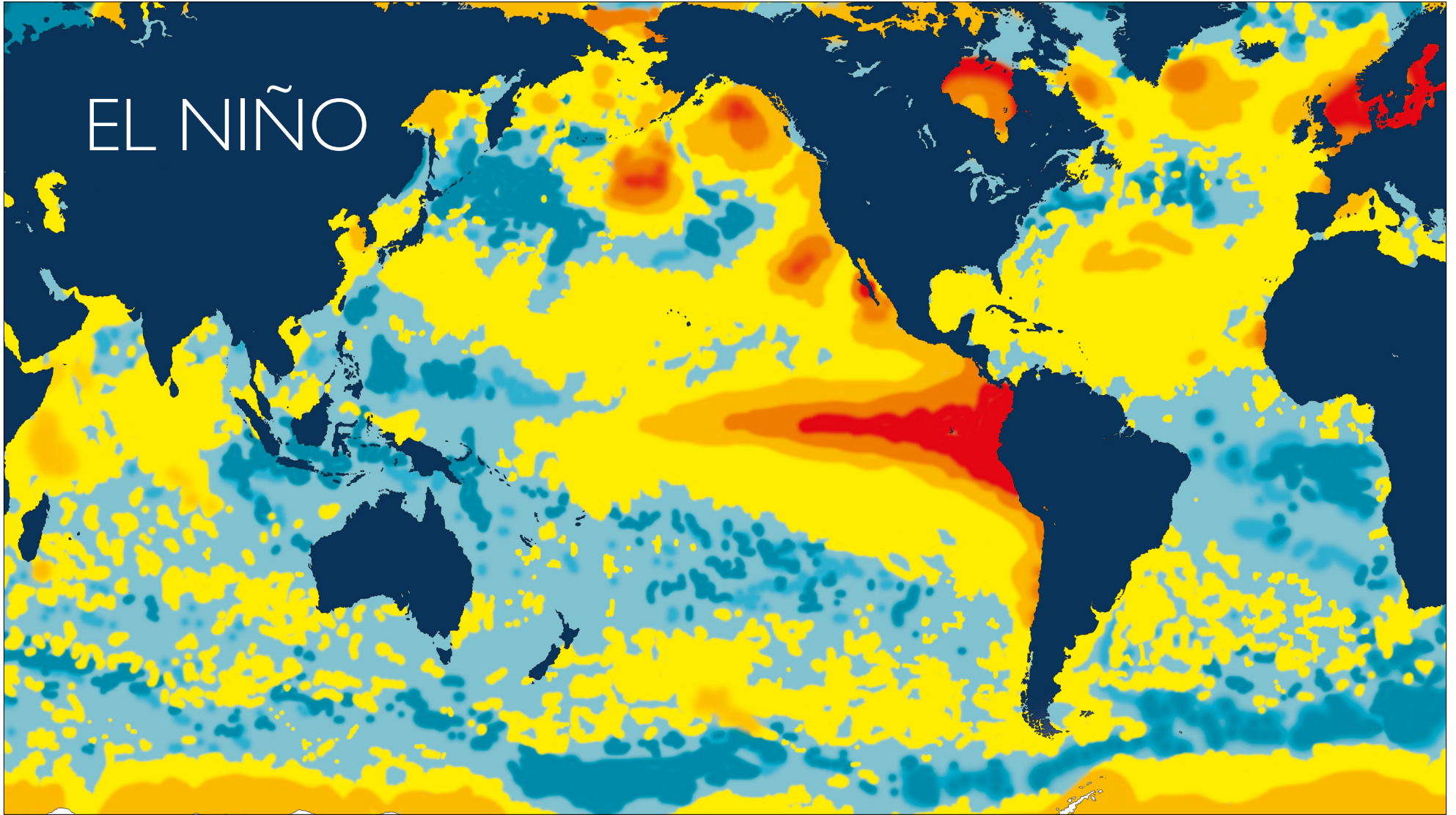


EL NIÑO

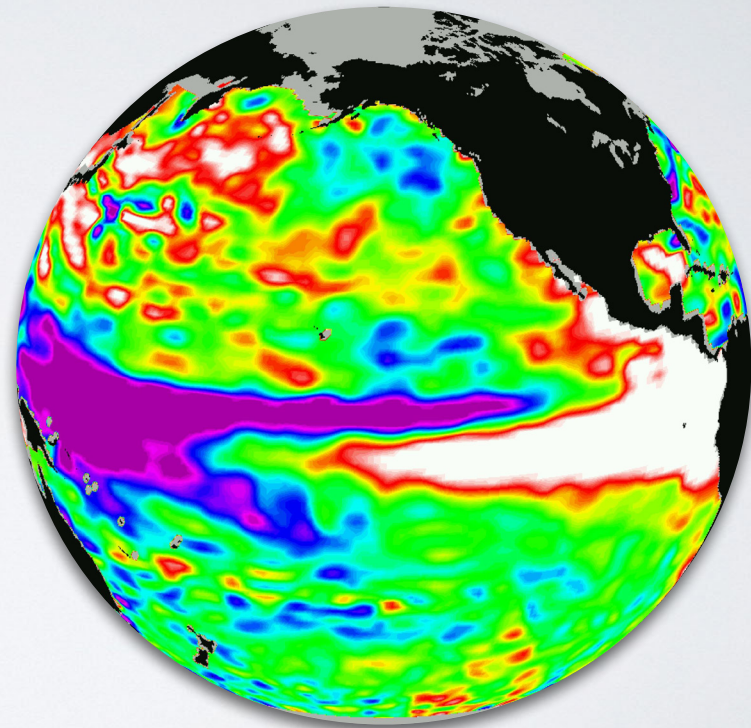


EL NIÑO

- In the 1600s, fishermen off the coast of South America saw the appearance of unusually warm water in the Pacific
- They termed the event El Niño
 - Spanish for “Christ Child” or “The Little Boy” and was chosen based on the time of year (December) when these warm water events occur

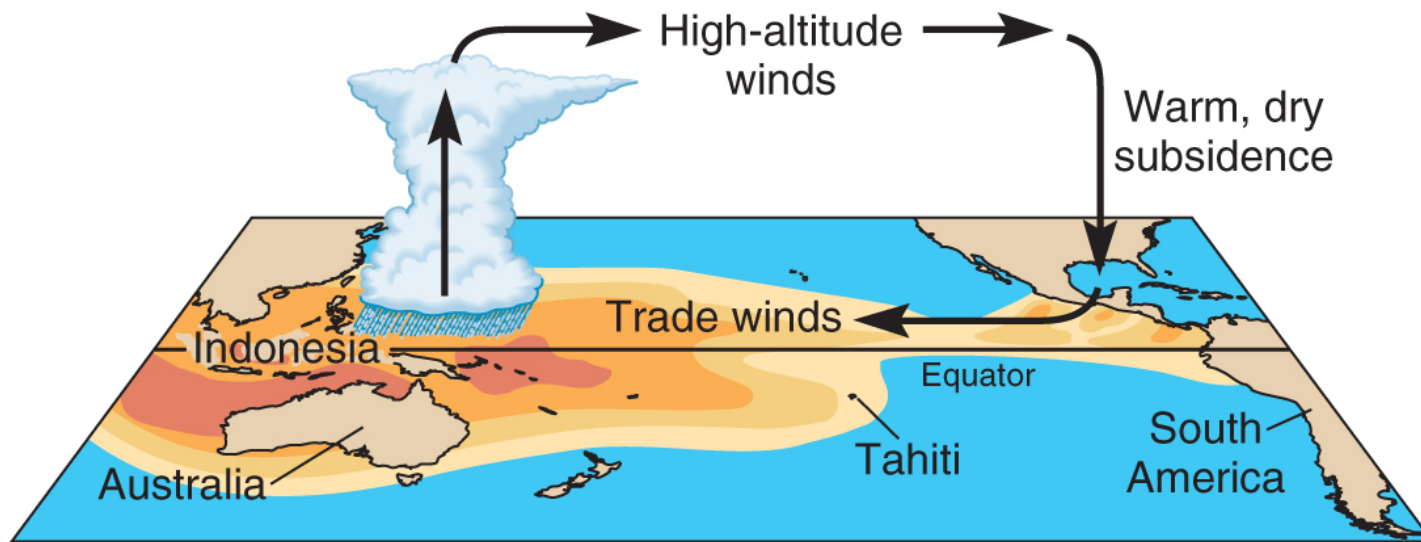
EL NIÑO

- El Niño - an ocean-atmosphere climate interaction linked to a periodic warming in sea surface temperatures across the central and eastern Pacific Ocean
- La Niña - climate pattern that describes the cooling of surface ocean waters along the tropical west coast of South America



EL NIÑO

- La Niña Conditions (Normal Conditions):
 - Wind blows from east to west along the equator in the Pacific and actually piles up water in the western Pacific
 - In the eastern part, deep colder water gets pulled up from below to replace the warm water that is pushed away
 - Western water temperatures are warmer (30° C)
 - Eastern water temperatures are cooler (22° C)



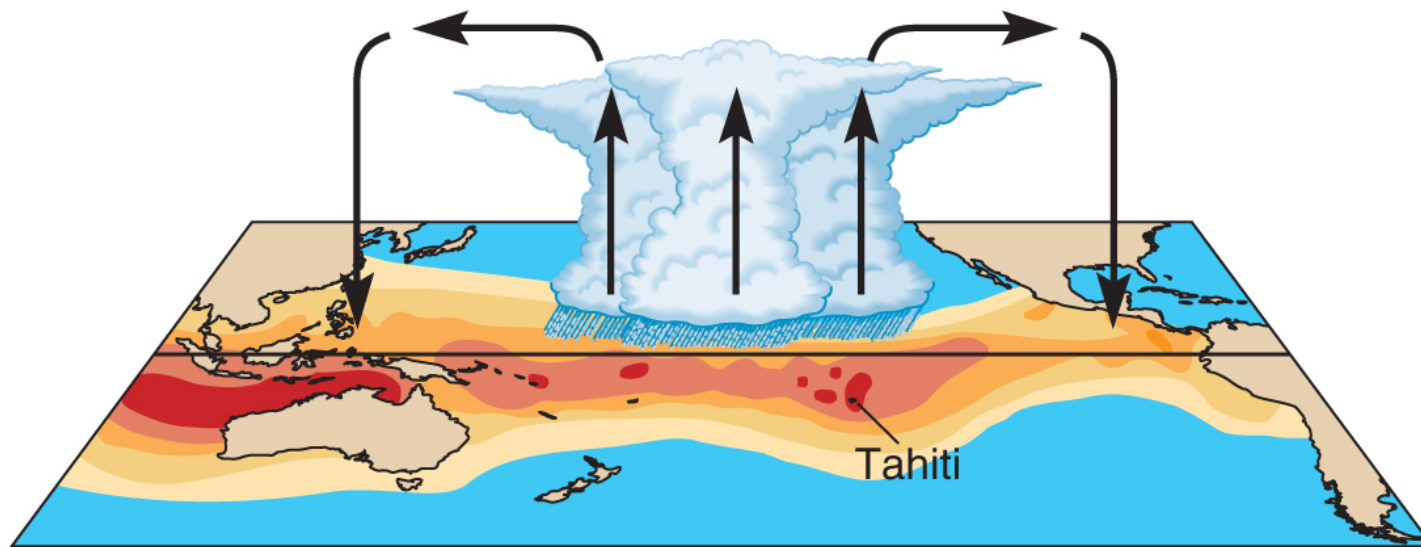
La Niña Conditions (Normal Conditions)

EL NIÑO

- El Niño Conditions:
 - Normal prevailing winds pushing that water get weaker
 - As a result, some warm water piled up in the west stays in the east and doesn't allow for the cold water to get pulled up
 - These tend to make the water in the eastern Pacific warmer

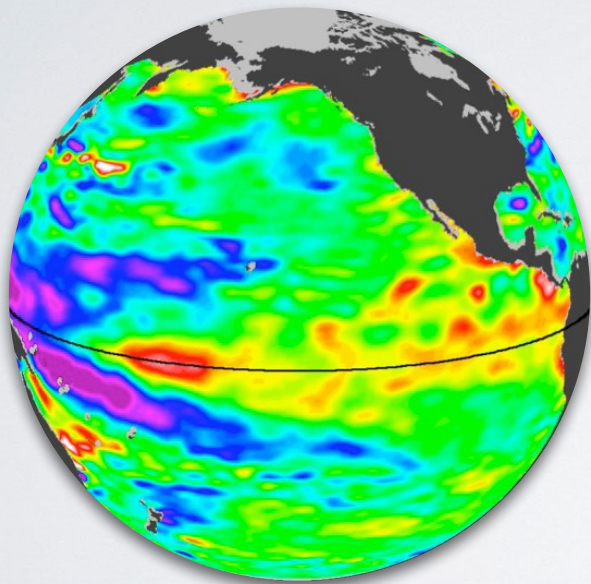
EL NIÑO

- El Niño Conditions: (continued)
 - The warmer ocean causes the winds to get weaker and the weaker winds cause the ocean to get warmer
 - This cycle is called positive feedback and causes El Niño to get more powerful

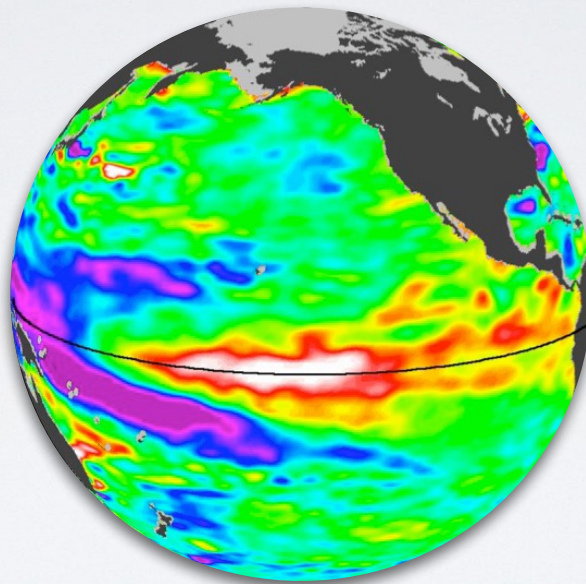


El Niño Conditions

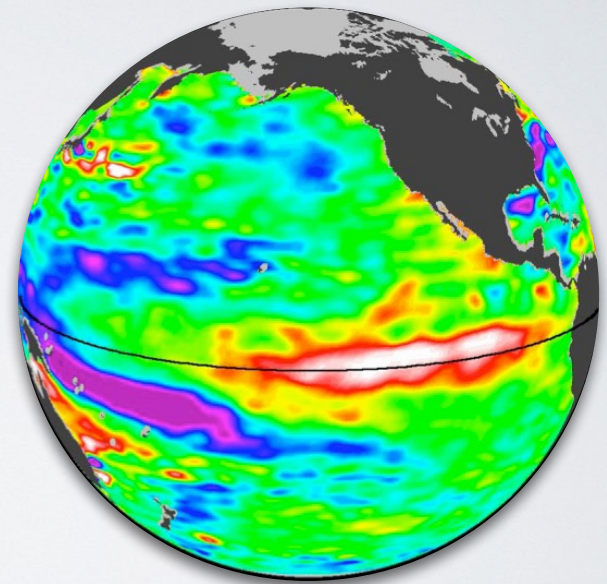
EL NIÑO



1/30/2010



2/14/2010

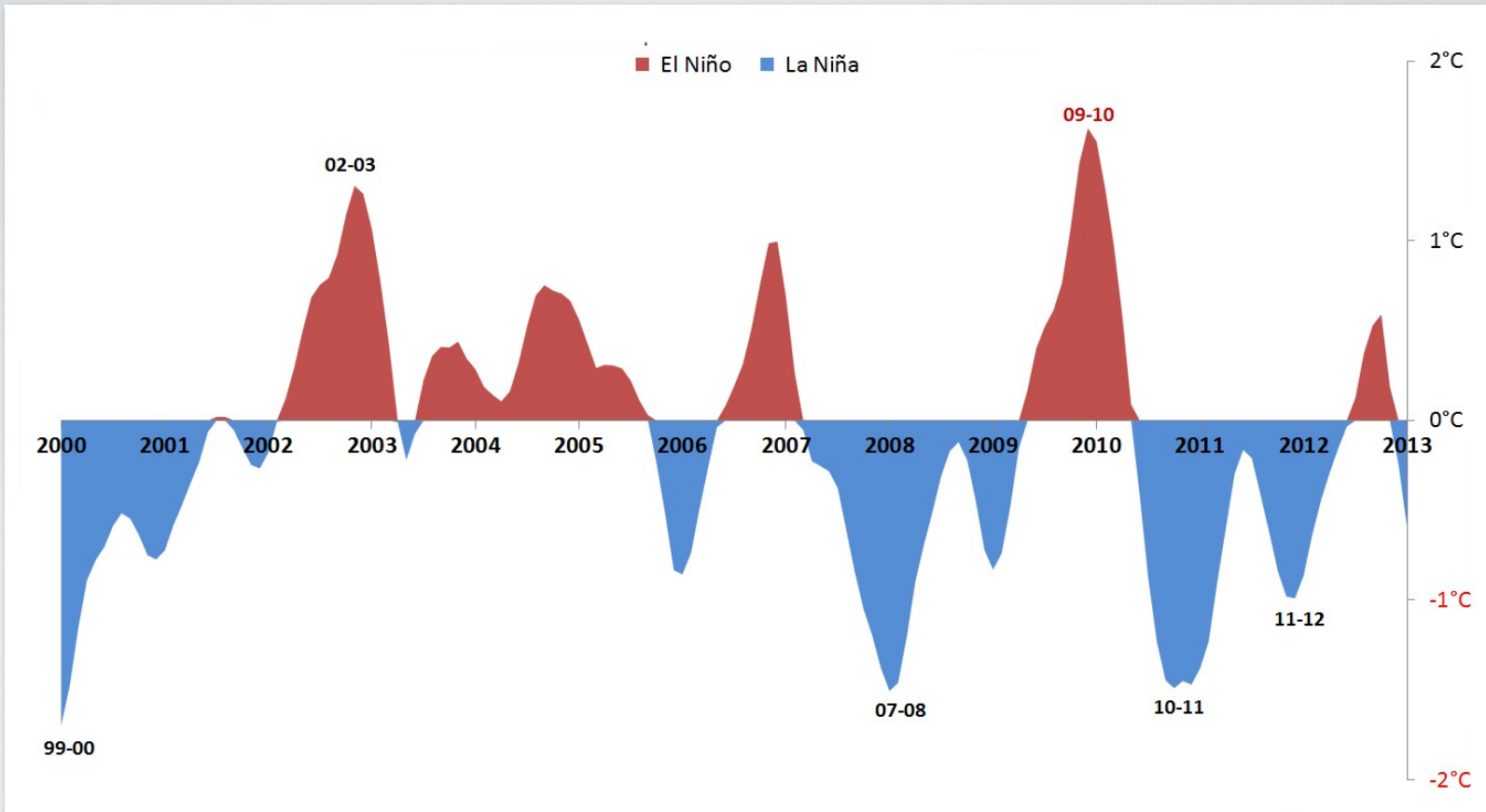


3/1/2010

EL NIÑO

- El Niños occur approximately every two to seven years

1902-1903	1905-1906	1911-1912	1914-1915	1918-1919	1923-1924	1925-1926
1930-1931	1932-1933	1939-1940	1941-1942	1951-1952	1953-1954	1957-1958
1965-1966	1969-1970	1972-1973	1976-1977	1982-1983	1986-1987	1991-1992
1994-1995	1997-1998	2002-2003	2006-2007	2009-2010	2012-2013	2015



El Niño Frequency

EL NIÑO

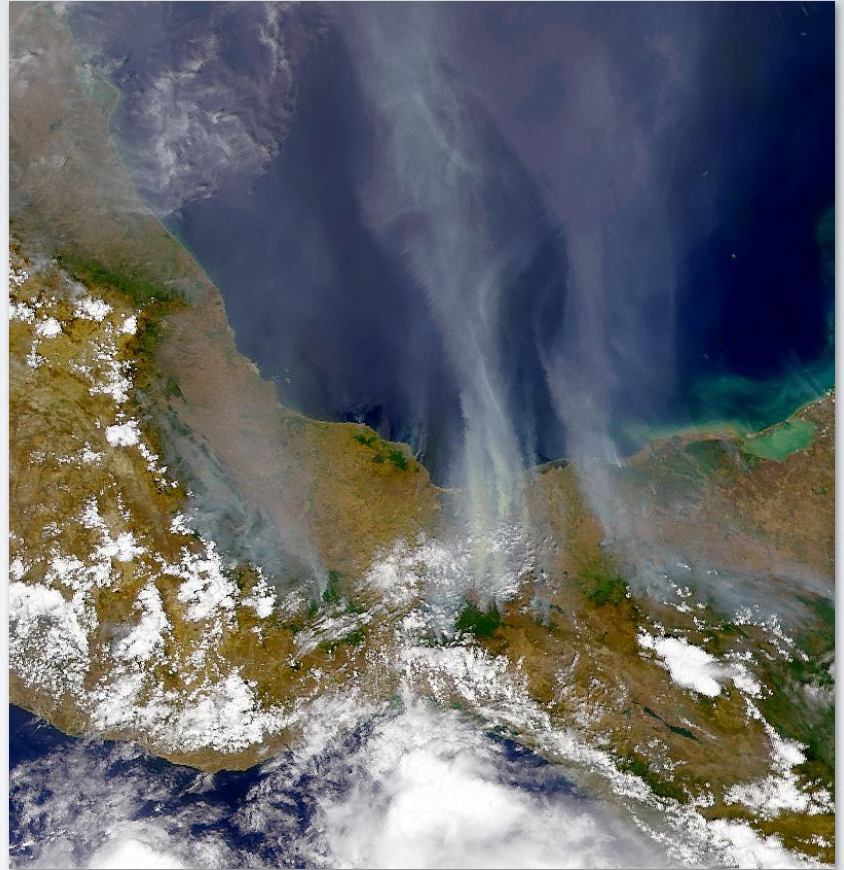
- Global Weather Related Effects of El Niño:
 - Peru has flooding rains and warm weather
 - Indonesia, Africa, and Australia have droughts
 - California has droughts then torrential rain with mudslides
 - Northeast United States has mild winters and fewer hurricanes
 - Southern Mexico suffers from increased wildfires



Drought along a Reservoir in California



Mudslides after Heavy Rains in California



Wildfires in Mexico

EL NIÑO

- Global Ecological Related Effects of El Niño:
 - Since El Niño reduces the upwelling of nutrient rich cold water which plankton are dependent on, fish have no food source
 - Fish either die or are forced to migrate to find food
 - This in turn causes sea birds to die or go elsewhere

EL NIÑO

- Global Ecological Related Effects of El Niño: (continued)
 - California has seen fish populations reduced
 - As a result marine mammals, such as seals and sea lions, may see an increase in dead and live strandings along the coast and poor seal and sea lion pup survival rates
 - However marine mammal populations grow annually and there is not a threat to their overall population



Elephant Seal Deaths



Drought along a Reservoir in California