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.

Tropical Hadley Cells

Subsolar point & intertropical convergence zone
The subsolar point moves

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

Which graph of monthly rainfall corresponds to Rio de Janeiro?

A B C

Check it out at:  http://iri.ldeo.columbia.edu/~bgordon/ITCZ.html

The ITCZ moves with the subsolar line.
Pacific slope of Panama during dry season
January through April

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°), what effect would this have on the seasons in the N. Hemisphere?

If the angle were 0°, when would an equinox occur?
Outside of the Tropics, slopes that face the sun capture more energy than those that face away from it.

Orographic Effect

A. Air rises & cools (adiabatic cooling @ 6°C/km)
B. As air cools it reaches its saturation vapor density - then it rains.

Where might these mountains be found?

A) 40° N latitude
B) 10° N latitude
C) 45° S latitude
D) Both A & C
Ocean Circulation Can Affect:

- Regional climate.
- The price of fish.

Effects of ocean currents on climate

El Nino
(about every 3-5 years)
Normal
Normal

El Nino

http://www.pmel.noaa.gov/toga-tao/el-nino/nino-home.html

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http://www.atmos.washington.edu/gcg/RTN/Figures/RTN22.html

Economic Impacts Attributed to 1982-1983 El Nino

http://www.atmos.washington.edu/gcg/RTN/fig/rtn22.html
**Peruvian Anchovy Fishery**

- **Annual Catch (10^6 MT)**
- Estimated sustainable yield in 1972
- Fishing starts in 1961
- World leader in 1971
- Severe El Nino in 1972

20% of world fishery