

Class 3a: The Round Earth, or

Map Projections and Climate Basics

How hot is it?

- What determines temperature?
- Insolation (*incoming solar radiation*)
- Cloud cover
- Altitude
- Water vapor in the air
- Land or water
- Air movement (wind)

Insolation

- Only at one latitude at a time are the sun's rays overhead
 - Between Tropic of Cancer and Tropic of Capricorn
- Everywhere else, rays are diffused

What causes the seasons?

- Volunteers?
- The tilt of the earth
- The angle of sunlight
- The change in heat received from the sun

Latitude and longitude

- Latitude: how far north or south
- From 0° at equator to 90° at poles
- Each parallel of latitude is a different size
- Key latitudes: Equator, 23.5°N and S

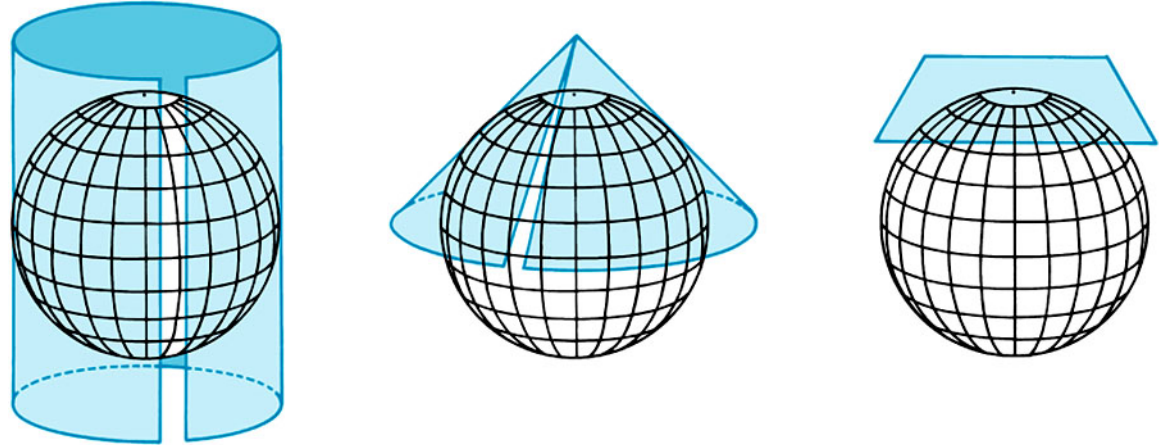
Latitude and longitude

- Longitude: how far east or west
- East or west of what?
- 1884 agreement on prime meridian at Greenwich
- Each meridian of longitude is the same distance around
- Not parallel lines
- Key longitudes: Prime Meridian, International Date Line, 100th meridian

Map projections

- Project a round globe onto a flat surface

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- Options?
- Stretch out some areas
- Cut out some areas
- Shrink some areas

Map projections

- Three properties to consider
 - Area (equal-area or equivalent)
 - Shape (conformal)
 - Distance (equidistant)
 - Choose two out of three
- How large an area?
- Purpose of the map
- Ulterior motives?

Cylindrical projections

- Shapes are preserved
- But not area!
- Mercator projection
- Deliberate distortion?
 - Cold War
 - Colonialism

Cylindrical projections: Gall- Peters

- Adjusting Mercator for a more “just” map
- Also preserves area
- Distorts shape differently

Conic projections

- Best for hemispheres or small regions
- Area and shape only slightly distorted

Planar projections

- Equidistant; good for navigation
- Only good for one hemisphere
- Distorts area, not shape

Other projections

- Based on more complicated math
- Interrupted, oval, combination

Robinson

Goode