

Causes of Climate

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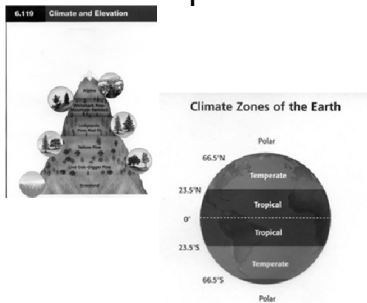
What Causes Climate?

- Climate:
 - long term, average temperature, precipitation, winds & cloud cover in an area.
- Microclimate:
 - Small areas with climate conditions that differ from those around them.

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Main factors that affect climate Temperature and Precipitation:

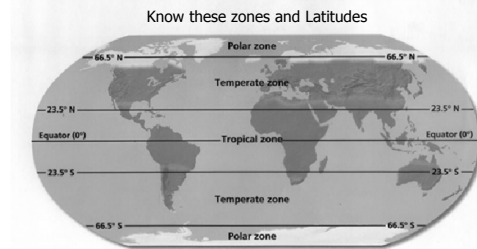
- Factors affecting Temperature:
 - Latitude
 - Altitude
 - Distance from large bodies of water
 - Ocean currents



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The main factor affecting Temperature is Latitude

6.95 World Temperature Zones



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The 2 main factors affecting temperature is Latitude & Altitude

- Generally speaking:
 - The higher the latitude the cooler the temp
 - 0° to 23.5° – Tropical Zone: warm summer warm winter
 - 23.5° – 66.5° – Temperate Zone: warm summer/cold winter
 - 66.5° – 90° – Polar Zone: cool summer very cold winter
 - The higher the altitude the cooler the temp
 - Temps drop on average 6.5°F for each kilometer rise in elevation

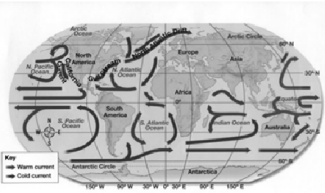
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The 2 other factors affecting temperature is distance from Oceans & types of Ocean Currents

- Generally speaking:
 - Large bodies of water
 - Water heats up slower but retains its heat better than land. Oceans moderate the climate around them.
 - Continental Climates have warm/hot summers & colder winters.
 - Marine Climates have cool summers & warmer winter

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The other factor affecting temperature is Ocean Currents



- Ocean currents moderate the climate
 - Warm water currents make the climate warmer in winter & summer
 - Cold water currents make the climate cooler than the climate found at the same latitudes inland.

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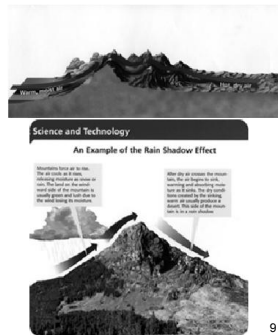
The main factors affecting Precipitation:

- Prevailing winds
- Presence of mountains
- Seasonal winds

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The main factors affecting precipitation: Mt. Ranges

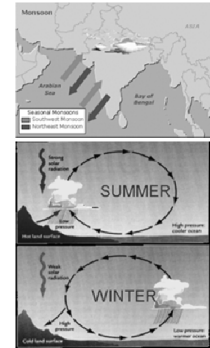
- Mt. ranges in the path of moving air masses force the air up and over the mountains.
- As the air is forced up and over, it cools and holds less water vapor.
- Windward side of the mt receives lots of rain/snow
- Leeward side is dry w/ little or no rain.



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The main factors affecting precipitation: Seasonal Winds

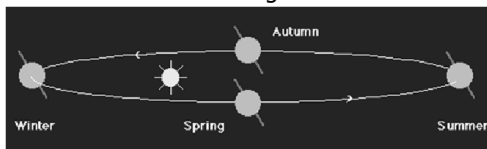
- Sea and Land breezes over a large region that change direction w/ the seasons are called Monsoons
- Regions receive tremendous amounts of rain in the summer
- Regions receive very little rain in winter.
- Monsoons in Thailand, India, Pakistan, Indonesia
- Southern Calif. receives its Santa Ana Winds blowing warm dry winds in the fall & early winter



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The 4 seasons are caused by the tilt of the Earth and its path around the sun.

- Earth is tilted at a 23.5° angle



- Summer: June 21st: Summer Solstice
- Winter: Dec. 21: Winter Solstice
- Spring: March 21: Vernal Equinox
- Fall: Sept 22: Autumnal Equinox

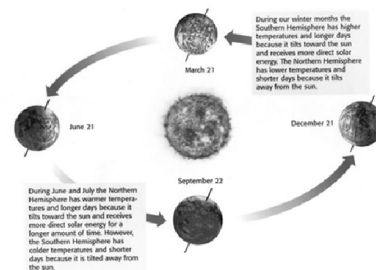
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Seasons

Holt Science and Technology

Teaching Transparency 151

Seasons, Latitude, and the Tilt of the Earth



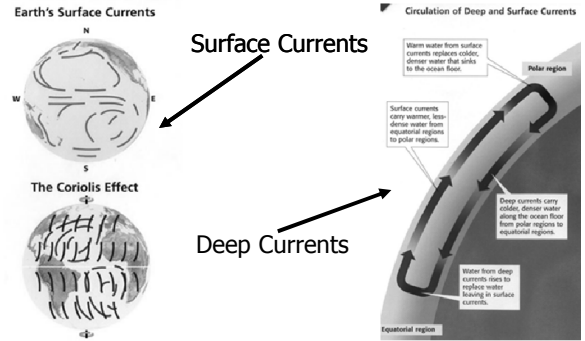
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Currents & Climate

- **Current:**
 - Large streams of moving water that flow through the oceans.
- **Surface Current**
 - Driven by winds affect water to depths of several hundred meters.
 - The Coriolis Effect – causes currents to curve to the right in Northern Hemisphere & left in the Southern Hemisphere.
 - The surface current warms or cools the air above it and influence the climate.
 - El Nino – causes warm water currents in eastern Pacific to replace normal cold water off Calif. coast. Produces heavy rain & severe weather conditions.
 - La Nina – Waters along Calif. coast are colder than normal. Produces heavy rain in Pacific northwest

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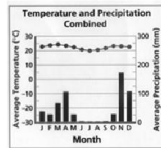
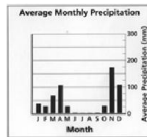
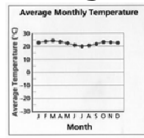
Currents & Climate



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Climate Regions

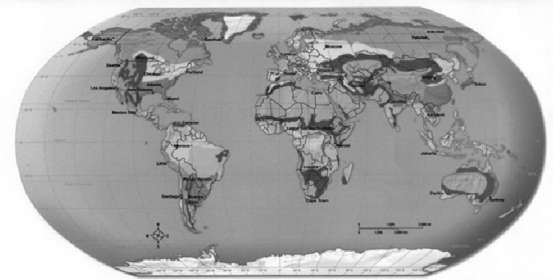
- **Climates classified by:**
 - Temperature
 - Precipitation
- **6 main regions:**
 - Tropical Rainy
 - Dry
 - Temperate Marine
 - Temperate Continental
 - Polar
 - Highlands



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Climate Regions

6.100 Climate Regions



Key		Temperate Marine		Temperate Continental		Polar		Highlands	
■	Tropical wet	■	Mediterranean	■	Humid continental	■	Tundra	■	ice cap
■	Tropical wet-and-dry	■	Humid subtropical	■	Subarctic	■			
■	Dry	■	Marine west coast						
■	Semiarid								
■	Arid								