

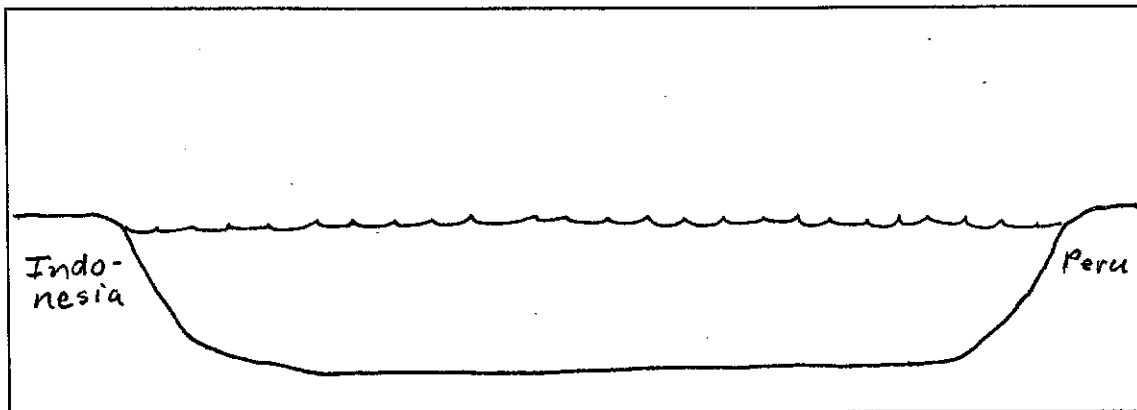
## ACTIVITY: El Nino

name: \_\_\_\_\_ period: \_\_\_\_\_

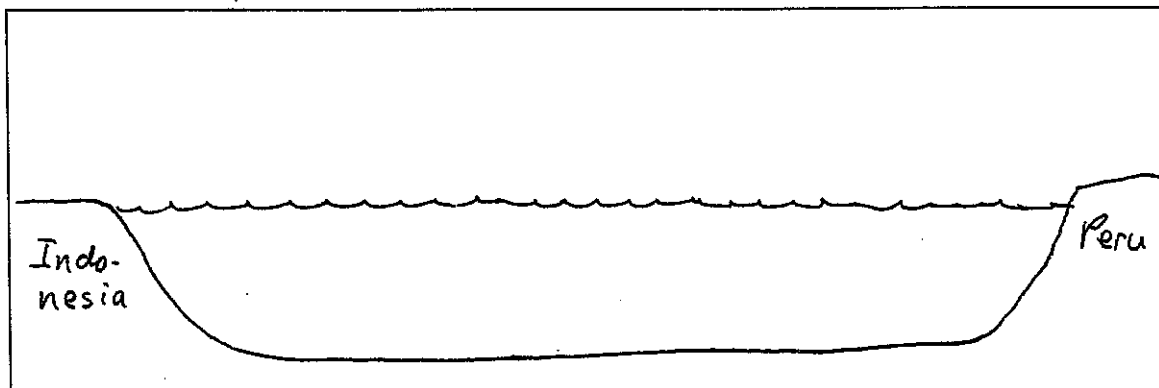
The term El Nino (Spanish for "the boy") was originally used by fishermen along the west coast of South America to refer to a warming of the coastal waters that typically appears around Christmas. Fish are less abundant during these warm intervals, so fishermen often take a break to repair equipment and spend time with their families. In some years, however, the water is especially warm and the break in the fishing season persists for months. Over the years, the term "El Nino" has come to be reserved for these exceptionally strong warm events that not only disrupt the lives of fishermen, but also bring heavy rains to the area. From 1950 to 1990, nine El Ninos have affected The South American coast. Strong events occurred in 1982-83 and in 1997-98.

### Pre-Activity Questions:

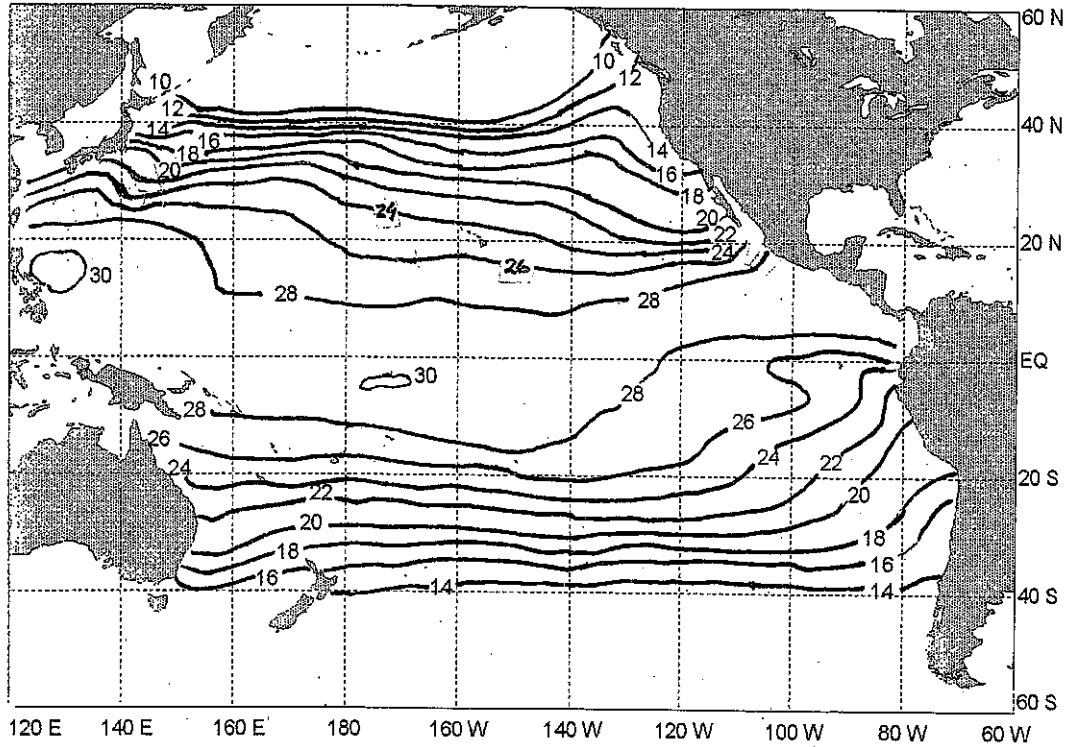
1. Scientists keep track of the equatorial waters of the Pacific Ocean so that they will know when an El Nino begins. How do they do this?
2. In non-El Nino years there is an upwelling of cold water along the west coast of South America. How does this upwelling contribute to the fishing industry of that area?
3. What is the "El Nino"?
4. In past decades, how have strong El Nino events affected winters across the USA?
5. In this space sketch the normal (non-El Nino) situation that exists in the equatorial Pacific Ocean.



6. In the space below, sketch the situation, as it would be during a STRONG El Nino event such as the ones that happened in 1982-83 and 1997-98.



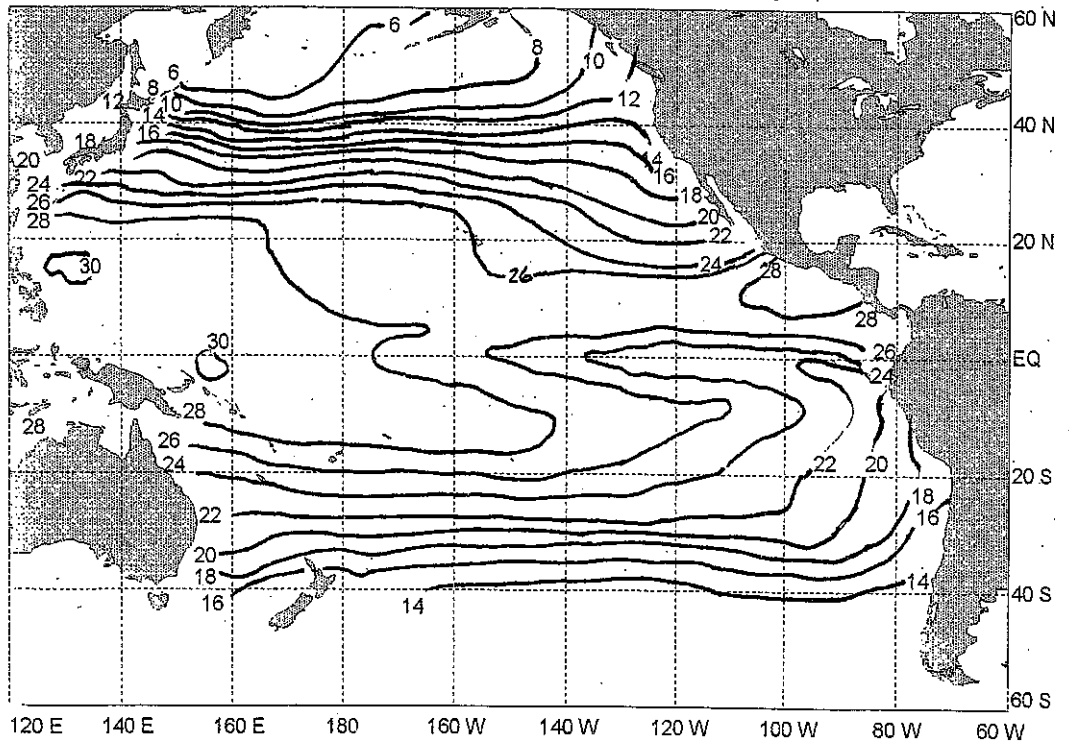
**June 1987 -- Sea Surface Temperatures (°C)**



**Temperature Color Key**

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

**June 1988 -- Sea Surface Temperatures (°C)**



Use sentences to answer the questions that are marked with asterisks (\*).

1. According to the maps that you just colored, which year (1987 or 1988) were the trade winds pushing the warm surface water toward the west?  
\_\_\_\_\_

2. During which year (see maps) was there more upwelling happening along the coast of Peru? Would this have been a good year for anchovy fishing?  
\_\_\_\_\_

3. \*El Nino events happen once every 2-10 years. During El Nino years, the upwelling off the west coast of South America lessens, causing a warming of the surface waters in this area. Which map shows evidence of an El Nino . . . . 1987, or 1988? Explain your reasoning.

4. \*Scientists have used "proxy evidence" to learn about strong El Nino events over the past 500 years. This evidence includes historical fisheries records from South America, writings of Spanish colonists in settlements along the coast of South America, analysis of coral reefs, and tree-ring evidence. **Explain how scientists would be able to tell whether or not there was an El Nino 100 years ago by examining historical records of how many fish were caught that year.**

5. \*When trees get more moisture they produce bigger rings. How would the tree ring formed in Peru in 1698 be different from other rings if there had been a strong El Nino in that year?

6. From the graphic below, circle those years in which "very strong" El Nino events are believed to have happened.

