Extreme Weather Impacts: Predicting El Niño and La Niña

Impact

Seasonal and inter-annual predictions yield billions of dollars in benefits

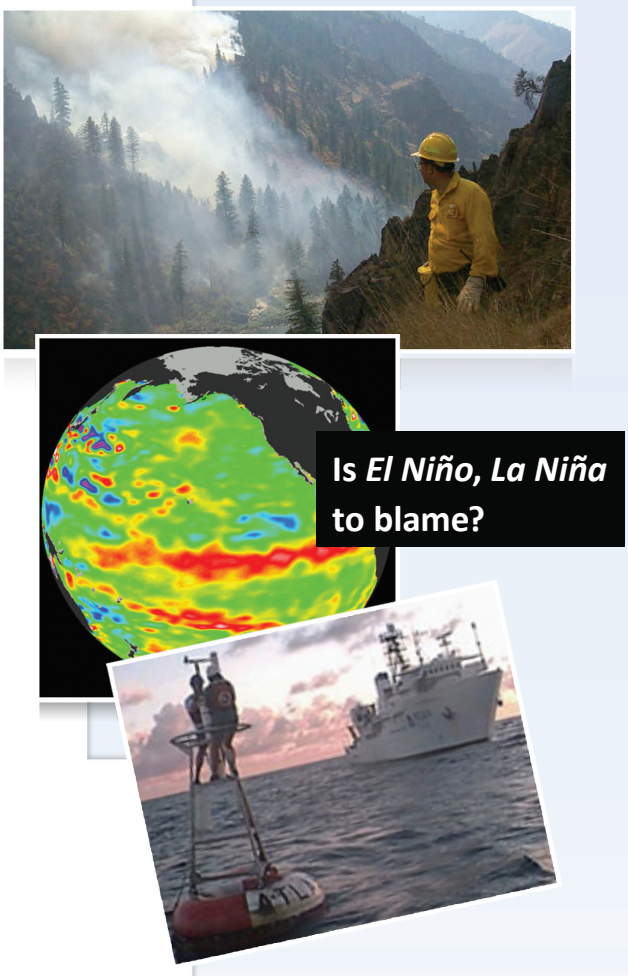
Called a "crowning achievement" by the American Geophysical Union, the Tropical Atmosphere Ocean (TAO)/ TRITON array has vastly improved observational capabilities over large areas of the Pacific Ocean. Developed by OAR's Pacific Marine Environmental Laboratory (PMEL) with funding from a forerunner of the OAR Climate Program Office, the array is a major component of the El Niño/Southern Oscillation (ENSO) Observing System, the Global Climate Observing System (GCOS) and the Global Ocean Observing System (GOOS).

Development of the array was a monumental technological achievement. Previously, the capability for deep ocean moored data buoys did not exist. Today, the low-cost, deep ocean moorings measure surface meteorological and subsurface oceanic parameters, and transmit all data to shore in real-time via satellite relay.

Once in place, the TAO data in concert with modeling efforts led the National Weather Service to antcipate the arrival of the 1997-1998 El Niño and forecasted expected impacts. Armed with a six-month advance warning of the 1997-98 El Niño, California alone estimated saving $1 billion as a result of preparedness measures taken by individuals, businesses, and government officials. Total U.S. economic impacts of the 1997-1998 El Niño were estimated to be on the order of $25 billion.

The TAO array transitioned to the National Weather Service in 2005. Today, PMEL will lead research and development for tropical moored buoy technology, continuing its strong tradition of science innovation for marine sensing.

When La Niña arrives, drought appears likely for some parts of the U.S. Through the support and urging of the Western Governors' Association, NOAA established NIDIS, the National Integrated Drought Information System, in 2006 to provide an integrated, interagency drought monitoring and forecasting system for the Nation. NIDIS is another OAR Climate Program Office-led effort.



"Scientists generally agree that ocean observatories' shining accomplishment has been the prediction of *El Niños*…[enabled by] the network of buoys known as the Tropical Atmosphere Ocean array…"
Science News, 2002

Images, top to bottom: Drought can lead to higher forest fire risk; OAR tracks El Niño Southern Oscillation; TAO buoy moored in the Pacific Ocean.

Learn More:
www.pmel.noaa.gov/tao/
www.drought.gov