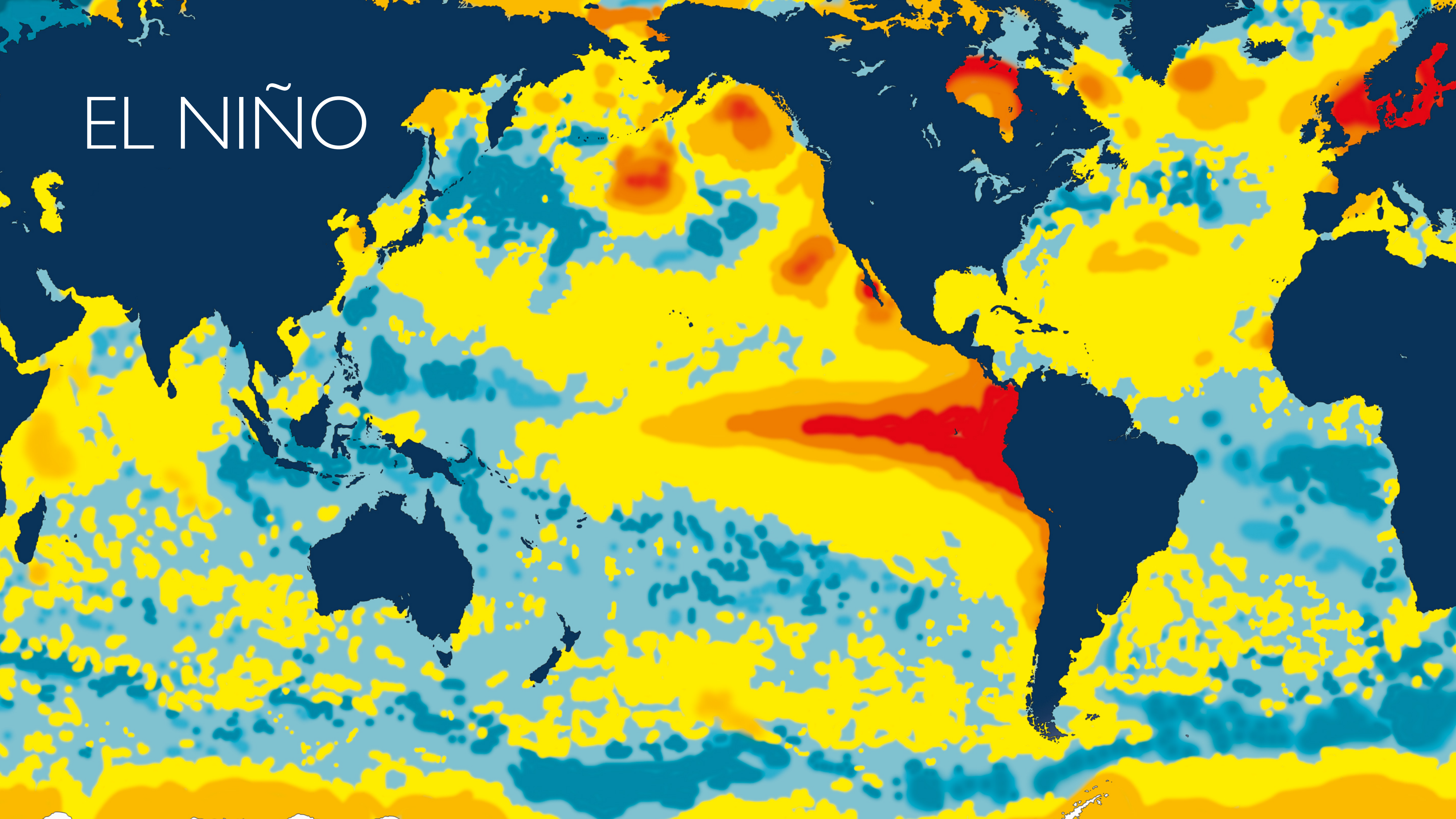


# EL NIÑO





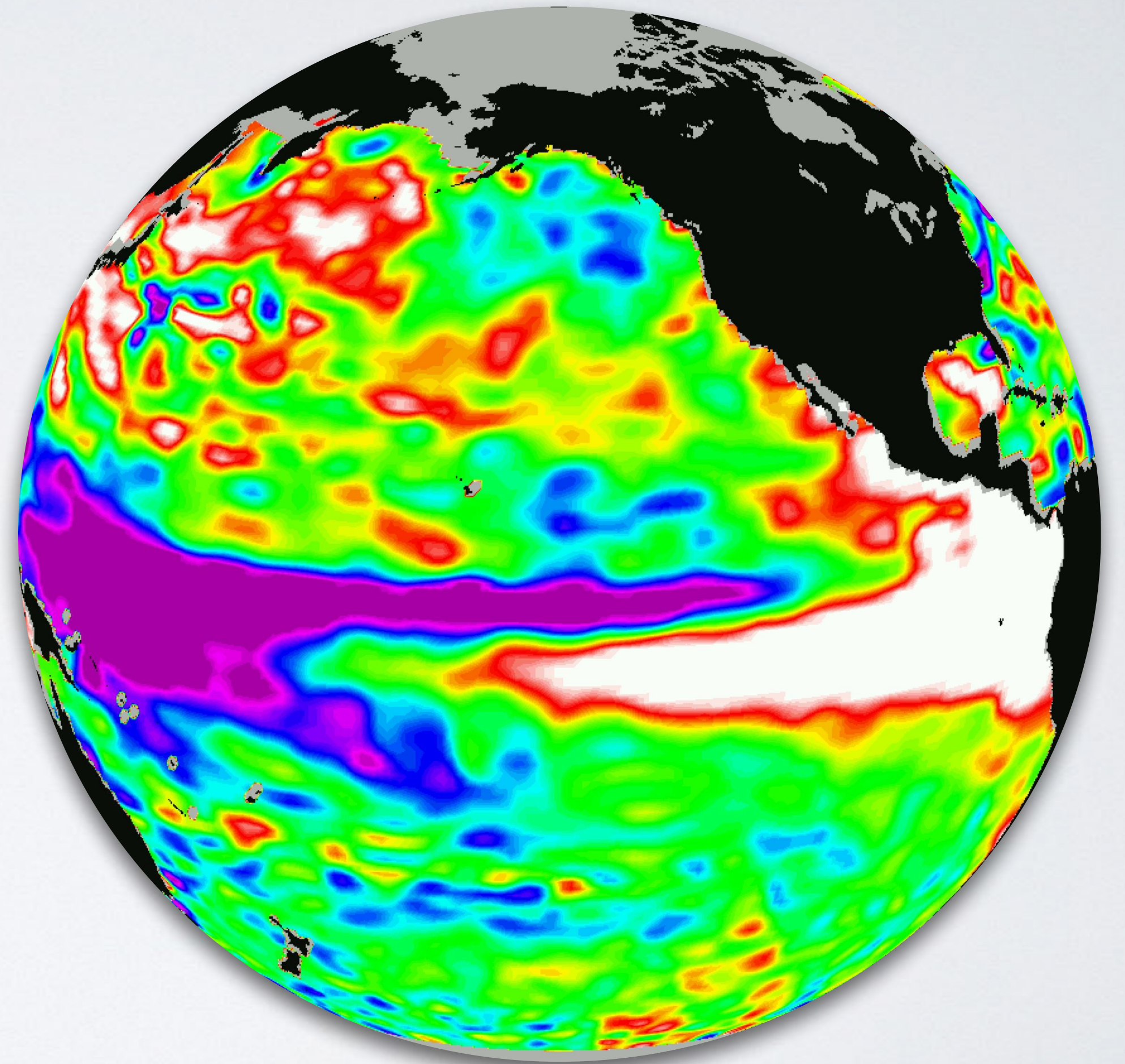
# EL NIÑO

- 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

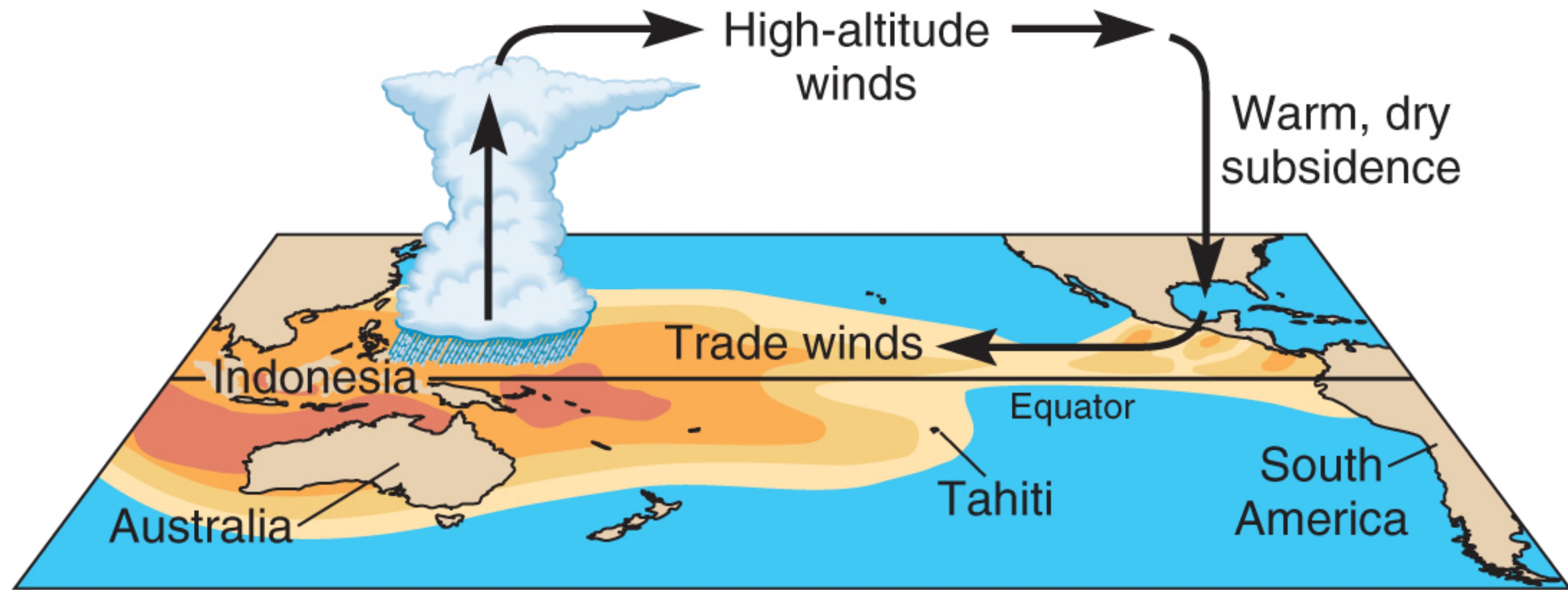




# EL NIÑO

- 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]





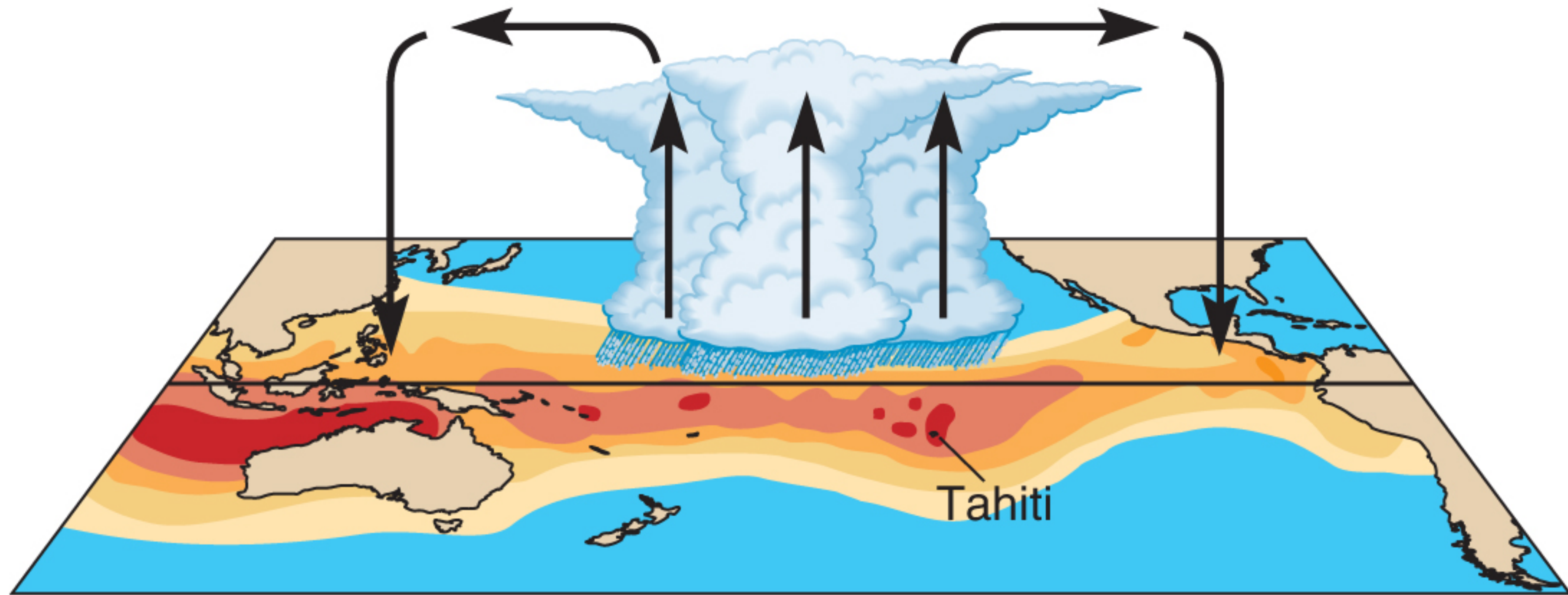
La Niña Conditions [Normal Conditions]



# EL NIÑO

- El Niño Conditions:
  - The normal prevailing winds that push the water get weaker
  - As a result, some warm water piled up in the west moves towards the east and stops the cold water upwelling
  - This makes the water in the eastern Pacific warmer and will change the associated weather
  - This cycle is called positive feedback and causes El Niño to get more powerful

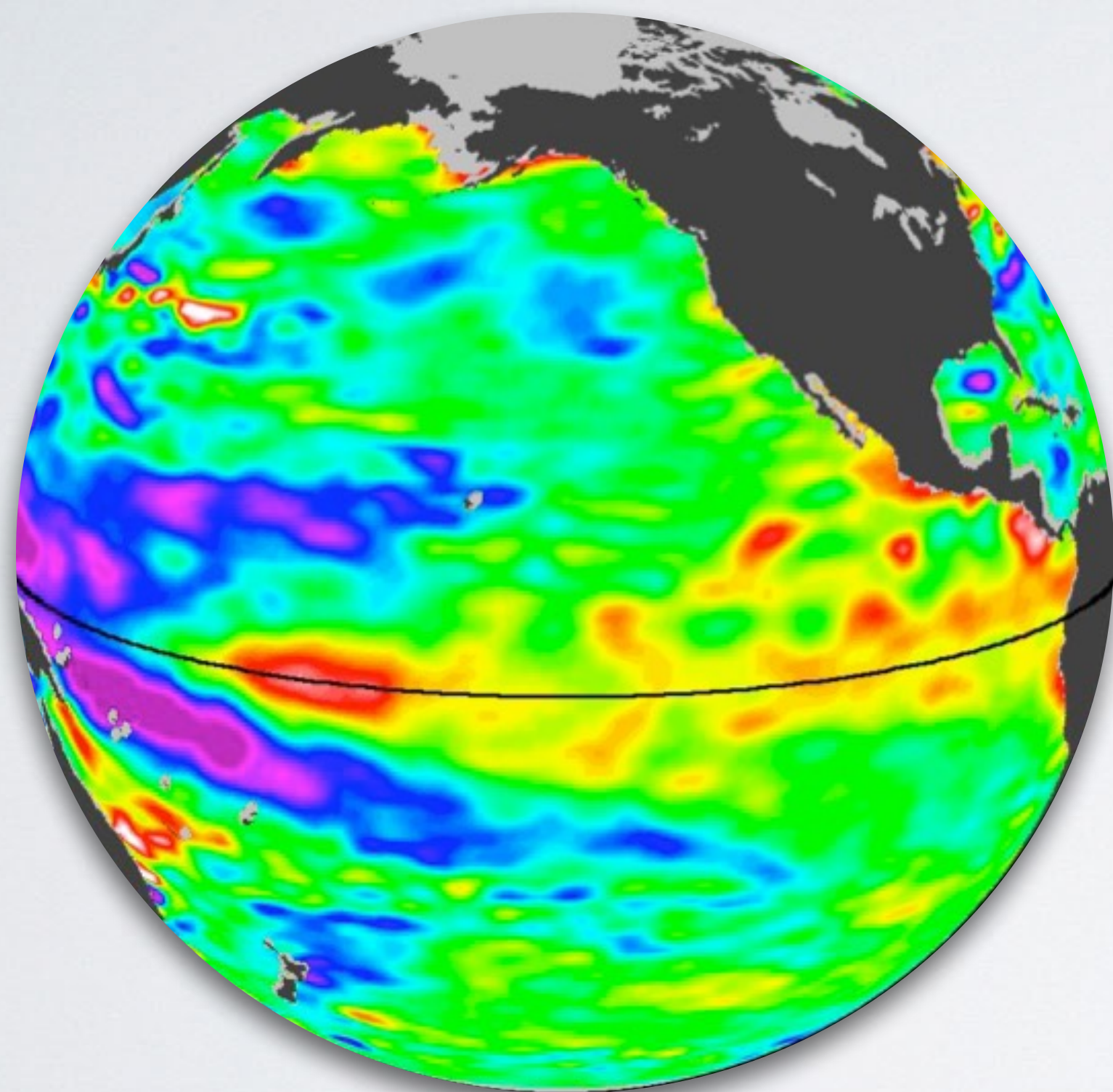




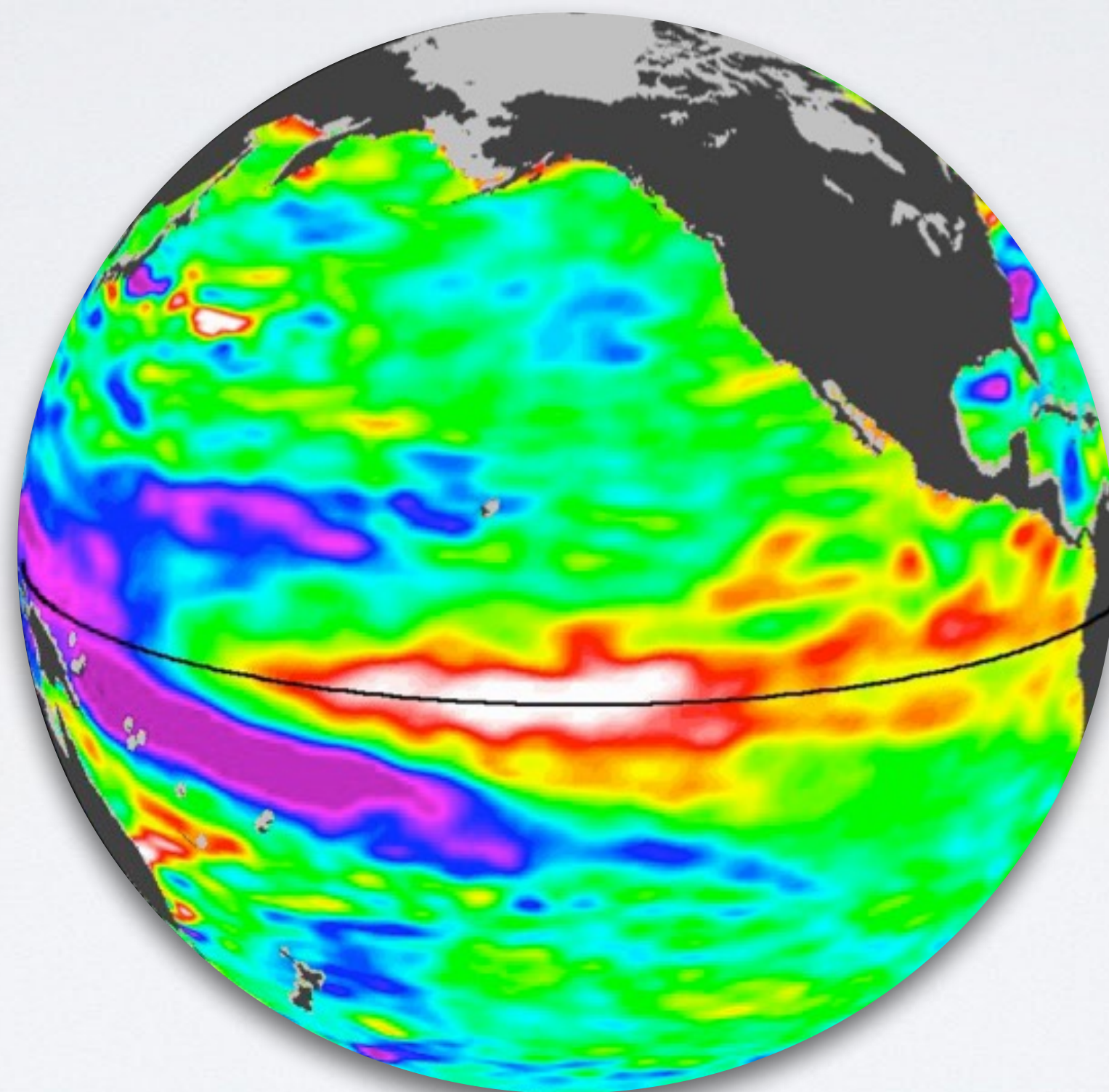
El Niño Conditions



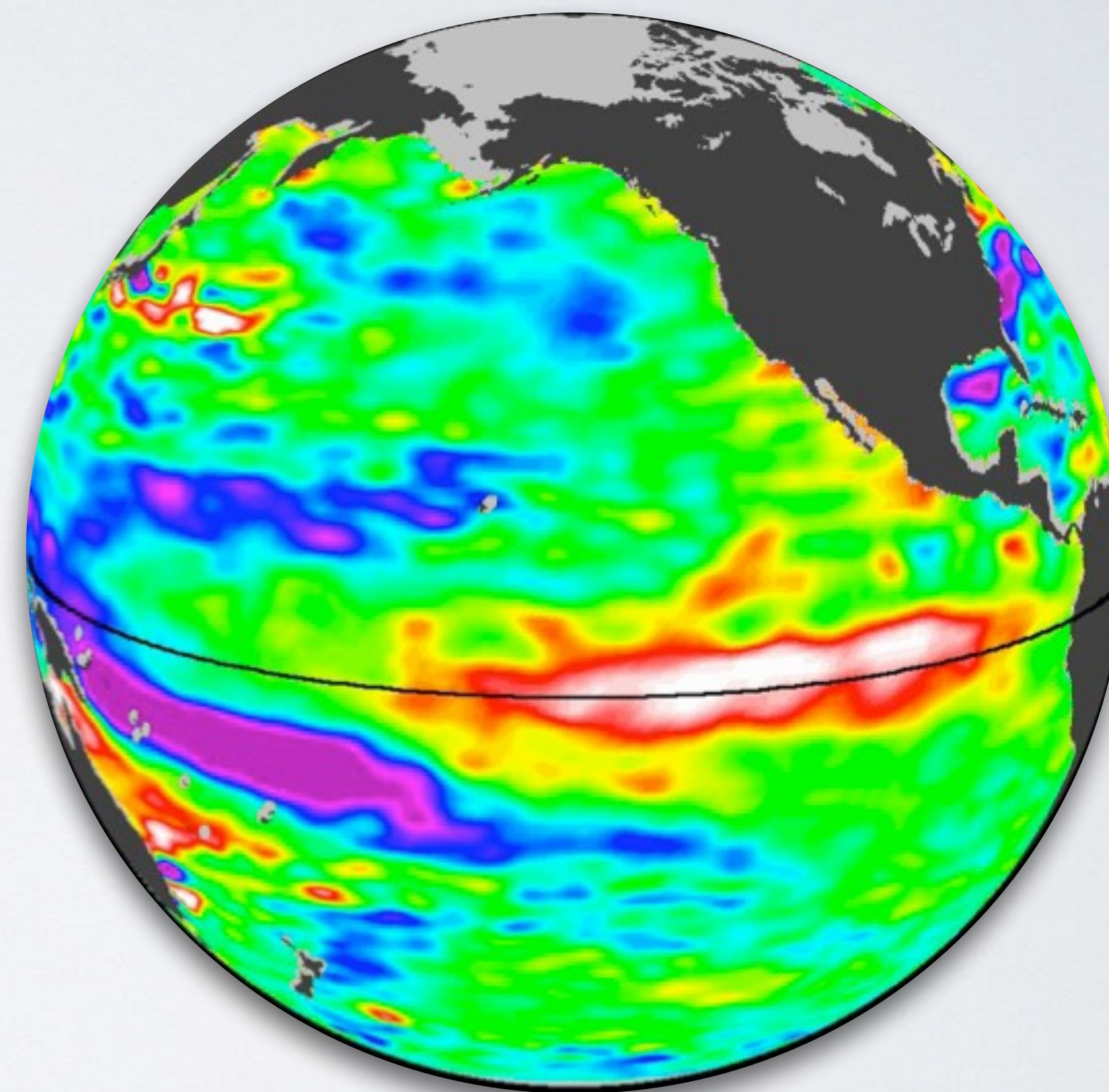
# EL NIÑO



1/30/2010



2/14/2010



3/1/2010

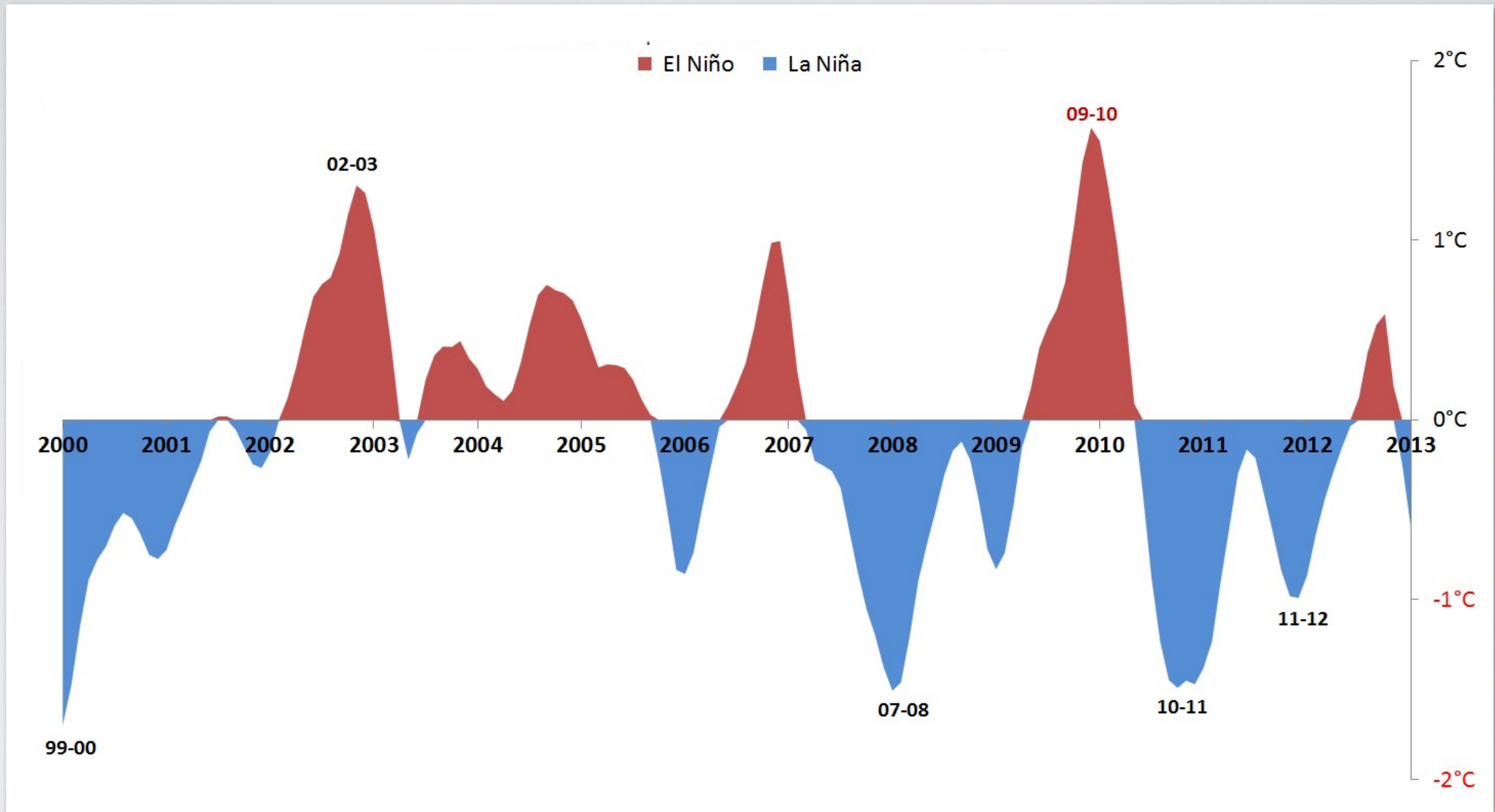


# EL NIÑO

- 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





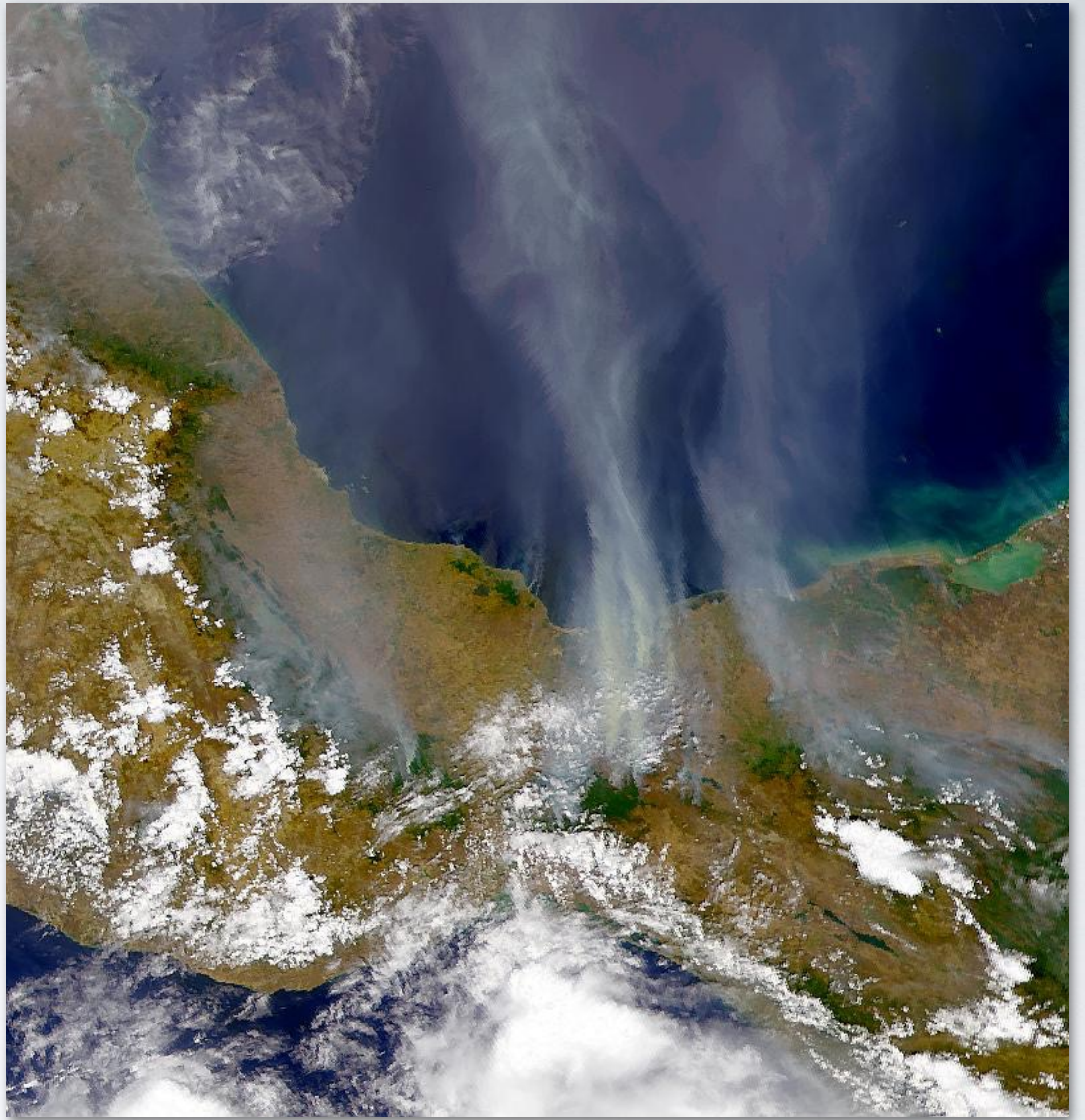
Drought along a Reservoir in California





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 and either die or are forced to migrate
    - 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 mammal deaths increase and pup survival rates decreases





Elephant Seal Deaths





Drought along a Reservoir in California