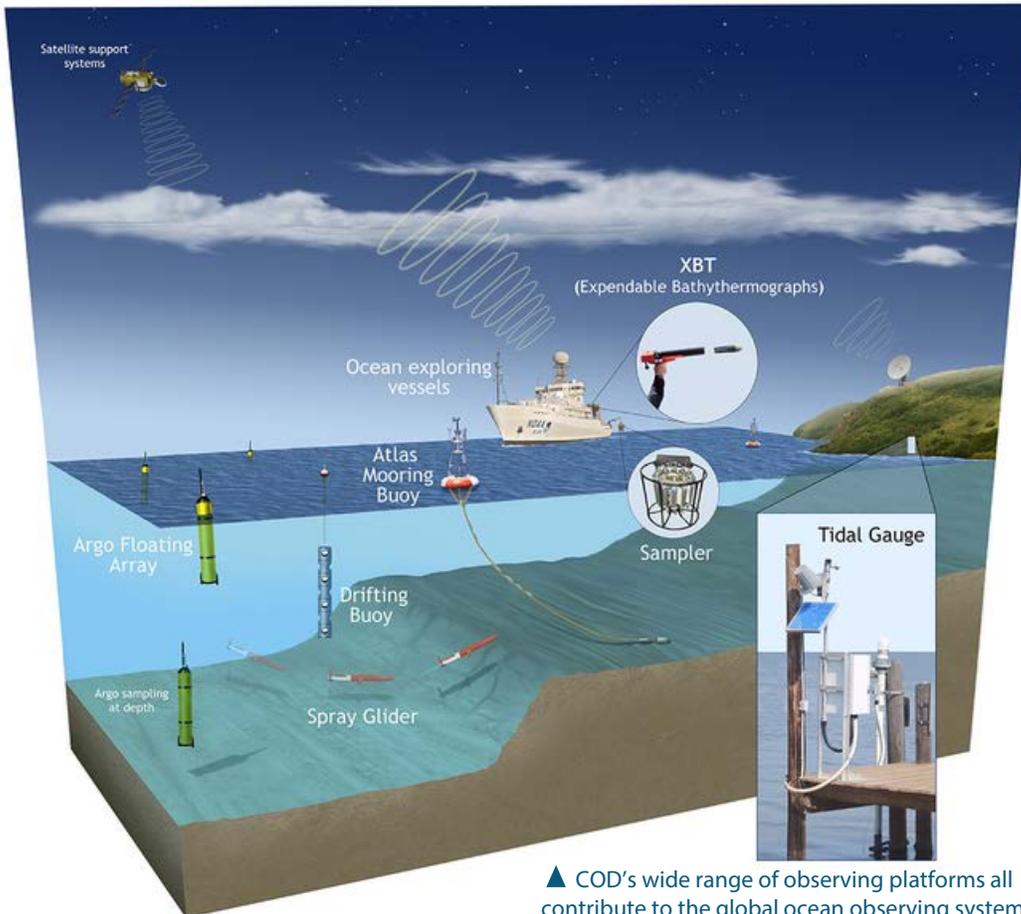




CLIMATE OBSERVATION DIVISION (COD)

Observing the global oceans and the Arctic

The **Climate Observation Division** sponsors thousands of global ocean observing platforms to provide high-quality, long-term observations and products to researchers, forecasters, and other users to prepare society for environmental changes.



▲ COD's wide range of observing platforms all contribute to the global ocean observing system that is used internationally. Image credit: NOAA.

HIGHLIGHTS



In just over 10 years, **Argo** collected **twice as much data** about the ocean than ships did in the previous 100 years.

OAR is investing \$1M in FY16 to maintain US contribution to Argo.

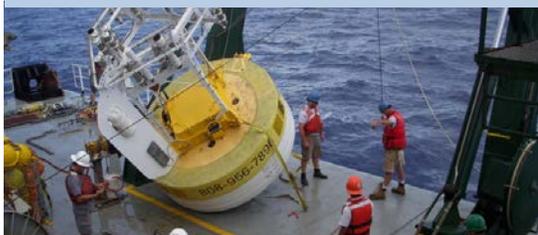
COD observed the Pacific "Blob," which impacted West Coast ecosystems with **waters an unprecedented 2° Celsius warmer than usual** in 2015.

Warming of the upper oceans accounts for about 63% of the total increase in global energy storage from 1971 to 2010.

In 2014 global ocean observations suggested **record-level ocean heat** content in the upper mile of the ocean.



WHAT WE OBSERVE



The ocean covers 71% of the Earth's surface. We monitor changes in:

- Temperature
- Sea Level
- Currents
- Winds and weather over the ocean
- Ocean acidification

WHY WE OBSERVE

Ocean observations are critical to :

- Monitoring environmental changes in the ocean.
- Providing a basis for improved weather, climate, marine, and ocean forecasts
- Predicting extremes such as hurricanes and drought
- Linking ocean variability to ecosystem changes
- Understanding how ocean changes impact transportation, populations, economies, and ecosystems

PARTNERSHIPS

Through COD, NOAA provides **50% of the world's ocean observing platforms.**

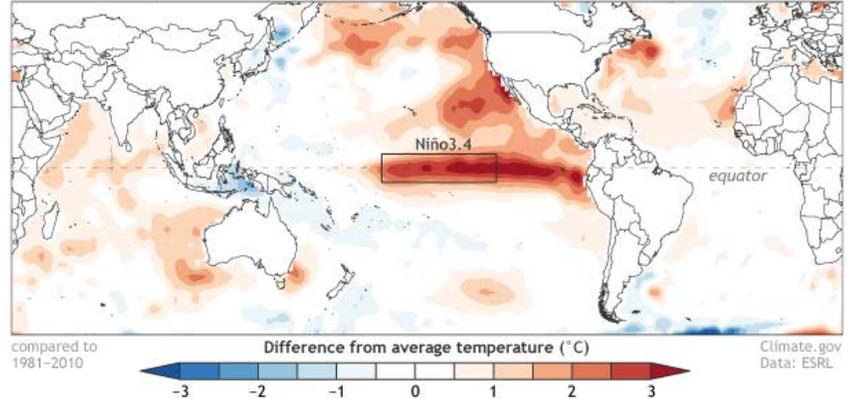
We partner with **over 50 countries** in developing and sustaining the global ocean observing system.

More than 24 NOAA Laboratories , Universities, Oceanographic Research Institutes, and other US centers of excellence carry out sponsored observing activities.

WHY IS UNDERSTANDING EL NIÑO IMPORTANT AND HOW DO WE STUDY IT?

El Niño is an **irregularly occurring** and complex series of ocean-atmosphere changes affecting the equatorial Pacific region, characterized by the appearance of **unusually warm, nutrient-poor water** off northern Peru and Ecuador, typically in late December. Impacts of El Niño are evident across the globe, including seasonal changes in US weather patterns **bringing more rain to some parts of California and fewer hurricanes in the Atlantic.**

Sea surface temperature anomaly, Oct 11–Nov 7, 2015



Climate Observation Division **supports hundreds of platforms** in the tropical Pacific that complement the TAO buoy array and satellite observations required **to understand and improve climate forecasts** used by water managers, farmers, and many others across the US.

The international, **Tropical Pacific Observing System 2020 Project** is assessing the current observing system and will recommend and test changes to the system. With better information, we will be able to **foster improved models of El Niño and La Niña**, which would ultimately help with weather forecasts, drought predictions, and other forecast products.



Monitoring ocean conditions for months at a time with autonomous gliders.

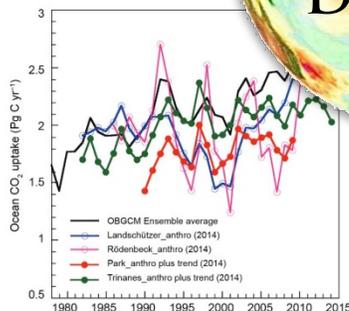
Describing ocean changes and trends important for coastal communities.



CLIMATE OBSERVATION DIVISION

WHAT DOES THIS MEAN FOR THE EAST COAST?

Observing the Florida Current allows us to determine how sea level changes may be linked to changes in large-scale ocean currents.



Researching how the ocean absorbs and stores anthropogenic carbon.



Providing foundational information for NOAA and US NAVY forecast models

