

Title: El Niño - La Niña AMS activity

Author: JulieAnn Hugick

Target grades: Middle School (Intermediate level or Regents level).

Group size: 2 or 3 students per group

Time: One class period (40-45 minutes)

Standards:

NY Physical Setting: Earth Science

Key Idea 2: Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.

2.2c A location’s climate is influenced by latitude, proximity to large bodies of water, Ocean currents, prevailing winds, vegetative cover, elevation, and mountain ranges.

Description:

Using the American Meteorological Society’s **El Niño - La Niña** Slide Chart, the students will gain a better understanding of how the oceans can affect Earth’s climate.

Materials needed:

El Niño La Niña Slide Chart (order at http://www.ametsoc.org/amsedu/aera/ed_mats.html).

Scanned images of the three charts needed are found after the student activity. These can be enlarged, copied and pasted in a PowerPoint program to share with the students as an instructional tool.)

Color pencils.

Safety consideration: none

Assessment suggestions: questions included

Links to websites:

Visualizing El Niño: <http://svs.gsfc.nasa.gov/vis/a000000/a000200/a000287/index.html>

El Niño , University of Indiana : [http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/elni/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/elni/home.rxml)

Table of Content

Student Activity Pages 2-3

Scanned images of charts Page 4

Answer key..... Pages 5-6

Prelab:

- How can the ocean effect climate? _____
- Define upwelling: _____
- In your own words, what is El Niño? _____
- In your own words, what is La Niña? _____

Use the AMS El Niño La Niña card

1. Place insert so that the center position is “**neutral conditions / long term average**”.

- | | | | | |
|---|------------|-----------------|------------|-------------|
| a. Where is there stormy weather? | W. Pacific | Central Pacific | E. Pacific | no location |
| b. Where is the ocean upwelling? | W. Pacific | Central Pacific | E. Pacific | no location |
| c. Where is the surface pressure highest? | W. Pacific | Central Pacific | E. Pacific | no location |
| d. Where are the Trade Winds from? | N | S | E | W |
| e. Where are the Surface Currents from? | N | S | E | W |

2. Pull the insert so that the center position is “**El Niño**”.

- | | | | | |
|--|------------|-----------------|------------|-------------|
| a. Where is there stormy weather? | W. Pacific | Central Pacific | E. Pacific | no location |
| b. Where is the ocean upwelling? | W. Pacific | Central Pacific | E. Pacific | no location |
| c. Where is the surface pressure increasing? | W. Pacific | Central Pacific | E. Pacific | no location |
| d. Where are the Trade Winds from? | N | S | E | W |
| e. Where are the Surface Currents from? | N | S | E | W |

3. Flip the insert so that the center position is “**La Niña**”.

- | | | | | |
|--|------------|-----------------|------------|-------------|
| a. Where is there stormy weather? | W. Pacific | Central Pacific | E. Pacific | no location |
| b. Where is the ocean upwelling? | W. Pacific | Central Pacific | E. Pacific | no location |
| c. Where is the surface pressure increasing? | W. Pacific | Central Pacific | E. Pacific | no location |
| d. Where are the Trade Winds from? | N | S | E | W |
| e. Where are the Surface Currents from? | N | S | E | W |

4. Return the insert to its original position

5. Using the information on the back of the AMS El Niño - La Niña card

a. It is predicted that 2007 will be a La Niña event. In terms of weather, what does that mean for the following regions?

Southern US: _____

Northwest US: _____

Northeast US: _____

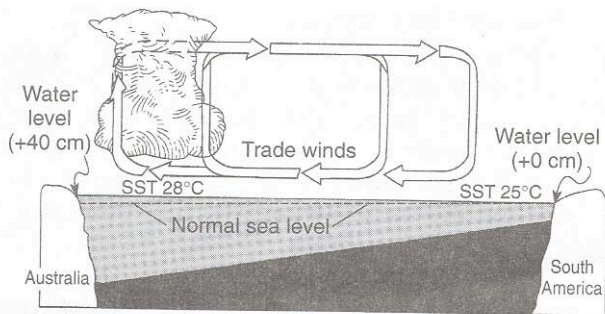
b. In 2002-2003 it was an El Niño event. In terms of weather, what does that mean for the following regions?

Southern US: _____

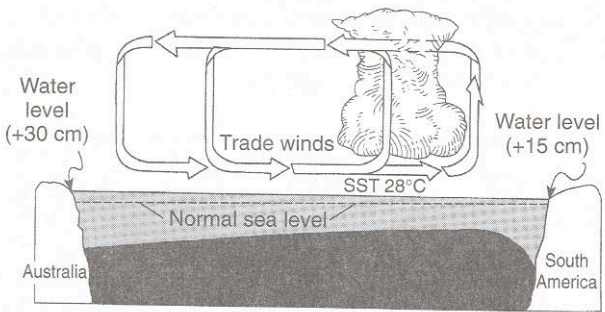
Northwest US: _____

Northeast US: _____

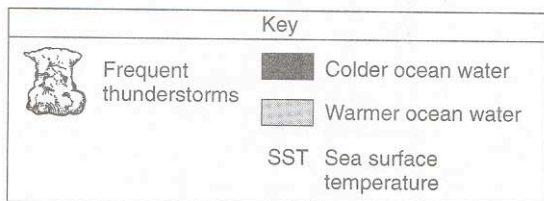
6. Color code the following diagrams.



Cross Section A: Normal Weather



Cross Section B: El Niño Conditions



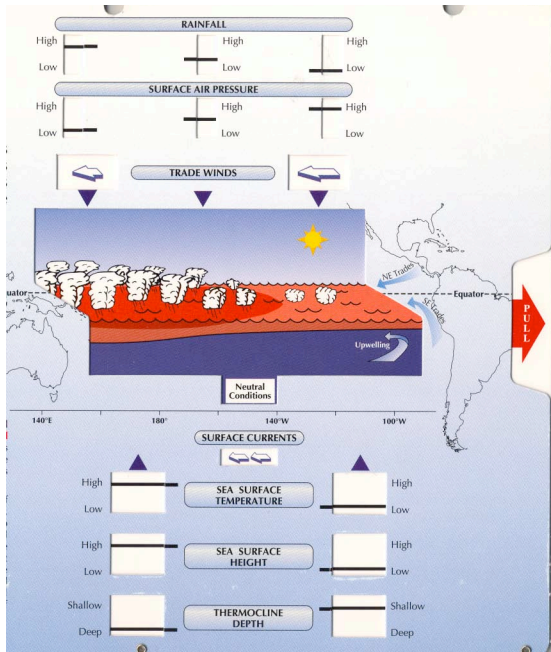
a. Describe the conditions near the coast of South America during **El Niño** conditions in terms of **temperature** and **winds**.

b. During **El Niño**, the shift in trade winds causes sea level to _____ along Australia and _____ along South America.

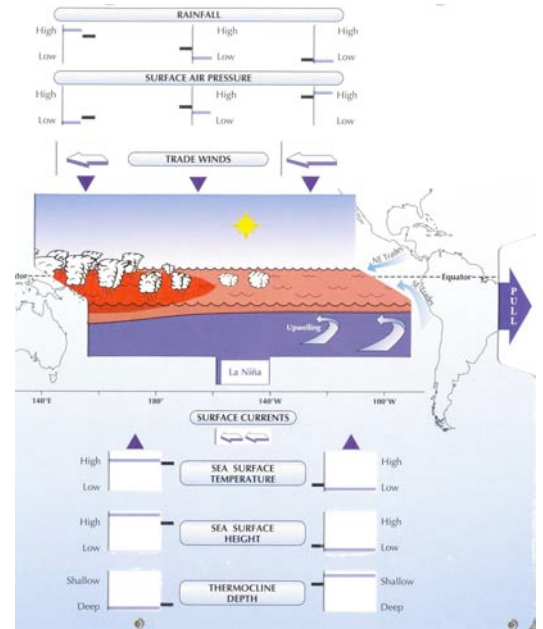
c. During **El Niño** events, **thunderstorms** increase in the eastern Pacific because

d. When **El Niño** conditions develop, this causes **worldwide** changes in

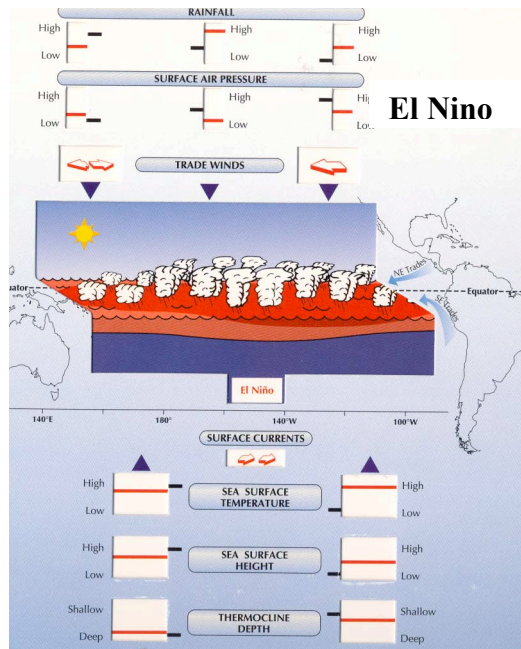
Neutral conditions / Long term average



La Nina



El Niño



Prelab:

- How can the ocean effect climate? _____
- Define upwelling: _____
- In your own words, what is El Niño? _____
- In your own words, what is La Niña? _____

**All reasonable
 Answers accepted.....**

Use the AMS El Niño La Niña card

1. Place insert so that the center position is “**neutral conditions / long term average**”.

- | | | | | |
|---|-------------------|-----------------|-------------------|-------------|
| a. Where is there stormy weather? | W. Pacific | Central Pacific | E. Pacific | no location |
| b. Where is the ocean upwelling? | W. Pacific | Central Pacific | E. Pacific | no location |
| c. Where is the surface pressure highest? | W. Pacific | Central Pacific | E. Pacific | no location |
| d. Where are the Trade Winds from? | N | S | E | W |
| e. Where are the Surface Currents from? | N | S | E | W |

2. Pull the insert so that the center position is “**El Niño**”.

- | | | | | |
|--|------------|------------------------|-------------------|--------------------|
| a. Where is there stormy weather? | W. Pacific | Central Pacific | E. Pacific | no location |
| b. Where is the ocean upwelling? | W. Pacific | Central Pacific | E. Pacific | no location |
| c. Where is the surface pressure increasing? | W. Pacific | Central Pacific | E. Pacific | no location |
| d. Where are the Trade Winds from? | N | S | E | W |
| e. Where are the Surface Currents from? | N | S | E | W |

3. Flip the insert so that the center position is “**La Niña**”.

- | | | | | |
|--|-------------------|-----------------|-------------------|-------------|
| a. Where is there stormy weather? | W. Pacific | Central Pacific | E. Pacific | no location |
| b. Where is the ocean upwelling? | W. Pacific | Central Pacific | E. Pacific | no location |
| c. Where is the surface pressure increasing? | W. Pacific | Central Pacific | E. Pacific | no location |
| d. Where are the Trade Winds from? | N | S | E | W |
| e. Where are the Surface Currents from? | N | S | E | W |

4. Return the insert to its original position

5. Using the information on the back of the AMS El Niño - La Niña card

c. It is predicted that 2007 will be a La Niña event. In terms of weather, what does that mean for the following regions?

Southern US: dry cool

Northwest US: wet cool

Northeast US: wet

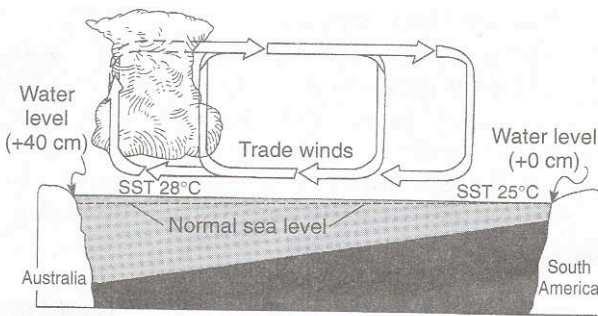
d. In 2002-2003 it was an El Niño event. In terms of weather, what does that mean for the following regions?

Southern US: wet cool

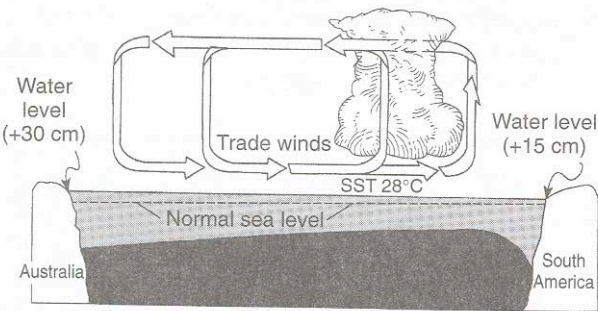
Northwest US: warm

Northeast US: warm

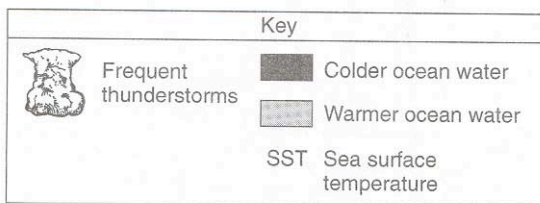
6. Color code the following diagrams.



Cross Section A: Normal Weather



Cross Section B: El Niño Conditions



a. Describe the conditions near the coast of South America during **El Niño** conditions in terms of **temperature** and **winds**. temp increases, wind reverse

b. During **El Niño**, the shift in trade winds causes sea level to decrease along Australia and increase along South America.

c. During **El Niño** events, **thunderstorms** increase in the eastern Pacific because the air starts to rise and adiabatic cooling causes increased clouds,

d. When **El Niño** conditions develop, this causes **world wide** changes in sea level, temperature, wind direction...