

Rangeland Productivity

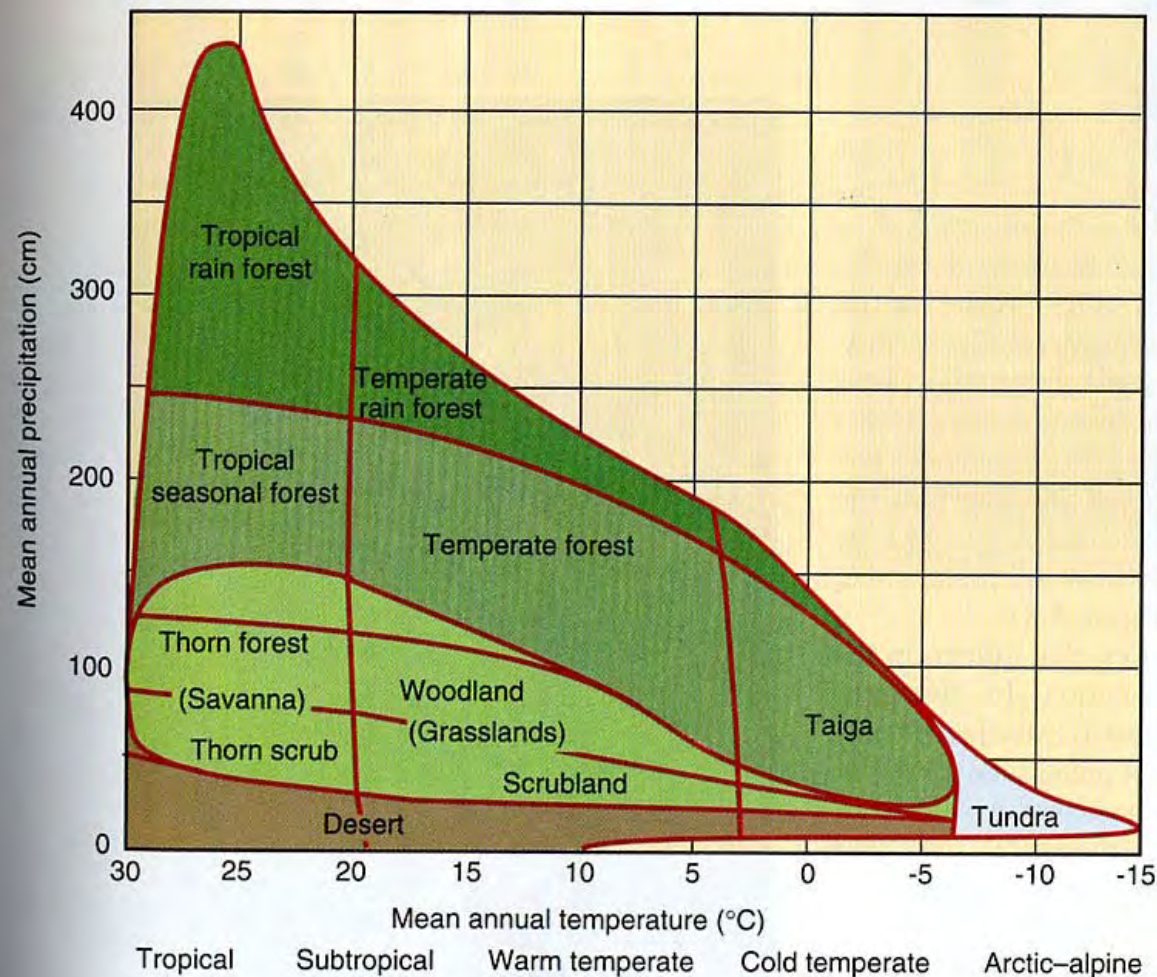


Figure 8.6 • A pattern of types of vegetation in relation to precipitation and temperature. Boundaries between types are approximate. For example, tropical rain forests occur in areas with an approximate annual rainfall of 250–450 cm/year and an approximate temperature range of 18°–28°C. Note that deserts occur over a wide range of annual temperatures, from 30°–5°C, as long as rainfall is less than about 50 cm/year. The warmer the climate, the more rainfall is required to move from desert to another biome. (Source: Adapted from R. H. Whittaker, *Communities and Ecosystems*, 2nd ed. [New York: Macmillan, 1975].)

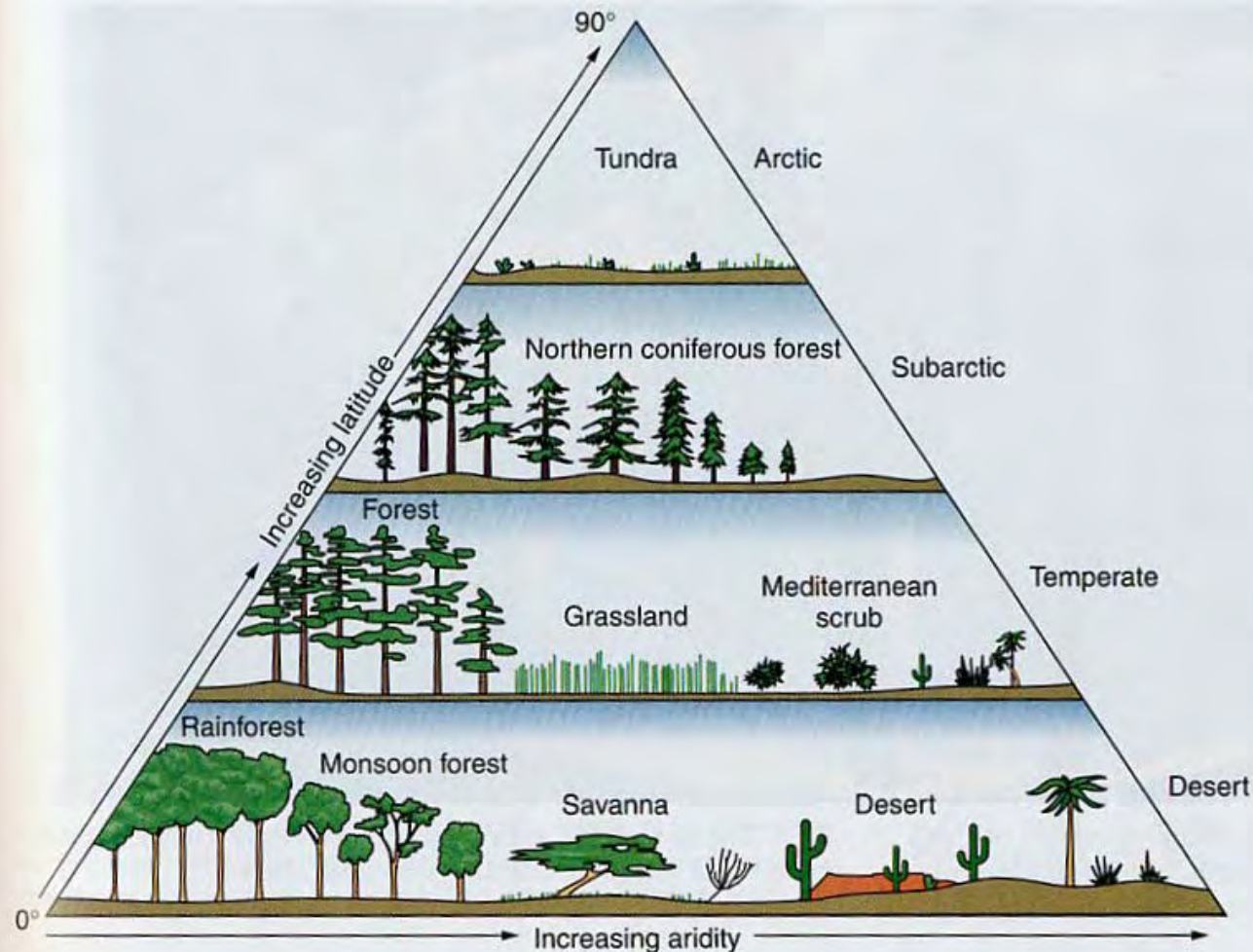
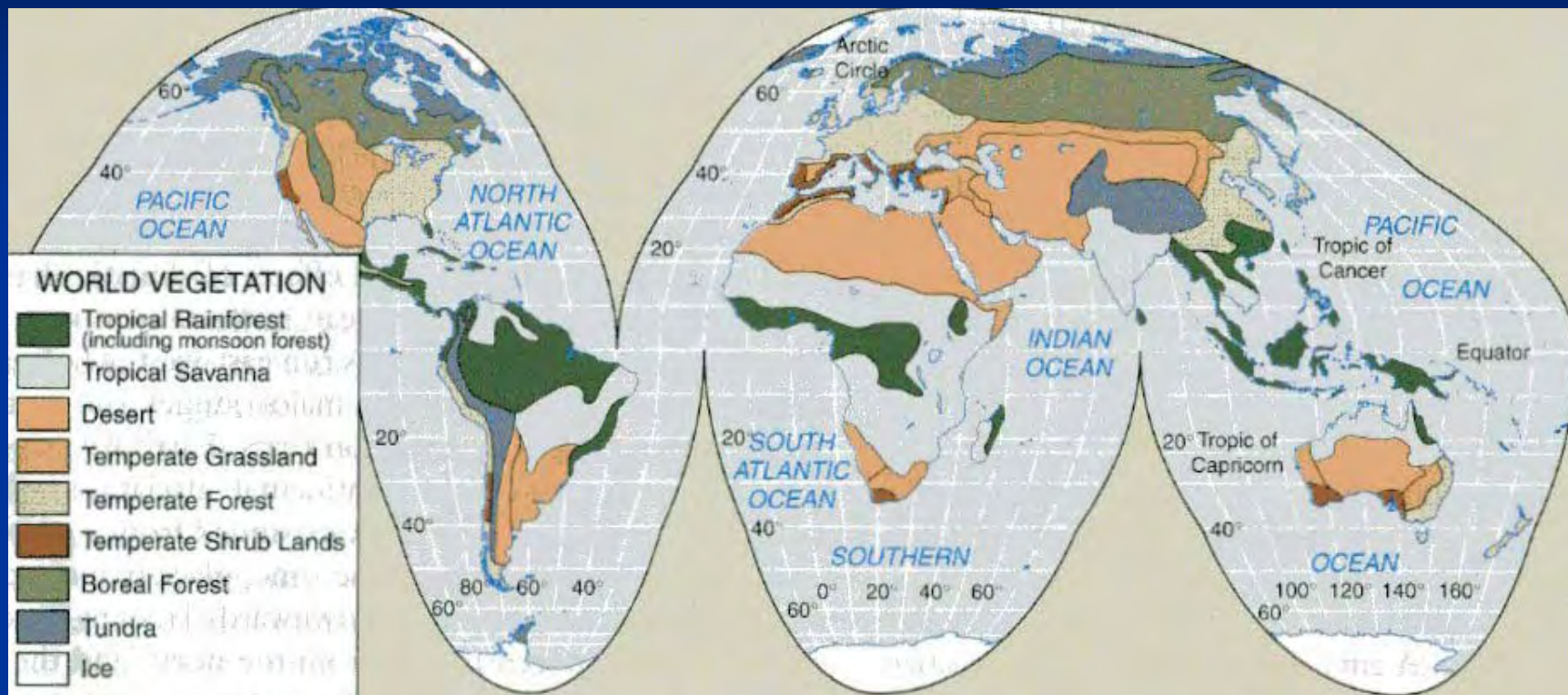
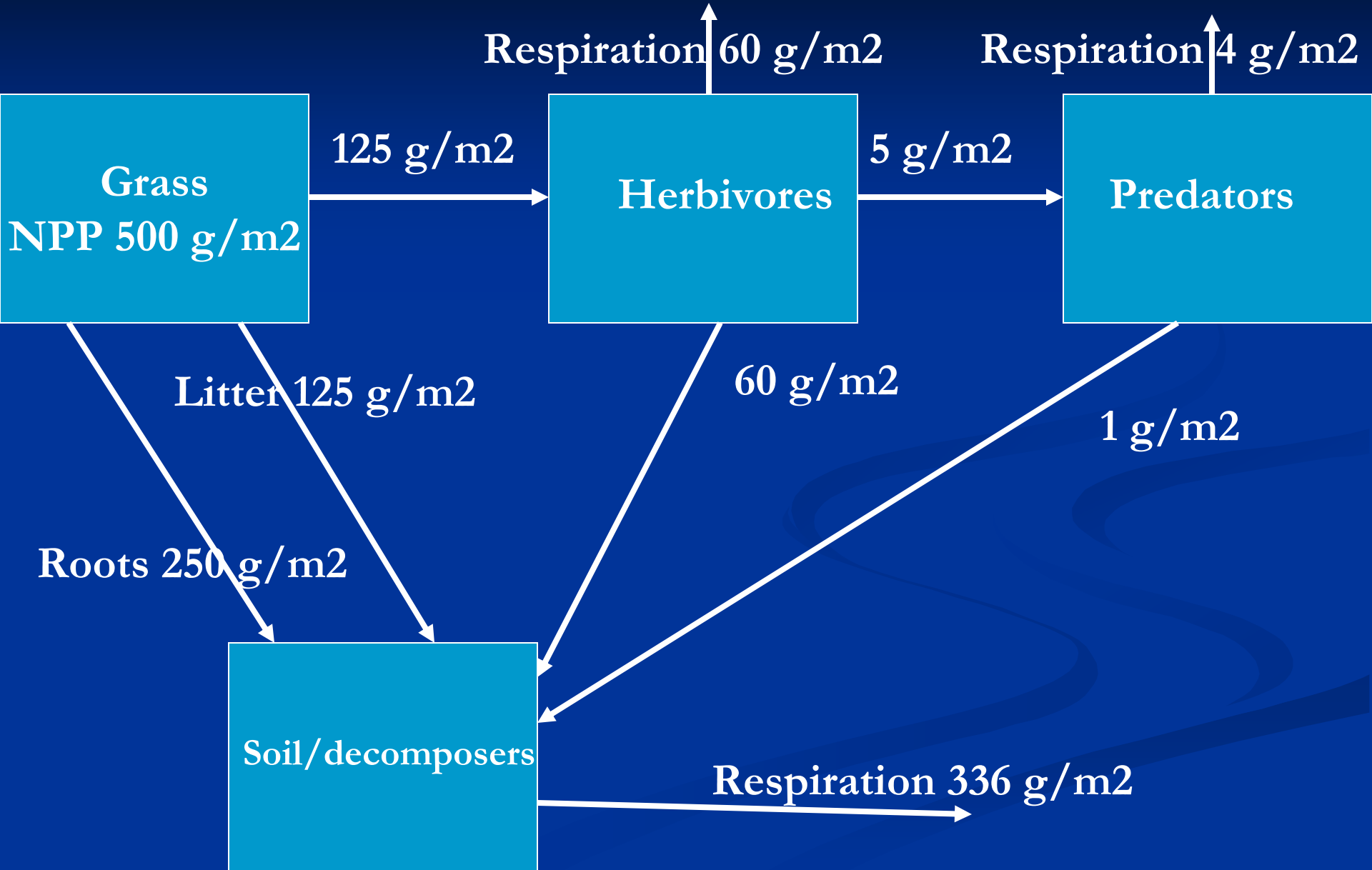


Figure 8.14 • Simplified diagram of the relationship between precipitation and latitude and Earth's major land biomes. Here, latitude serves as an index of average temperature, so latitude can be replaced by average temperature in this diagram. (Source: H. J. deBlij and P. O. Muller, *Physical Geography of the Global Environment* [New York: Wiley, 1996], Figure 27-4, p. 293.)

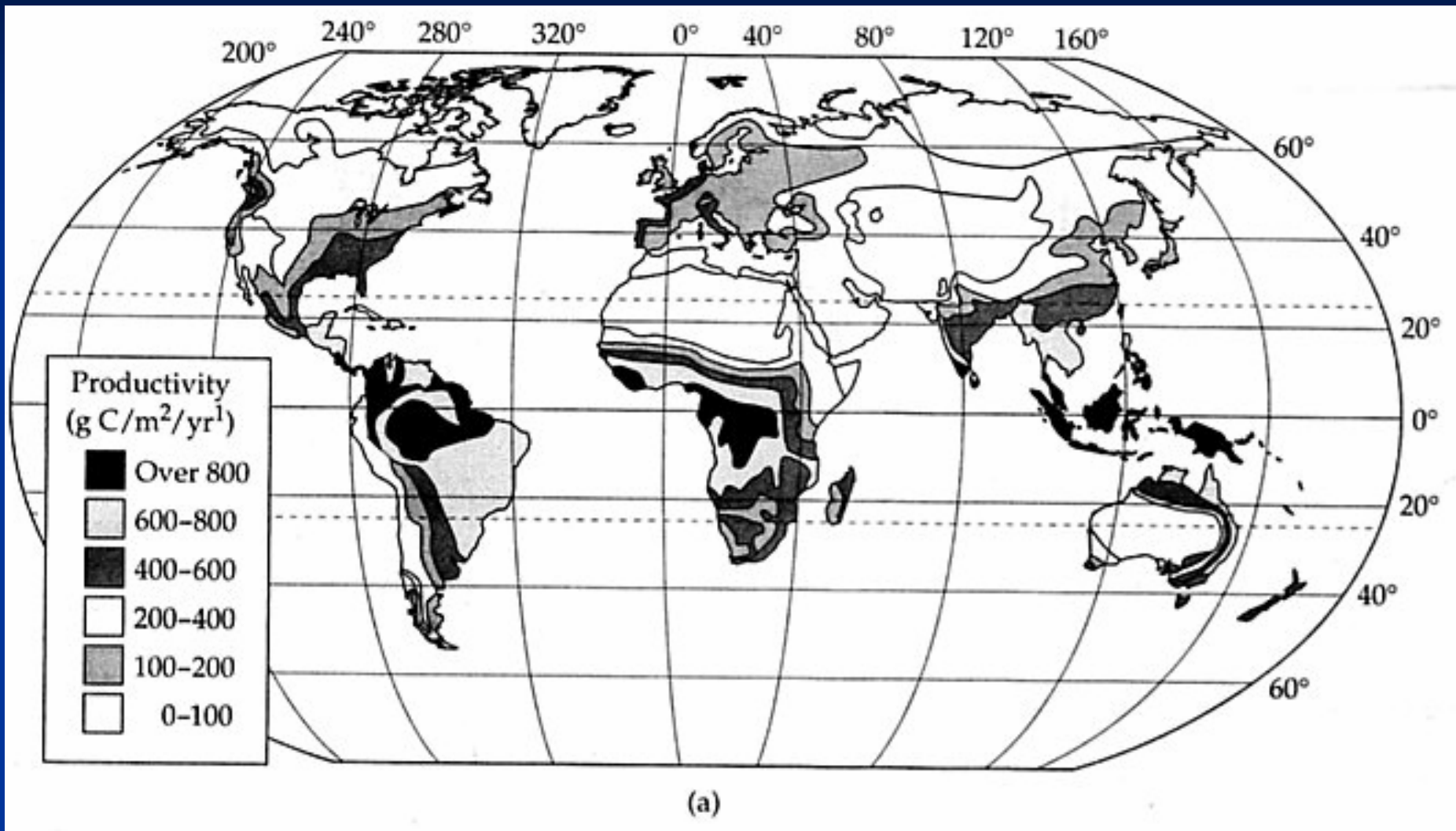


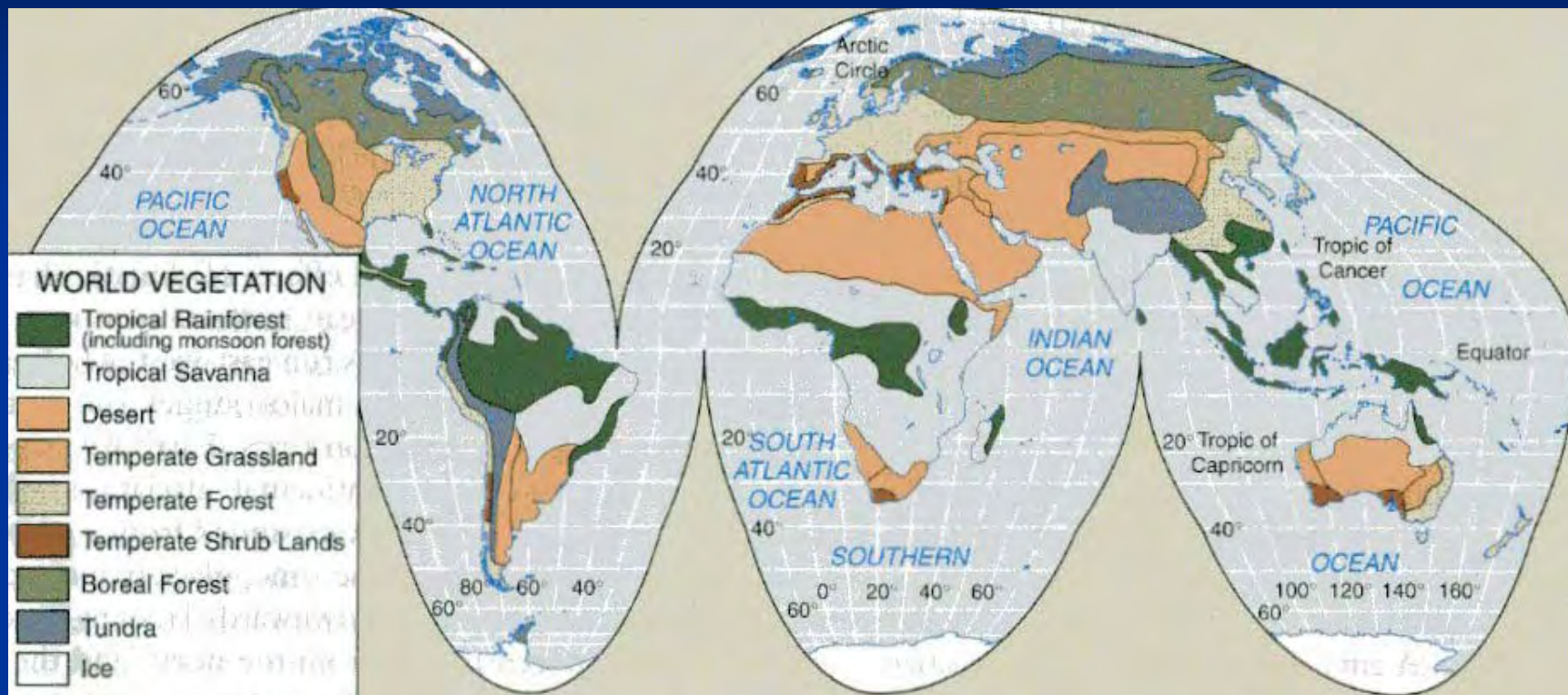
Energy flow in a simplified grassland ecosystem (grams dry matter/m²/year)



Productivity and diversity relationships among biomes

Biome	g Biomass/m ² /yr	g C/m ² /yr	Biodiversity
Tropical Forest	1900	850	very high
Temperate Forest	1250	550	medium
Savanna	900	400	medium
Boreal Forest	800	350	low
Mediterranean Shrubland	700	300	medium
Temperate Grassland	600	250	medium
Tundra	150	70	low
Desert	90	40	low
Cultivated	650	300	very low
Wetlands	2000	900	low
Lakes	250	110	low





Patagonian steppe



Perennial-dominated Coastal Prairie at Point Molate



Mesic Valley Grassland in northeastern San Joaquin Valley





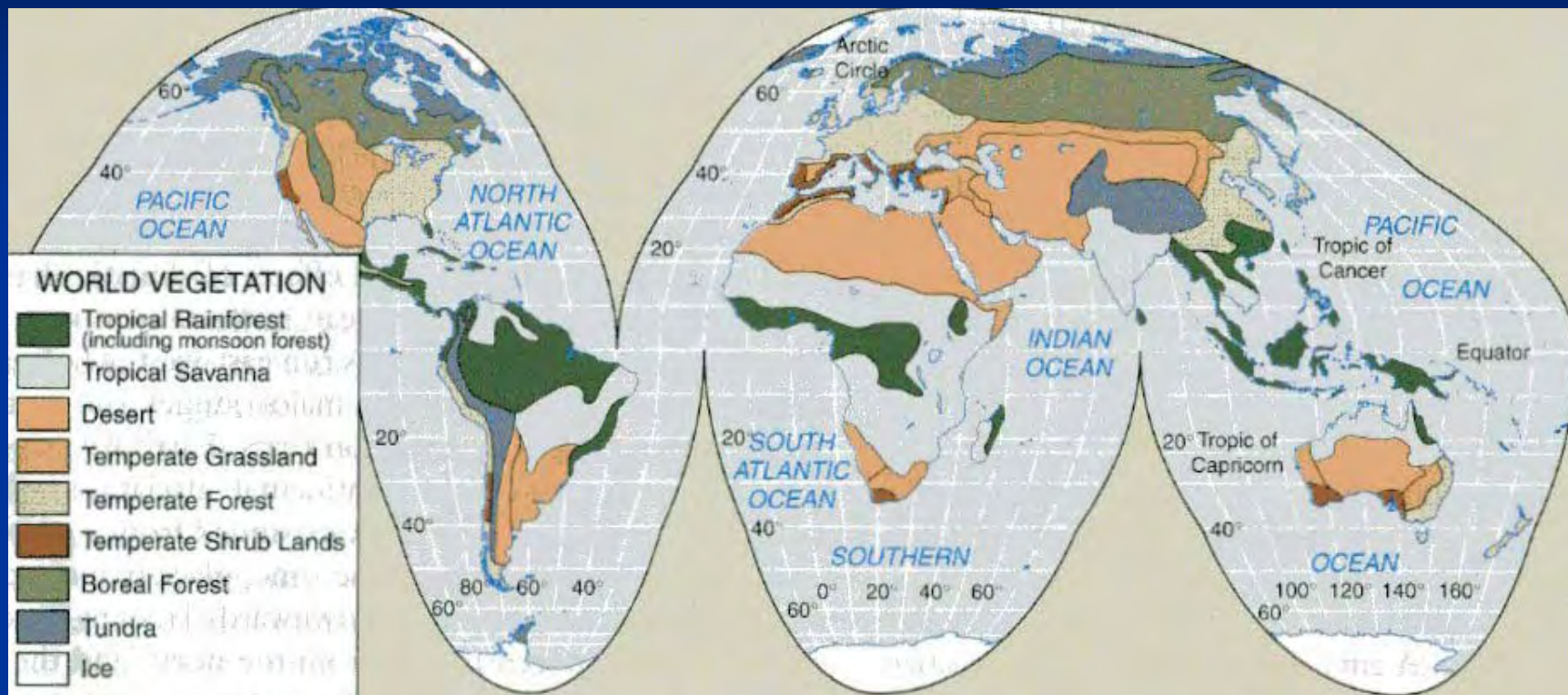
Bluebunch wheatgrass grassland, Oregon

Stoneman Meadow





Panicum turgidum “grassland” Mali



East African savanna



Californian oak woodland





Elephants in Acacia savanna

Elephants in former Acacia savanna



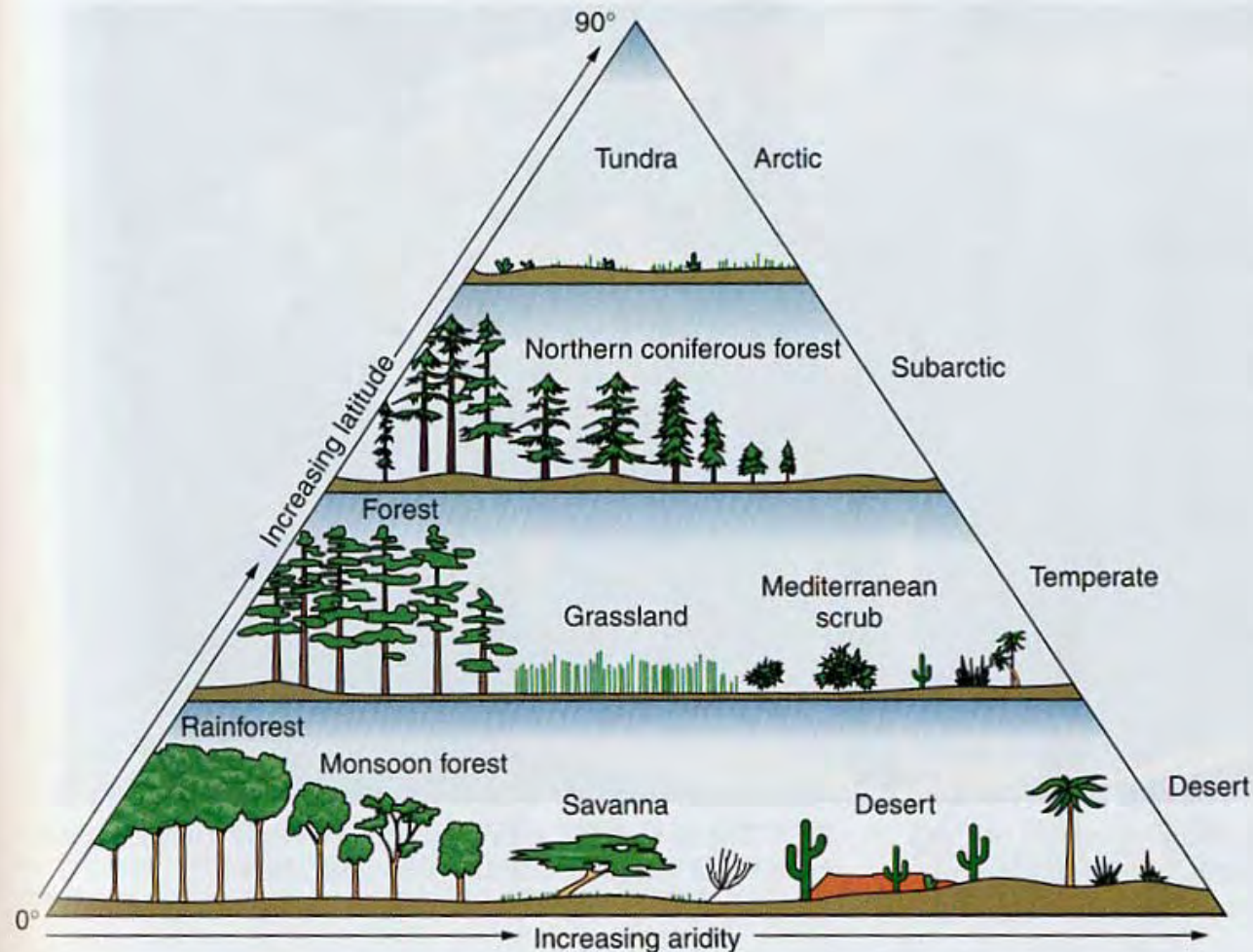
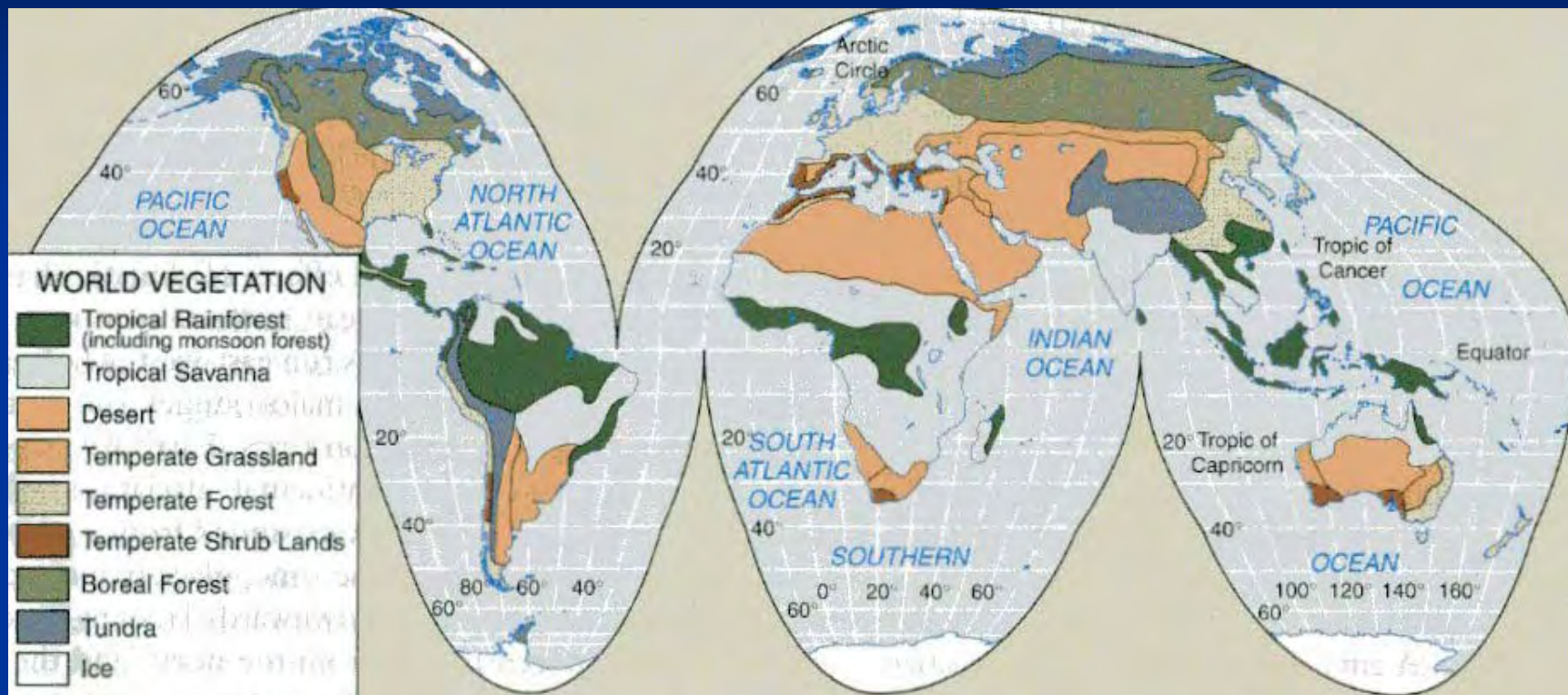


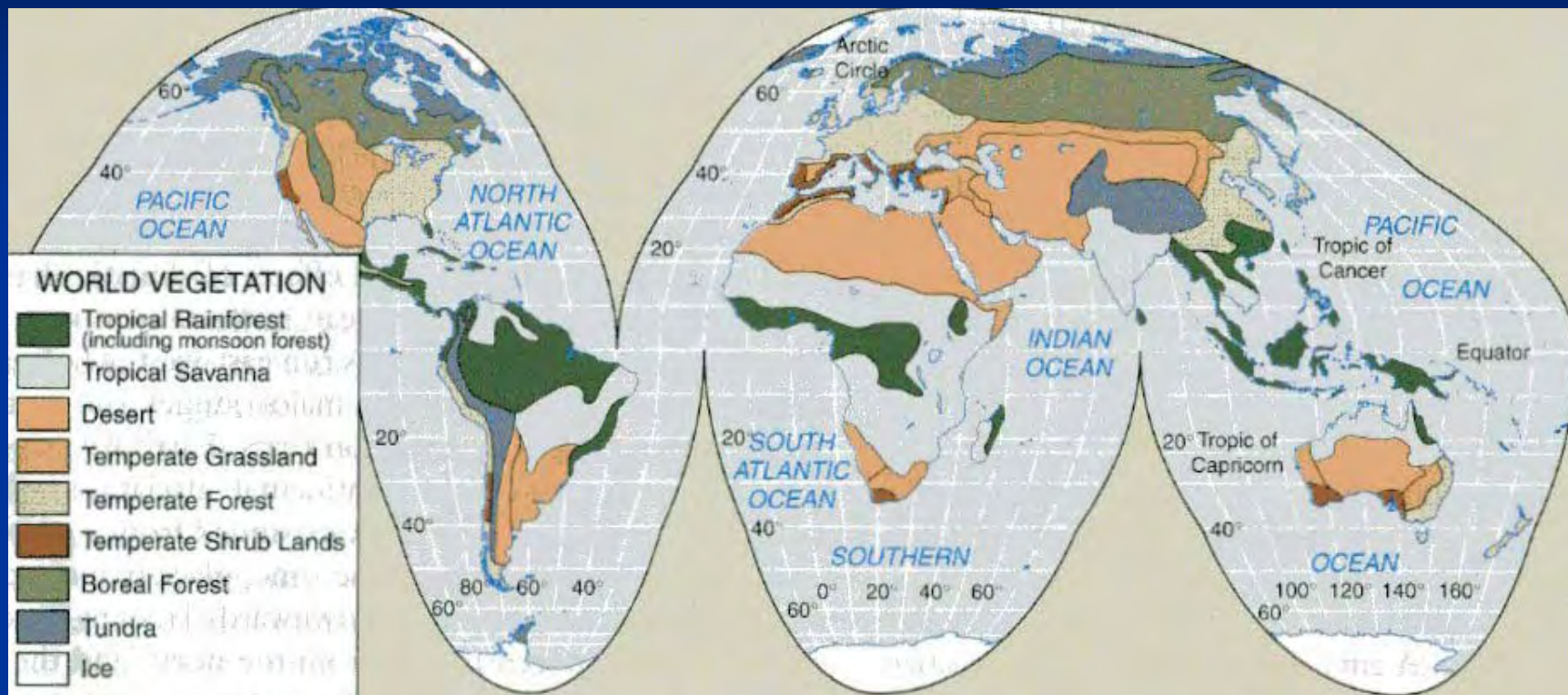
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Spanish Heather







Mojave desert shrubland





Rhanterium shrubland in Arabian Desert



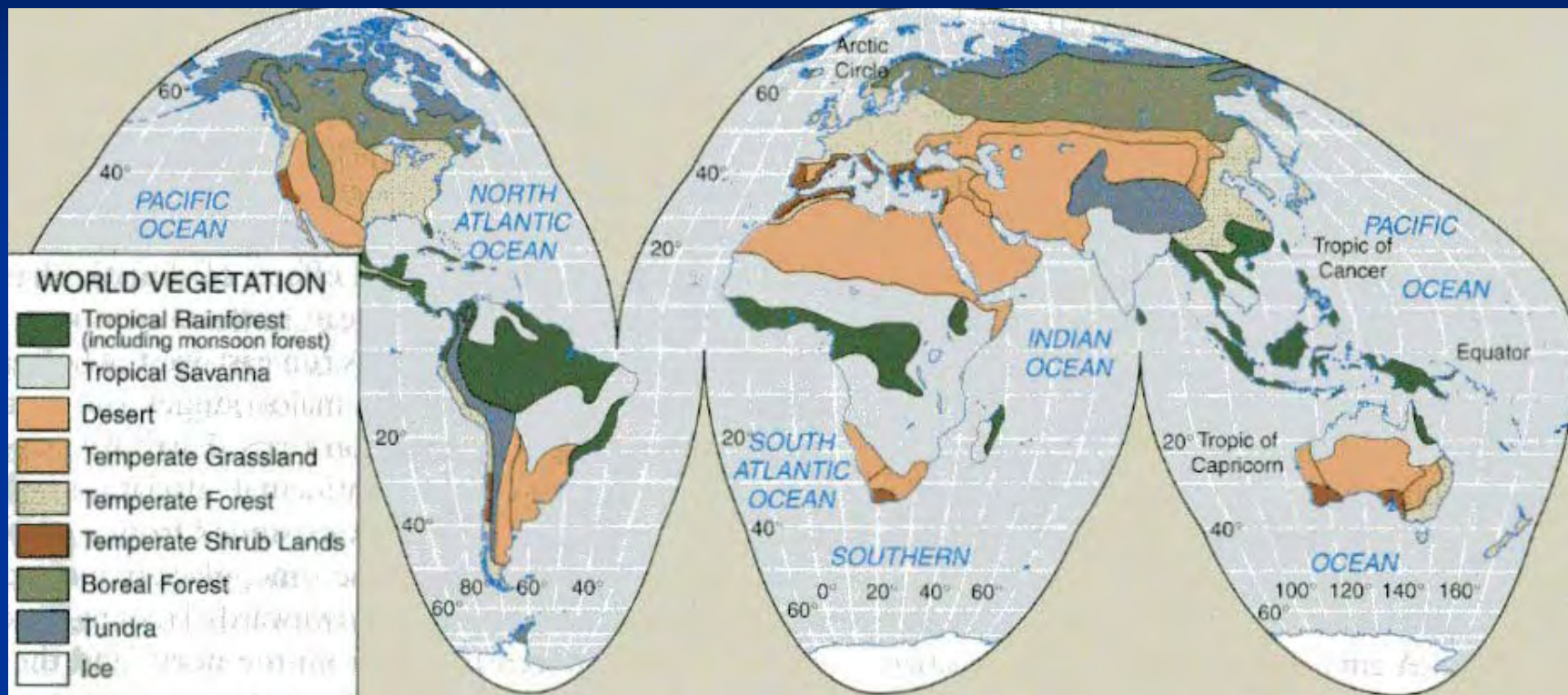
Joshua tree woodland, Mojave Desert



Mojave River



Waterbuck at Kenyan Lakeshore



Alpine grassland





Alpine landscape Pyrenees



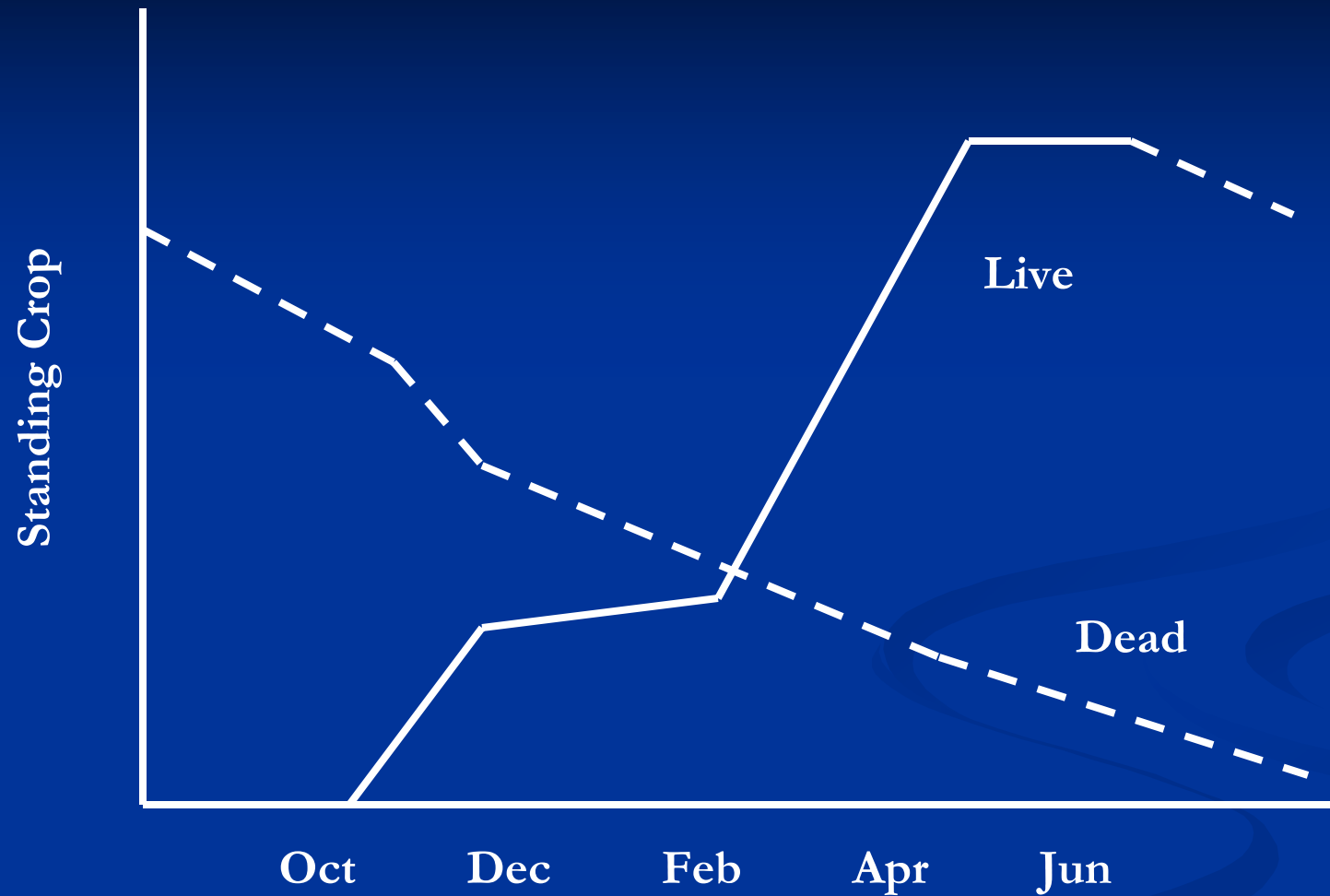
Subalpine shrubland Patagonia



Willows along river, Mount Fairweather Alaska

Seasonal and yearly variations

- George, M., J.W. Bartolome, N. McDougald, M. Connor, C. Vaughn, and G. Markegard. 2001. Annual range forage production. Univ. Calif. Div. Agric. Nat. Res. Rangeland Management Series Pub 8018. 9p.
- George, M., G. Nader, N. McDougald, M. Connor, B. Frost. 2001. Annual rangeland . forage quality. Univ. Calif. Div. Agric. Nat. Res. Rangeland Management Series Pub 8022. 13p.



Seasonal changes in above-ground biomass

Hopland October

Right grazed, left ungrazed



November



December



January



February



March



April



May



June

