map new coastlines formed when lava enters the ocean. When lava seeps into the sea, as it did in the 2018 Kilauea eruption, it creates new areas capable of collapse. Mapping these areas helps researchers identify areas vulnerable to undersea landslides and tsunamis.



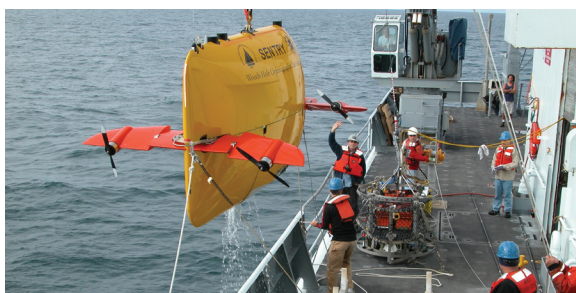
Understanding a hurricane's aftermath

NSF-supported chemical oceanography research is helping communities manage coastal areas after major hurricanes. When Hurricane Harvey's massive rains fell over a Texas estuary, researchers needed to know how it changed water quality. As they rescued their docks and sensors from the storm, they also collected samples of water and mud to measure how the hurricane affected nutrients and salinity.



Monitoring dead zones

NSF-supported scientists use underwater robotic gliders to collect continuous oceanographic data for weeks to months at a time, without human assistance. Scientists monitoring low-oxygen "dead zones" use gliders to navigate the rugged and tumultuous Pacific coastline. Gliders can take many measurements over long periods of time to identify why these dead zones form. Scientists identified one dead zone the size of Rhode Island!



Next generation ocean scientists

Early career research cruises prepare the next generation of scientists to effectively supervise and organize their own research voyages. Students form about 20% of sea-going science parties.

DID YOU KNOW?

The seafloor and rocks beneath it are humming with microbial life, causing scientists to wonder how long life may have thrived there – and what percent of Earth's biosphere it ultimately makes up.