IV. Application

A. Predictions

1. Predict what would happen to the coastal areas of the Atlantic Ocean if El Ninos developed off the coast of Africa.

2. Predict the effect of a severe El Nino on the salinity (saltiness) of the northern Gulf of Mexico and write the reason for the effect on salinity.

3. Predict what would happen to the U.S. Southwest if an El Nino increased the sea surface temperature by 3 degrees and the increase in temperature extended across the whole Pacific Ocean.

4. Using the dates of previous El Ninos, predict when the next El Nino will occur.

- Click "Back" to return to the NOAA Research "El Nino" main page.
- Click "Enrichment."

V. Enrichment Activities

A. Wind Patterns

If your class has studied global winds, explain in detail why El Nino sea surface temperatures affect weather patterns and where the effects occur.

B. Social Studies/Language Arts

- Click on the "Economic Impacts" site.

Read the data and write an explanation of the economic impacts of an El Nino event.

- Click "Back" to return to the El Nino "Enrichment.1" Web page.

C. Math Activity

Predict the effect of the 1997 El Nino on Rockhampton, Australia based on the departure from normal of sea surface temperature during the 1982 El Nino.

- Click on the "Rainfall" site to return to the Rockhampton data.
- Click on the statement "I Agree to These Terms" to get the data.
- Choose "Graph total precipitation each year for a period of years."
- Click on the picture of Australia.
- Click "Okay."

- At the "Select a station" page, select Rockhampton Airport.
- Scroll down to the "Select a time period to graph" section and enter the years 1955 and 1988 in the boxes.
- Click "Graph Data."
- Scroll down to and click on "View the dataset."

Follow the directions below to compare the abnormal sea surface temperature during the 1982/1983 El Nino and the rainfall amount for the same period in Rockhampton.

1. Compute the average rainfall amounts for Rockhampton, Australia for the years 1955 to 1989 to obtain an average yearly rainfall. Record the average below.

   Average yearly rainfall = _____ cm

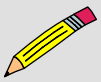
2. Compute the average rainfall for 1982 and 1983, and then record the 1982/1983 average below.

   1982/1983 rainfall = _____ cm

3. Subtract the 1982/1983 rainfall from the average rainfall, then record the difference below.

   Deviation from normal = _____ cm

- Choose Favorites or Bookmarks in your browser to return to the NOAA Research "El Nino" main page.
- Click on "Enrichment" again.
- Click on the "El Nino Comparison Graph" site.
- Scroll to the graph of El Ninos.



4. Find the 1982/83 abnormality in temperature measured at the March/April closest to the middle of the graph. Record the temperature abnormality below.

   Temperature Difference _____ degrees

5. Divide the Deviation from Normal by the Temperature Difference. This gives you a number telling you how much the rainfall should increase for each degree that the sea surface temperature is above normal. Record the answer below.

   Rainfall Increase per degree = _____

Using your calculations, predict what the rainfall increase will be in Rockhampton, Australia during the March/April period if an El Nino occurred that was 4.1 degrees above normal.

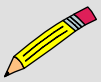
6. Multiply your Rainfall Increase per Degree value times the 4.1-degree increase.

Rainfall Increase per Degree x 4.1 = Predicted Rainfall

Your answer will give you an idea of how much additional rain will fall (above normal) in Rockhampton if an El Nino of 4.1 degrees above normal were to happen.

- Choose Favorites or Bookmarks in your browser to return to the NOAA Research "El Nino" main page.
- Click on "Enrichment" again.
- Click "Forward" at the bottom of the page to go to the "Enrichment.2" web page.

D. Research



1. Research other El Ninos using the Internet. Here's an idea of information to look for:

    a. When it occurred
    b. How long it lasted
    c. What countries and areas were most and least affected?
    d. What happened to the weather as a result of each one?
    e. On a map, draw the greatest sea surface area covered by an El Nino.

2. Collect newspaper and magazine articles about El Nino. Write a brief summary of each one.

3. Find out differences between El Nino, La Nina, and El Viejo.

E. Interviews

1. Interview local weather people about the reports they have done on El Ninos.

2. Interview 10 people to find out how much they know about El Ninos and what effect they think El Nino has on the weather. Develop eight to ten questions and write them out leaving space to write their answers.

F. Class Reports

1. Prepare a two-minute news report on El Nino. If you have a video camera, film your report. Interview one "expert" in your report.

2. Create a series of drawings on a map showing the increase and decrease in the area (size) covered by the 1997 El Nino. Make sure you include the date on each drawing.

G. Related Web Sites

1. "Comparison of Different El Ninos" graph
   http://www.cdc.noaa.gov/ENSO/enso.different.html

2. El Nino Theme Page
   http://www.pmel.noaa.gov/toga-tao/el-nino

3. San Diego School District's "El Nino or El No-no"
   http://powayusd.sdcoe.k12.ca.us/projects/ElNino/

4. Climate Prediction Center – El Nino/La Nina Home
   http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/

5. Idealized El Nino Simulation
   http://www.cdc.noaa.gov/~jjb/anim.html

6. Today's El Nino/La Nina Information
   http://www.pmel.noaa.gov/tao/elnino/1997.html