El Niño

"What is El Niño?"

El Niño is a phrase now applied to the abnormal warming of the sea surface along the equator from South America to the Dateline. The phenomenon typically lasts 12-18 months, and occurs irregularly with a 4-7 year recurrence interval.

Areas such as equatorial Peru, Ecuador, Southern California, and the Gulf of Mexico Coast may experience an abundance of rainfall during El Niño which can contribute to flooding.

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### Interesting Facts about El Niño

1. El Niño is a natural event and occurs in the eastern Equatorial Pacific Ocean. It is triggered by low pressure centers in the tropical Pacific. When the low pressure areas are strong, the surface waters become warmer than normal, causing changes in weather patterns around the world.

2. El Niño events can have a significant impact on climate, affecting regions such as South America, Southeast Asia, and the United States.

3. El Niño events can lead to droughts in some areas and floods in others. For example, during the 1997-1998 El Niño event, Indonesia experienced severe drought and forest fires.

4. El Niño events can also affect ocean currents, leading to changes in sea levels and ocean temperatures. For instance, the 1982-1983 El Niño event caused a significant rise in sea levels in the eastern Pacific Ocean.

5. El Niño events can influence weather patterns, leading to changes in precipitation and temperature. For example, during the 1997-1998 El Niño event, parts of Australia experienced increased rainfall.

### PROCEDURE

1. **Make an El Niño model:**
   - Use a large loaf pan as the Pacific Ocean.
   - Add water to the loaf pan until it is about 1 inch deep.
   - Add 3 drops of red food coloring to cold water.
   - Add 3 drops of blue food coloring to very cold water.
   - Add more food coloring if using larger pans.

2. **Observe the slope between the hot and cold water:**
   - Observe how the hot and cold water do not mix.
   - Note: In reality the ocean's water is not as well mixed as this model suggests.

3. **Build your own El Niño:**
   - **MATERIALS**
     - Cold water
     - Blue food coloring
     - Red food coloring
     - Clear bottle
     - 300 ml (10 fl oz)
   - **PROCEDURE**
     - Fill the clear bottle with cold water.
     - Add 3 drops of blue food coloring to the cold water.
     - Add 3 drops of red food coloring to very cold water.
     - Add more food coloring if using larger pans.

4. **Determine the effect of El Niño on the atmosphere:**
   - During El Niño, the average wind speed of the northern Pacific increases, while the wind speed in the southern Pacific decreases. This can lead to changes in weather patterns, such as increased rainfall in some areas and decreased rainfall in others.

5. **Summarize the effects of El Niño on the ocean:**
   - El Niño events can cause changes in sea temperatures, ocean currents, and atmospheric conditions. These changes can affect weather patterns, ocean life, and human activity.

### Web Sites

[NOAA Research: El Niño](http://www.pmel.noaa.gov/toga-tao/el-nino/)
[El Niño Poster](http://www.oar.noaa.gov/k12/)
[SOS](http://www.sos.noaa.gov)
[Equatorial Pacific Ocean](http://www.pmel.noaa.gov/toga-tao/el-nino/)
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### Analysis Questions

1. Which two main parts of the Earth are affected by El Niño?
2. Which wind belt is responsible for El Niño events?
3. In normal years, which layer of water is blown west by trade winds?
4. During El Niño, this layer is blown east by ?
5. ____ what happens to the slope between the hot and cold water.
6. ____ what happens to the layer of water at the surface.

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**Note:**

El Niño is not only a natural phenomenon, but also a human-caused event. By understanding the effects of El Niño, we can better prepare for its impacts and mitigate its negative effects.