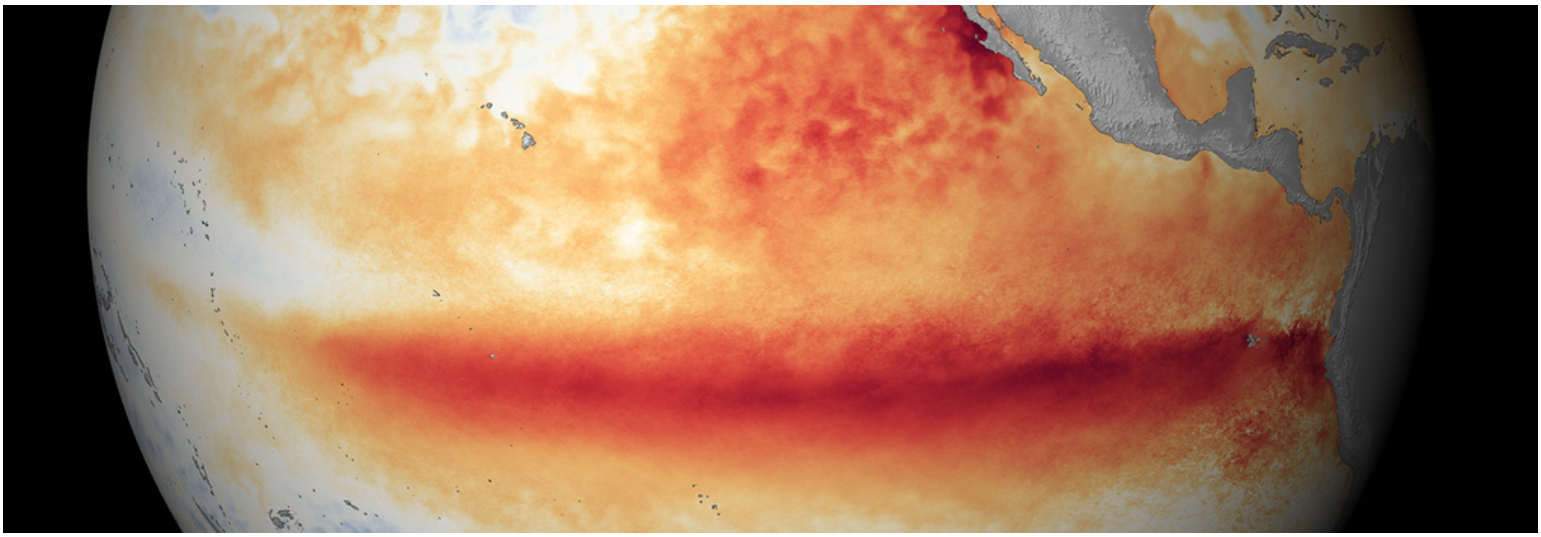
NOAA El Niño Rapid Response Field Campaign



NOAA G-IV

NOAA R/V Ronald H. Brown

NASA Global Hawk UAS

Kiritimati Island

X-Band Radar

Summary

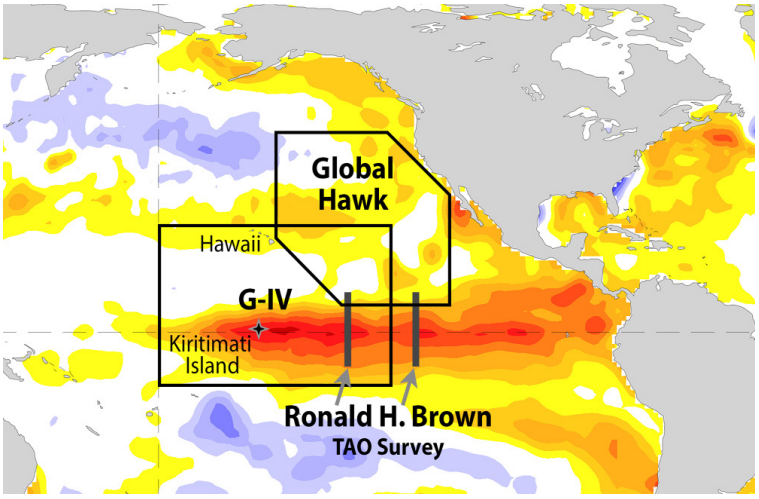
NOAA scientists embarked on a land, sea, and airborne research effort from the tropical Pacific to the U.S. West Coast to better observe and understand how El Niño influences U.S. weather. This is an unprecedented effort to gather never-before collected observations of the initial interaction between the ocean and atmosphere during one of the strongest El Niños in the last century.

What is El Niño?

El Niño is a recurring phenomenon characterized by exceptionally warm ocean temperatures in the equatorial Pacific that increases the odds for warm and dry winters across the northern United States and cool, wet winters across the south. El Niño is the warm phase of the ocean cycle known as El Niño-Southern Oscillation, or ENSO for short. La Niña is the cool phase. The pattern can shift back and forth every two to seven years, disrupting weather patterns across the globe.

Why does it matter?

El Niño influences weather around the world. Some regions experience warmer and drier than average temperatures, while other areas are wetter and cooler than average. El Niños can produce extreme precipitation events that threaten life and property in the U.S. For example, during the two strongest El Niños prior to this, California has been soaked by intense rainstorms that have caused flooding, landslides and other property damage.



Mission map showing potential flight areas of the NOAA G-IV and NASA Global Hawk, and location of the NOAA Ship Ronald H. Brown.

Why this campaign?

The ongoing major El Niño presents an unprecedented scientific opportunity to accelerate advances in understanding and predictions of an extreme climate event and its impacts. This field campaign examines the response of the atmosphere to the warm ocean water at the heart of this very strong El Niño. The observations being collected help scientists better understand the chain of events that produces, among many other weather impacts, extreme precipitation on the West Coast.

Flight scientist Randall Dole (left) and crewmember Al Goldstein monitor data while aboard the G-IV aircraft during a research flight.

How is this being accomplished?

NOAA and partner assets are being deployed from January to March 2016 to support the El Niño Rapid Response Field Campaign.

IN THE AIR...

NOAA's Gulfstream IV aircraft is flying out of Honolulu International Airport on the island of Oahu carrying a suite of meteorological sensors on 24 research flights in the central Pacific from late January to mid-March. The G-IV will be dropping weather instrumentation and using Doppler radar located in the aircraft's tail to gather weather data along with important weather features.

NASA's Global Hawk Unmanned Aircraft carried a suite of meteorological sensors and dropped weather instruments during three research flights in February in the eastern Pacific. The Global Hawk is a key asset for the Sensing Hazards with Operational Unmanned Technology (SHOUT) project led by the NOAA Unmanned Aircraft System Program. The Global Hawk is based at the NASA Armstrong Flight Research Center at Edwards Air Force Base.

IN THE OCEAN...

NOAA's Ship Ronald H. Brown is launching weather balloons up to eight times a day during the Tropical Atmosphere Ocean (TAO) buoy survey cruise in the eastern tropical Pacific. The ship departed Honolulu on February 16 and arrives in port in San Diego on March 18.

ON THE GROUND...

Kiritimati (Christmas) Island is a remote atoll approximately 1,340 miles south of Honolulu. Researchers are launching weather balloons twice a day from late January through March 2016.

A Scanning X-Band Radar has been temporarily installed in the south San Francisco Bay as an experimental system to provide additional rainfall estimates in complex terrain during heavy precipitation events.

Katanute Tuevi, of the Kiribati Meteorological Service, assists with a radio-sonde balloon launch.

Researchers at the NOAA Earth System Research Laboratory in Boulder, CO discuss conditions at daily forecast briefings. This information is crucial for planning and coordination of the field activities.

What are the potential benefits?

NOAA researchers anticipate that the data gathered by weather balloons and instruments dropped from aircraft will help improve the models that are used to support weather forecasts. The data will also provide insights that researchers hope will improve year-to-year ENSO forecasts, as well as the accuracy of models predicting longer-term impacts of climate change.

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