

## Atmospheric Circulation Affects Climate

- Influences the location of rain forests & deserts.
- Can influence seasonal rainfall patterns in the tropics.
- Can interact with surface topography to create rain shadows.

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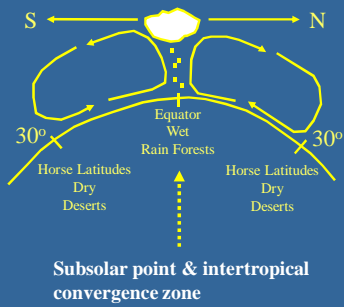
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## Tropical Hadley Cells



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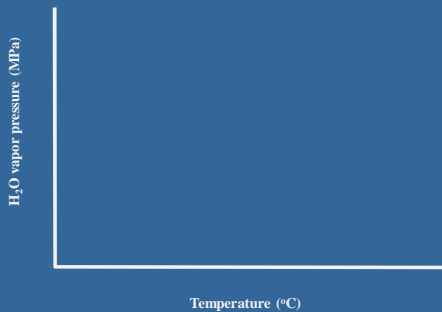
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**For a given amount of air:** Draw temperature vs. saturation vapor pressure  
What is the saturation vapor pressure ?  
What is the dew point temperature ?  
What is the relative humidity ?



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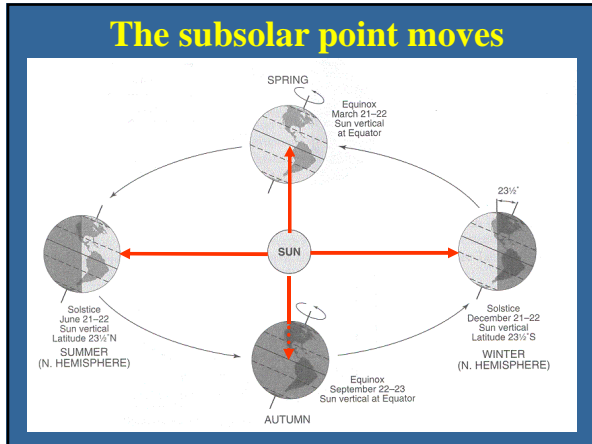
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### A moving subsolar point can affect climatic pattern in the tropics.

January                      December

Which graph of monthly rainfall corresponds to Rio de Janeiro?

**A**

**B**

**C**

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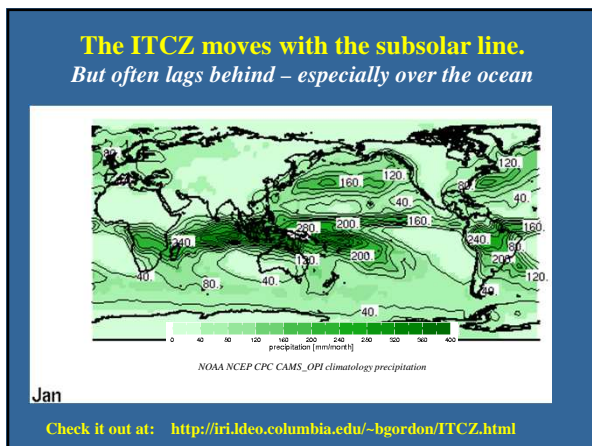
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**Pacific slope of Panama during dry season  
January through April**



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**Thought Question**

If the angle between the orbital plane of the Earth around the Sun and the plane formed by the Earth's equator were to decrease (currently it's  $23.5^\circ$ ), what effect would this have on the seasons in the N. Hemisphere?

If the angle were  $0^\circ$ , when would an equinox occur?

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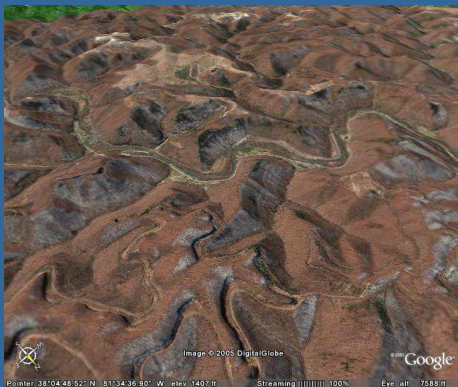
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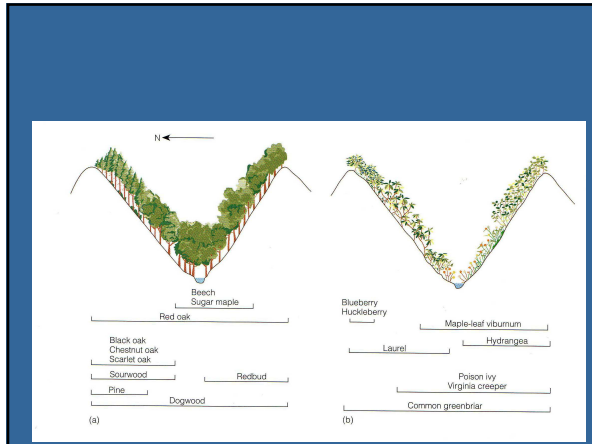
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### Orographic Effect

A. Air rises & cools (moist adiabatic cooling @ 6°C/km)

B. As air cools it reaches its saturation vapor density - then it rains.

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### Where might these mountains be found?

A) 40° N latitude  
 B) 10° N latitude  
 C) 45° S latitude  
 D) Both A & C

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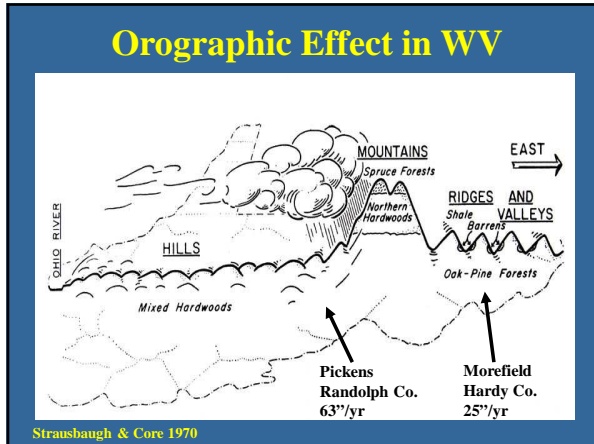
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### Ocean Circulation Can Affect:

- Regional climate.
- The price of fish.

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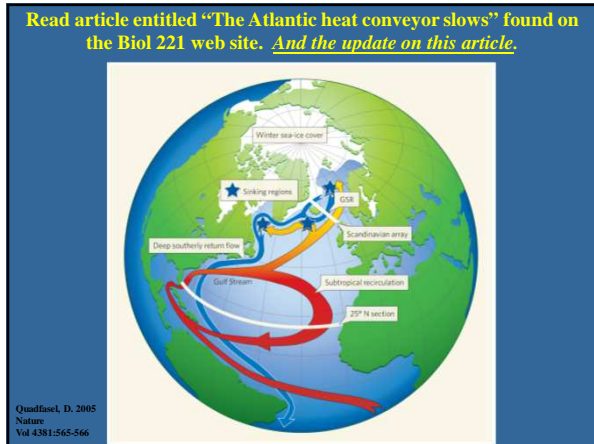
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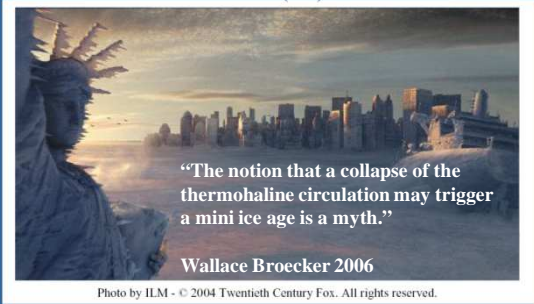
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### The Day After Tomorrow ?



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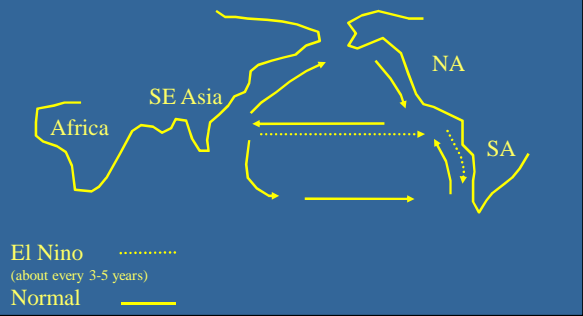
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### Effects of ocean currents on climate



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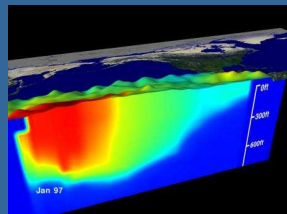
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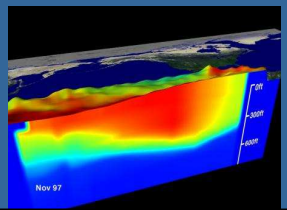
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### Normal



### El Niño



<http://www.pmel.noaa.gov/loqa-tao/el-nino/nino-home.html>

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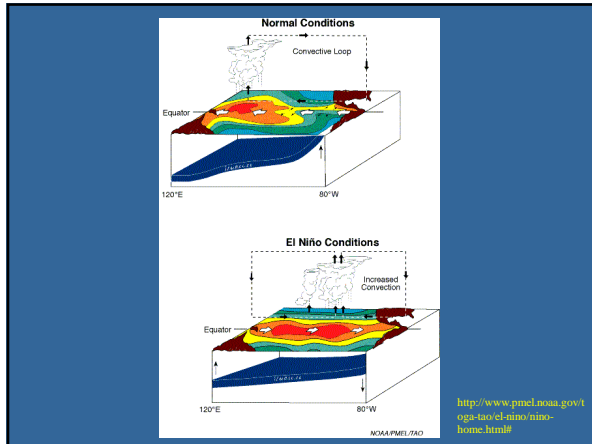
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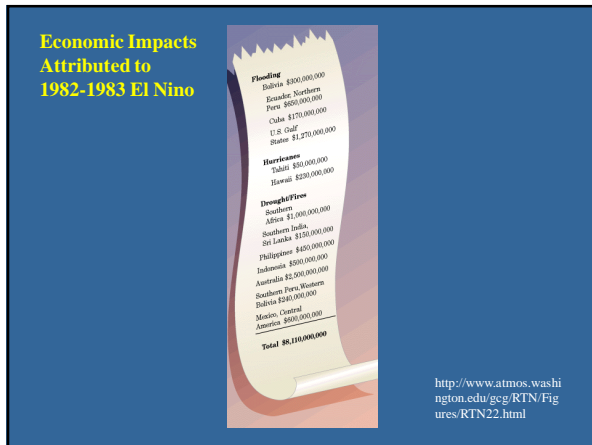
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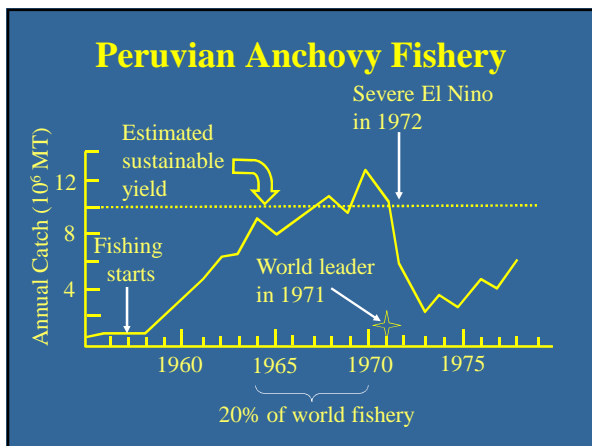
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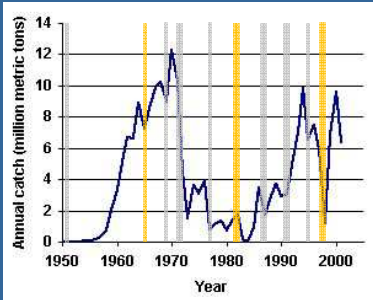
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Low catch for ~ 20 years  
Has improved but still sensitive



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