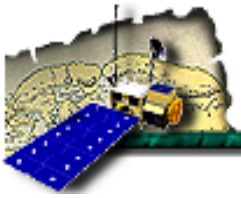


El Niño Analysis

The analysis of sea-surface temperatures plotted on an ocean map can reveal patterns related to general oceanographic conditions. El Niño is a recurring episode resulting from interaction between the ocean and the atmosphere and has major impact on sea-surface temperatures over vast stretches of the tropical Pacific.

This activity compares sea-surface temperature patterns during a major El Niño occurrence to a time more representative of long-term average conditions. The data employed were acquired from temperature sensors carried aboard ships, floating buoys, and satellites which was provided by the Climate Analysis Center of the National Oceanic and Atmospheric Administration.

Objectives:

After completing this investigation, you should be able to:

- Demonstrate a method for analysis of sea-surface temperature patterns.
- Compare sea surface temperature patterns during a major El Niño episode with that more representative of average conditions.

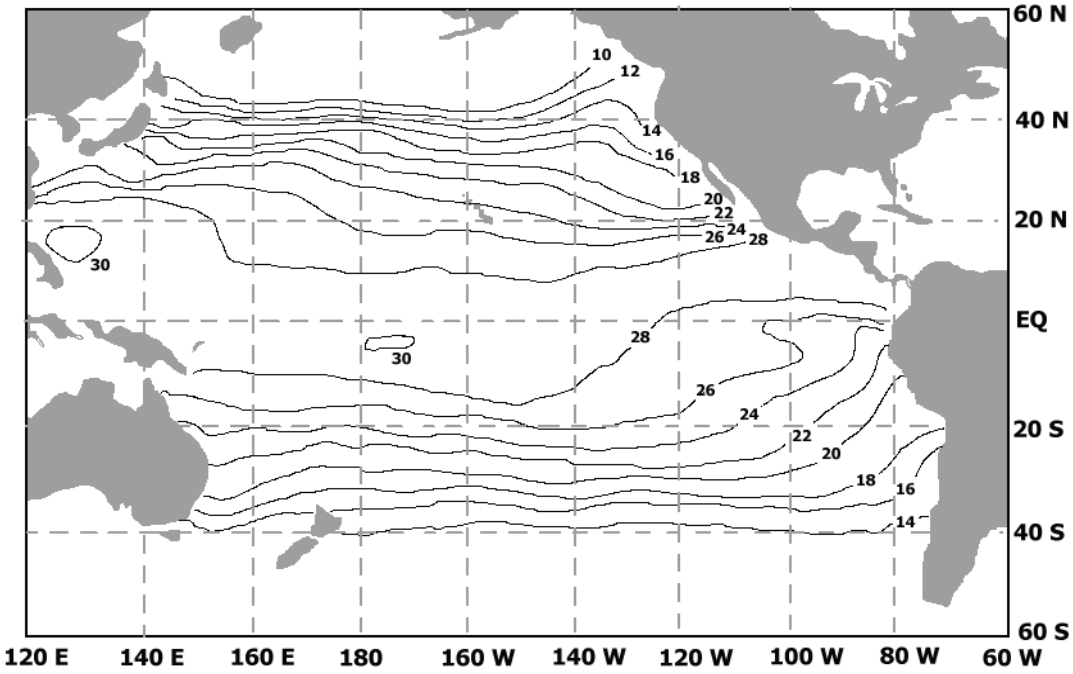
Investigations:

1. The accompanying maps of the Pacific Ocean display sea-surface temperature patterns at two different times. The lines drawn on the map are constant temperature lines called isotherms. Each isotherm is labeled according to the temperature it represents, in °C. The difference from one isotherm to the next on the maps is (1°) (2°) (4°).
2. The temperature patterns can be highlighted with color. To start, use colored pencils to fill in the color key provided. Note that all temperatures above 28°C will be colored red and all below 20°C will be colored violet.
3. Color the entire Pacific Ocean by referring to the color key. Start by locating on each map the area with the highest reported temperature and color it red. Expand the region by coloring red outward to the 28°C isotherms.
4. Using the next color in your color key, follow the same procedure for the next lower temperature band that ranges between 28°C and 26°C. Continue this process for all the temperature ranges in your color key.
5. Note that only colors representing adjacent sequential temperature ranges can come into direct contact on the map. For example the 20°-22°C color band and the 24°-26°C color band cannot touch; they must always be separated by a (26°-28°C) (22°-24°C) (18°-20°C) color band.
6. Locate on your map a location where the adjacent temperature bands are relatively narrow. If you were traveling on the map in a direction cutting directly across the bands, you would observe a temperature change that was relatively (small) (large) over a short distance.
7. During times typical of average conditions, strong Trade Winds drive warm surface water away from west coast of equatorial South America. The retreating warm water is replaced by cold water upwelling from the depths. During an El Niño event, the trade winds slacken, the upwelling of cold water ceases and the sea surface temperature rises off the west coast of equatorial South America. By comparing your analysis of the two maps, the maps for (1987) (1988) would indicate the occurrence of an El Niño.

Source:

The Maury Project, American Meteorological Society.

June 1987 - Sea Surface Temperatures (C°)



Temperature Color Key

> 28° C	26 - 28° C	24 - 26° C	22 - 24° C	20 - 22° C	< 20° C
red	orange	yellow	blue	green	violet

June 1988 - Sea Surface Temperatures (C°)