Hoh Rain Forest
Olympic National Park, WA

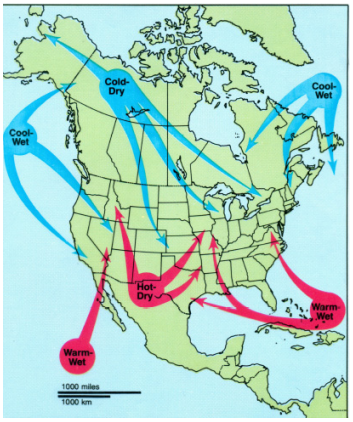
Hoh Rainforest
Olympic National Park, WA

Physical Geography

- The Great Shapers
  - –Plate Tectonics ("continental drift")
  - – Uplift and erosion
  - –The Ice Ages
- A Recap on Climate
- A Primer on Soil

Big Ideas

- A contested continent
- Population growth and movements, old and new
- Increasing human diversity
- Technological innovation
- Urban growth and sprawl
- Resource use and misuse
- Industrialization and de-industrialization
- Movers & shapers: Plate tectonics & the Ice Ages
- Water for movement and well-being
- Lots of latitude – the Tropics to the Arctic
- A physical environment under assault.

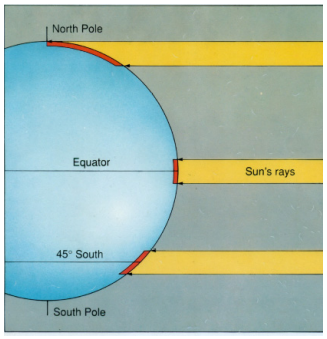


North American air masses and their movements

U.S & Canada: Climatic Determinants

- Curvature and latitude
- Inclination of the Earth's axis, and resulting seasonal change
- Effects of elevation
- Ocean surface currents
- West-to-east rotation of the Earth on its axis produces west-to-east movement of weather systems.

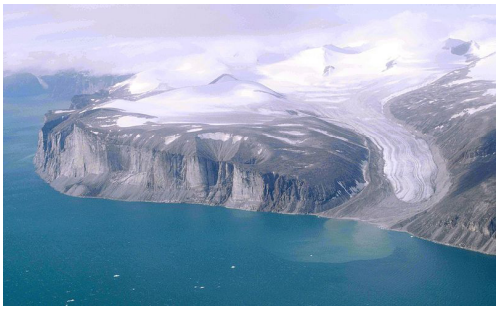
Effect of curvature on the supply of Solar Energy



Climates of the U.S. and Canada

South Beach (Miami Beach), FL

Baffin Island, Canada



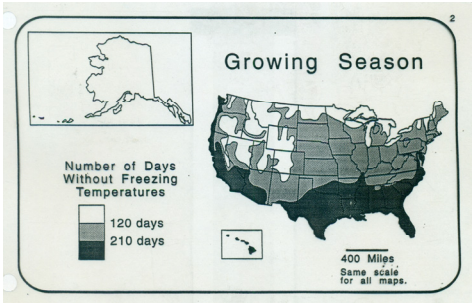
Growing season is the average number of days between the last killing frost of the spring and the first killing frost of the fall.

It has a huge impact on agriculture because different crops require different amounts of time to grow to maturity, or to ripen.

Therefore, growing season can have a significant determinant of the geography of crops.

Map of the Growing Season

(cartography by Phil Gersmehl)



Cotton (long growing season)

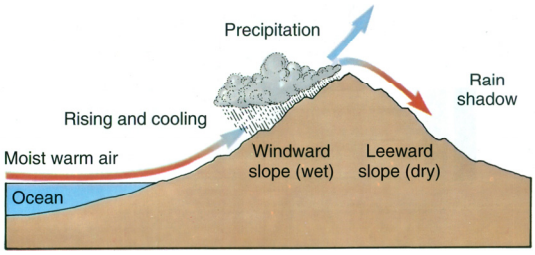
Corn (intermediate growing season)

Wheat (short growing season)

The Effects of Elevation on Temperature

- "The higher you go, the cooler it gets," or
- As elevation increases, temperature decreases, or
- There is an inverse relationship between temperature and altitude.
- Why? Because the atmosphere is a mixture of gases that have different weights and different capacities to retain heat.
- The heaviest gases (like oxygen), which tend to sink to the bottom of the atmosphere, also have the highest capacity to retain heat.
- Thus, higher elevations tend to cool because of the decreased oxygen, which may also make breathing difficult (a phenomenon sometimes called "thin air."

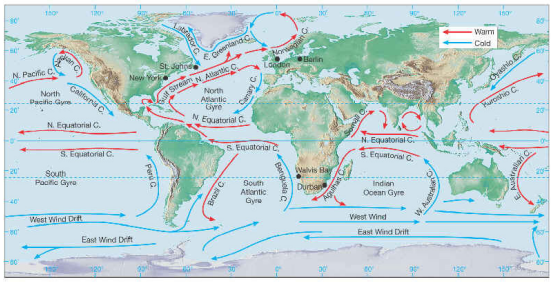
The Effects of Elevation on Precipitation



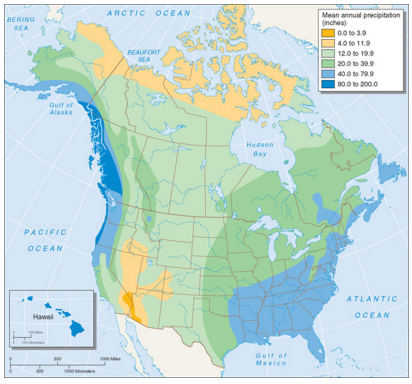
Climates of the U.S. and Canada

Death Valley National Park, CA

Ocean Surface Currents



Precipitation



Precipitation: A function of . . .

- **Latitude**
- **Altitude**
- **Ocean Currents**

Natural vegetation

Big Cypress National Preserve, FL

Everglades National Park, FL

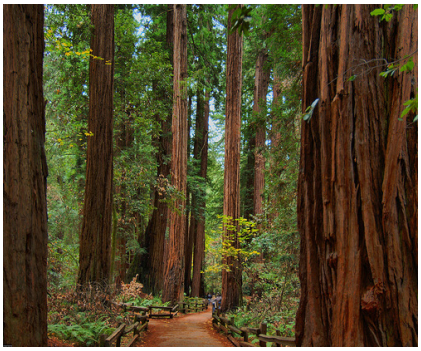
Southern Pine Forest (with Palmetto underbrush)

Alaskan Taiga Northern Boreal Forest

The Alaskan Tundra

Redwoods National Park, CA

Redwoods National Park, CA



Joshua Tree National Park, CA

Sage brush on the eastern (leeward) side of the Sierra Nevada Range, CA

Creosote Bush, Eastern CA

Saguaro Cactus
Saguaro National Park, AZ

Soils

An Introduction to Soils (Part 1)

Soil – weathered particles of lithosphere (bedrock) that are no more than 2.0 mm in diameter

Weathering – the breaking up of bedrock into smaller and smaller particles, eventually resulting in soil.

Soil separates – the 3 categories of soil based on their diameters (Any soil is a combination of these)

*** Sand – particles between 0.05 – 2.0 mm**

*** Silt – particles between 0.002 – 0.05mm**

*** Clay – particles less than 0.002 mm**

An Introduction to Soils (Part 2)

A fertile soil is one that provides abundant nutrients to plants by means of osmosis. Fertility is facilitated by:

- **Bedrock that weathers (breaks up) relatively easily**
- **Relatively deep topsoil that has abundant organic matter (especially the fine roots of grasses, or leaves that accumulate on the surface) that readily decomposes**
- **Dominance of moderately sized particles**
- **Climatic conditions that are:**
  - **Not too cold**
  - **Not too hot**
  - **Not too wet**
  - **Not too dry**