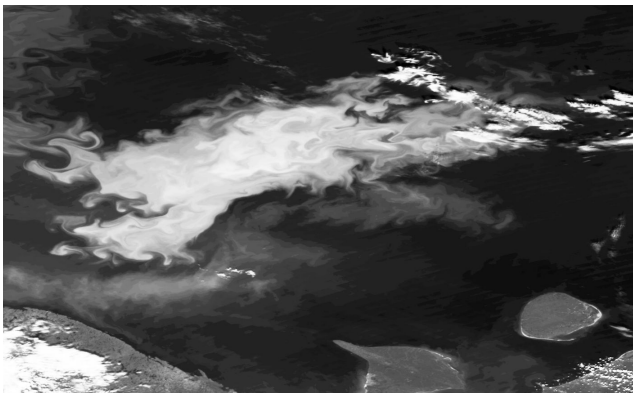
Research Project: Exploring El Niño and Chlorophyll Data



Your mission: You have joined a team of scientists who are studying the effects of El Niño on biological systems in the ocean. Specifically, you are interested in the relationship between sea surface temperature (SST) and productivity, as measured by the amount of chlorophyll. Your task is to determine if there is a relationship between sea surface temperature and the distribution of phytoplankton, and, if so, how this relationship is impacted during El Niño. The team has decided that you will compare two time periods: December 2009 and December 2010.

1. Form a hypothesis: Form a hypothesis to answer the research question below:

> Research Question: Is there a relationship between sea surface temperature and the distribution of phytoplankton? If so, how is this distribution impacted during El Niño?
>
> Hypothesis: During an El Niño event, when sea surface temperatures in the eastern Pacific ocean increase, the amount of phytoplankton, as measured using chlorophyll-a, _____ (fill in).

2. Test Your Hypothesis with Data: In order to test your hypothesis, closely observe the data maps and graphs presented in the Level 4 online activity, *Understanding El Niño*. Record your observations and analyze your data on the following page.

Compare the DATA MAPS for 2009 and 2010.

1. Which year shows warmer sea surface temperatures in the eastern Pacific (near the equator)? _____
2. Which year shows higher chlorophyll concentrations in the eastern Pacific (near Mexico City)? _____

Compare the GRAPHS for 2009 and 2010. Complete the table below.

		Date: 2009		Date: 2010	
Latitude	Longitude	SST	Chlorophyll	SST	Chlorophyll
0°	140° E				
0°	180°				
0°	140° W				
0°	100° W				

3. Interpret the data: Answer the questions below.

3. Which is the El Niño year? Which is the non-El Niño year?
4. Can you see any patterns between SST and chlorophyll distribution?
5. Describe the pattern of SST and chlorophyll distribution during an El Niño year.
6. Describe the pattern of SST and chlorophyll distribution during a non-El Niño year.

4. Draw conclusions:

7. Was your hypothesis supported?
8. Based on your analyses of the data, how would you describe the relationship between El Niño, SST, and chlorophyll concentration?