Climate

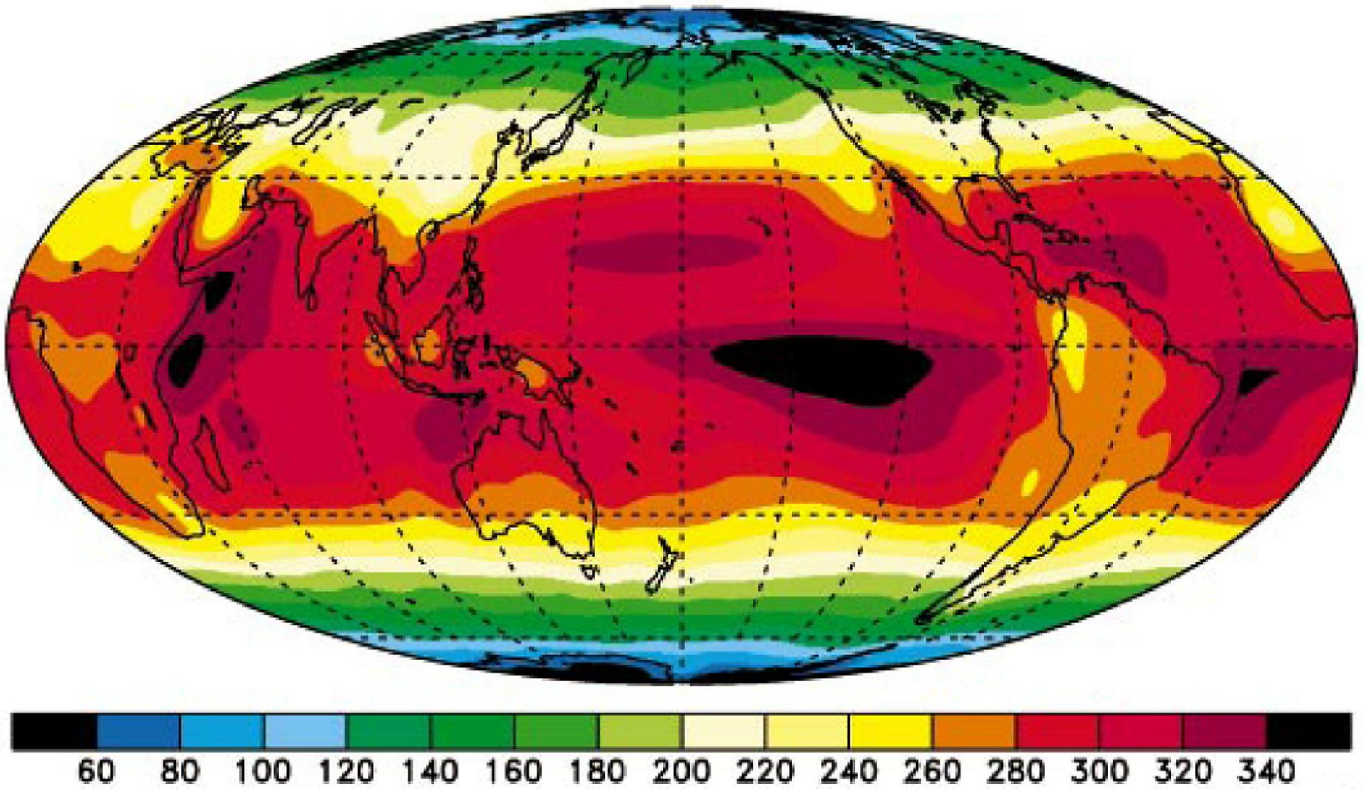
Average conditions of a region or the weather patterns that occur over many years.

Factors that determine Climate

- Every climate can be differentiated based upon two factors.
  - Temperature patterns
  - Precipitation patterns

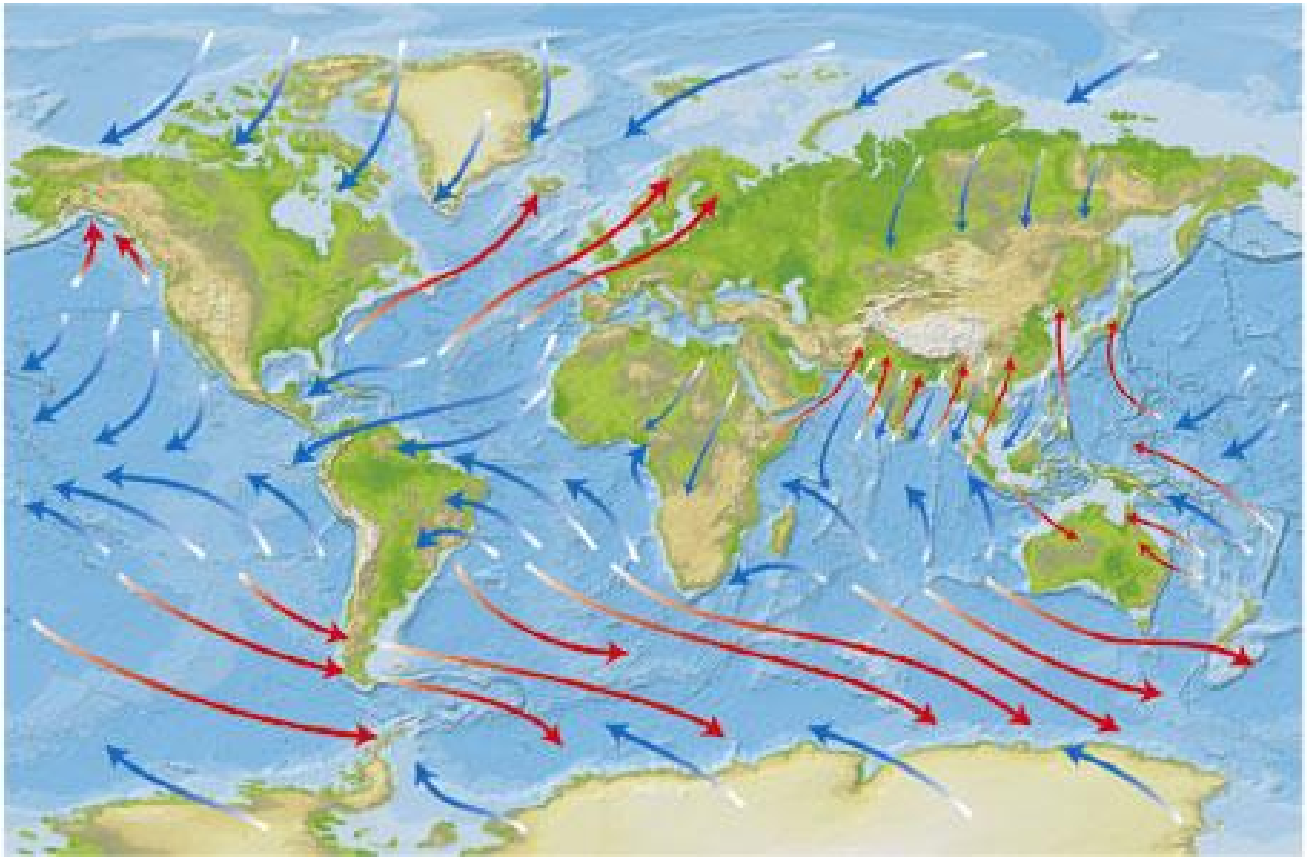
Factors that affect climate

- Latitude: (distance from the equator) determines the amount of solar energy received and the prevailing wind belts.



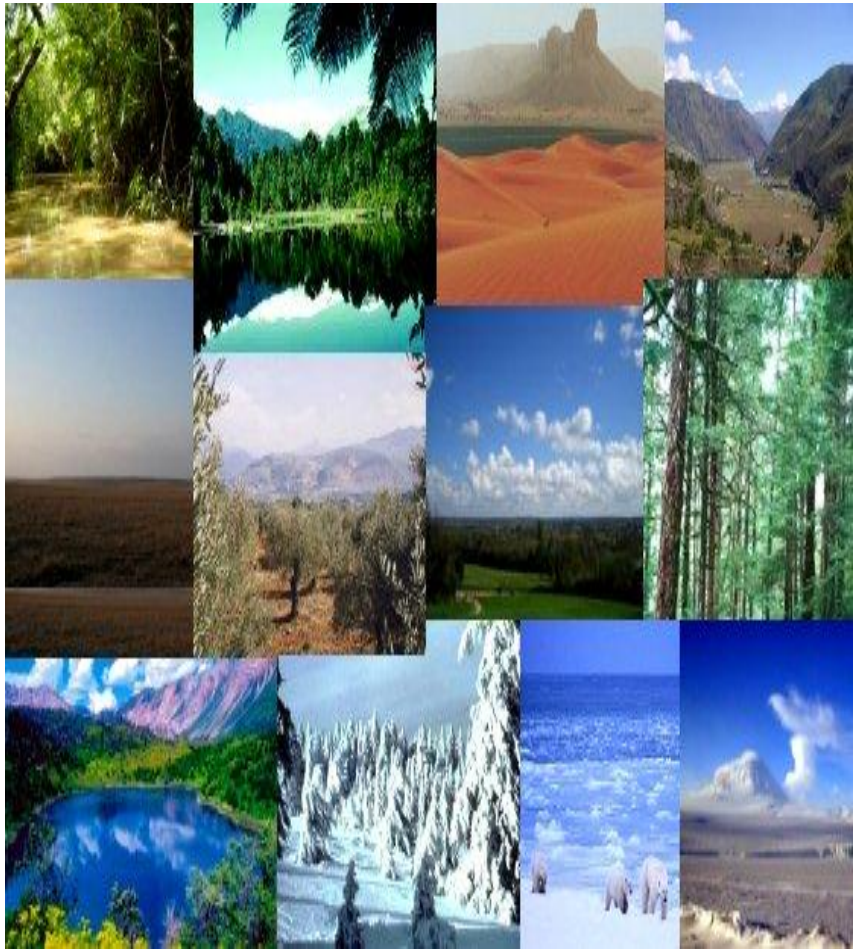
Factors that affect Climate

- Wind patterns: affects humidity, precipitation, temperature and clouds.



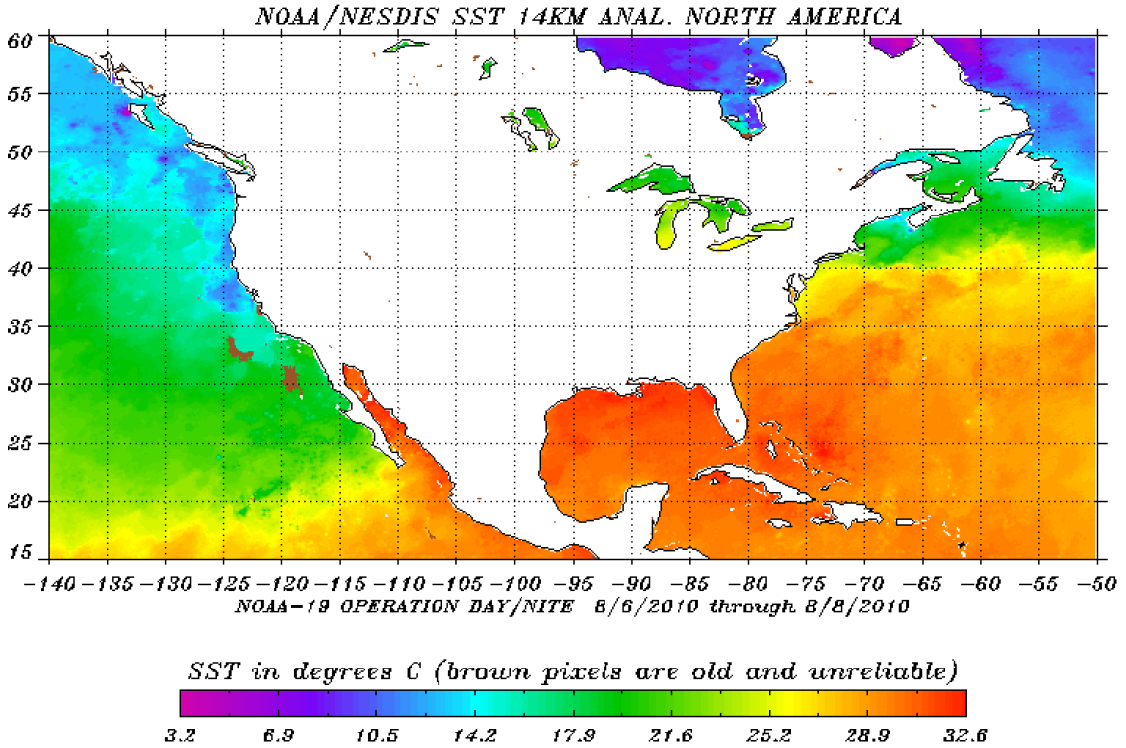
Factors that affect climate

- Elevation: the higher the elevation, the colder the climate.
- Topography: topographic features such as mountains play an important role in the temperature and precipitation that falls over an area.



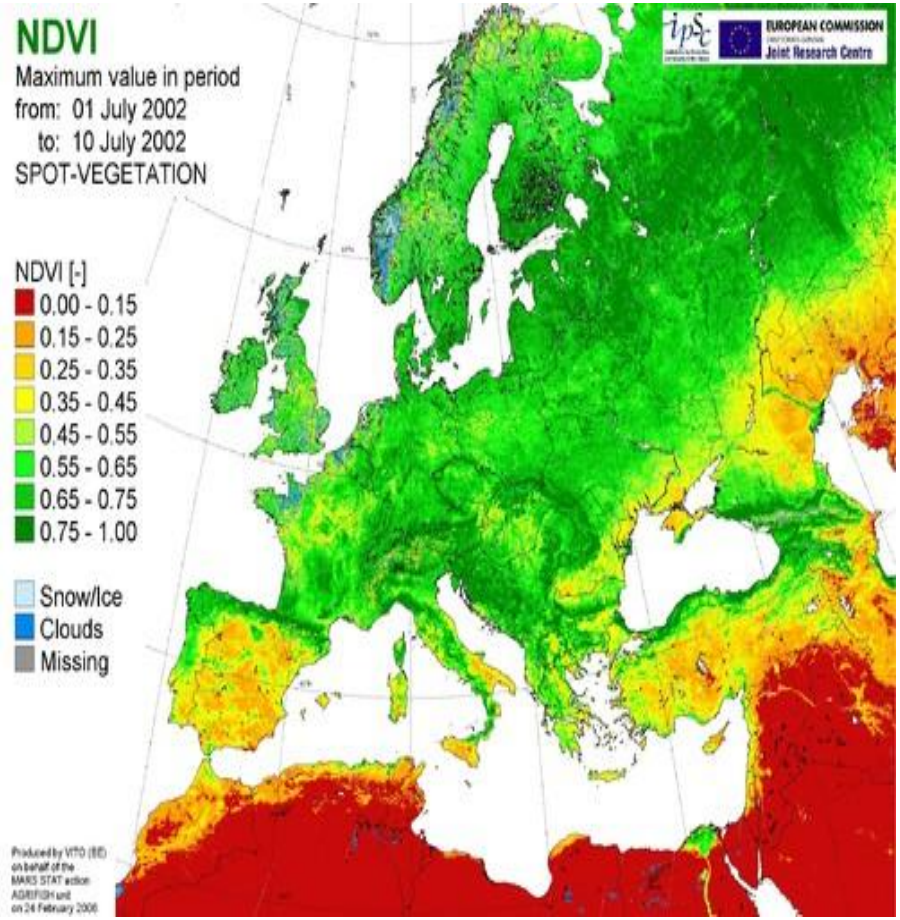
Factors that affect climate

- Water bodies: large bodies of water such as oceans and seas have an important effect on the humidity and temperature of an area because the temperature of the water body influences the temperature of the air above it.



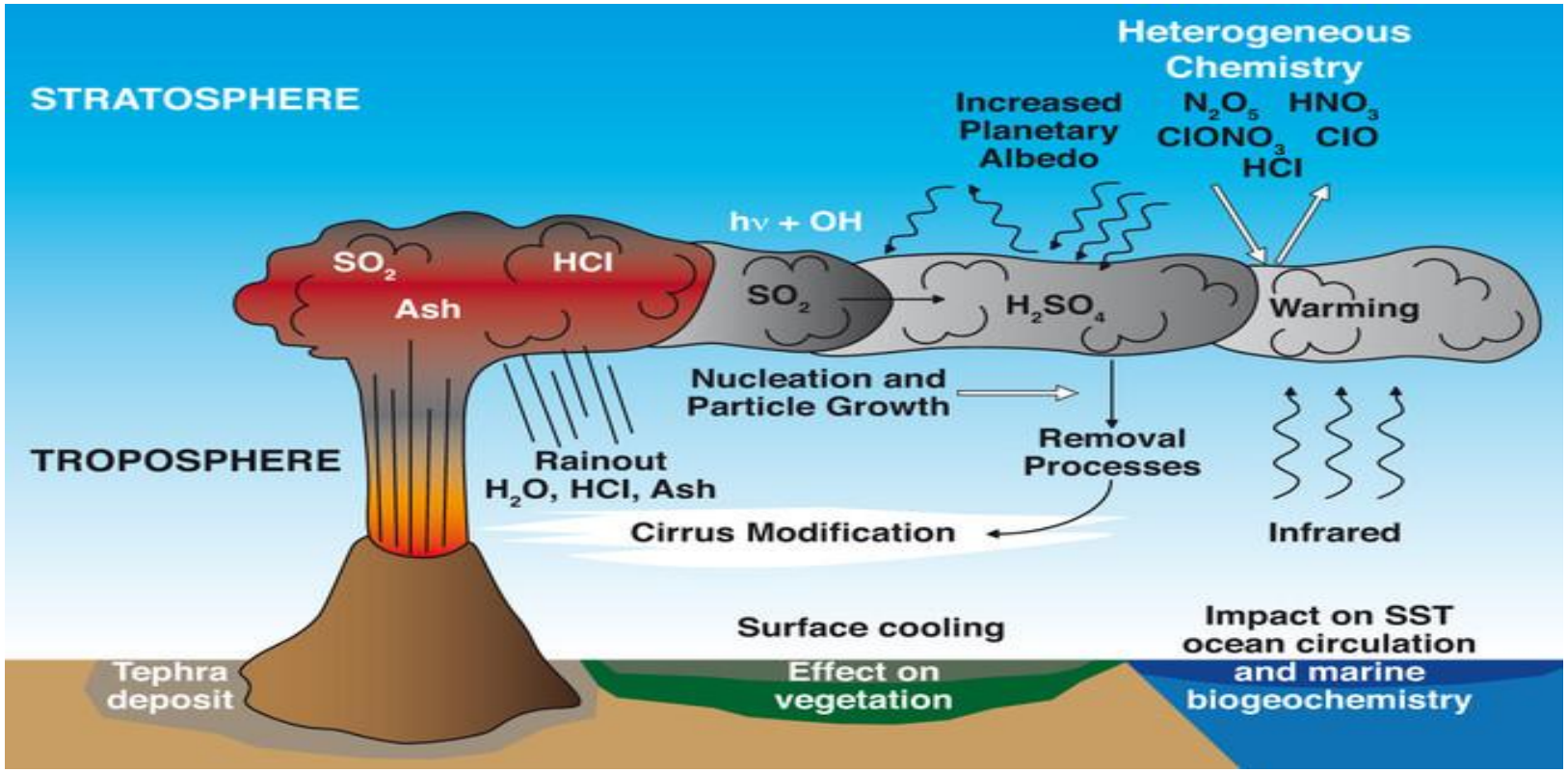
Factors that affect climate

- Ocean currents: warm or cold currents combined with winds blowing from the ocean to the shore can affect the climate.
- Vegetation: can affect both temperatures and humidity patterns in an area because it influences how much energy is absorbed and reflected.



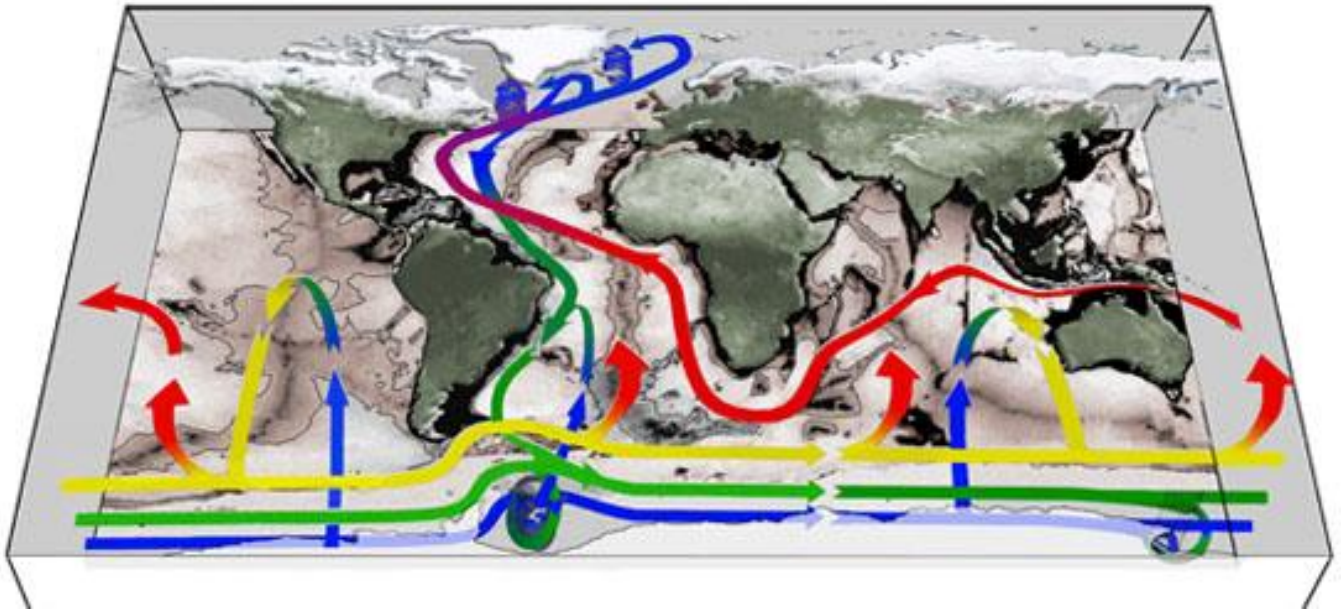
Natural processes that change climate

- Volcanic eruptions: the presence of volcanic dust and gases in the air affect the amount of energy that is reflected back into space. It causes the climate to cool.



Natural processes that change climate

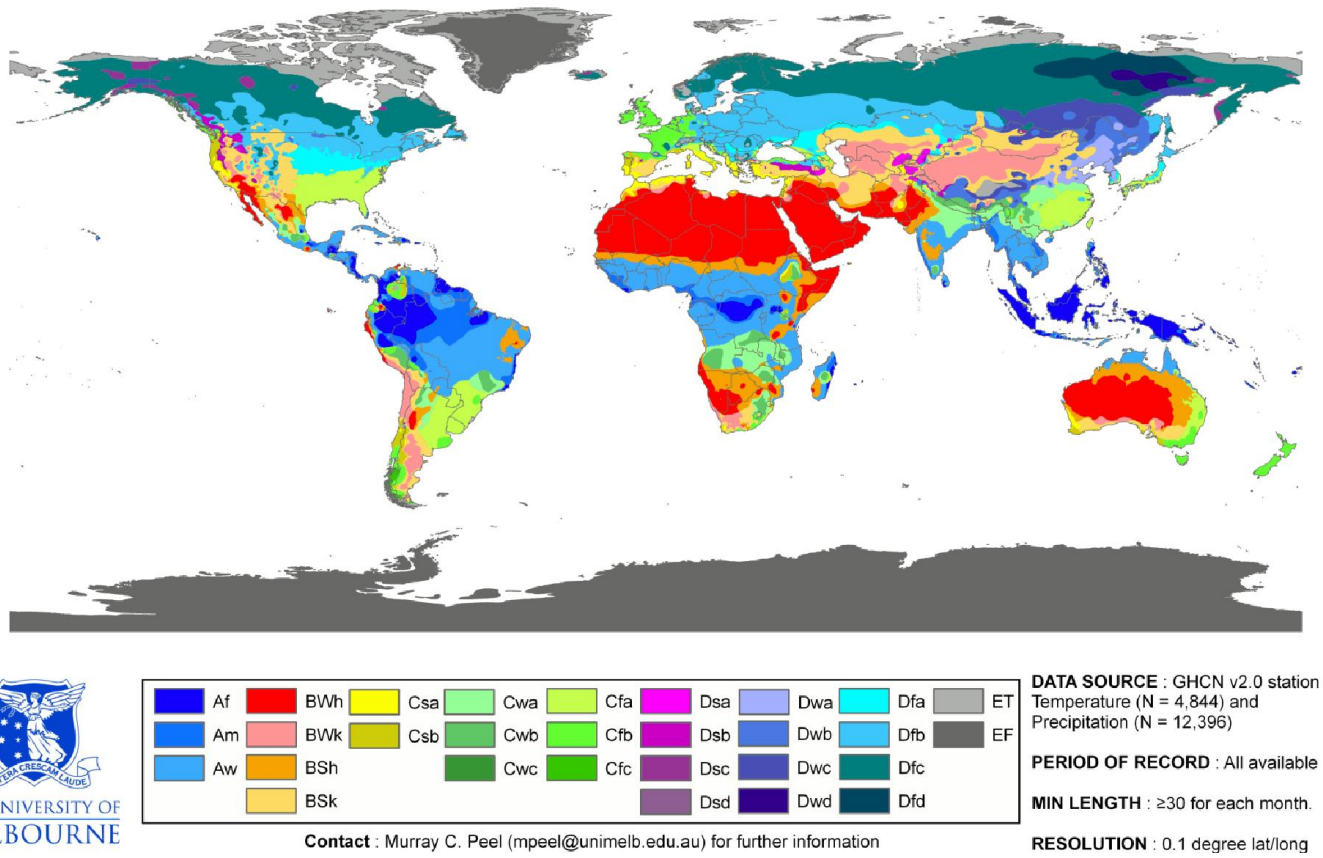
- Ocean circulation: changes in ocean circulation can cause the climate to change.



- Other: solar activity and earth motions.

Coastal Climate vs. Inland Climate

- In warm seasons, areas closer to large bodies of water tend to have a moderate climate compared to inland climates.
- Bodies of water are slower to heat and hold heat longer than soil and rocks
- In cooler seasons, coastal areas are **warmer** than inland since water will lose heat more slowly than land



KOPPEN CLIMATE CLASSIFICATION SYSTEM

Climate Types

- The five key climate groups based on the annual and monthly averages of temperature and precipitation:
  A. Moist Tropical Climates
  B. Dry Climates
  C. Moist Mid-Latitude Climates with Mild Winters
  D. Moist Mid-Latitude Climates with Cold Winters
  E. Polar Climates

Moist Tropical Climates

Climates without winters.

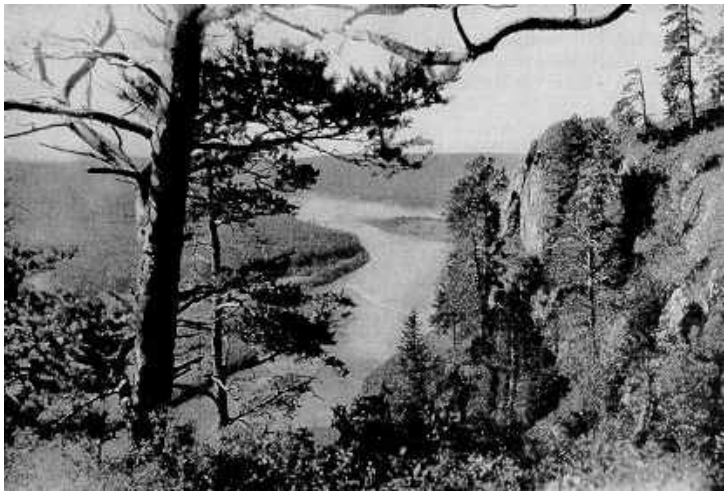
- Characteristics include:
  - Over 18 degrees C mean temperature
  - Precipitation that can be over 200 cm per year
- There are two types:
  - Wet tropical (rainforest in Brazil)
  - Wet and dry tropical (savanna in Africa)

Dry Climates

- Characteristics
  - Yearly precipitation is not as great as the potential loss of water by evaporation

Moist Mid-Latitude Climates

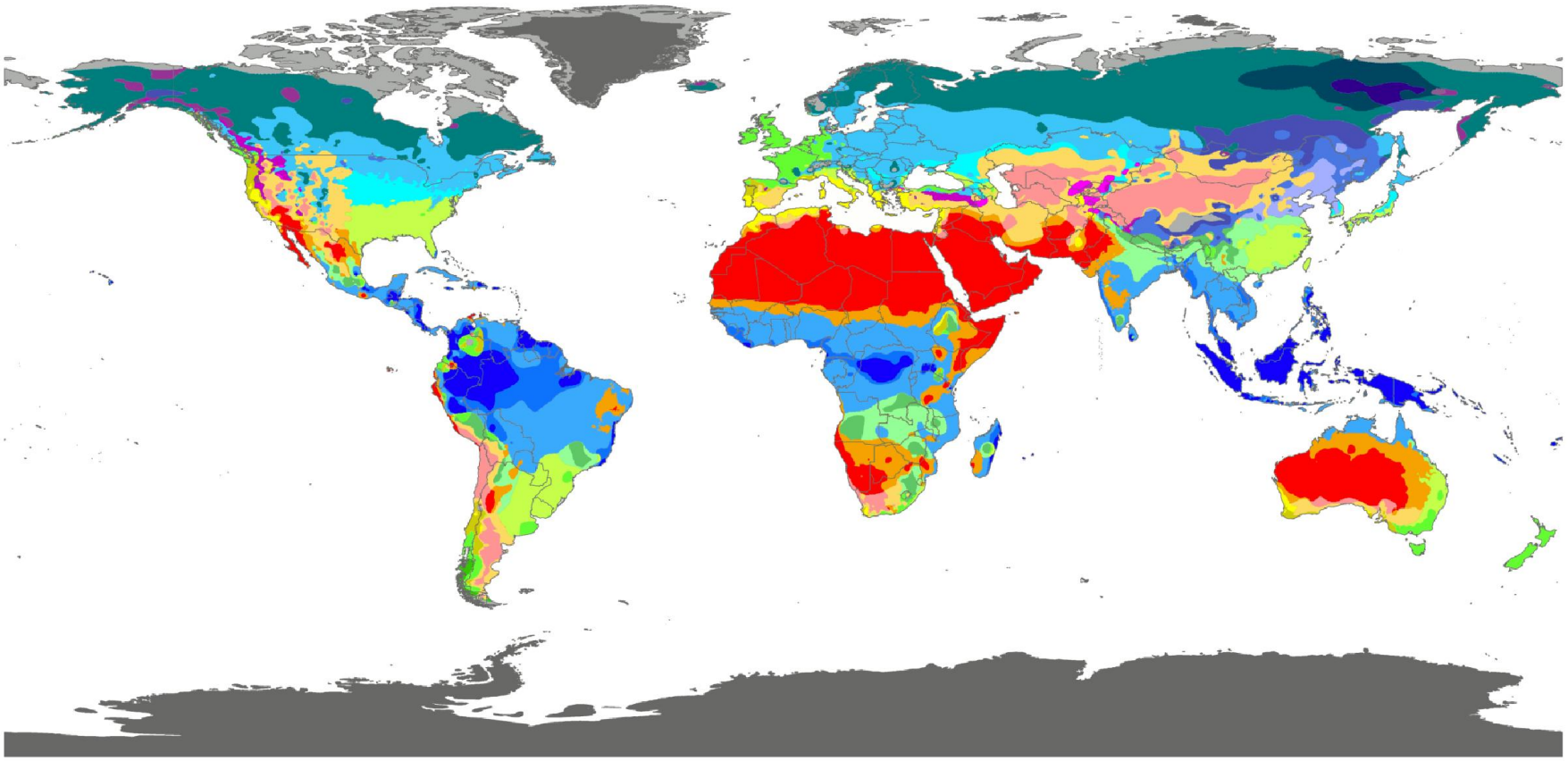
- Characteristics—based on location and type of winter
  - Mild winters (-3C to 18C): 30 to 50° latitude mainly on the eastern and western borders of most continents
  - Severe winters (less than -3C): areas affected more by arctic air masses



Polar Climates

- Characteristics
  - Mean temperature of the warmest month is below 10 degrees C

World map of Köppen-Geiger climate classification



THE UNIVERSITY OF MELBOURNE

Af	BWh	Csa	Cwa	Cfa	Dsa	Dwa	Dfa	ET
Am	BWk	Csb	Cwb	Cfb	Dsb	Dwb	Dfb	EF
Aw	BSh		Cwc	Cfc	Dsc	Dwc	Dfc	
	BSk				Dsd	Dwd	Dfd	

Contact : Murray C. Peel (mpeel@unimelb.edu.au) for further information

DATA SOURCE : GHCN v2.0 station data
Temperature (N = 4,844) and
Precipitation (N = 12,396)

PERIOD OF RECORD : All available

MIN LENGTH : ≥30 for each month.

RESOLUTION : 0.1 degree lat/long