

Atmospheric Moisture and Humidity

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Weather Balloon

Weather instrument shelter

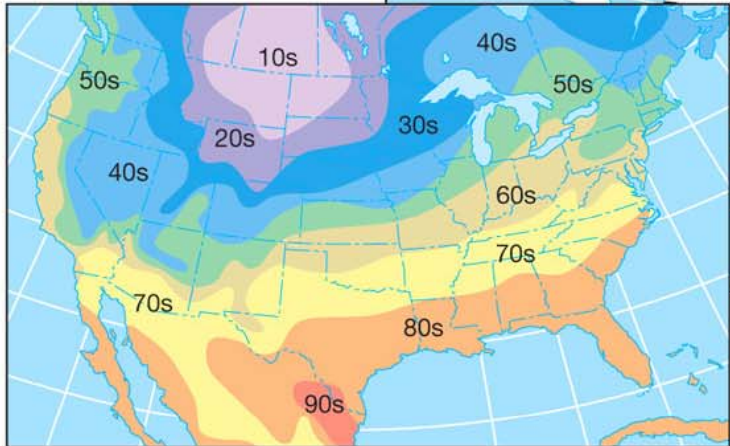
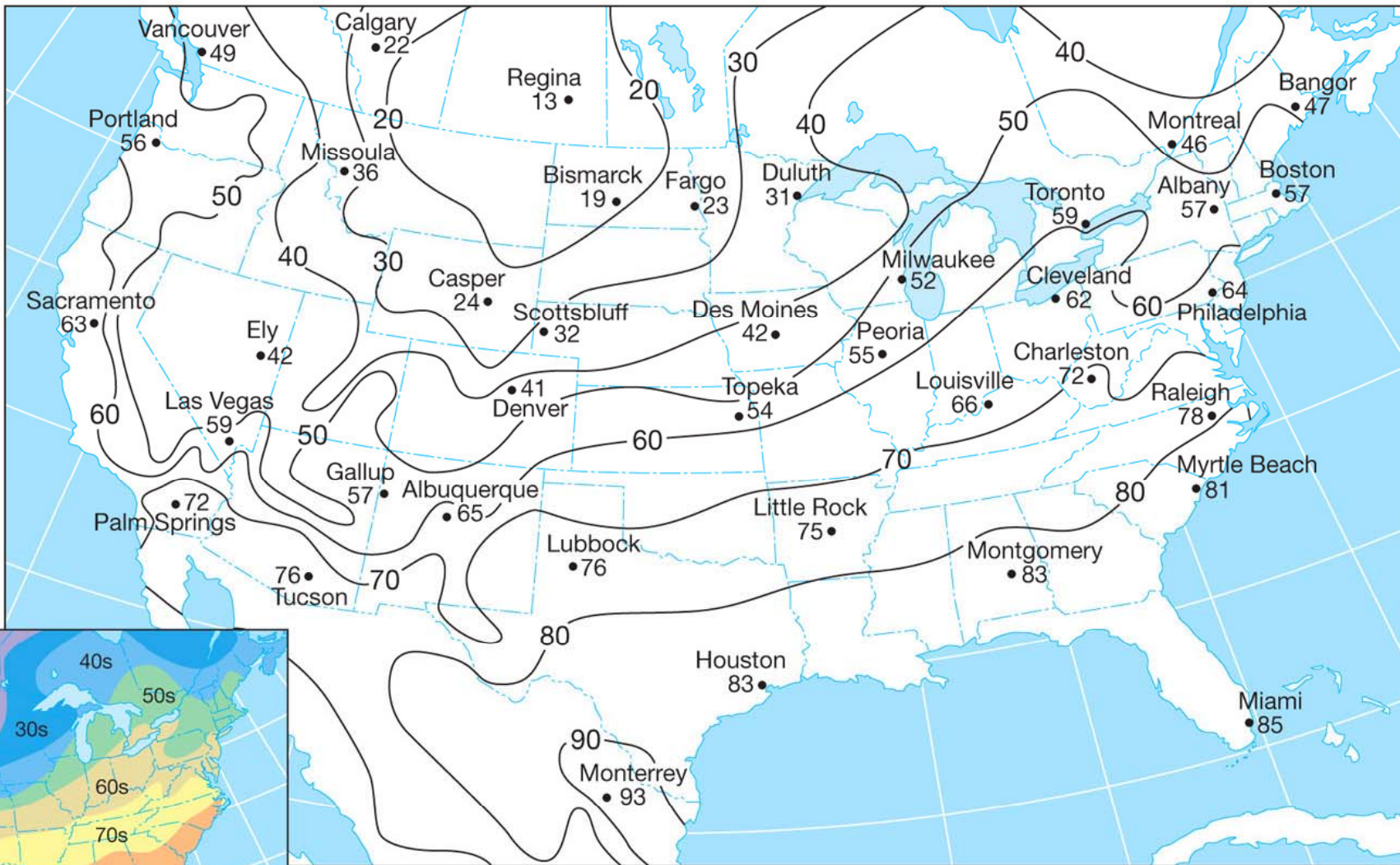


Temperature measurement

Daily maximum and minimum are measured

Other values calculated from these

- Daily temperature range
- Daily mean temperature
- Monthly mean temperature
- Annual mean temperature
- Annual temperature range

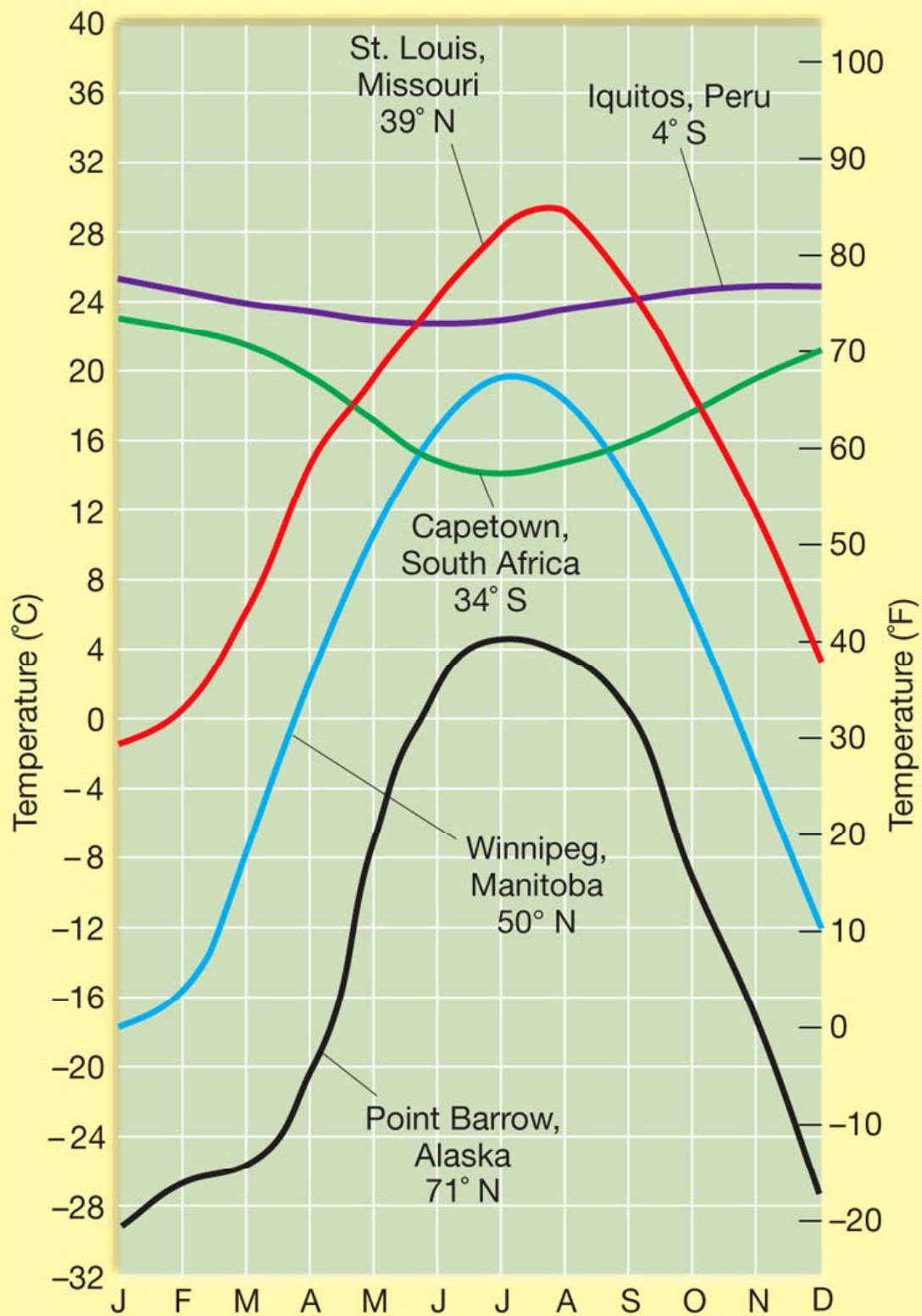


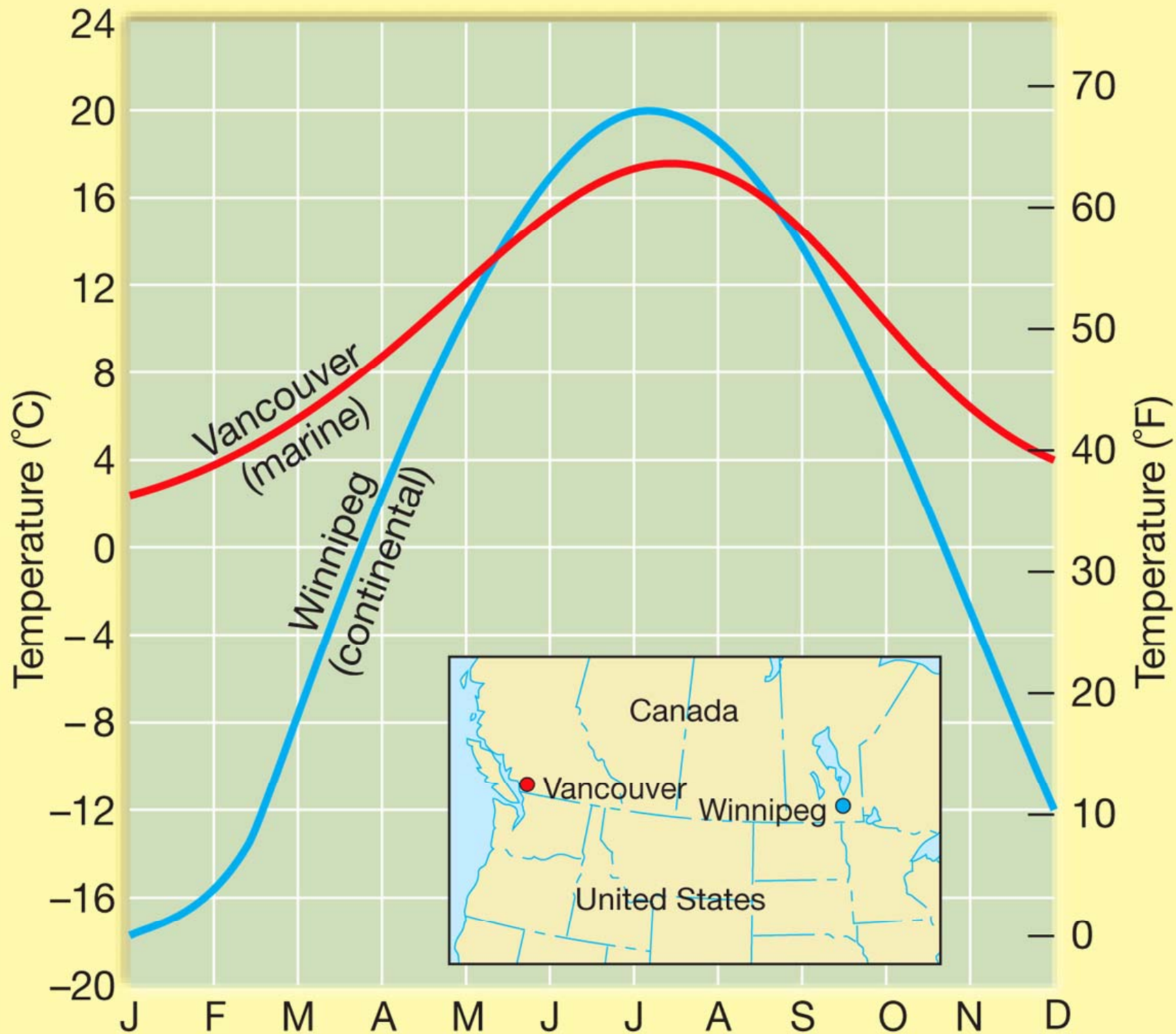
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Isotherm

- Line of equal temperature
- Divides map into areas warmer than that temperature and areas cooler than that temperature
- Maps with isotherms use constant difference from one isotherm to the next
- Often colored for ease of understanding

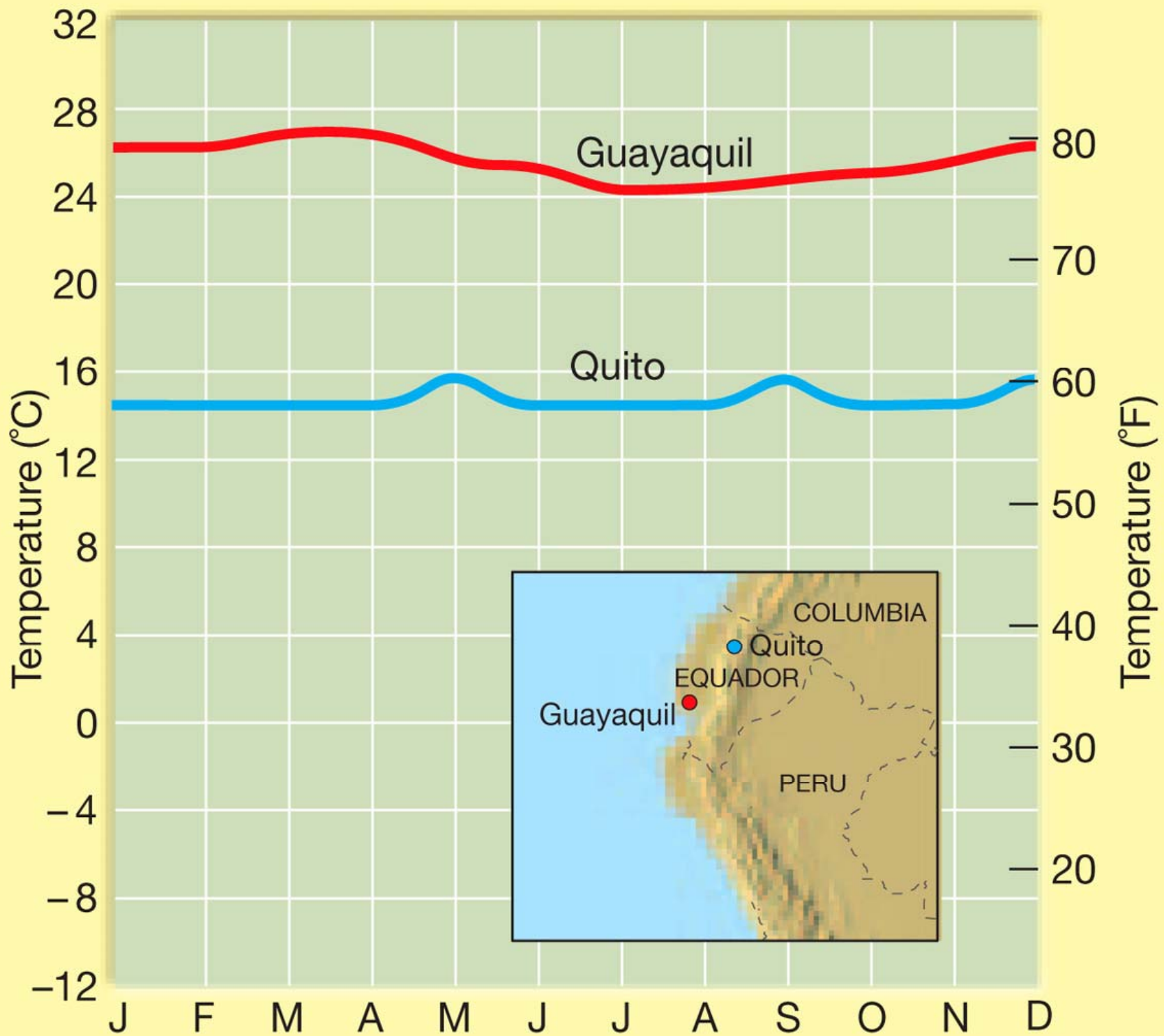
Monthly Temperatures vs. Latitude





Land-water relationship

- Water moderates the temperature
- Warmer winters and cooler summers near large bodies of water

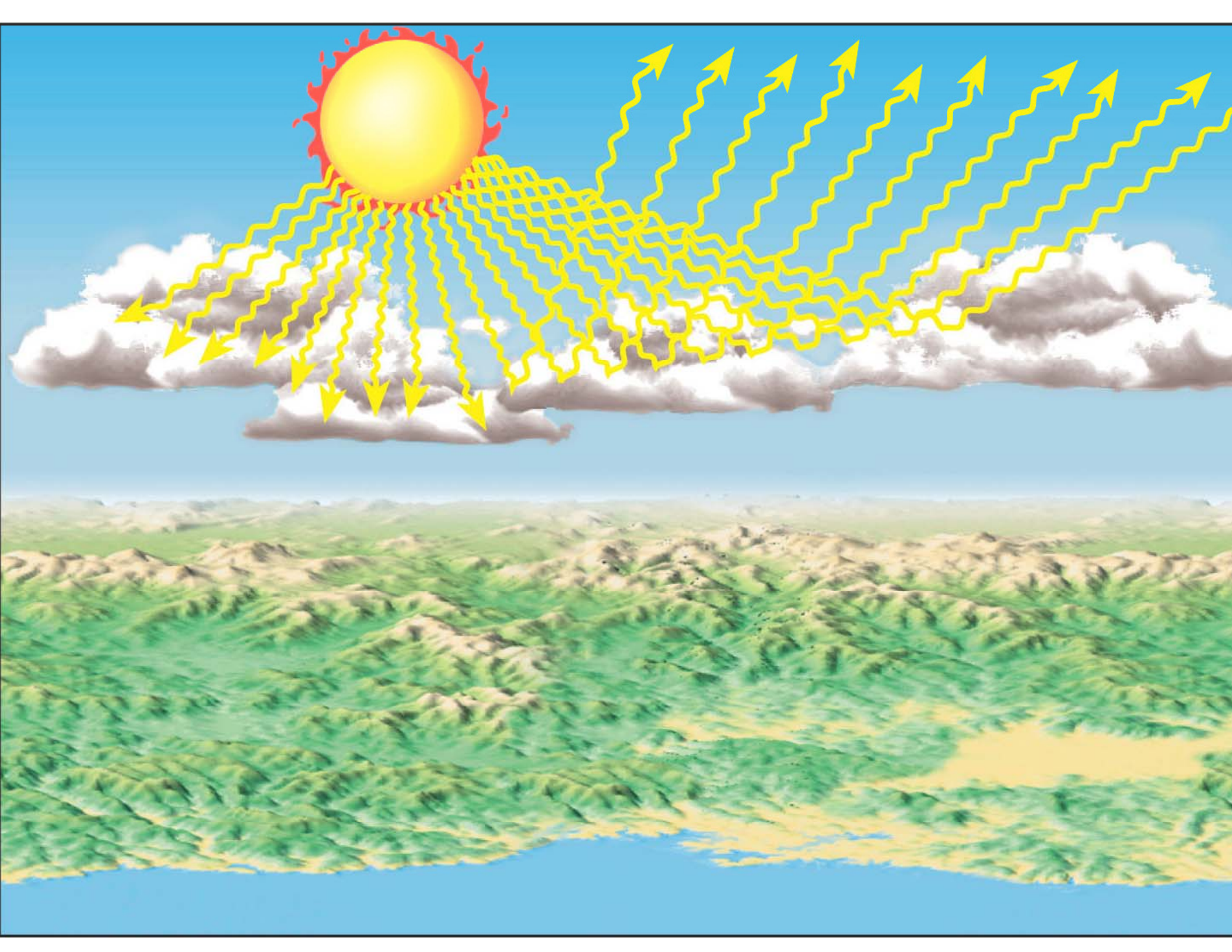


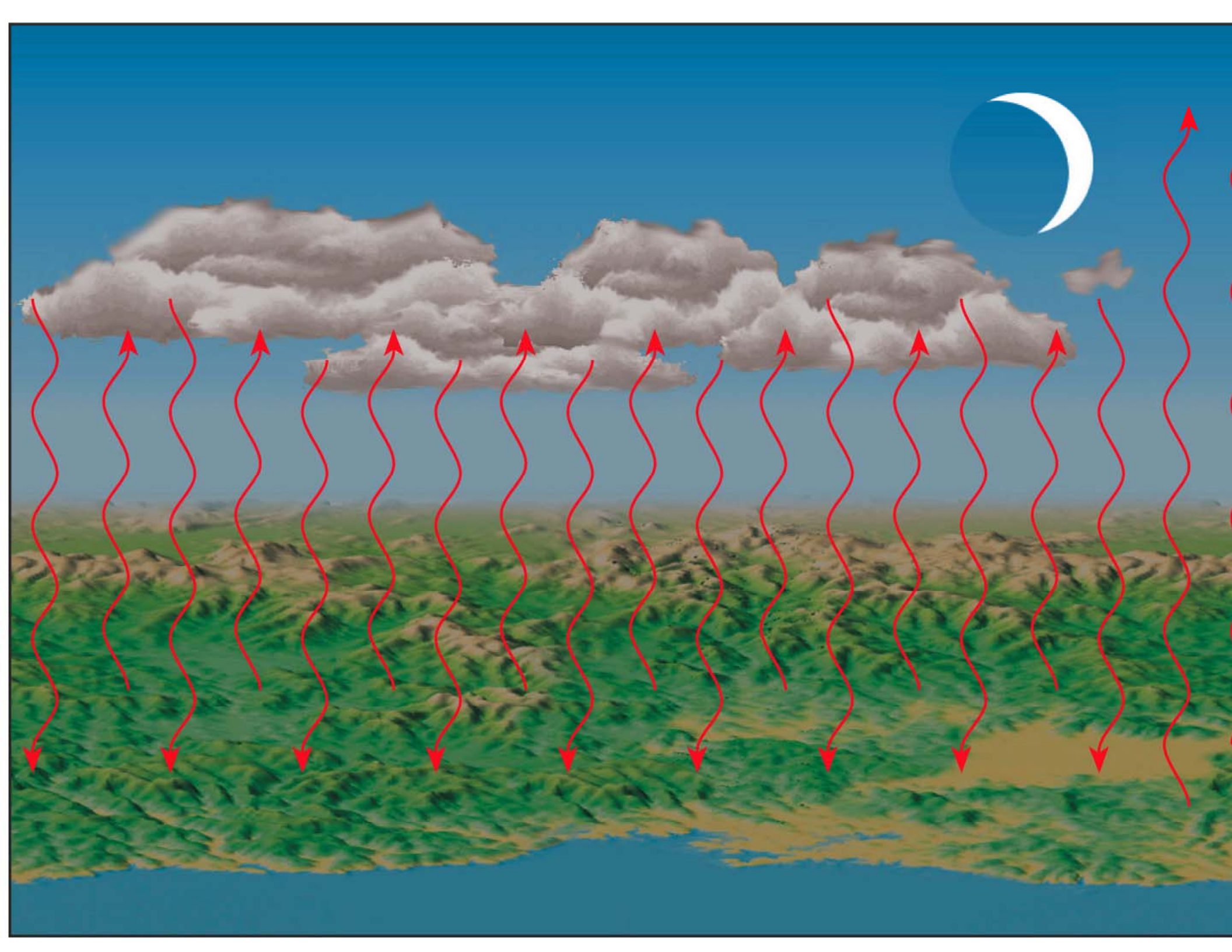
Changes in temperature with change in elevation

- Two different mechanisms
 - Earth's atmosphere is heated from below
 - Gases cool as they expand

Earth's atmosphere is heated from below

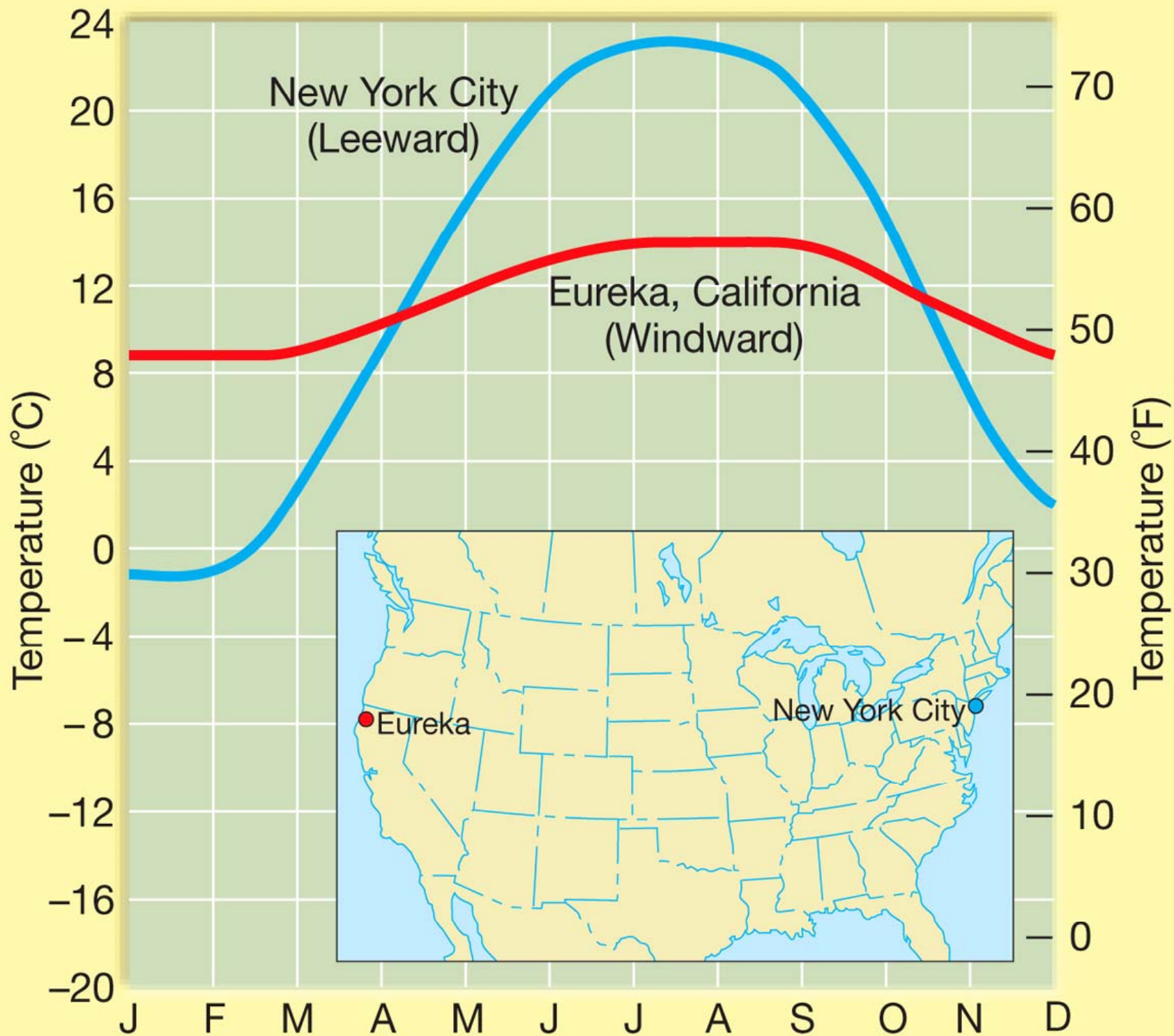
- It is warmer closer to the sea level
- It is cooler at higher altitudes
- **Environmental lapse rate**
 - About $6.5^{\circ}\text{C} / 1000\text{ m}$
 - About $3.5^{\circ}\text{F} / 1000\text{ ft}$

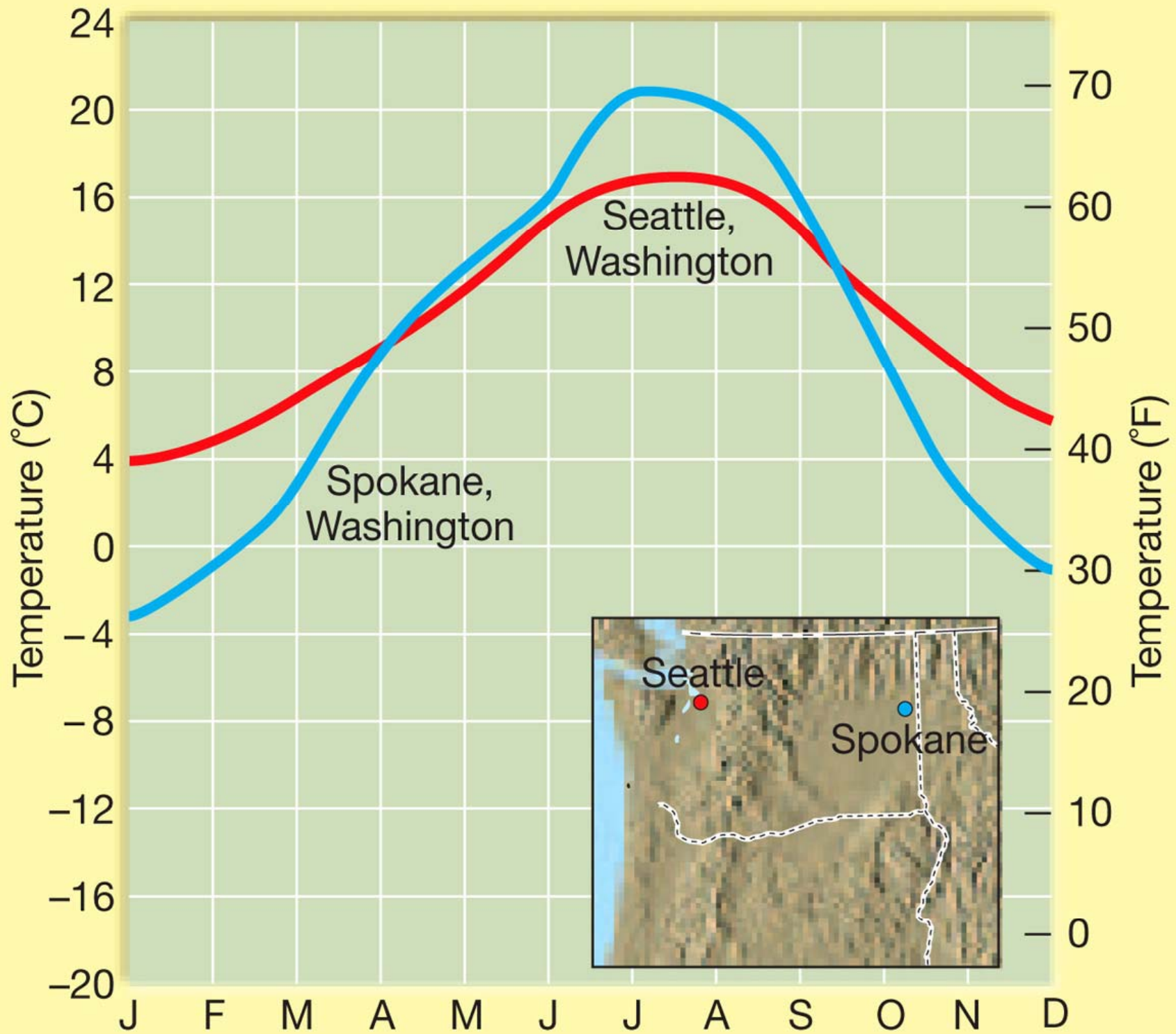




Cloudiness

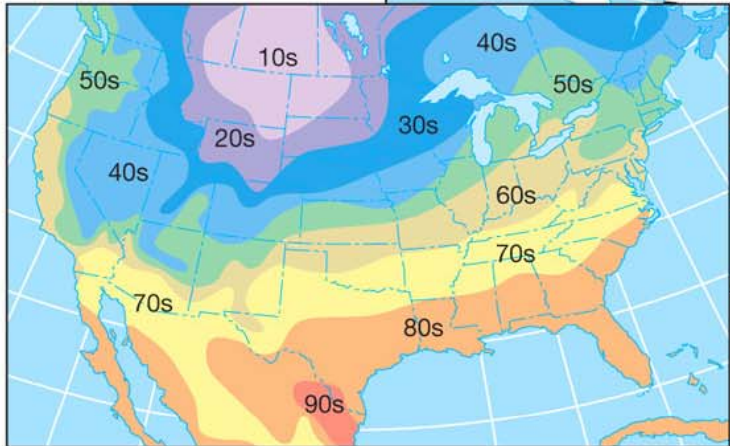
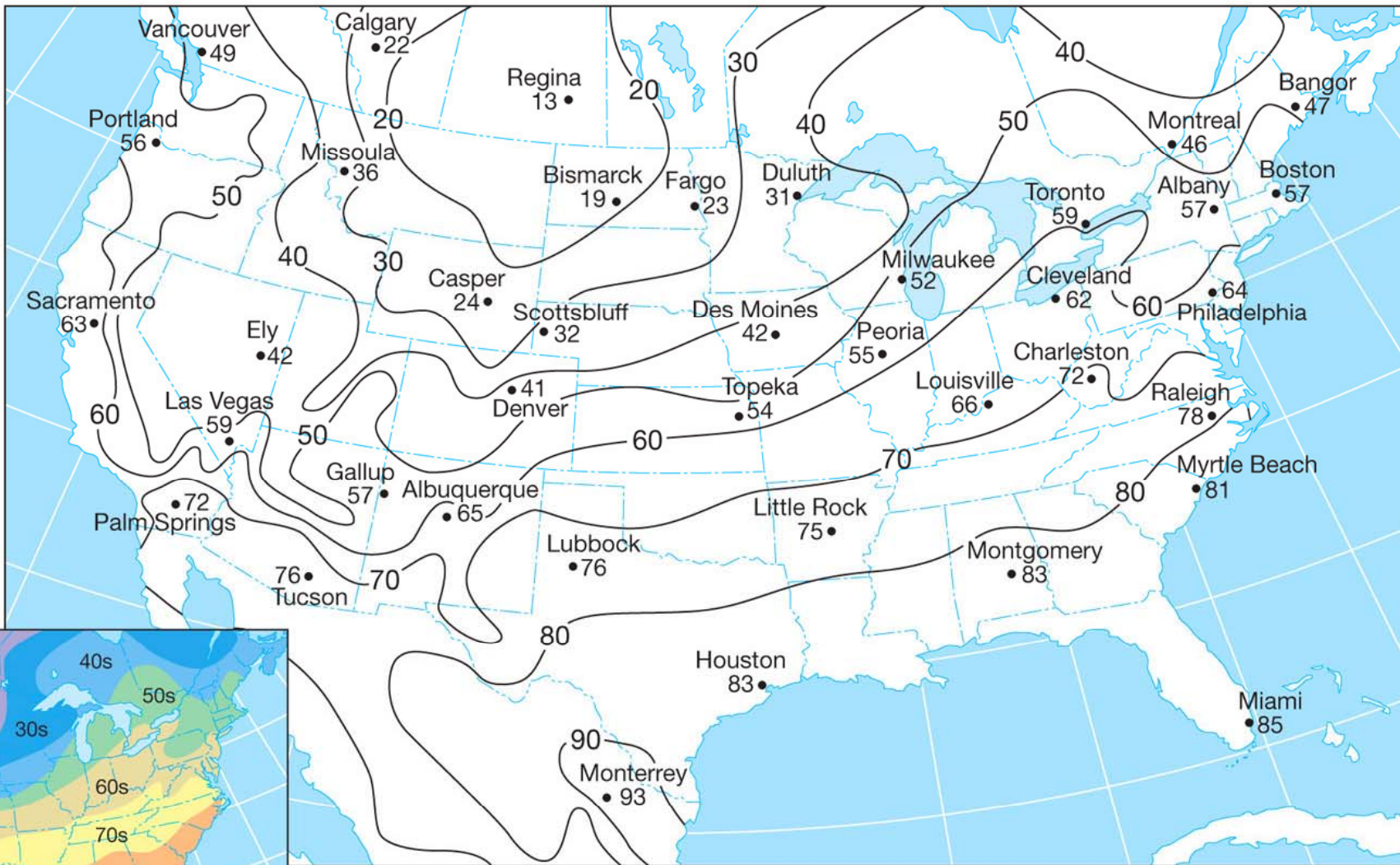
- Daytime clouds shade surface, reflect energy away from area
- Nighttime clouds blanket area, reflect heat energy back toward Earth's surface





Geographic position

- Western sides of ocean basins get equatorial heat from ocean currents
 - More moderate winter temperatures on east coasts of continents
- Eastern sides of ocean basins have cold polar currents
 - Cooler year-round temperatures on west coasts of continents

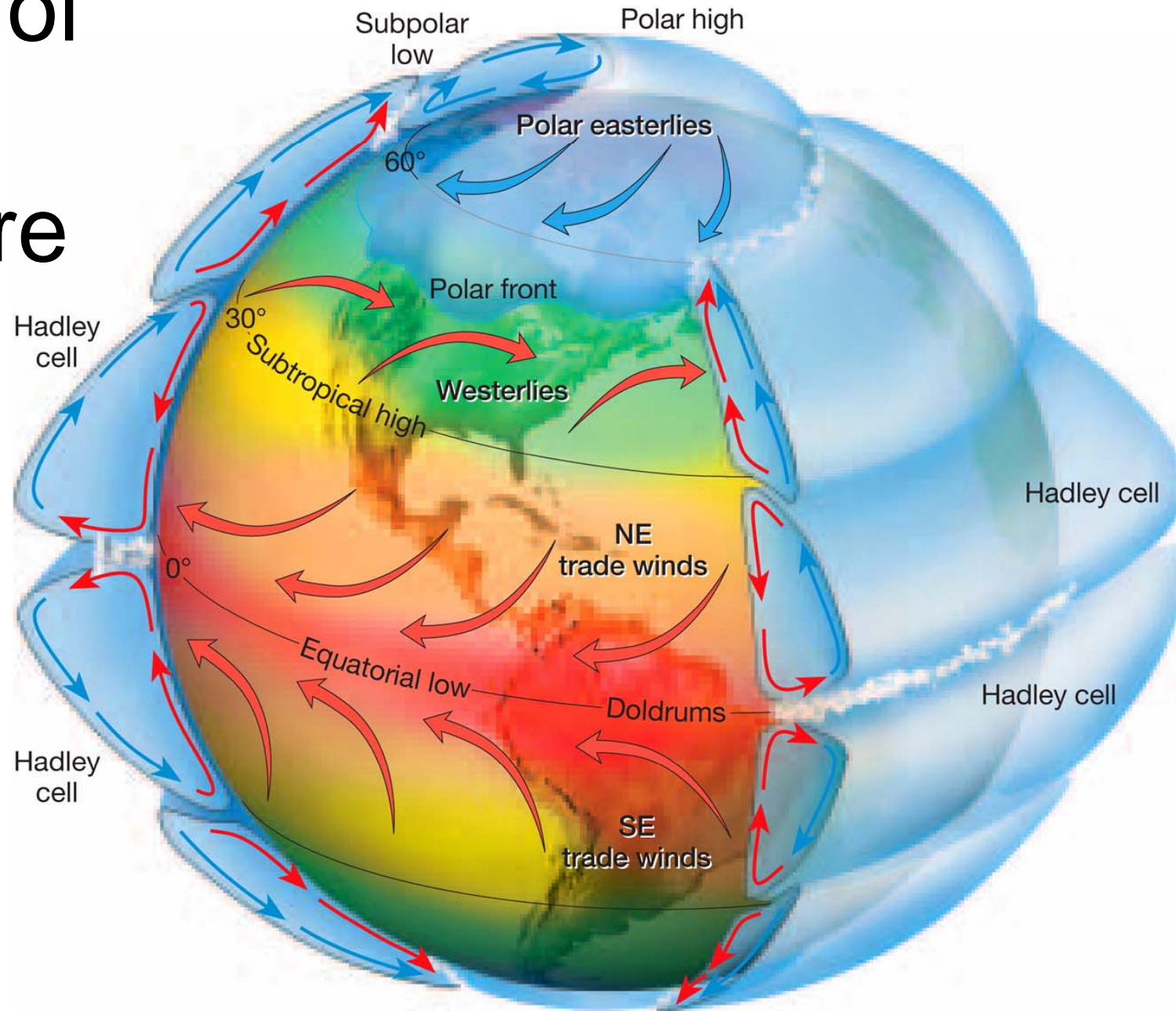


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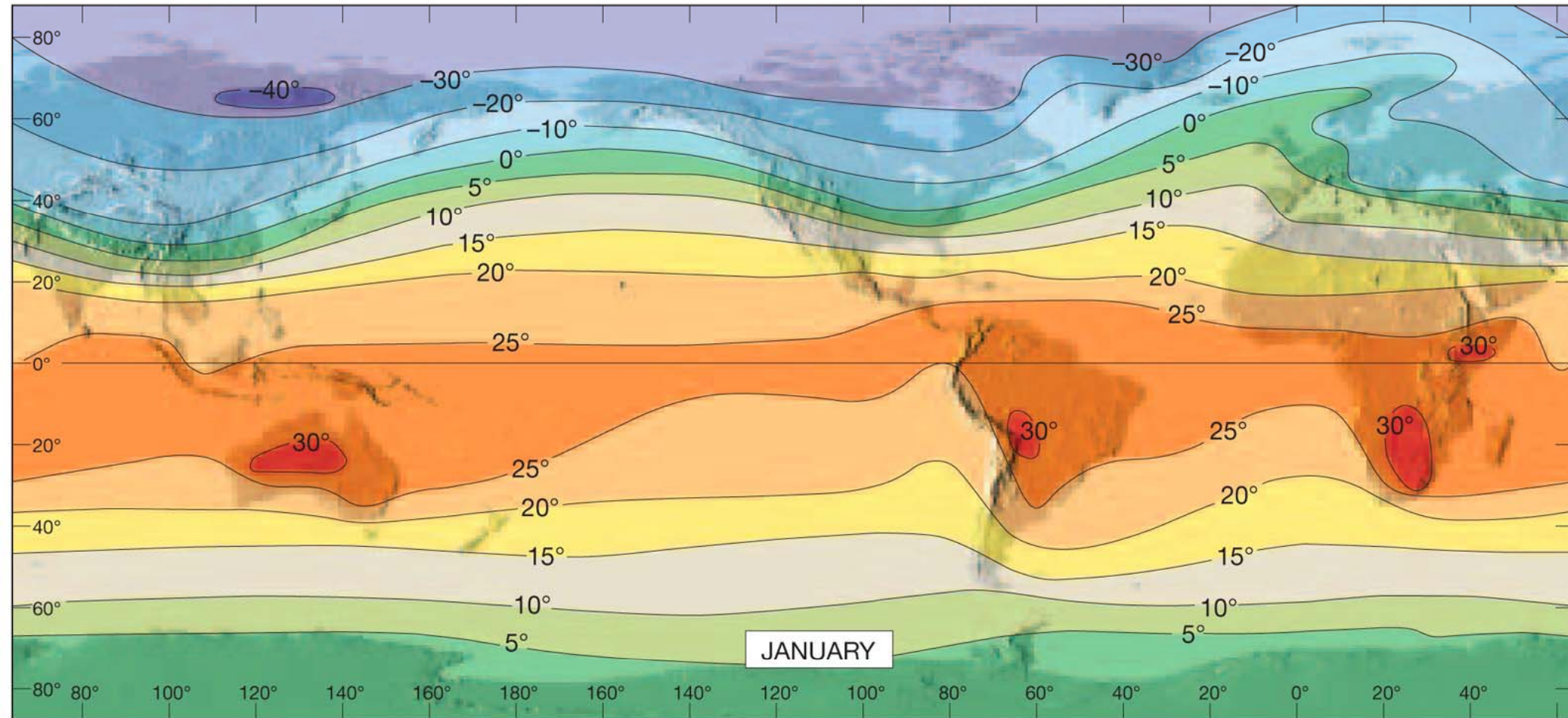
Controls of Temperature

- Day length
- Sun angle
- Land-water relationship
- Geographic position relative to general circulation of the atmosphere and ocean
- Altitude
- Cloudiness

General circulation of the atmosphere

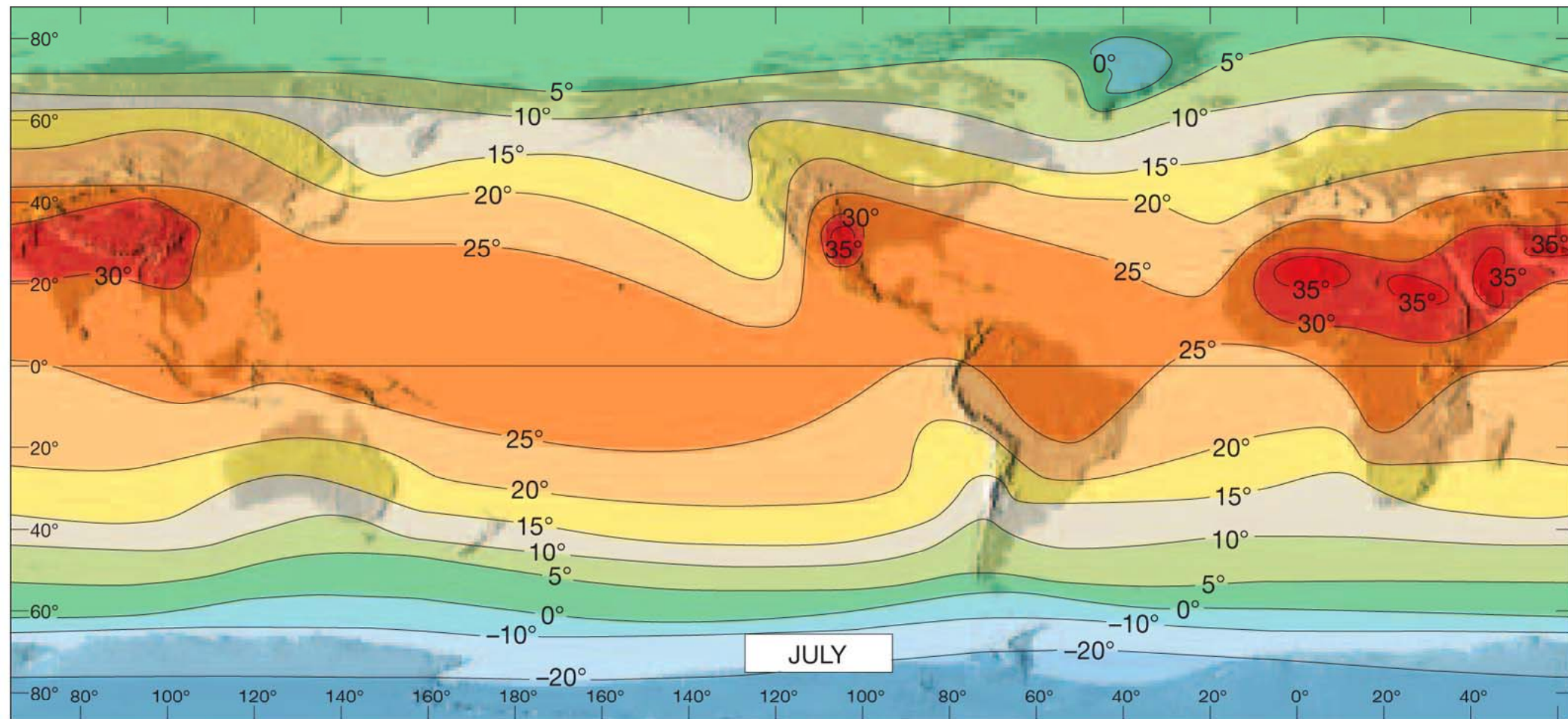


January temperature



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July temperature



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