



# NOAA's Office of Oceanic and Atmospheric Research

## A world leader in observing, understanding, and predicting the Earth system

The Office of Oceanic and Atmospheric Research (OAR) is the primary research arm of NOAA, conducting research and development that increases our knowledge of climate, weather, oceans and coasts. Its work is at the core of NOAA's mission to produce the environmental intelligence people need to live well and safely on this dynamic planet. OAR supports laboratories and programs across the United States and collaborates with both internal and external partners, including 16 NOAA-funded Cooperative Institutes and 33 Sea Grant Institutions. OAR research contributes to accurate weather forecasts, enables communities to plan for and respond to climate events such as drought, and enhances the protection and management of the nation's coastal and ocean resources.

### Climate Research

Individuals, businesses, and communities turn to NOAA as a trusted source for science and information to help them understand and prepare for changes to our planet's climate. NOAA's regional climate tools, which develop and utilize new information about the impacts of climate on natural and managed resources, infrastructure, and public health, are supported by our global climate observation and monitoring networks, world-renowned scientists, and state-of-the-art climate models.



NOAA Carbon Wave Glider deployed in Alaska to help scientists better understand how melting glaciers affect the chemistry of the Prince William Sound.

### Weather and Air Chemistry Research

NOAA not only works to improve current weather forecasting, but also works to anticipate and address the needs of the future. For example, OAR is developing innovative techniques for earlier detection of tornadoes and other severe weather to provide more advanced forecasts to the public.



The NOAA P-3 research aircraft is much like a "flying chemical laboratory," containing specialized instrumentation that can help scientists better understand air quality and climate changes.

### Ocean, Coastal, and Great Lakes Research

NOAA, in collaboration with its research partners, explores and investigates ocean, coastal, and Great Lakes habitats and resources. We provide scientific results to help manage and understand fisheries, conserve and restore our coasts, and build a stronger economy.

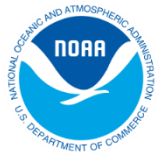


Chief Bosun Jerrod Hozendorf watches as ROV Deep Discoverer is deployed from the aft deck of NOAA Ship *Okeanos Explorer*



For more information, please visit: [www.research.noaa.gov](http://www.research.noaa.gov)





# Recent Mission Highlights

## NOAA Conducts El Niño Rapid Response Field Campaign

In response to the strong El Niño in early 2016, OAR led a NOAA-wide El Niño Rapid Response Field Campaign to improve observations and documentation of weather effects during El Niño events. This land, sea, and airborne field campaign provided an unprecedented volume and variety of coordinated data, including intensive observations such as air temperature, pressure and rainfall estimates gathered in the tropical Pacific and California. El Niño influences weather around the world. By conducting a field campaign while the event was ongoing, NOAA accelerated the scientific understanding and predictions of El Niño events, which will lead to a better understanding of how El Niño influences U.S. weather.

## NOAA Improves Forecast Resolution with New OAR-developed Global Weather Model

Applying some of the latest modeling technology developed at OAR's Geophysical Fluid Dynamics Laboratory, NOAA is adding higher resolution to the future U.S. Global Forecast System (GFS) model. Higher resolution will provide forecasters the tools to zoom in on smaller and smaller storm systems, allowing for better understanding of how storms evolve and improved forecasting. As part of an effort to replace the current GFS with a state-of-the-art global weather forecasting model, NOAA selected the Finite-Volume on a Cubed-Sphere (FV3) core as a new engine for GFS's numerical weather prediction model in July 2016. With the FV3 core, NOAA will be able to simulate individual clouds and storms at resolutions as fine as one to three kilometers.

## NOAA Launches Water Resources Dashboard:

In response to requests from water managers and city planners for access to relevant water data for flooding and drought planning, NOAA OAR launched a Water Resources Dashboard in March 2016 to support community planning and climate adaptation. NOAA and our partners worked together to identify needs and develop this dashboard as a one-stop location for datasets on drought, flooding, precipitation, climate and other measures to help create more resilience in the face of severe weather and climate change. The dashboard also hosts a webinar series featuring scientists and decision makers to educate users on the science behind and practical uses for the datasets within the water and planning communities.

## NOAA Develops New Sensor for Coral Monitoring

NOAA recently developed a new inexpensive sensor to drastically improve the ability to measure and monitor changing temperatures on coral reefs at an unprecedented scale. While providing high accuracy in measurement, this sensor, known as InSituSea, costs roughly 10% the cost of an off-the-shelf temperature sensor. Temperature can vary by several degrees from the top to the bottom, and from near shore to ocean sides of a reef. By deploying many of these cost-effective sensors, scientists can observe small-scale temperature variations at multiple locations at reefs. These observations will allow scientists to more discretely understand why some species or colonies of coral become bleached while others do not.



**NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION**

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