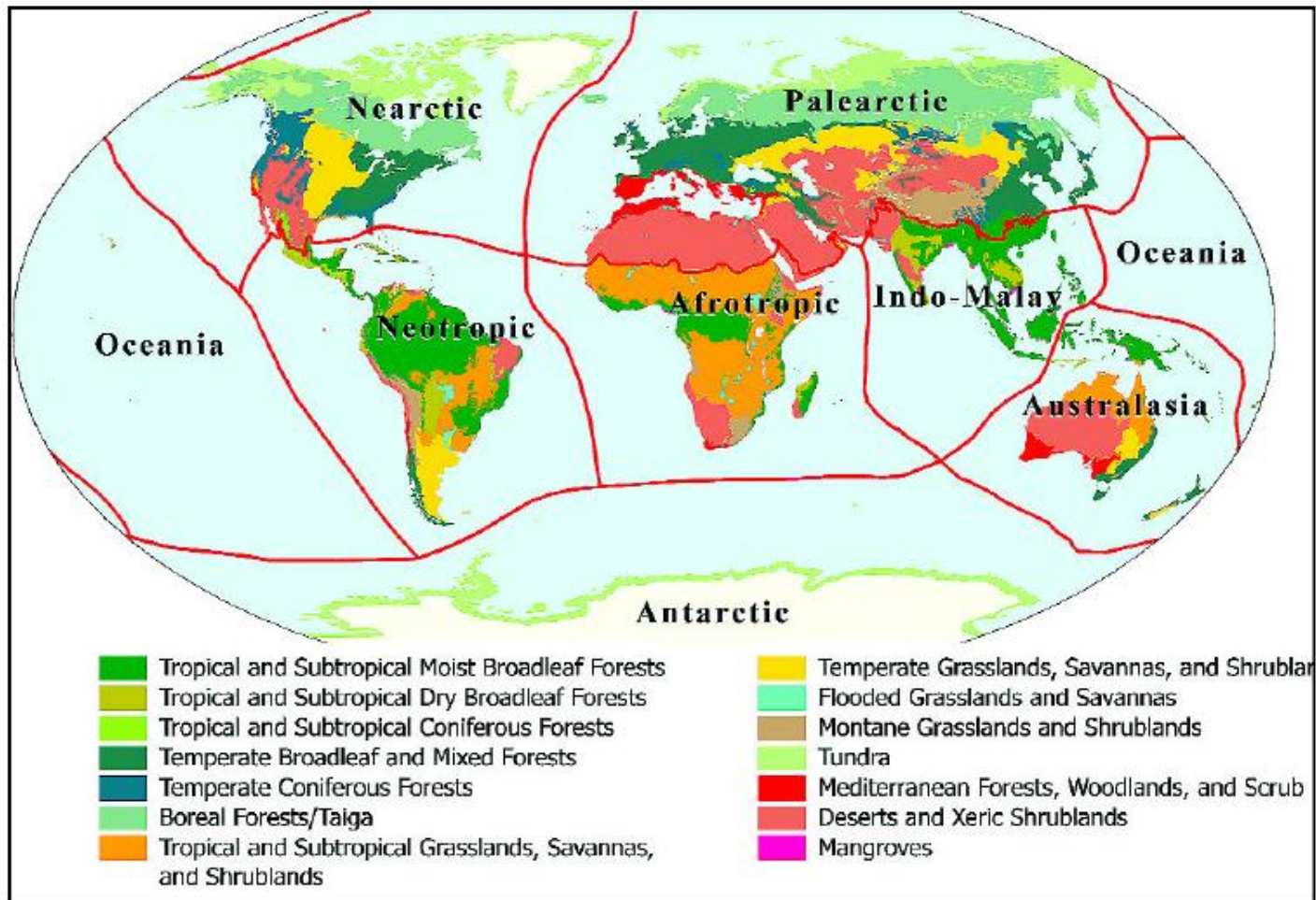
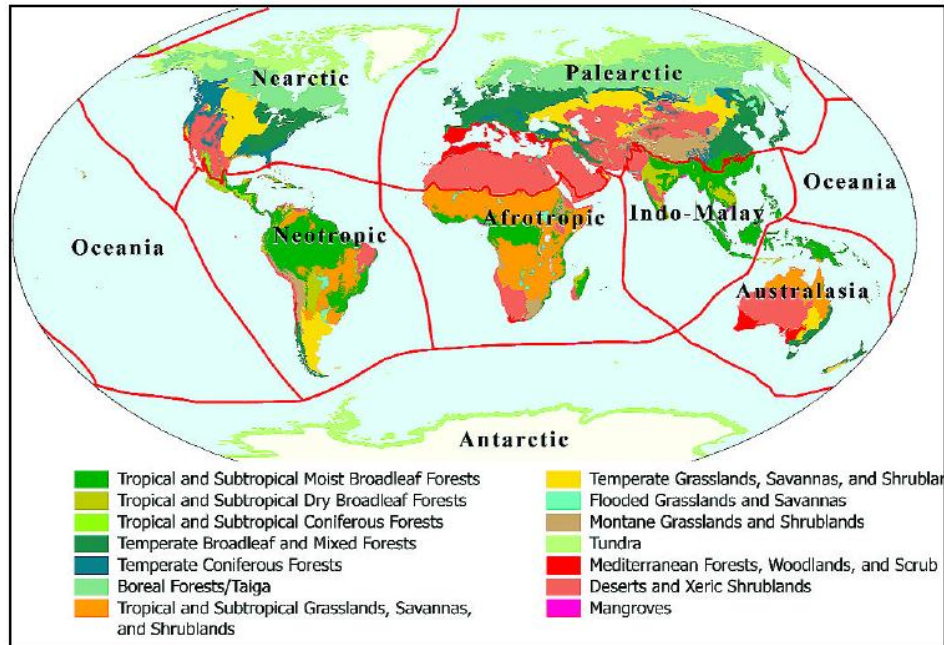


Jan 30 Terrestrial Forest Biomes of the World

World Wildlife Fund Terrestrial Biomes and Biogeographic Realms of the World



World Wildlife Fund Terrestrial Biomes and Biogeographic Realms of the World

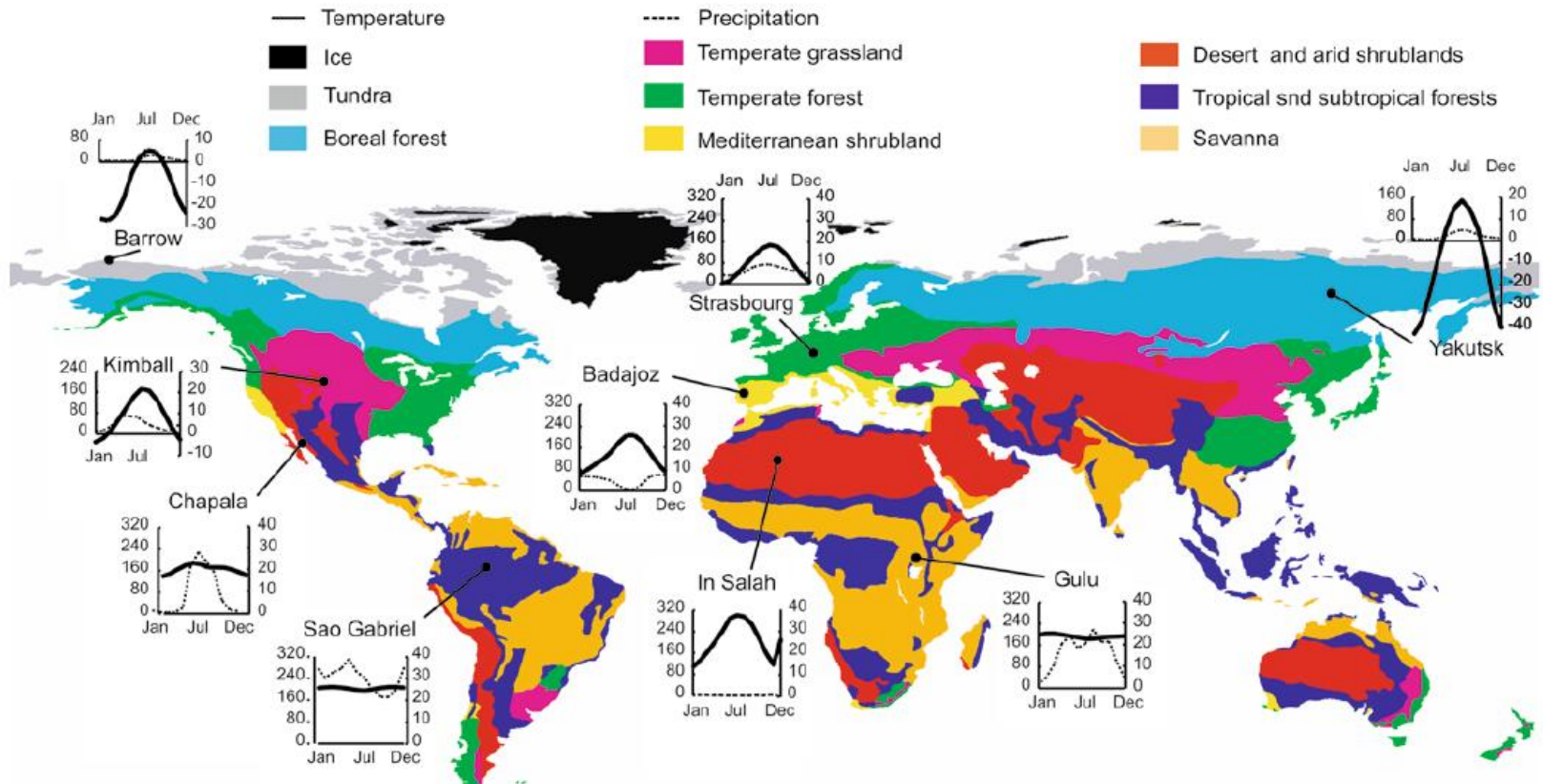


Biome - large-scale unit of vegetation defined by the physiognomy of dominant, climax vegetation.

Elements of physiognomy:

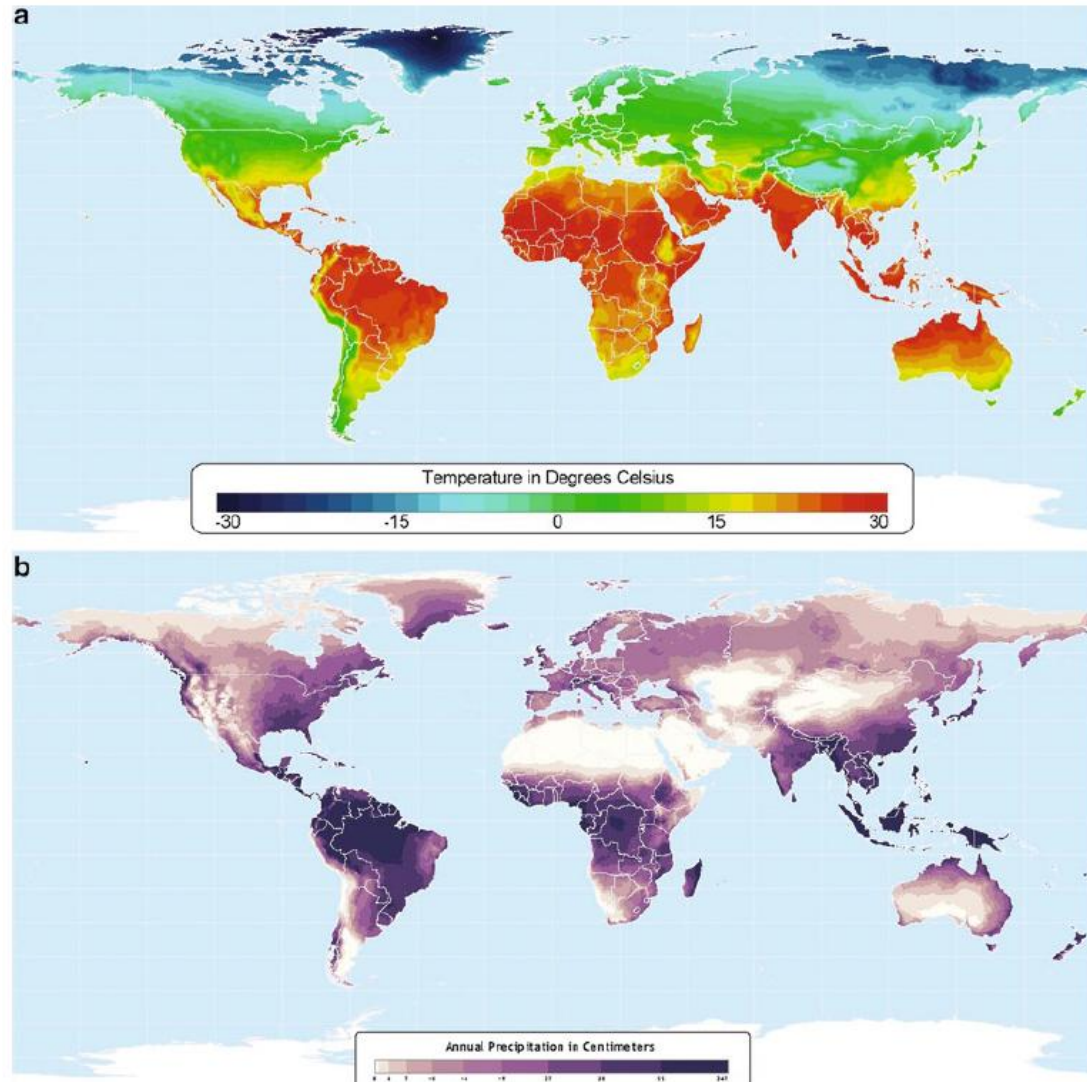
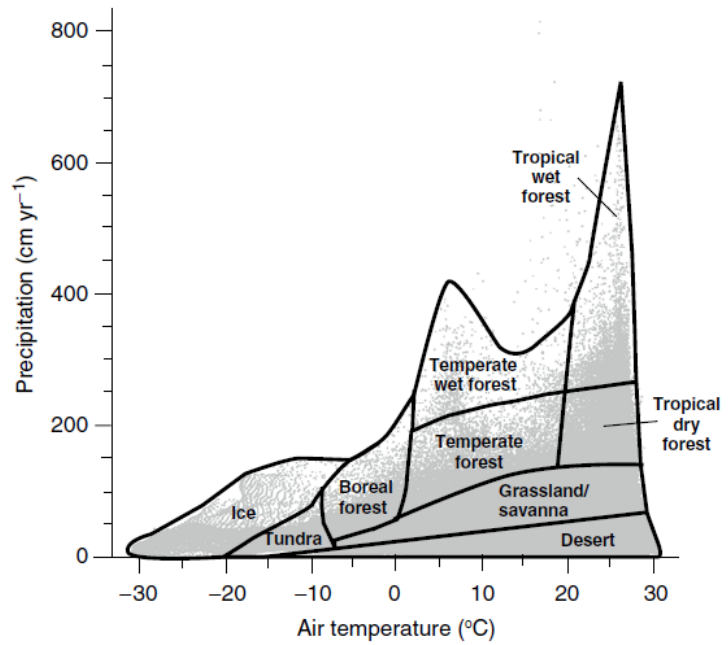
- growth form (trees, shrubs, herbs);
- function (evergreen, deciduous);
- leaf morphology (needle-leaved, broad-leaved);
- plant spacing (forest, woodland, savanna).

Terrestrial Forest Biomes of the World



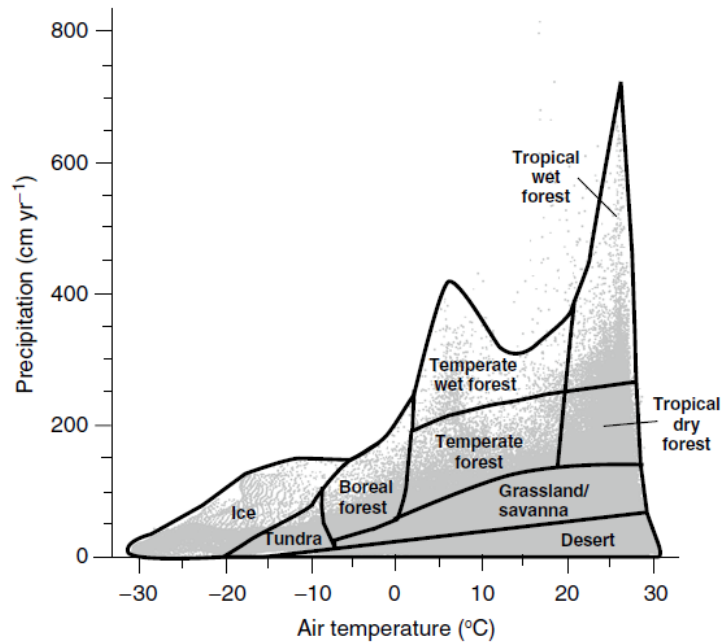
Chapin et al. 2011. Fig 2.24

Climate Controls on Biomes

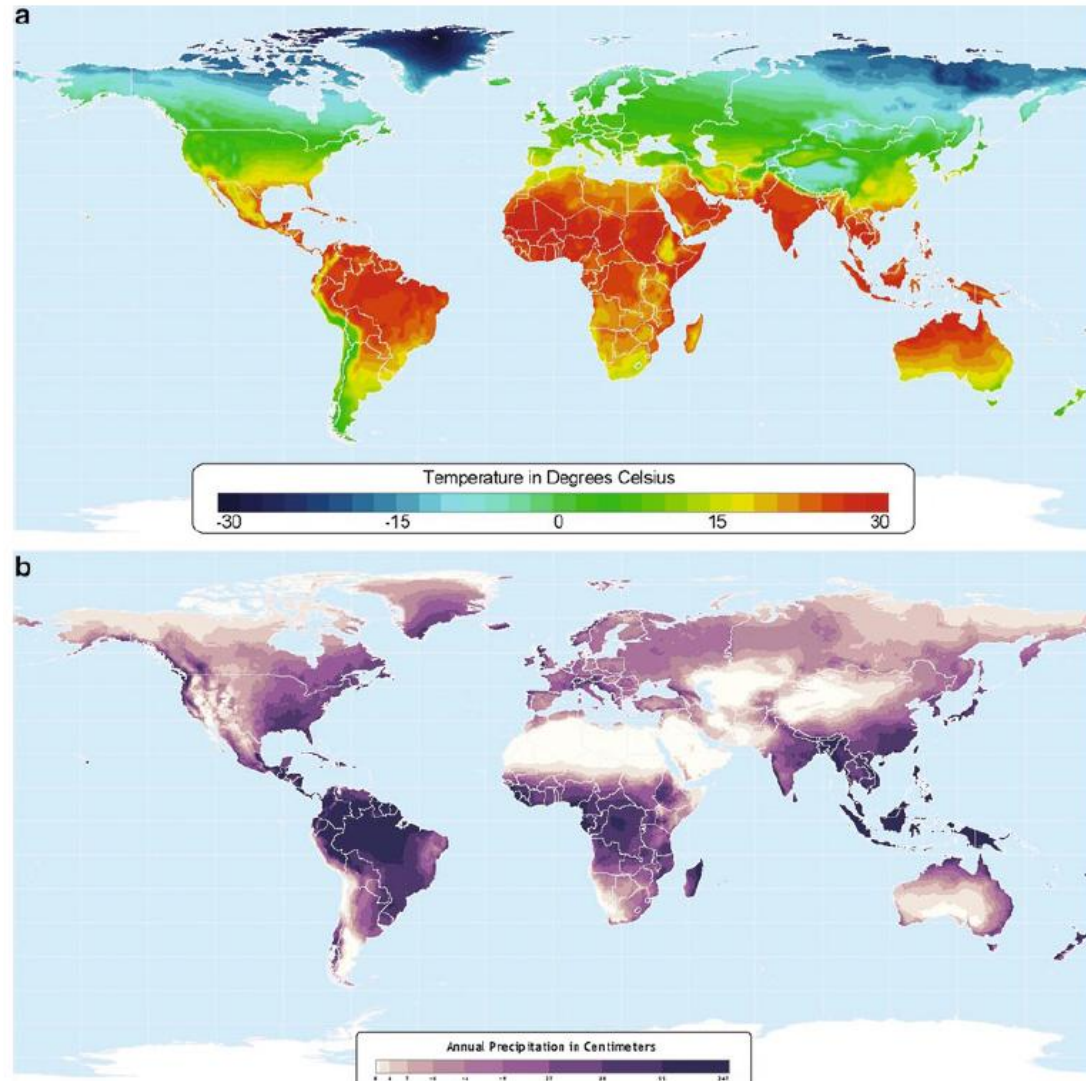


Chapin et al. 2011. Fig 2.23

Climate Controls on Biomes

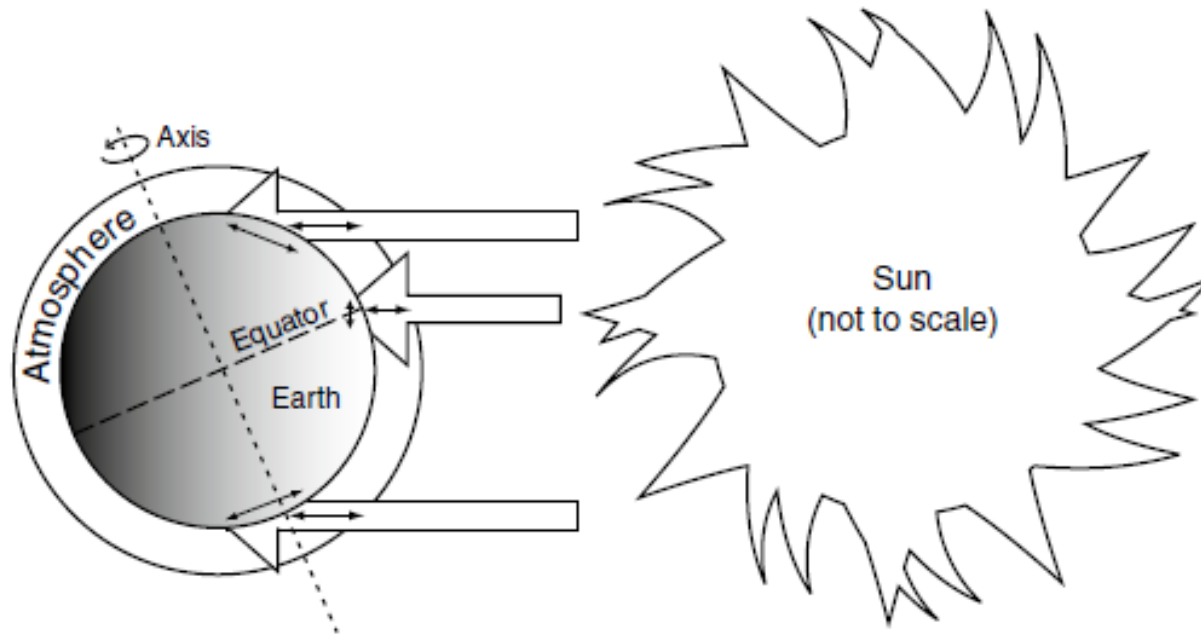


Biomes are predictable across the globe because climate varies predictably and plant lifeform, leaf type and spacing are all adaptations for coping with climate and related constraints.



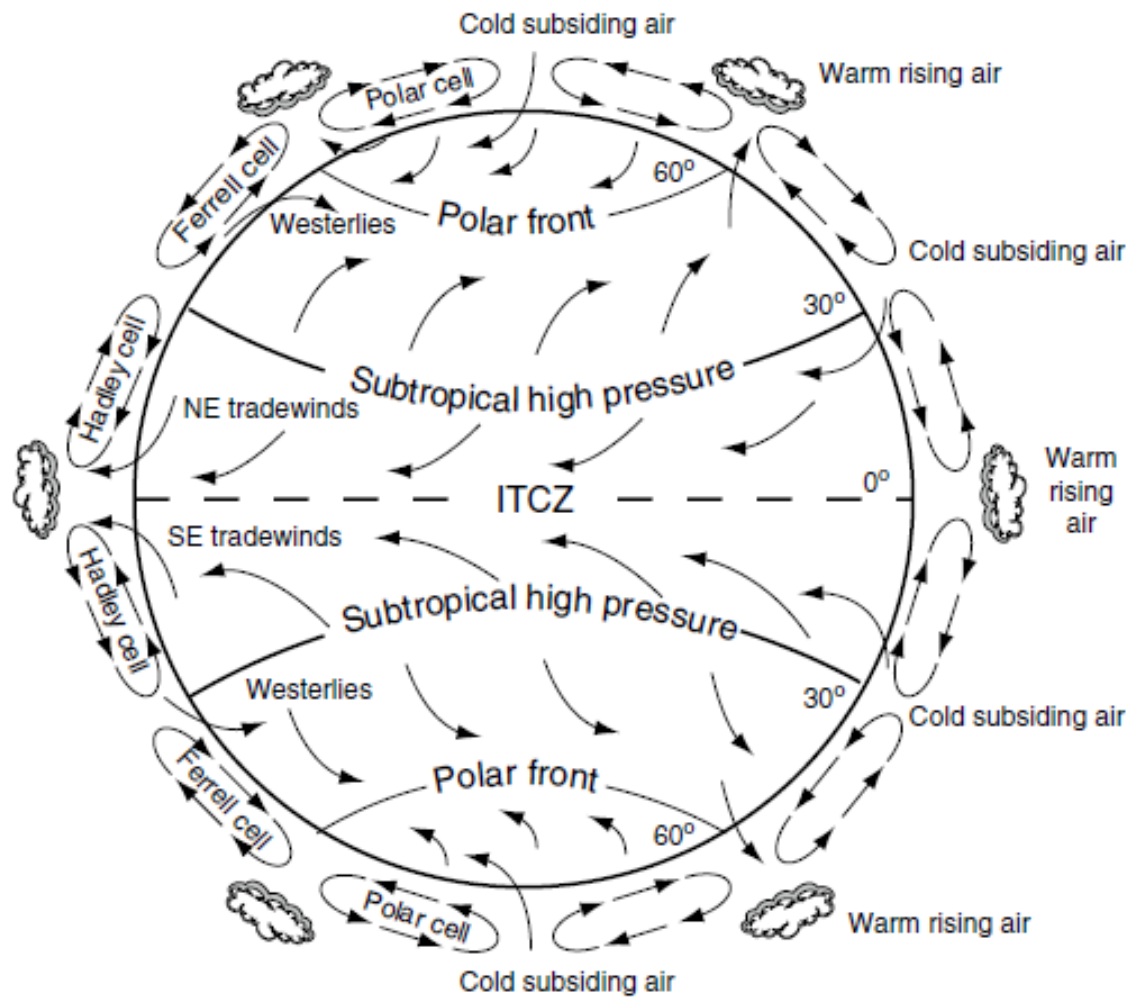
Chapin et al. 2011. Fig 2.23

Climate Controls on Biomes: Atmospheric Circulation



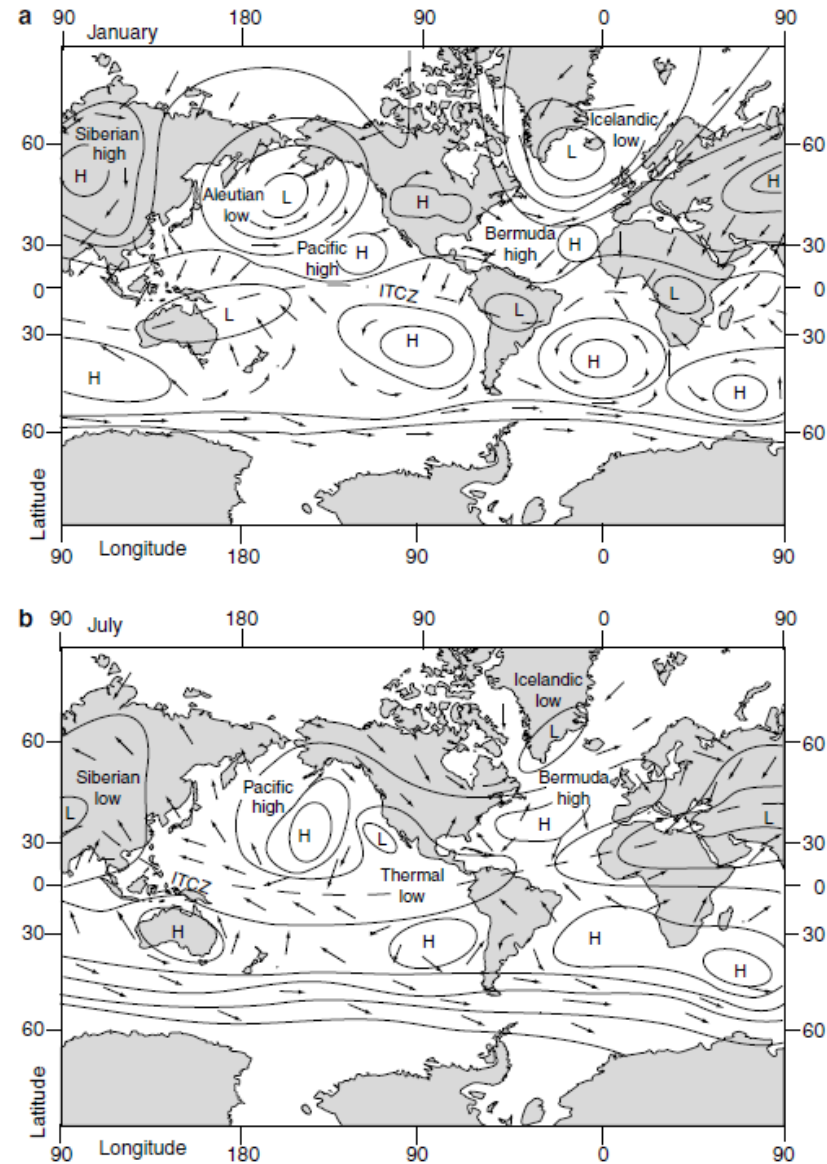
Chapin et al. 2011. Fig 2.6

Climate Controls on Biomes: Atmospheric Circulation

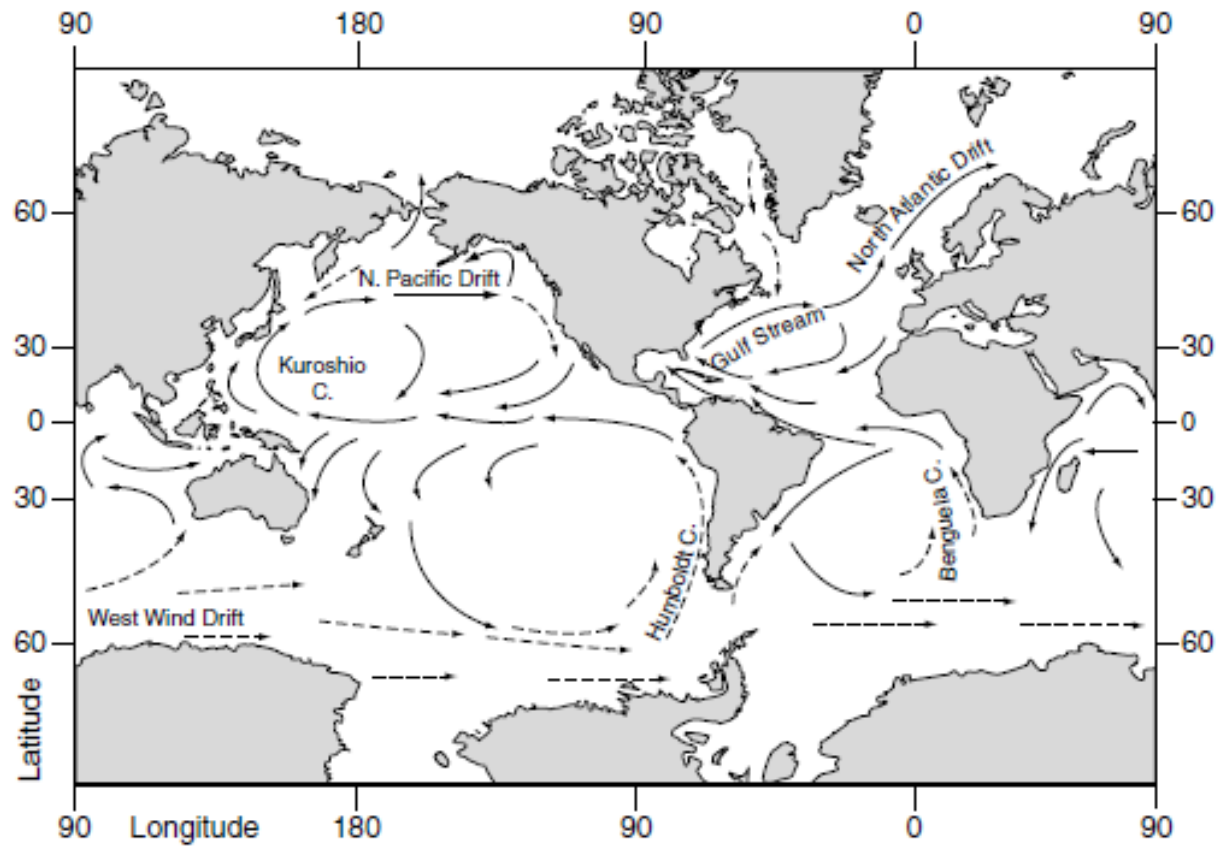


Chapin et al. 2011. Fig 2.8

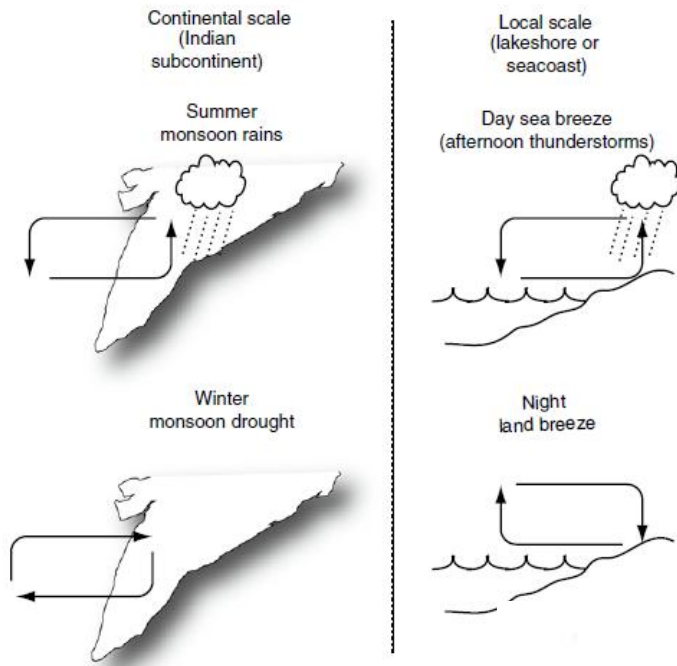
Climate Controls on Biomes: Atmospheric Circulation



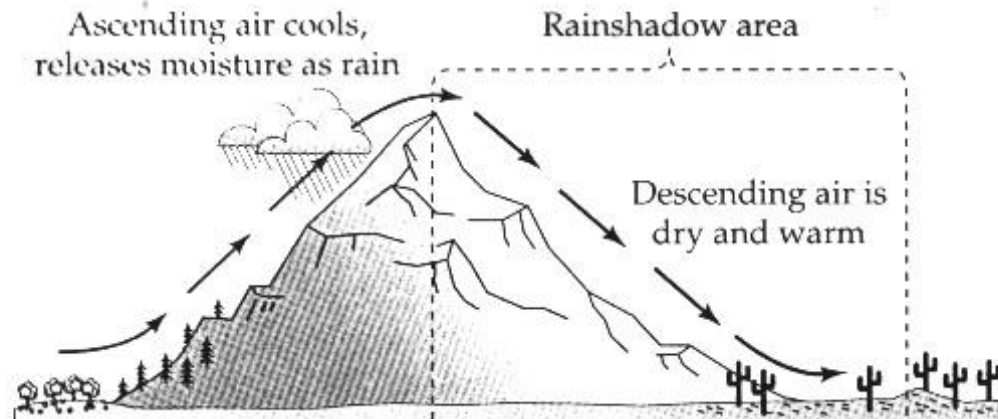
Climate Controls on Biomes: Ocean Circulation

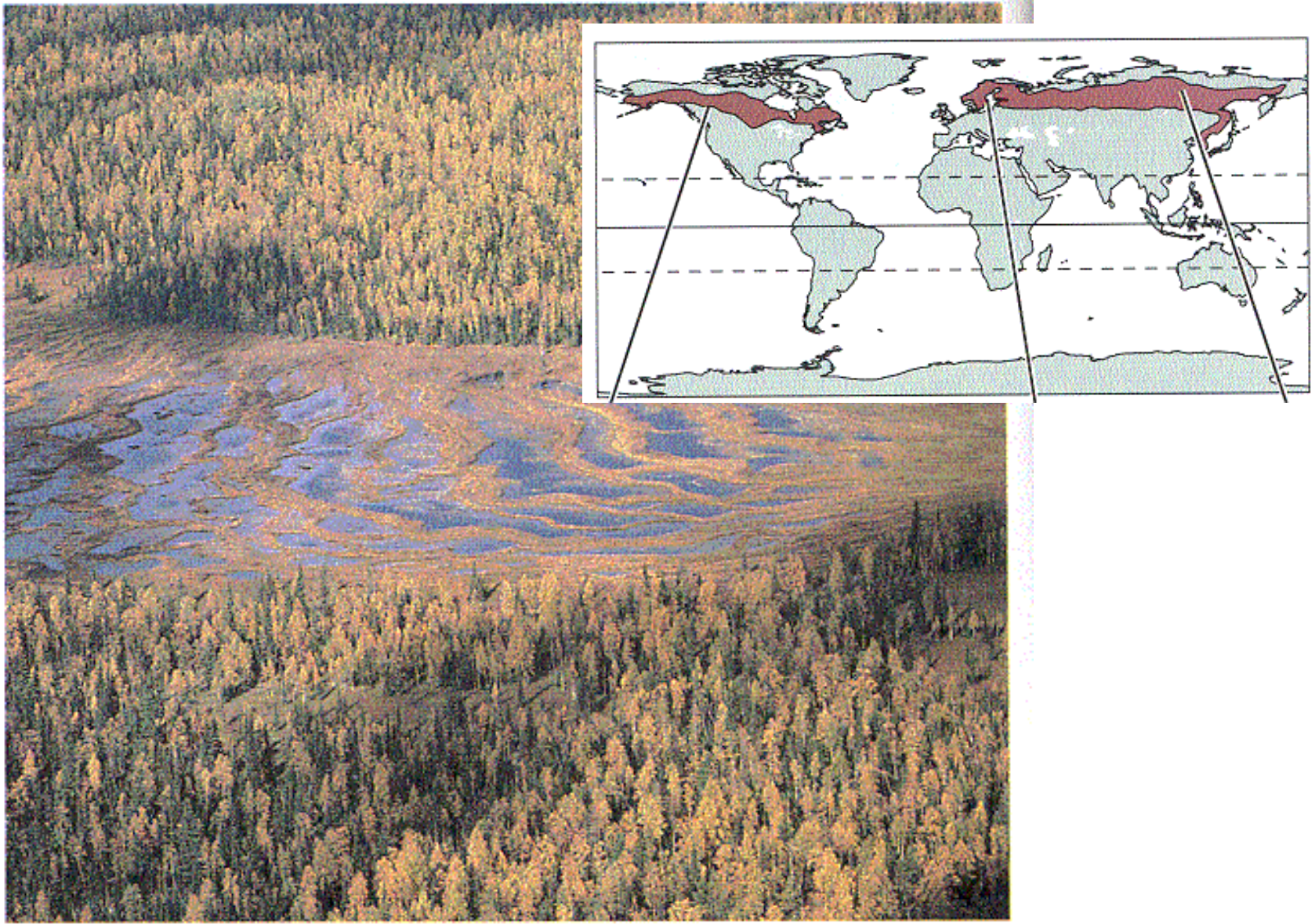


Climate Controls on Biomes: Landform Effects



Chapin et al. 2011. Fig 2.9

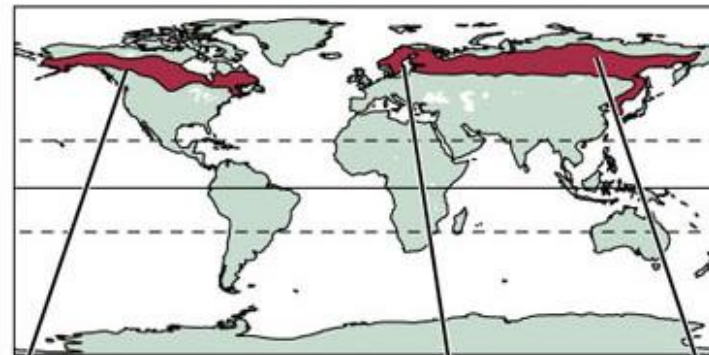




Boreal Forest

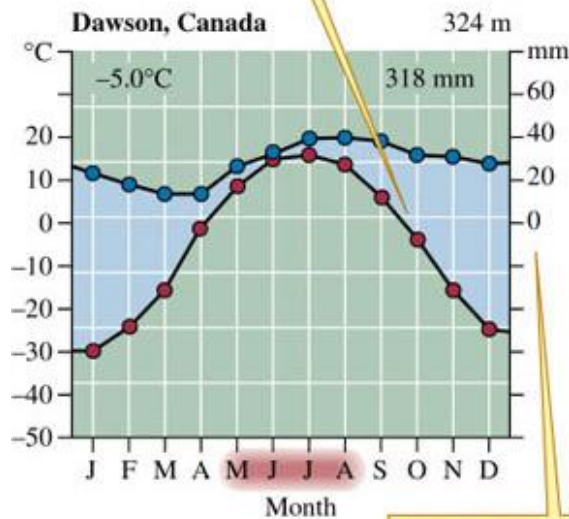
Boreal Forest (Taiga)

■ Moist ■ Dry ■ Mean minimum temperature $>0^{\circ}\text{C}$

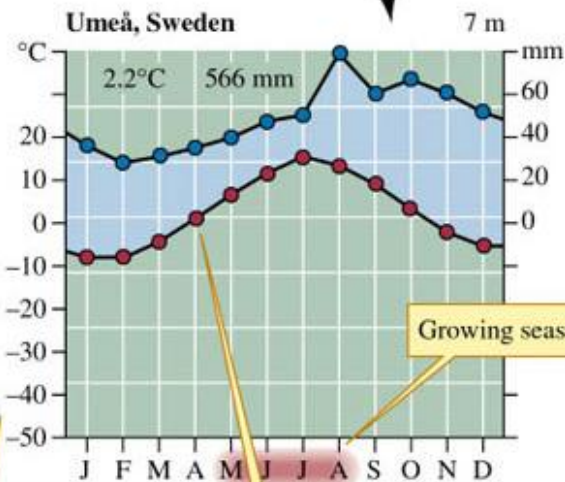


Tropic of Cancer
 Equator
 Tropic of Capricorn

Boreal forest climate often shows great temperature variation.

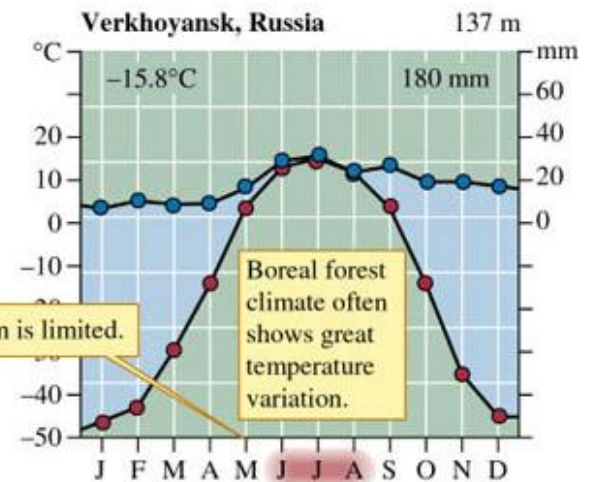


Modified temperature and precipitation scales reflect cold, dry climate.

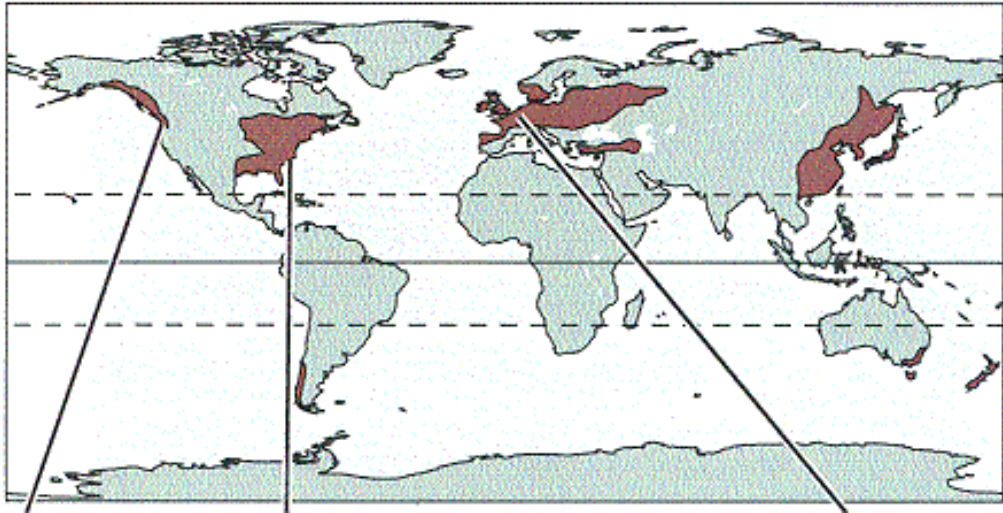


Proximity to the sea moderates temperatures.

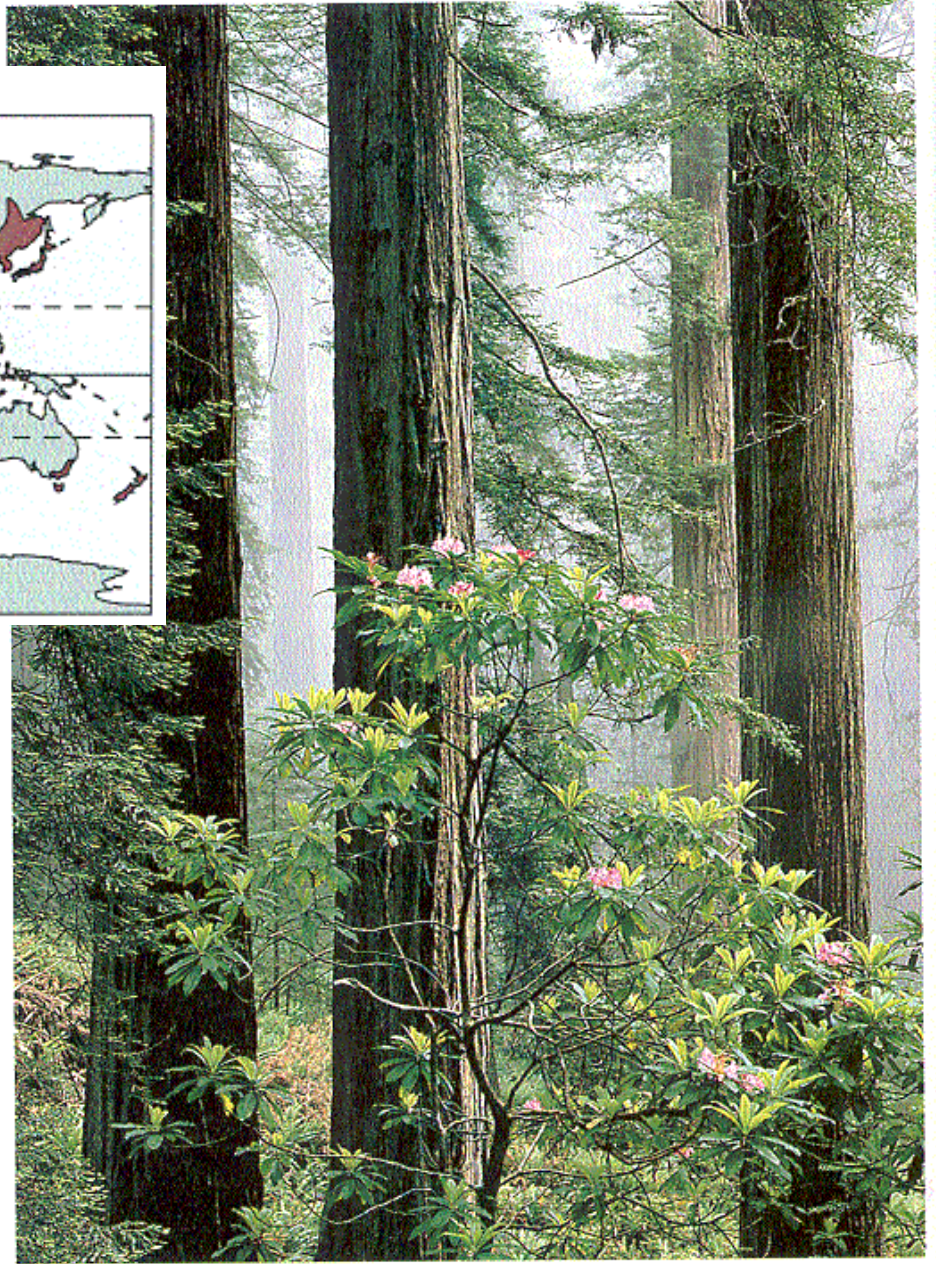
Growing season is limited.



Boreal forest climate often shows great temperature variation.

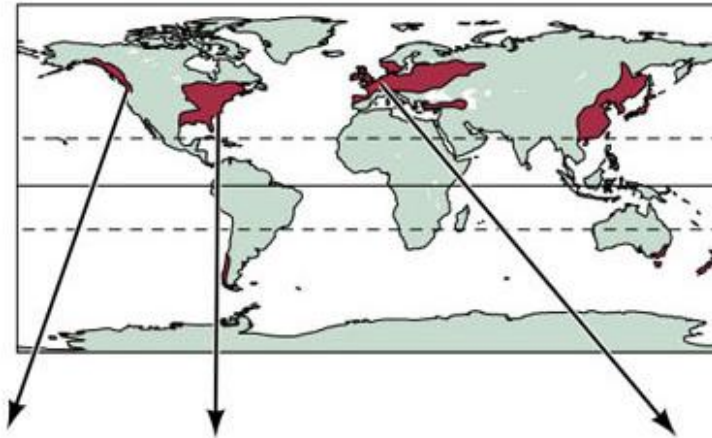


Temperate Forest

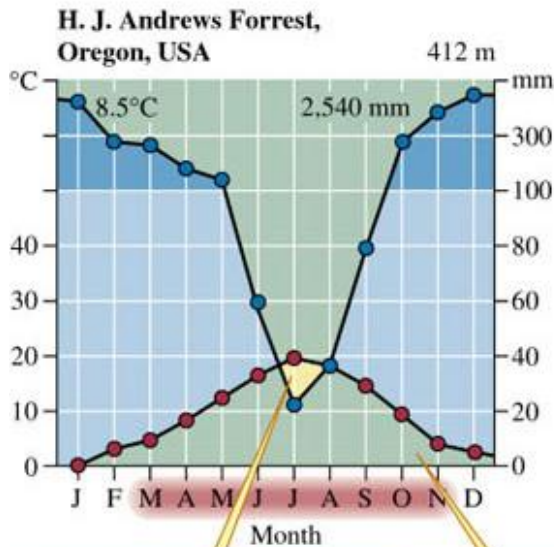


Temperate Forest

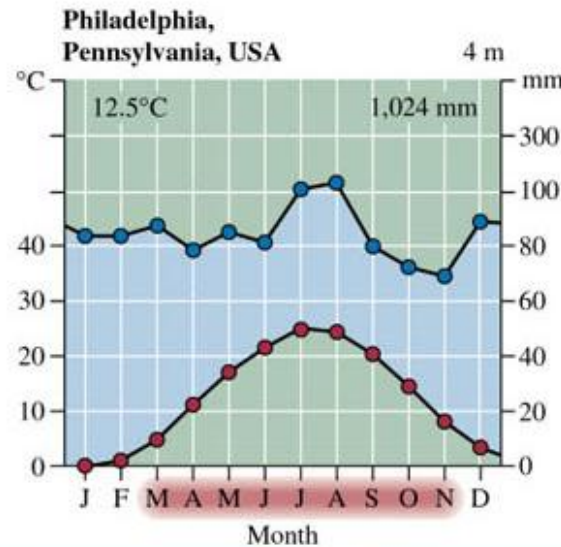
Moist Dry Mean minimum temperature $>0^{\circ}\text{C}$



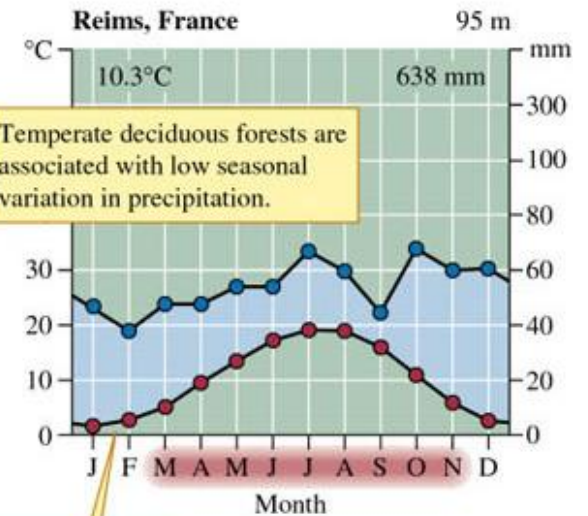
Tropic of Cancer
Equator
Tropic of Capricorn



Temperate coniferous forests are associated with seasonal drought.



Moderate variation in temperature.



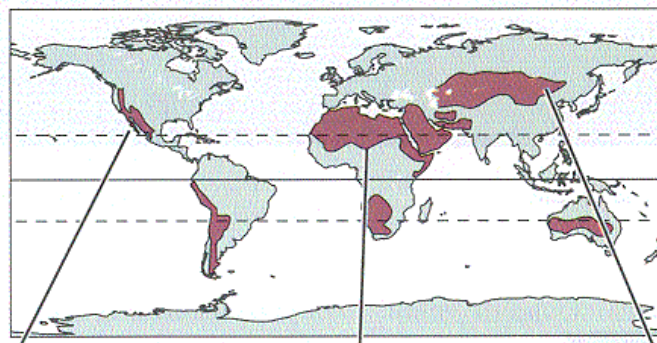
Temperate deciduous forests are associated with low seasonal variation in precipitation.

Moderate variation in temperature.



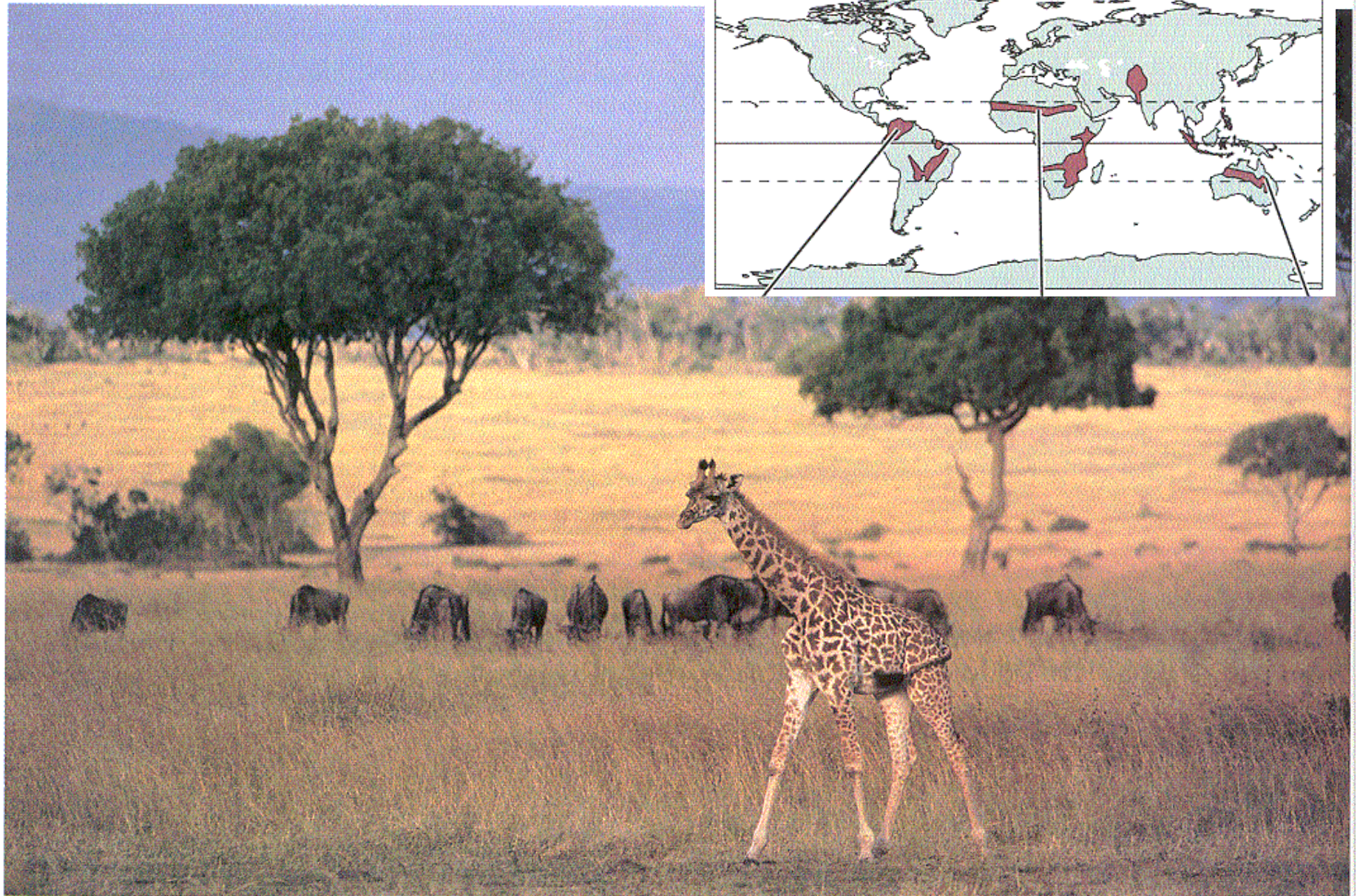
FIGURE 2.18 *Life on the edge. Two dormant acacia trees living on the boundary of a gravel plain and sand dunes in the Namib Desert of southwestern Africa.*

■ Moist
 ■ Dry
 ■ Mean
 minimum
 temperature $>0^{\circ}\text{C}$



Tropic of Cancer
 Equator
 Tropic of Capricorn

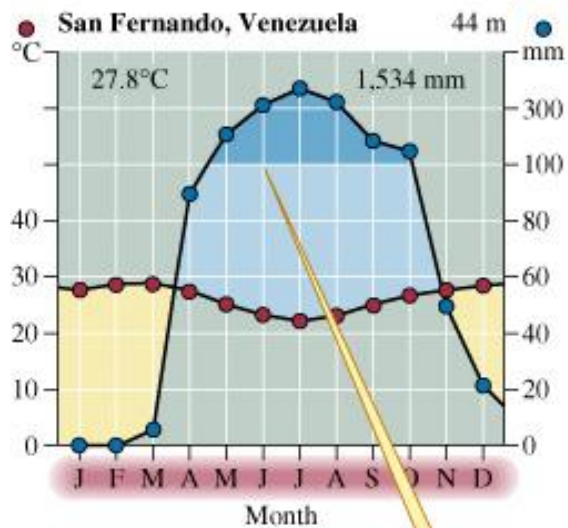
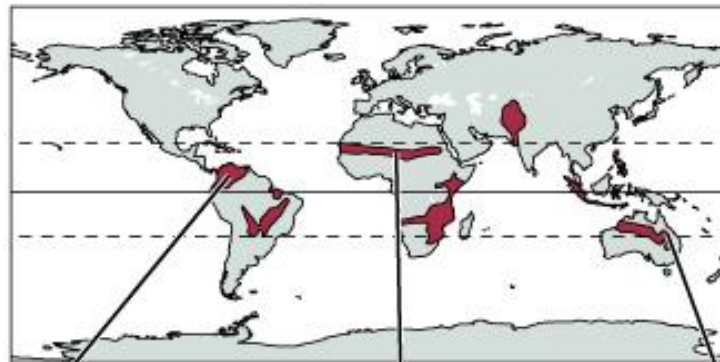
Desert



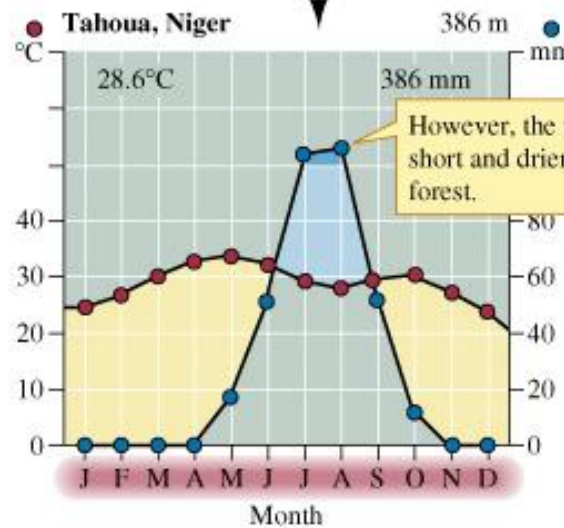
Tropical Savanna

Tropical Savanna

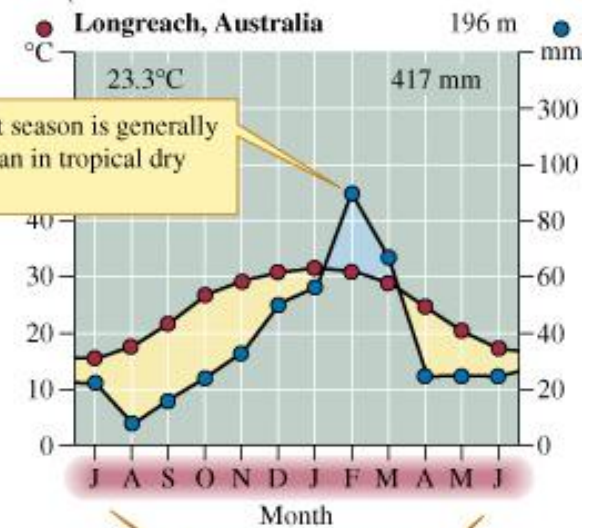
Moist Dry Mean minimum temperature $>0^{\circ}\text{C}$



There is tropical savanna in some wet regions where impermeable subsoil creates conditions more favorable to grasses than trees.



However, the wet season is generally short and drier than in tropical dry forest.



This is a Southern Hemisphere site, so months are ordered July to June.

Tropical Rain Forest

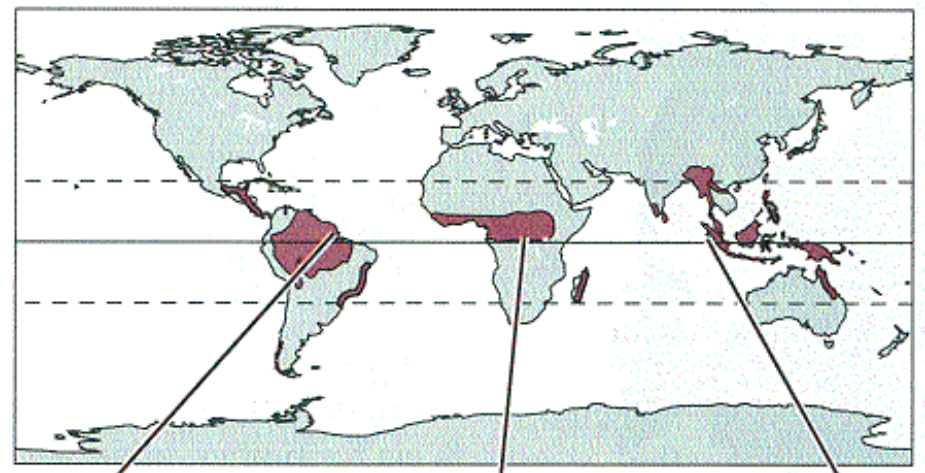
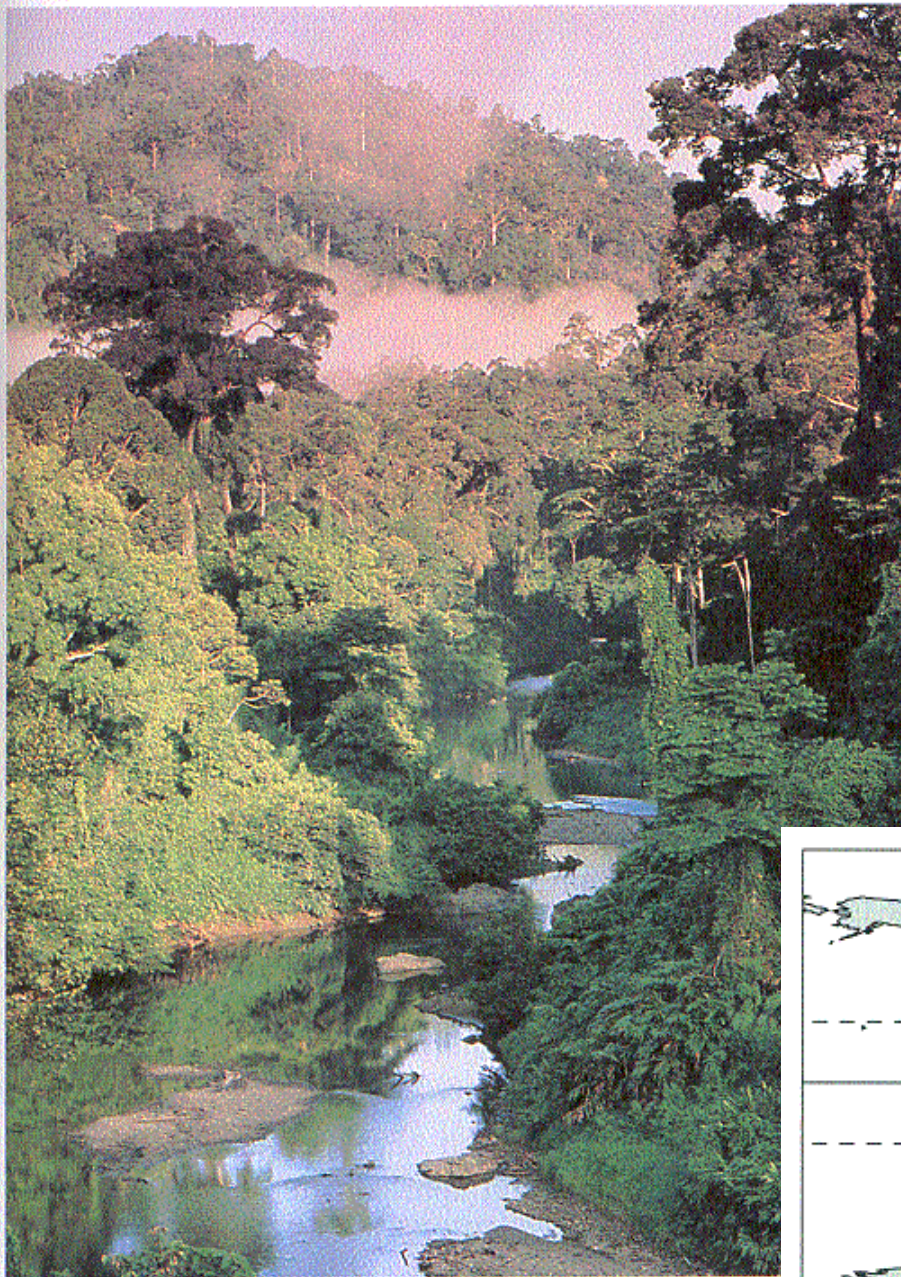




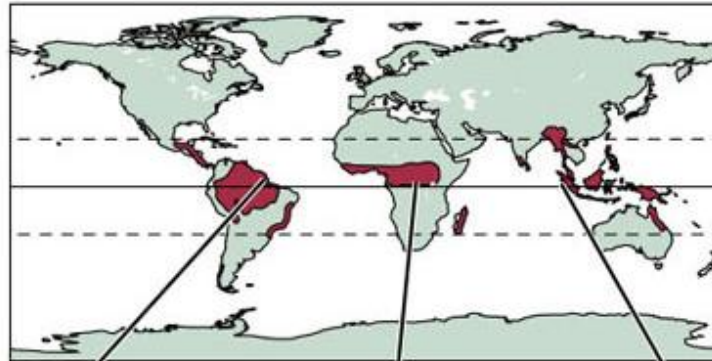
FIGURE 2.9 *Tropical rain forest in Borneo.*

Tropical Rainforests

Moist  Dry  Mean minimum temperature $>0^{\circ}\text{C}$

Precipitation exceeds 100 mm during most months.

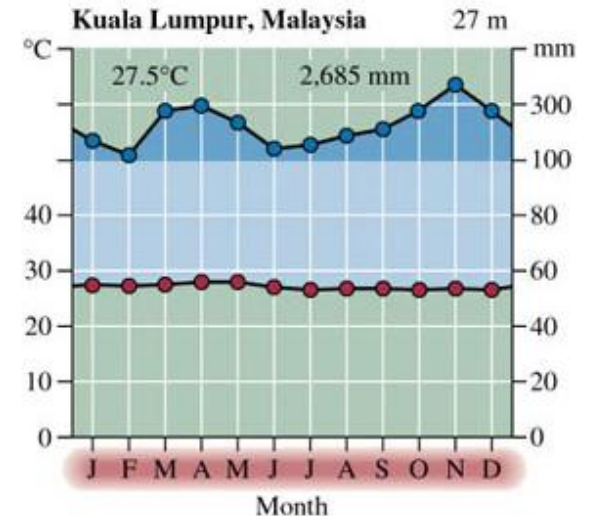
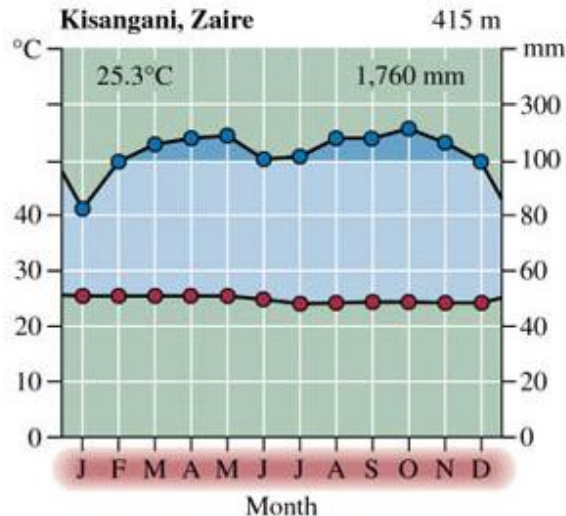
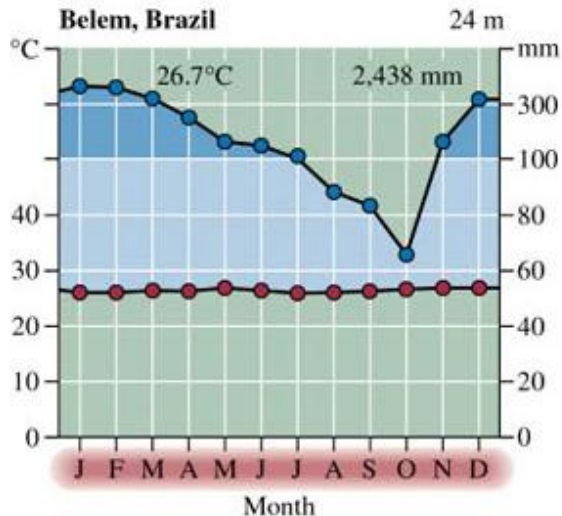
Annual variation in temperature is slight.



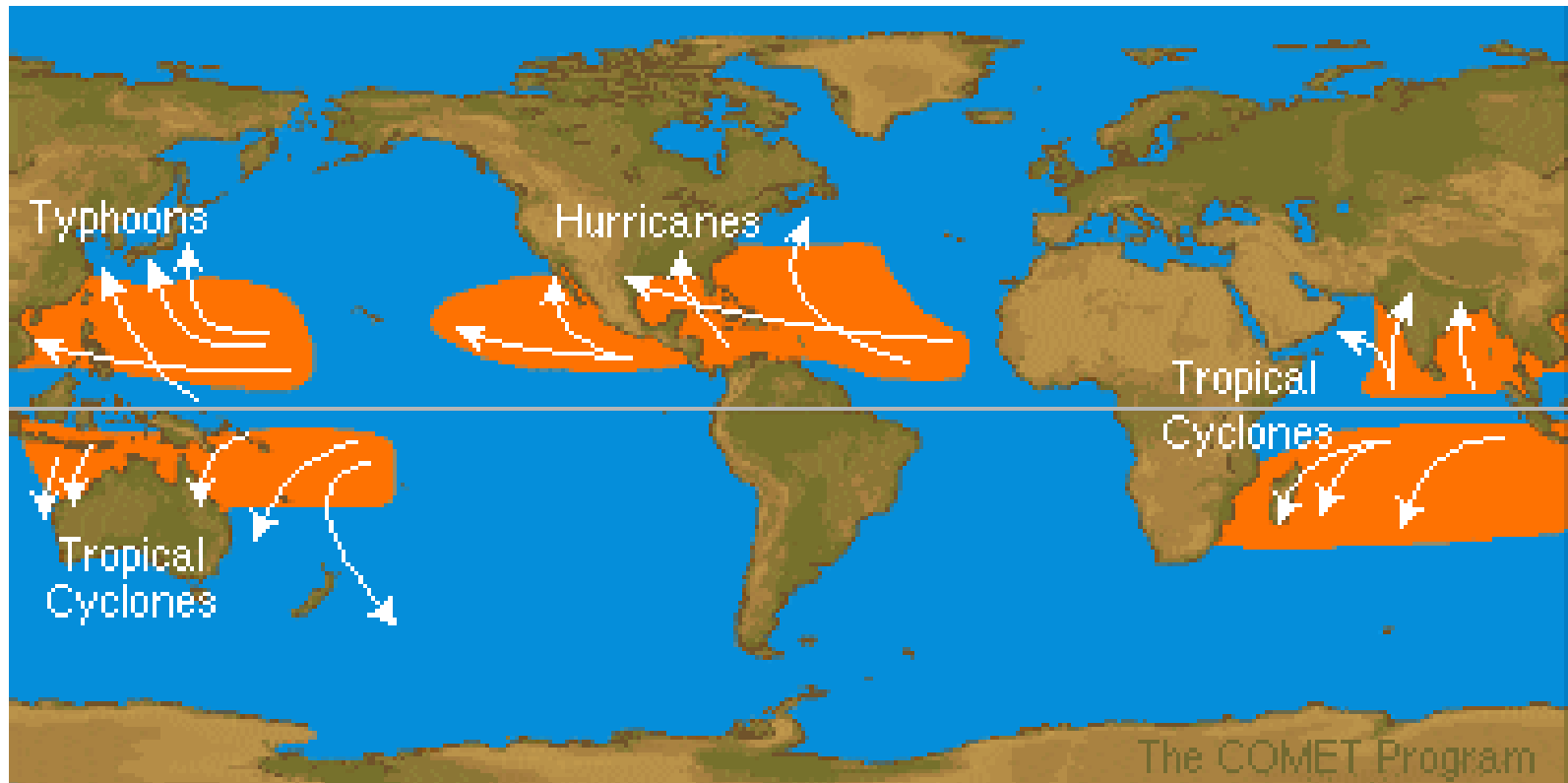
Tropic of Cancer

Equator

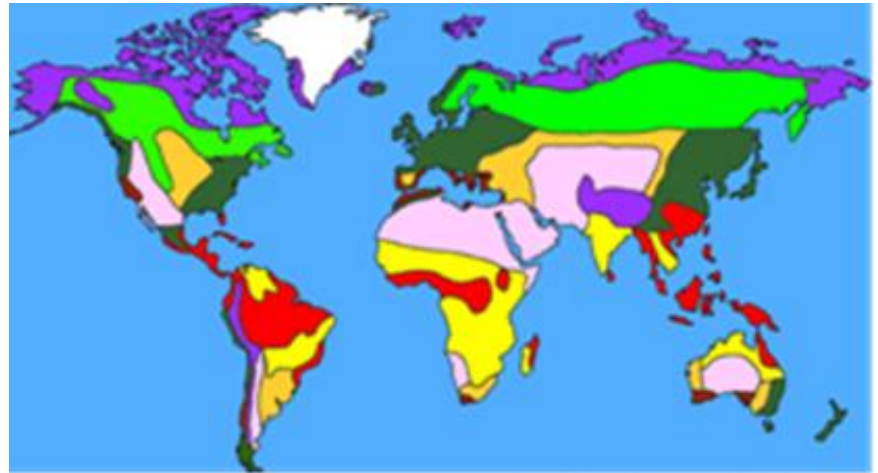
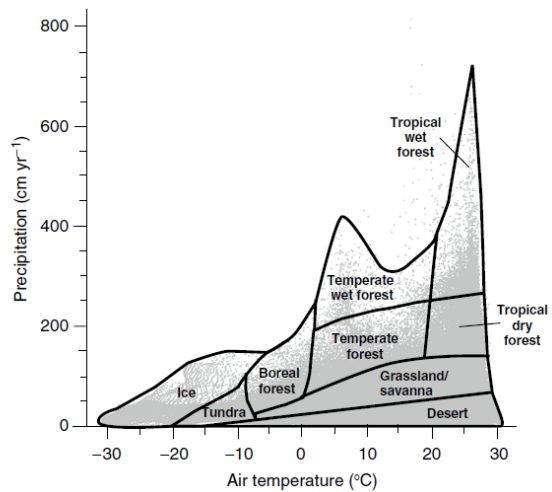
Tropic of Capricorn



Climate Controls on Biomes: Disturbance regimes



Implications of Global Atmospheric, Ocean, and Landform Patterns



Biome physiognomy, distributions and storm disturbances are functions of global abiotic patterns filtered through plant adaptations.

Discussion Question

To what extent are ecological system structure, function, and composition predictable based on global abiotic factors alone? What ecological principles may govern such predictions?

Trait	Biome 1	Biome 2	Biome 3
Vegetation composition			
Vegetation productivity			
Vegetation structure			
Landscape composition and configuration			
Disturbance regimes			
Population dynamics			
Community structure and interactions			
Humans			

Sites for Virtual Biomes

World Wildlife Fund. <http://www.worldwildlife.org/science/wildfinder/>
Map of ecoregions, extensive description, list of species

Around the World: A biome Virtual Field Trip
<http://www.harlingen.isd.tenet.edu/tif/hhs/biome.html#Invitation>
Oriented towards K-12 groups?

MBGnet (Missouri Botanical Garden)
<http://www.mbgnet.net/>

Others?

References

Olson, D.M. et al. 2001. Terrestrial Ecoregions of the World: A New Map of Life on Earth. BioScience 51(11): 933-938.