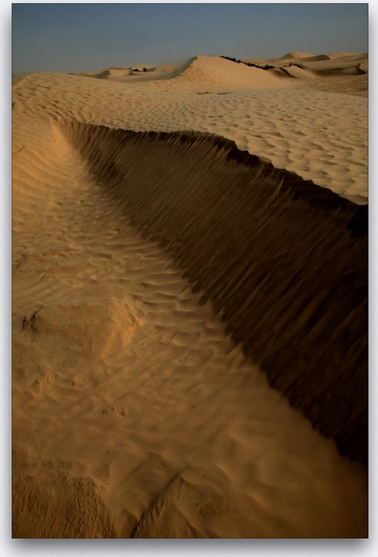
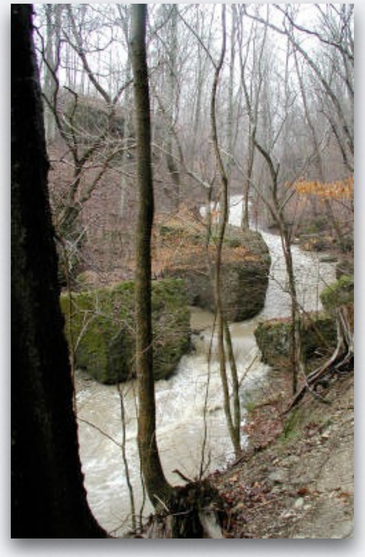
CLIMATE VARIABLES

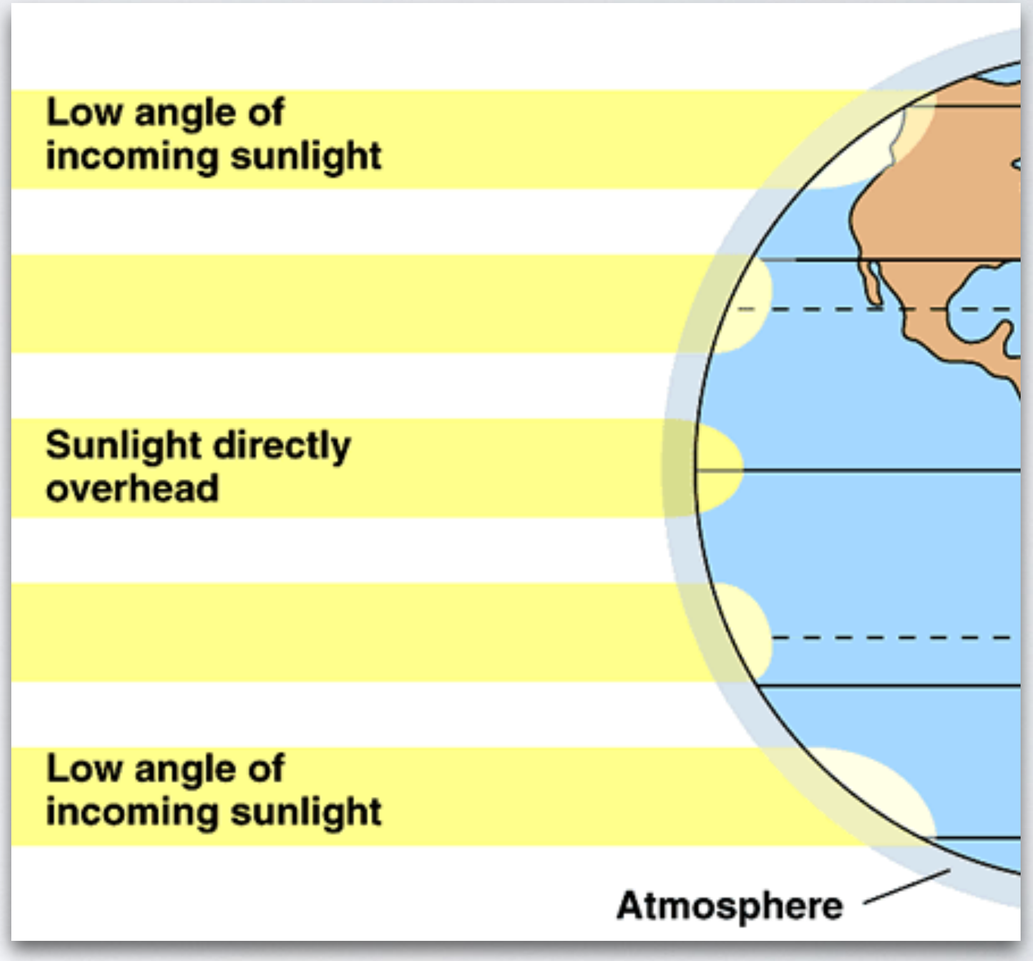
CLIMATE VARIABLES

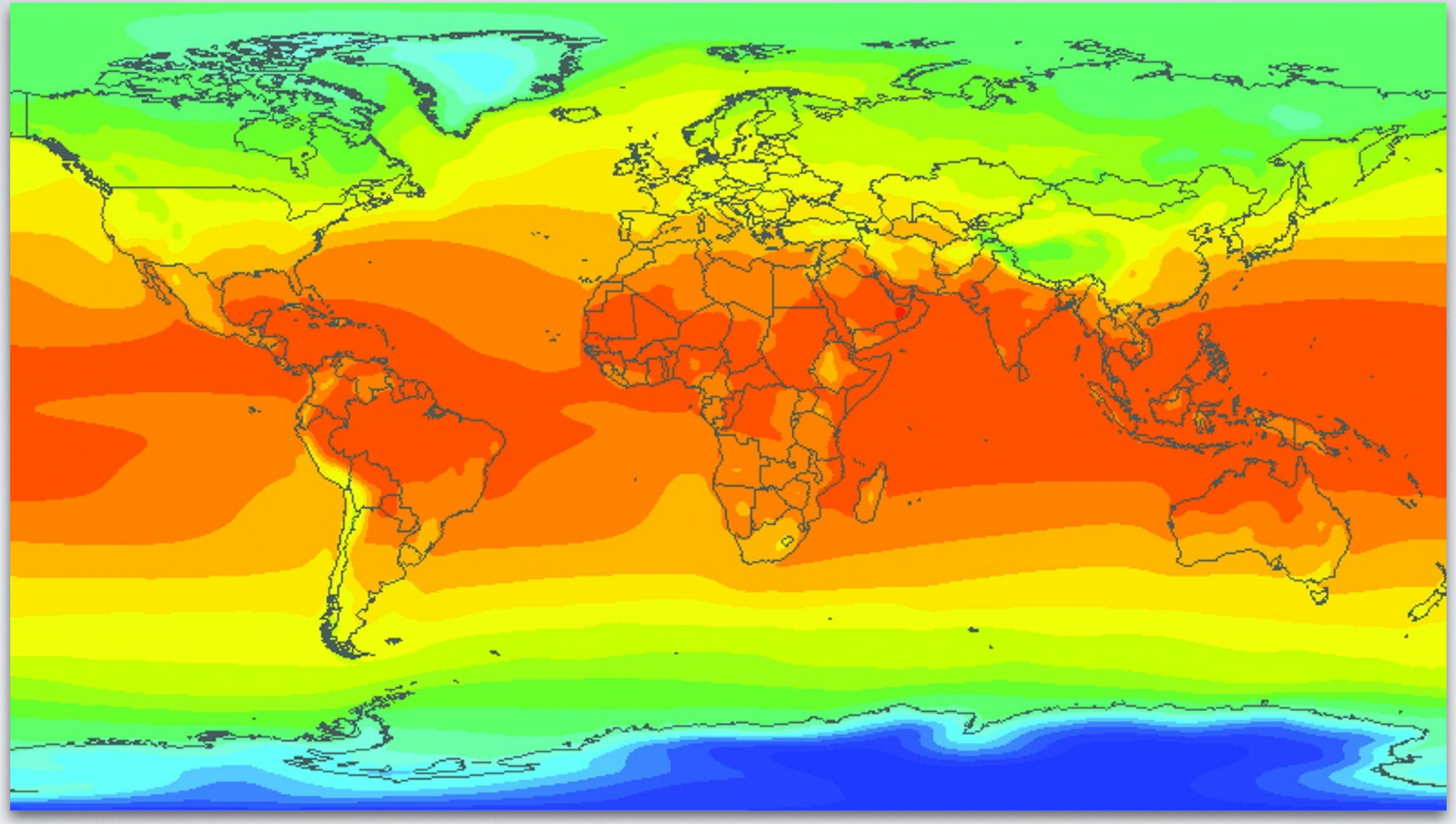
- Climate - the overall weather conditions over a long time span


CLIMATE VARIABLES

1. Latitude and Temperature
    - Temperature is affected by latitude, the angle of insolation, intensity, and duration of sunlight

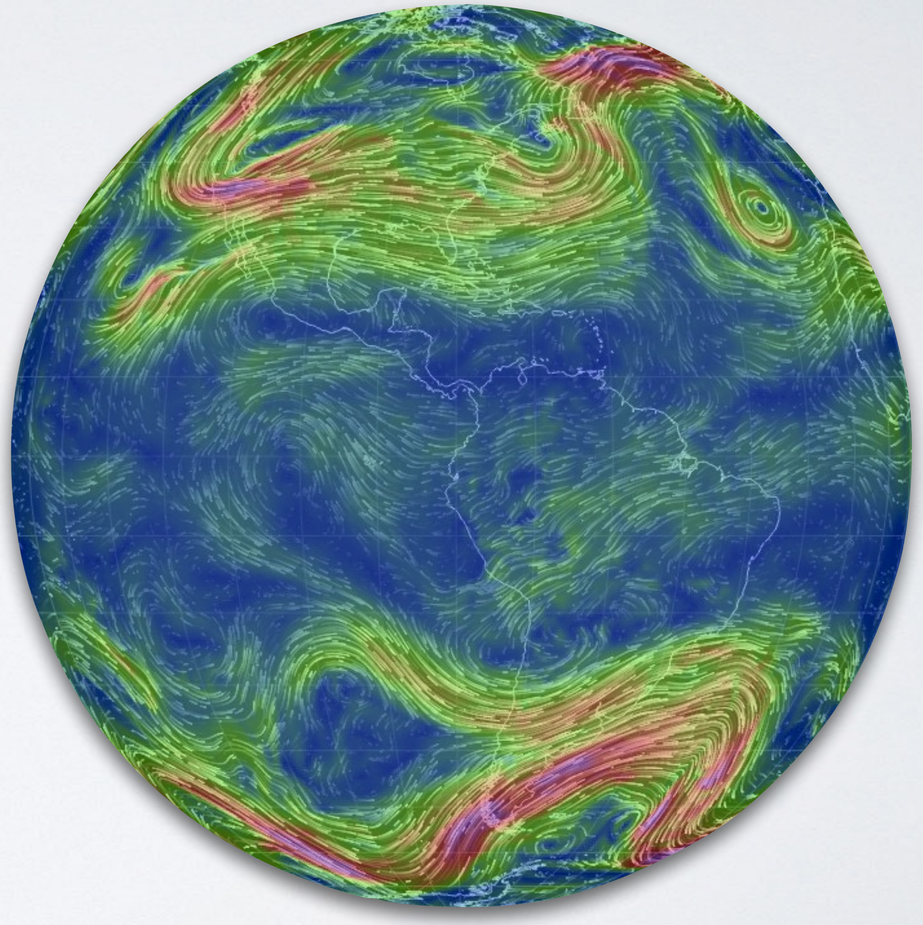


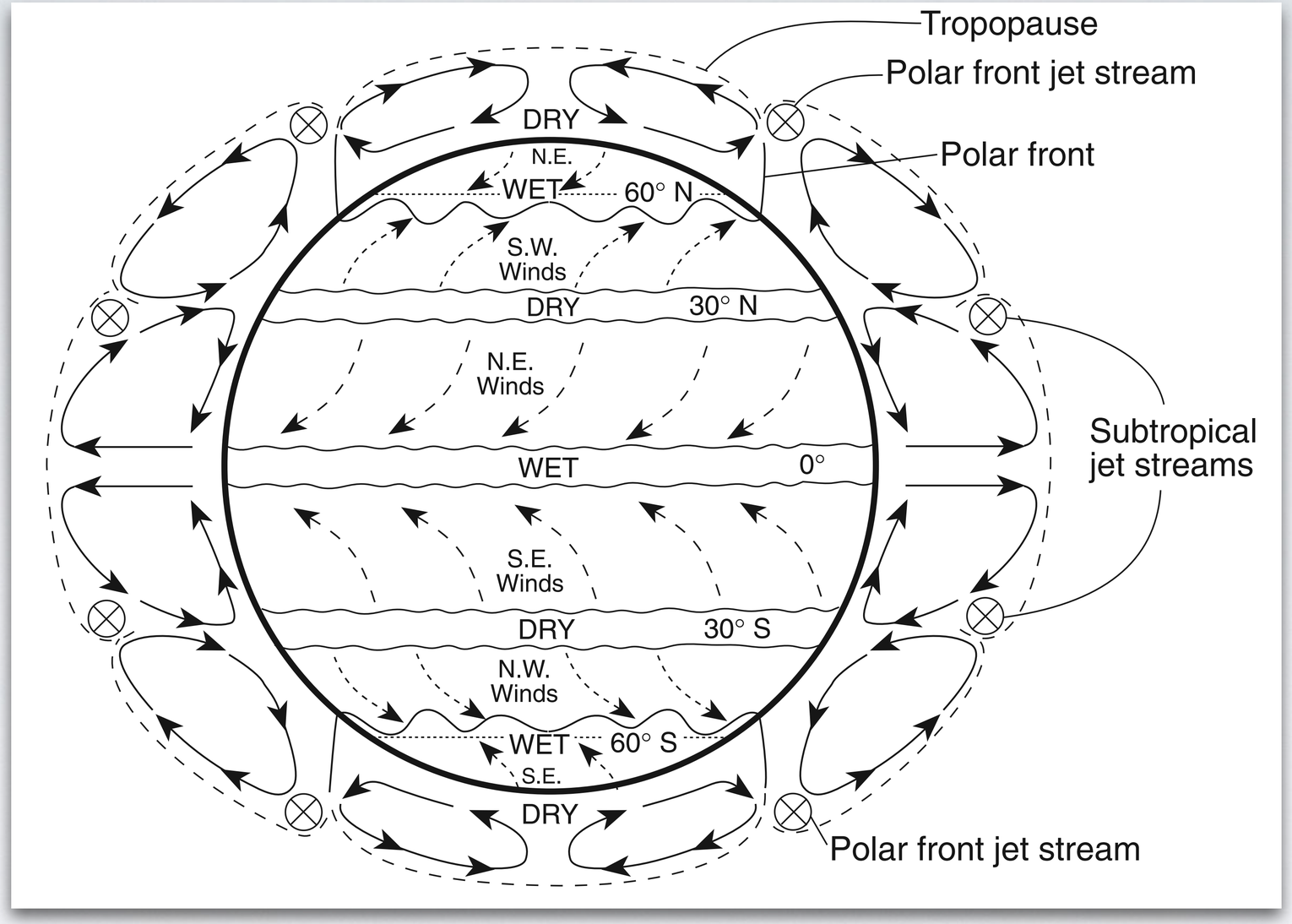


Latitude and Temperature

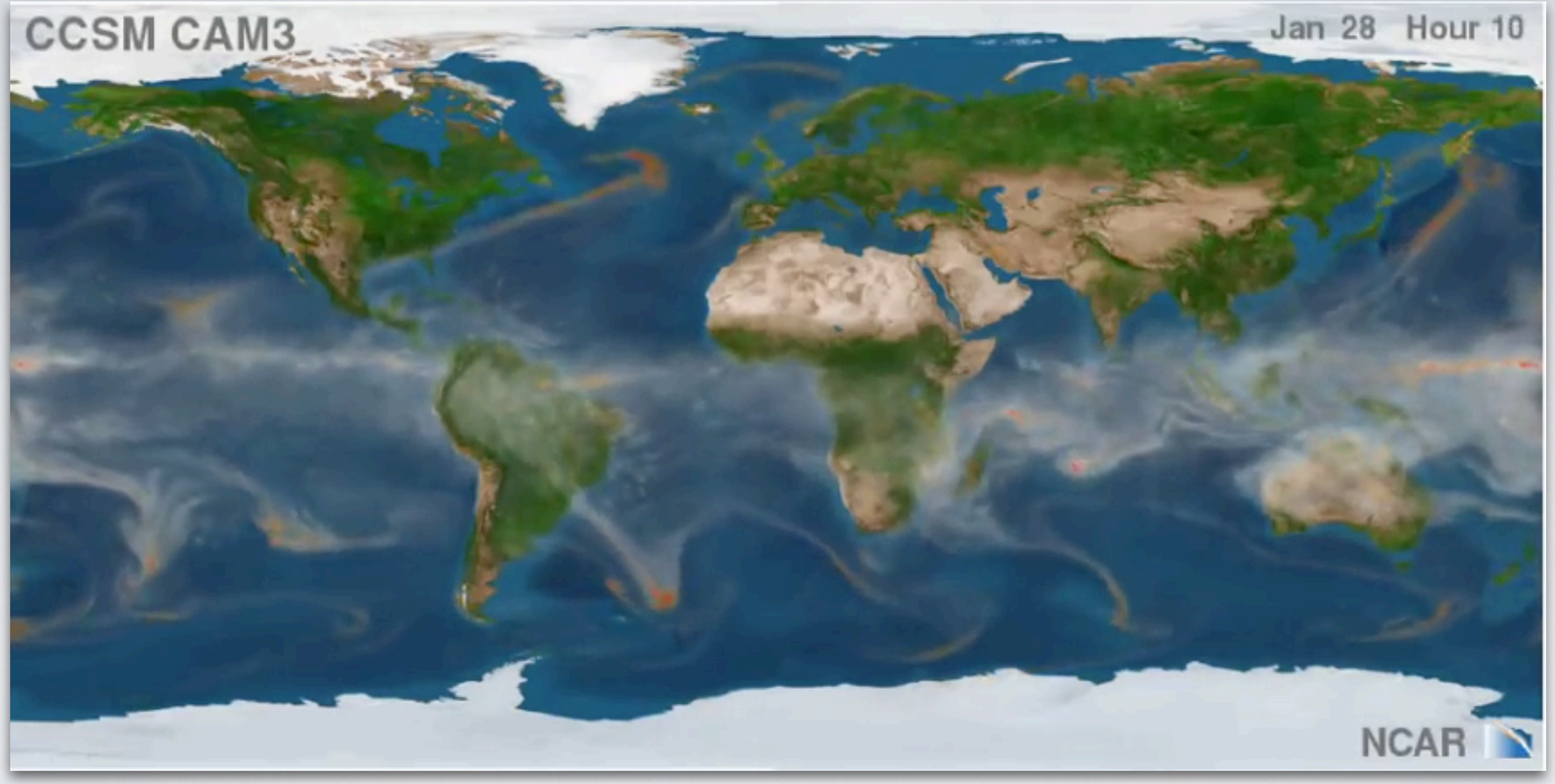
CLIMATE VARIABLES

2. Prevailing Winds - movement of air over the Earth's surface that blows from the same direction
    - Prevailing Winds are caused by pressure differences and redistribute heat





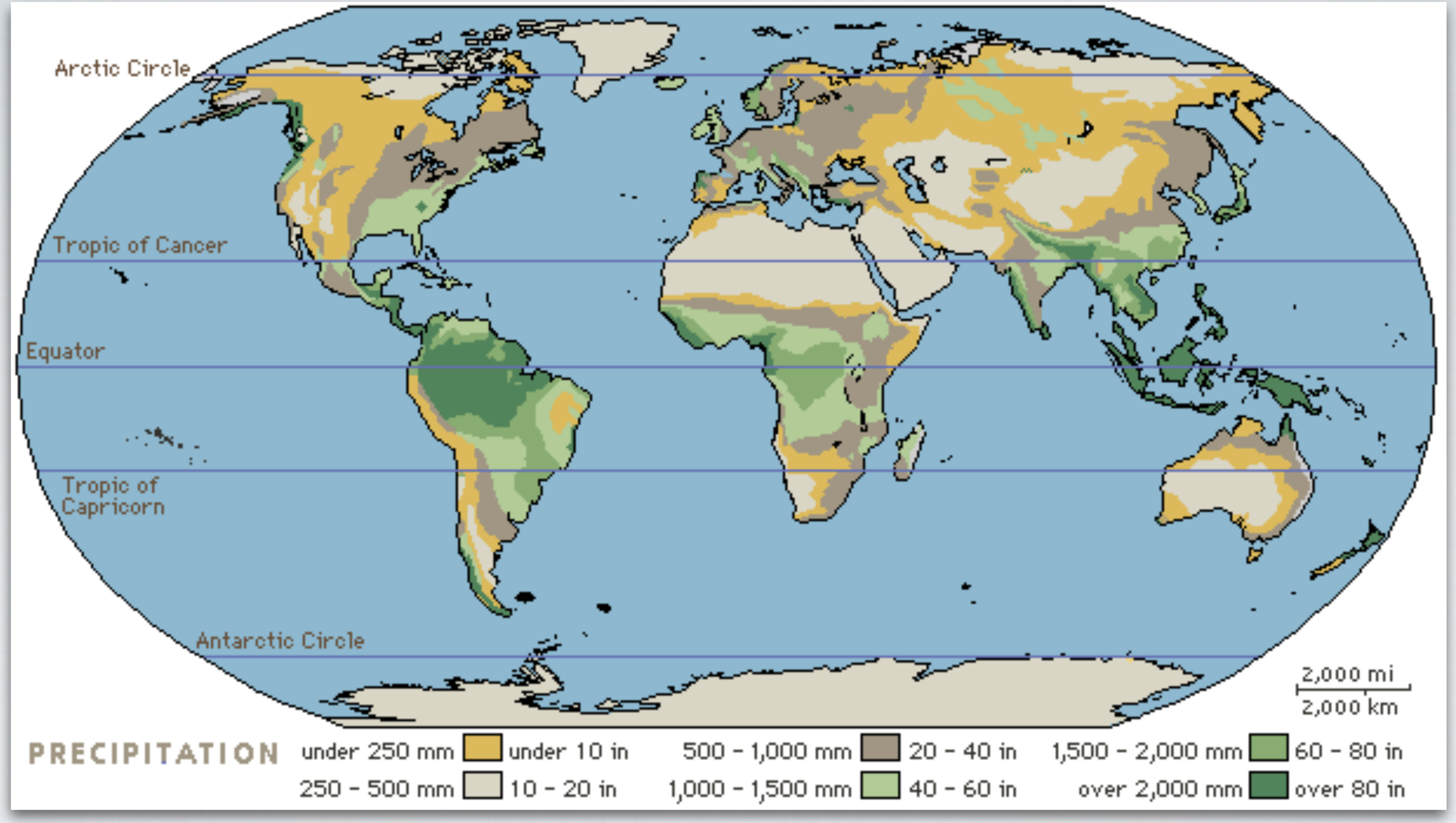
Planetary Winds and Moisture Belts in the Troposphere



Planetary Winds and Moisture Belts in the Troposphere

CLIMATE VARIABLES

3. Latitude and Moisture
    - Moisture content varies with latitude due to planetary winds
        - Low Pressure at the equator causes air to rise, expand, cool, and condense to form clouds and rain
        - High pressure causes air to sink and form arid regions



Latitude and Moisture

CLIMATE VARIABLES

4. Large Bodies of Water

   - Oceans, seas, lakes, and bays modify climate regions where land masses close to a body of water will be regulated by the slow rate of heating and cooling of water

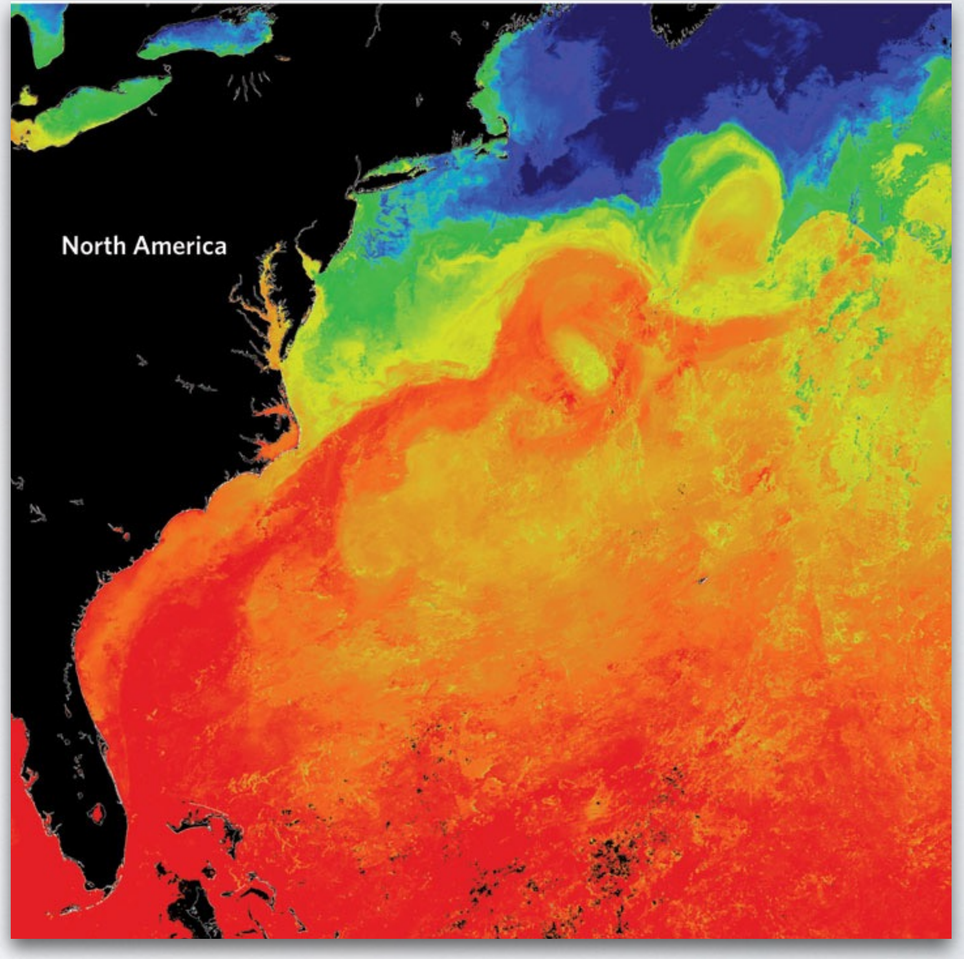
MATERIAL	SPECIFIC HEAT (Joules/gram • °C)
Liquid water	4.18
Solid water (ice)	2.11
Water vapor	2.00
Dry air	1.01
Basalt	0.84
Granite	0.79
Iron	0.45
Copper	0.38
Lead	0.13

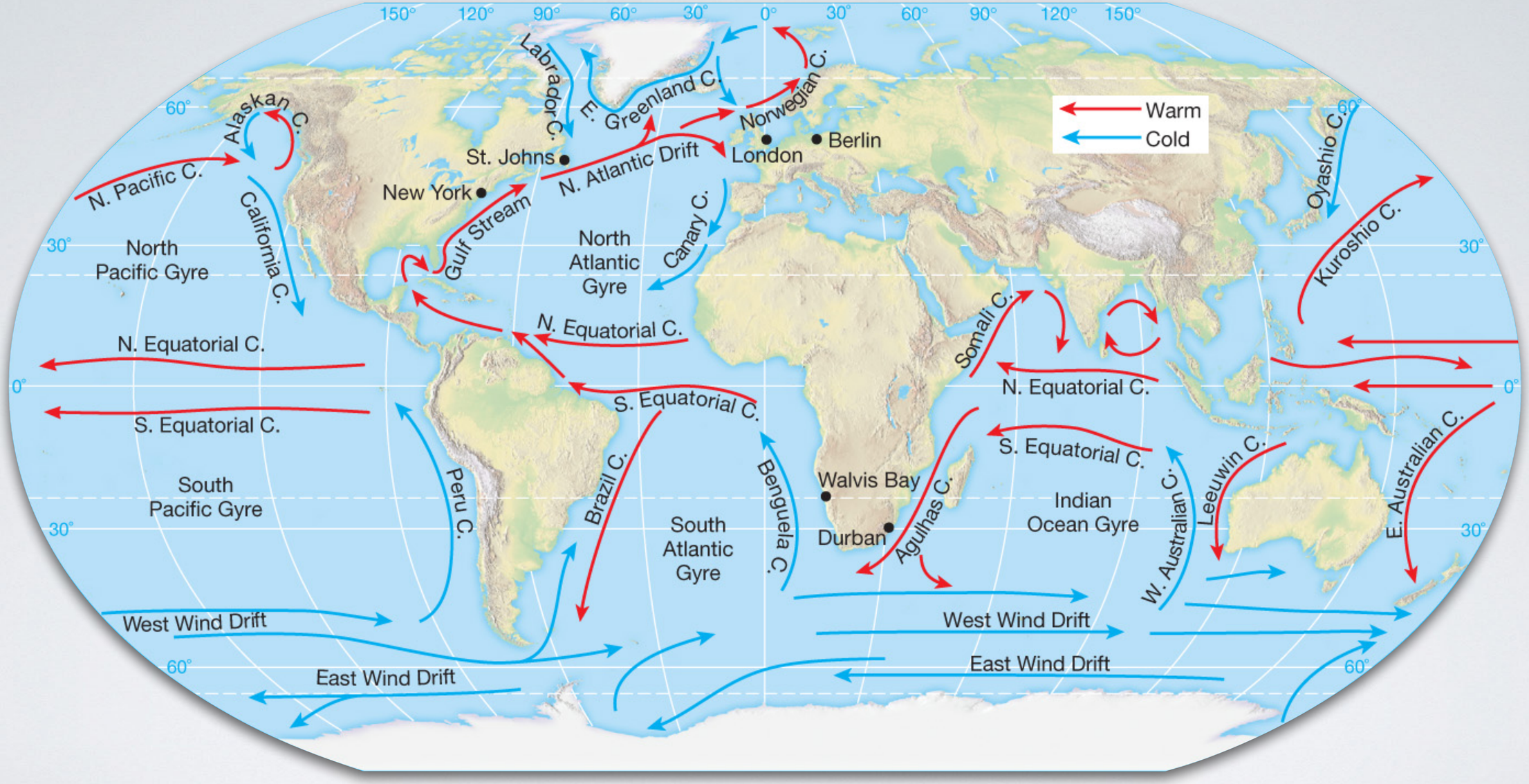
Specific Heat of Common Materials

Large Bodies of Water

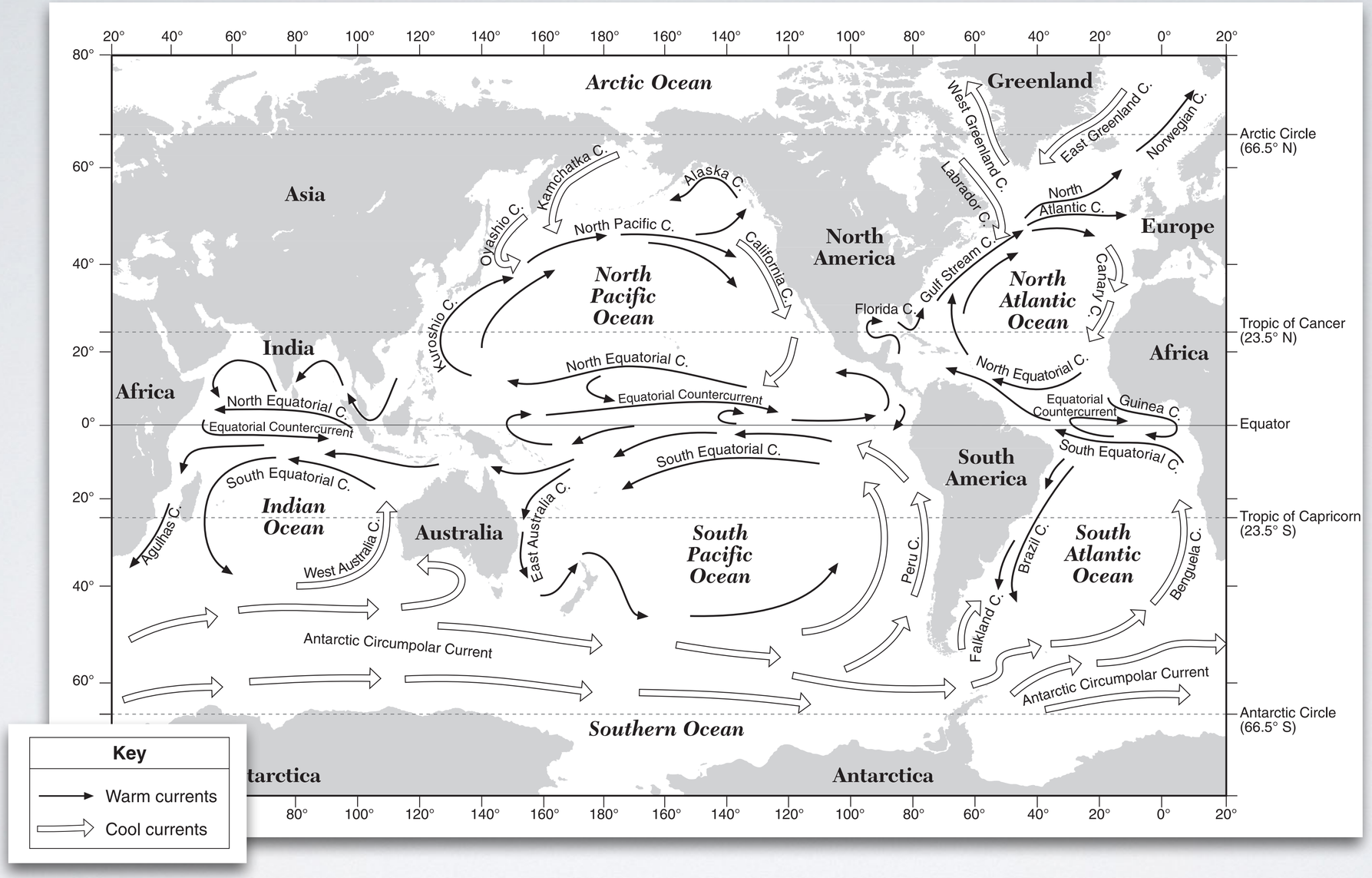
CLIMATE VARIABLES

5. Ocean Currents
    - Coastal climates are modified by ocean currents
        - Warm waters flow away from the equator
        - Cold waters flow away from the poles





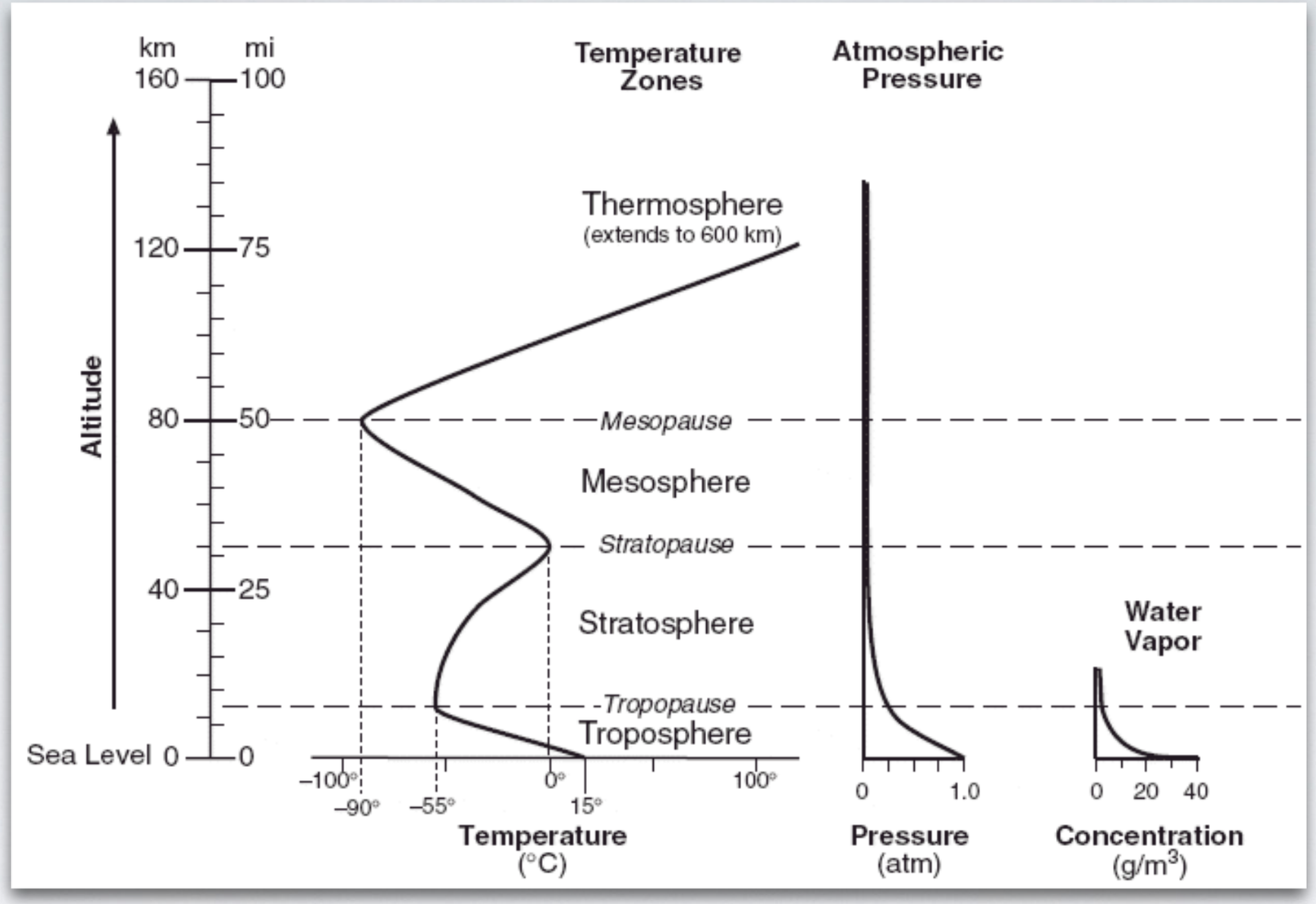
Ocean Currents



Surface Ocean Currents

CLIMATE VARIABLES

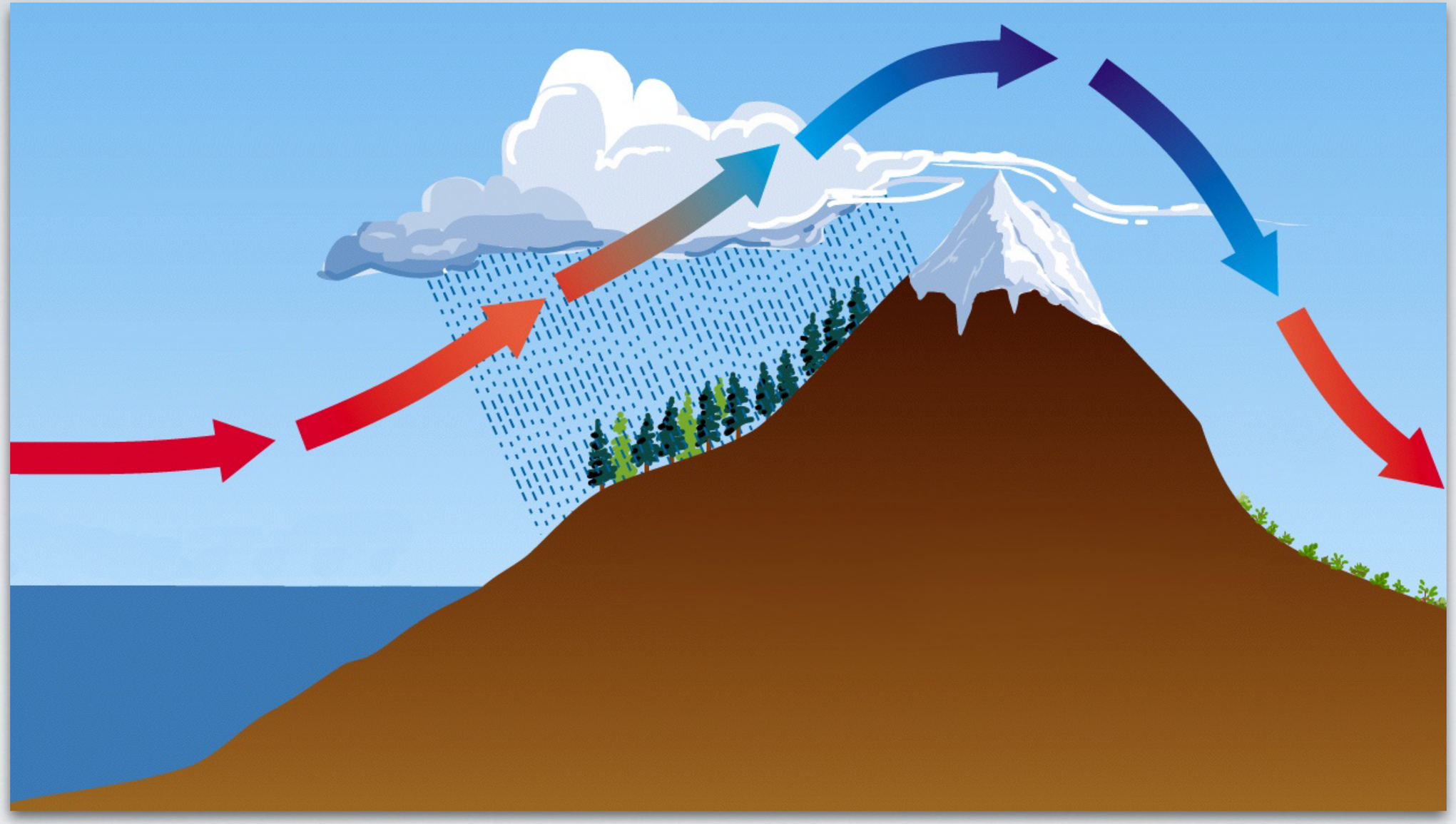
6. Mountains and Elevation
    - Higher elevations are cooler due to temperatures decreasing



Temperature and Elevation

CLIMATE VARIABLES

6. Mountains and Elevation [continued]
    - Mountains intersect planetary winds causing the air rise, expand, cool, and condense creating a cooler and more moist region on the windward side



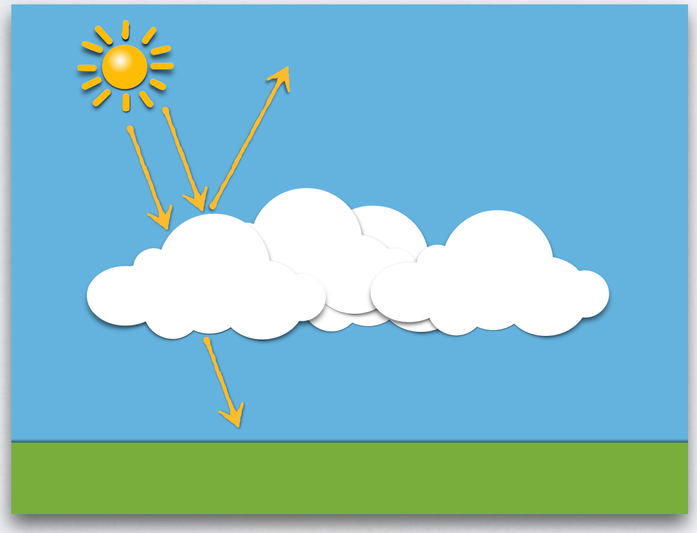
Mountains and Elevation

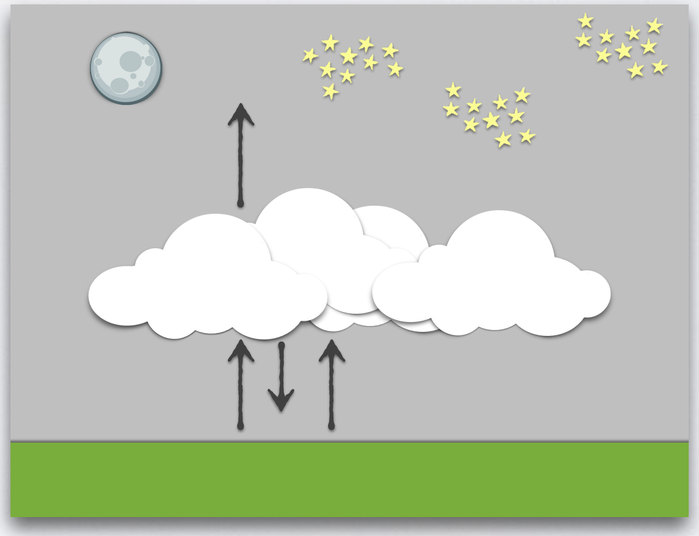
Mountains and Elevation

CLIMATE VARIABLES

7. Cloud Cover

- During the day clouds block sunlight from warming Earth's surface and at night trap heat in the atmosphere





CLIMATE VARIABLES

8. No Cloud Cover

- During the day sunlight reaches the earth and heat energy warms the surface and at night reradiates back into space