

BIOMES

EnvSci – Unit 2

Standard (SEV I d): Evaluate claims, evidence, and reasoning of the **relationship between the physical factors** (e.g., insolation, proximity to coastline, topography) and organismal **adaptations** within **terrestrial biomes**.

Learning Target: Based on information regarding climate and vegetation, I can sort ecosystems into their terrestrial biomes.

BASIC TERMS

- **Biome:** a group of ecosystems that share similar climates and similar vegetation
 - Example: Tropical Rain Forest, Tundra, Desert
- **Tropical:** Occurs near the equator, no major change in temperatures
 - Tropical Rain Forest, Coral Reefs
- **Polar:** Occur near the North and South Poles; cold weather dominates
 - Tundra
- **Temperate:** moderate temperature; seasonal
 - Temperate Rain Forest, Deciduous Forest

DECIDUOUS FOREST

What season is this?



Not too hot or cold



OUR BIOME



Four approximately equal seasons

Trees lose leaves in fall



Lots of trees with leaves (as opposed to needles)



Some larger mammals, like foxes and bears

Animals don't have to have very thick fur



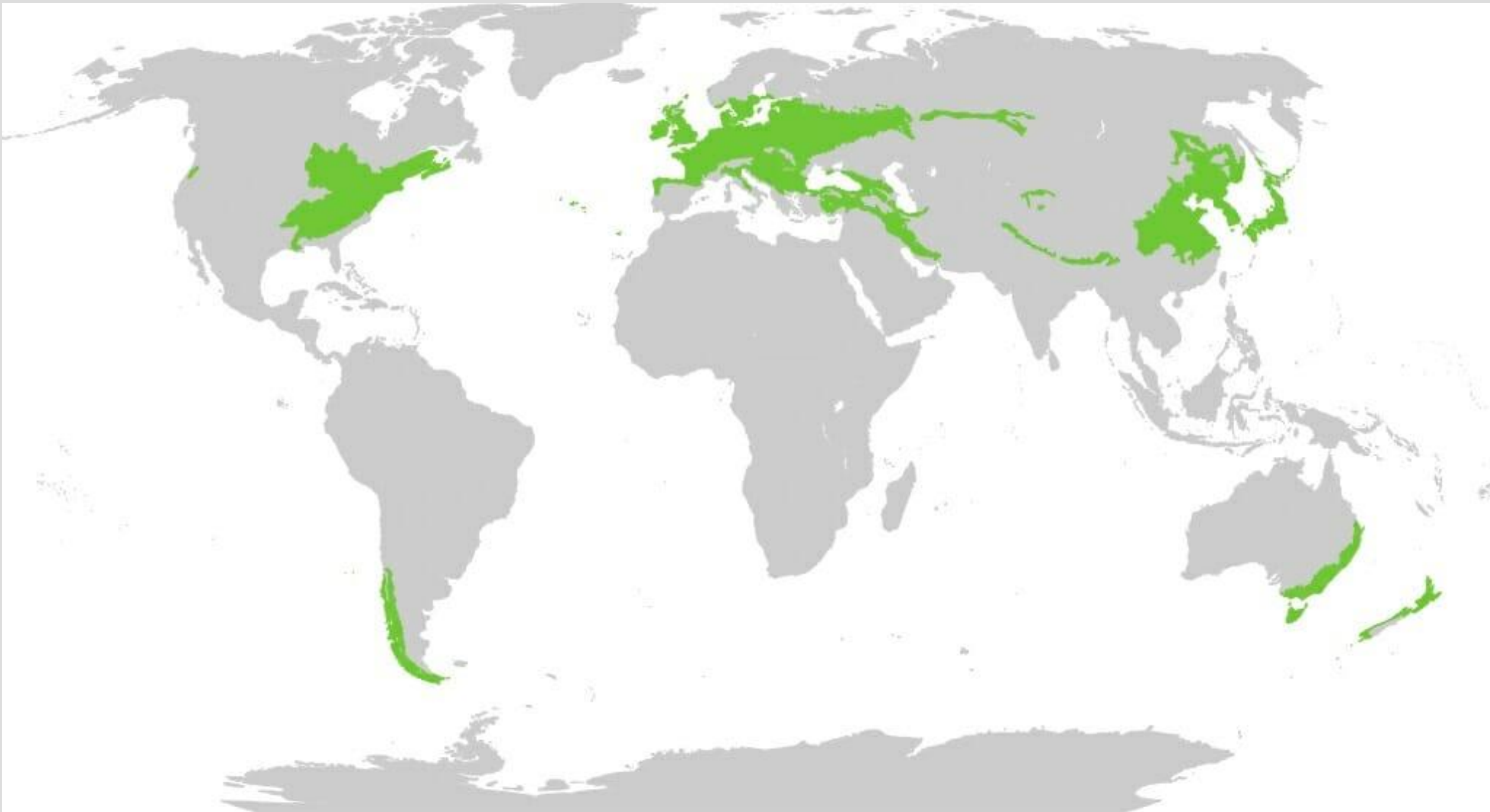
Oak and maple trees, which squirrels love

Adaptation



DECIDUOUS FOREST

- General Description: Wet biome (all forests are wet biomes) with four approximately equal seasons. Trees lose leaves in winter.
 - Climate: Seasonal and wet
 - Vegetation: Dominated by trees that lose leaves in the winter, such as oak and maple trees. Trees 'sleep' (go dormant) in the winter as an adaptation to the cold.
- Where it's found: Southern temperate latitudes where there's enough water and where there's seasonal change
 - Examples: HERE! And all the way up the East Coast of the United States.
- Animal adaptations
 - Mammals that gain/lose fat and fur depending on the season., such as squirrels.
 - Birds that migrate, such as robins.



OTHER THINGS TO KNOW

- OUR BIOME
- Receive about 30-60 inches of rain a year.
- Average temperature is 50 degrees F
- Winter often gets below freezing

TAIGA

Longer winters



Mostly evergreen trees



Also called a coniferous forest



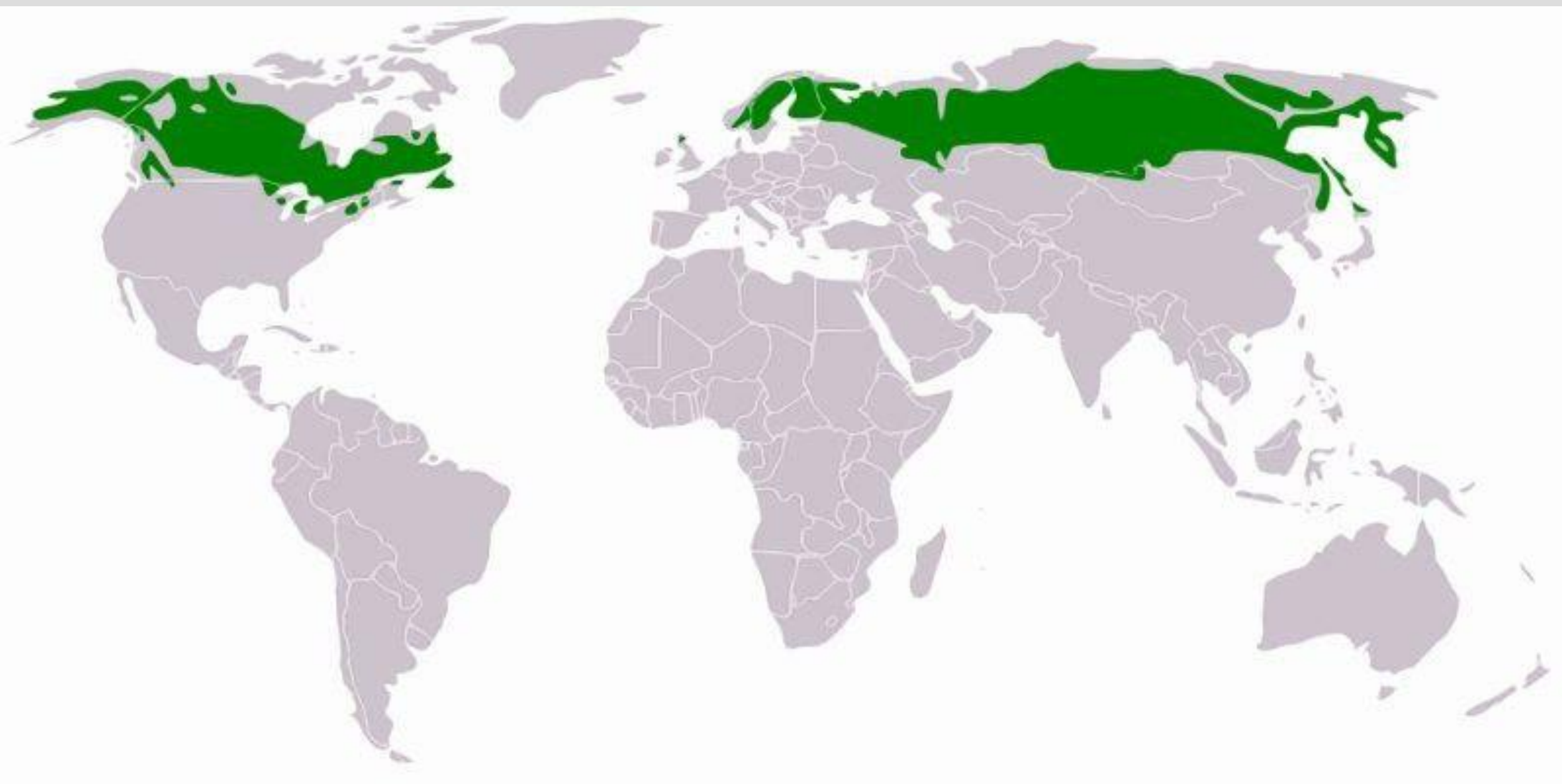
Gets lots of precipitation in the form of snow

Adaptation



TAIGA

- **General Description:** Wet biome (all forests are wet biomes) with very long winters that's dominated by coniferous trees.
 - **Climate:** Cold and wet (lots of snow)
 - **Vegetation:** Dominated by coniferous trees (evergreen trees with cones). Evergreen trees' needles have a waxy coating that protects them from the cold (an adaptation). But the needles are acidic, so there's not much undergrowth (they turn the ground acidic).
- **Where it's found:** Northern temperate latitudes (just below the poles)
 - **Examples:** Canada, southern Alaska, sub-arctic Russia and Scandinavia.
- **Animal adaptations**
 - **White fur/feathers** to blend in with the snow (ex: snowy owl and arctic fox)
 - **Mammals with thick fur, short legs, and fur growing in unusual places**, such as the inside of the ear and the bottoms of paws (ex: Canadian lynx and hare)



OTHER THINGS TO KNOW

- Largest terrestrial biome
- Located right below the tundra
- Also known as a coniferous forest or a boreal forest
- Short summers and long winters

TUNDRA

Cold almost all year



do you think she knows how to knock?

“Summers” are in the 30s and 40s

Too cold and dry for trees

Mosses and lichens!



Has permafrost





**Very little
precipitation.
Frozen desert!**

**Found in northern polar regions and also in
high altitudes (up mountains)**

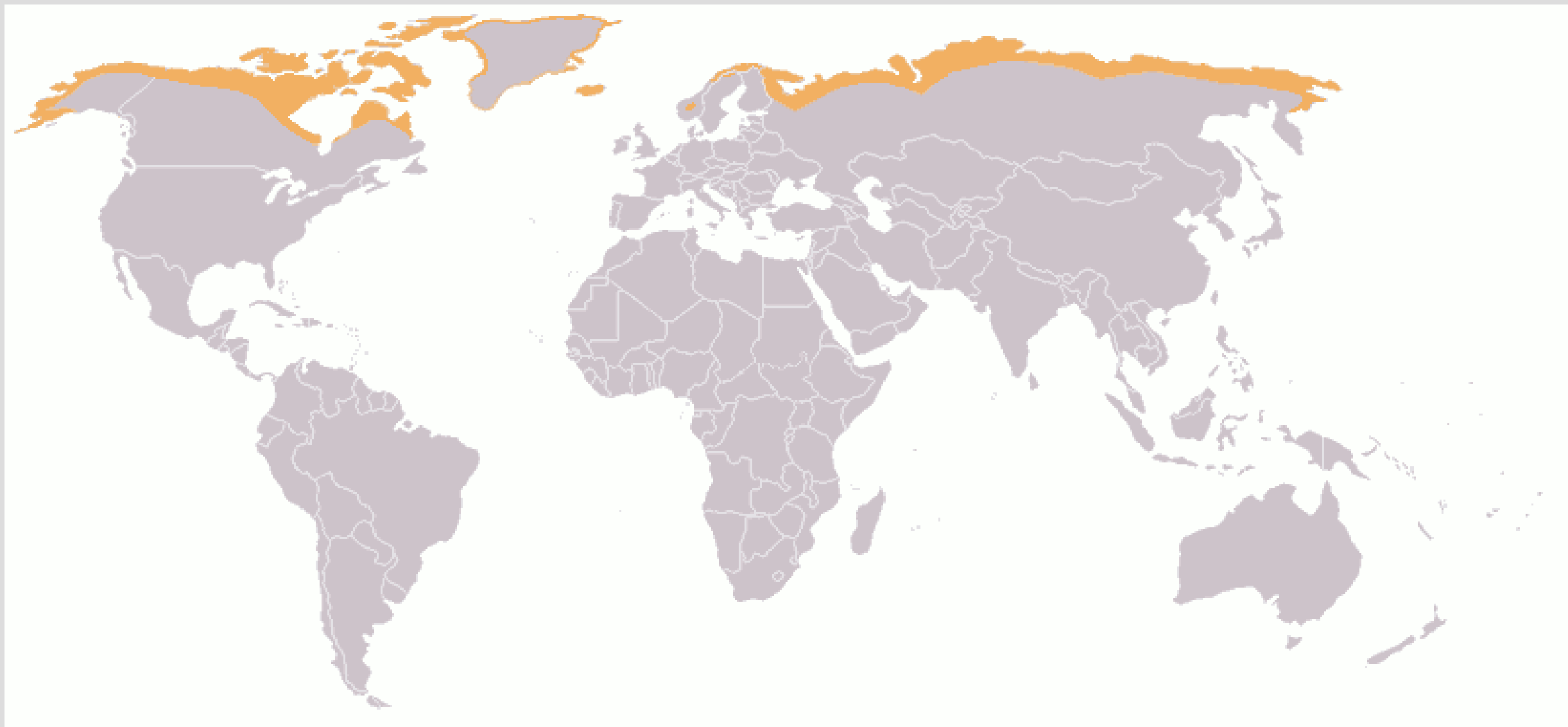
Adaptation

The
polar bear
has small
ears and tail;
this adaptation
minimizes
heat loss.



TUNDRA

- **General Description:** Frozen desert! Cold and dry year-round. It looks snowy, but that's because the little snow they get never melts.
 - **Climate:** Cold and dry (very little snowfall, but the snow doesn't usually melt)
 - **Vegetation:** Lichens and mosses! And some herbs. The permafrost (permanently frozen soil) prevents most plants from growing.
- **Where it's found:** Northern polar regions
 - **Examples:** Northern Alaska, Northern Canada, Northern Russia
- **Animal adaptations**
 - White fur to blend in with the snow (ex: polar bear)
 - Carnivorous because not many plants grow there (ex: polar bear)



OTHER THINGS TO KNOW

- Average temperature is -19 degrees F
- Winter lasts around 8 months
- Fragile biome as permafrost melts
- One of the harshest biomes, if not the harshest

GRASSLAND

**Too dry to have a lot of trees
but gets enough rainfall to support smaller plants**



Long dry spells make it more likely to have fires



Supports large herbivores (e.g. elephants)



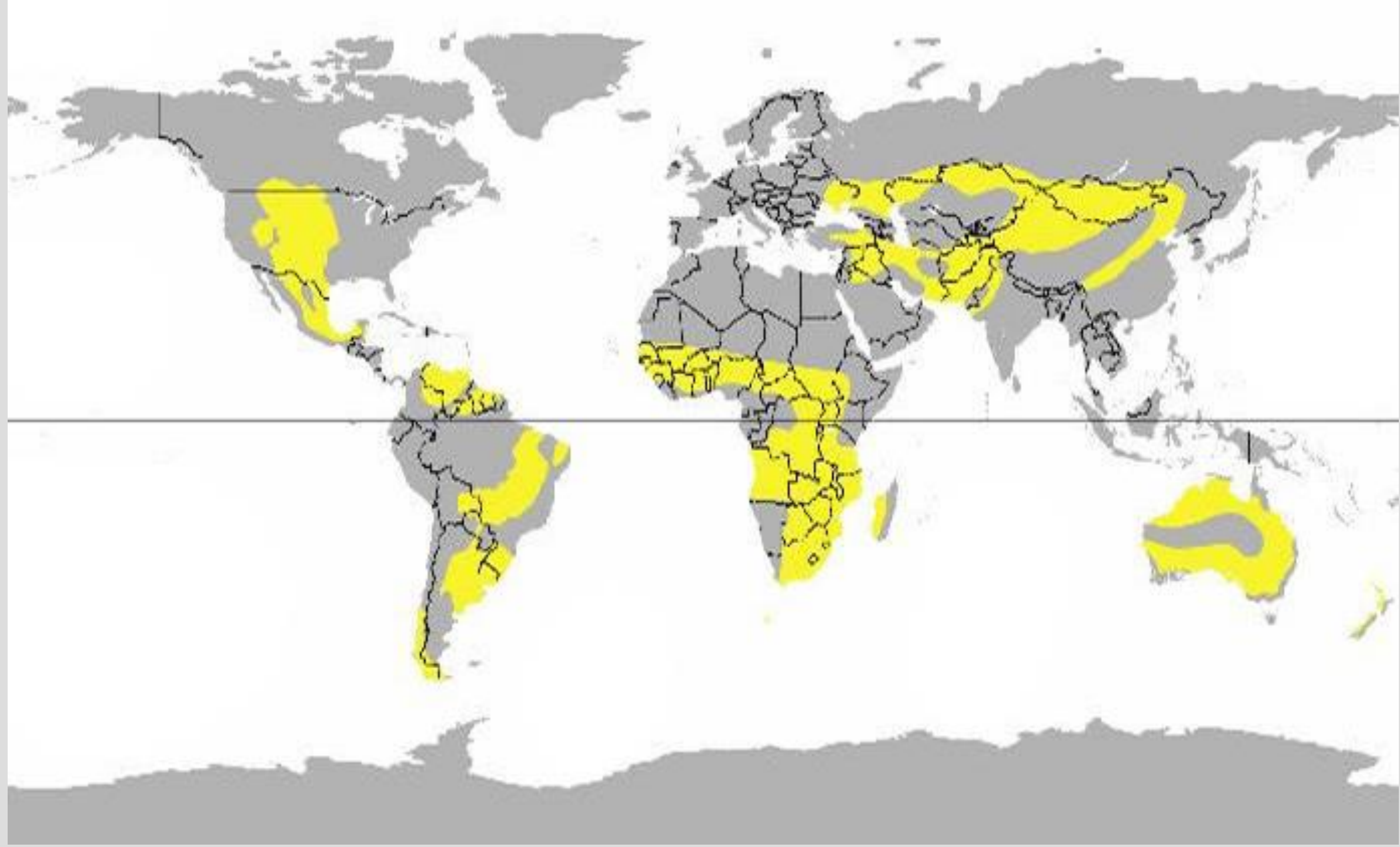
...and the carnivores that hunt them!

Adaptation



GRASSLAND

- **General Description:** Temperate or tropical plains that have very fertile soil and are dominated by grasses and the large herbivores that eat them.
 - **Climate:** Temperate or tropical; low to moderate precipitation (not enough to support a lot of trees but enough to support grasses). Tropical: Savanna (like the Lion King)
 - **Vegetation:** Mostly grasses
- **Where it's found:** Temperate or tropical latitudes; continents' interiors (away from the coast)
 - **Examples:** US's Great Plains (Kansas, etc.), African savanna
- **Animal adaptations**
 - **Temperate:** Camouflage and burrowing because there aren't a lot of places to hide (burrowing also protects from winter)
 - **Savanna:** Camouflage and/or speed (co-evolution)



OTHER THINGS TO KNOW

- Typically situated between a forest and a desert
- 25% of the world is covered in grasslands- on every continent except Antarctica
- Wild fires due to lightning strikes

DESERT

Very dry biome often found near the equator



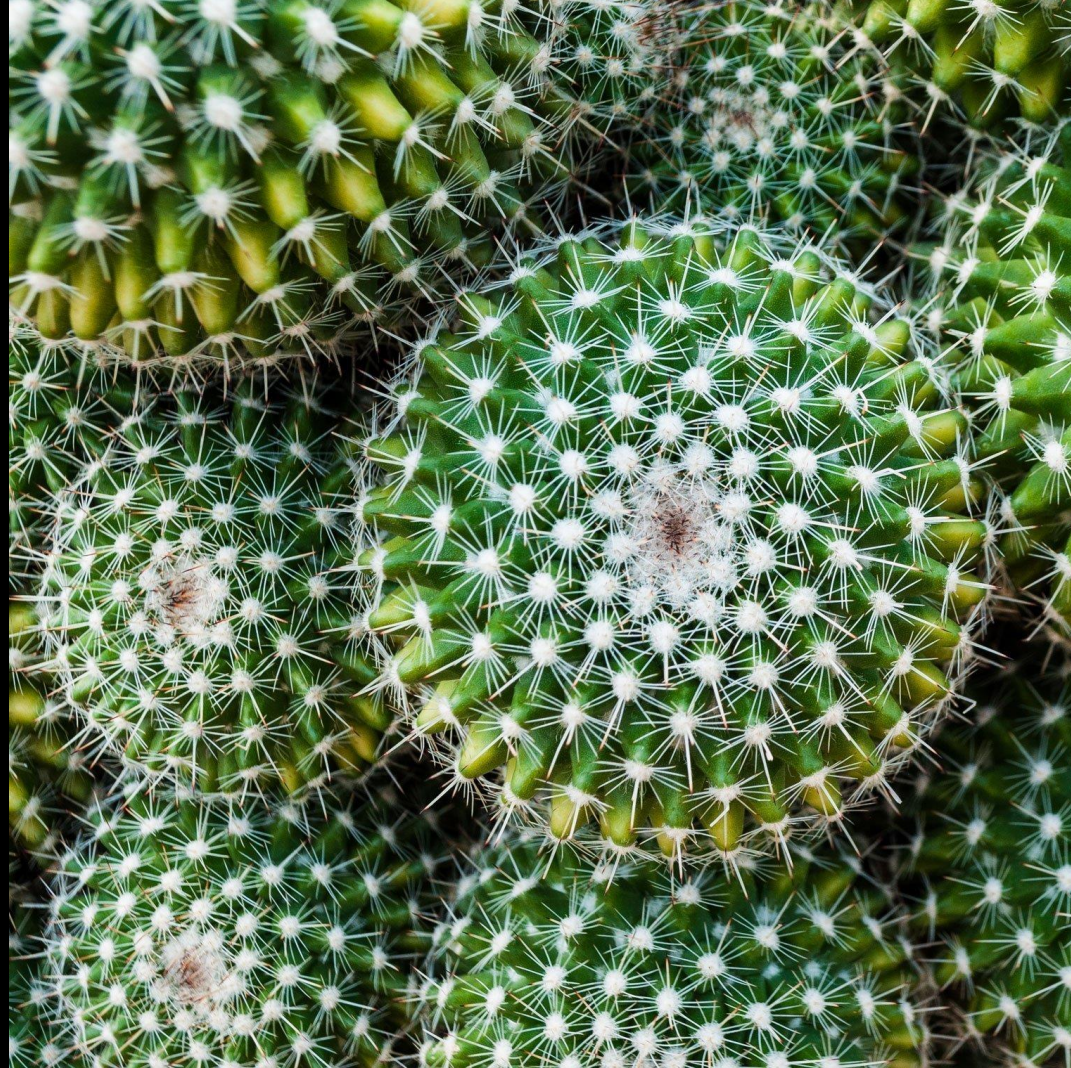
Some have very cold nights

Supports reptiles and other heat- and drought-adapted plants and animals



Plants often have waxy coatings to keep in water. Because they're basically big water jugs, they need thorns/spikes to keep animals away.

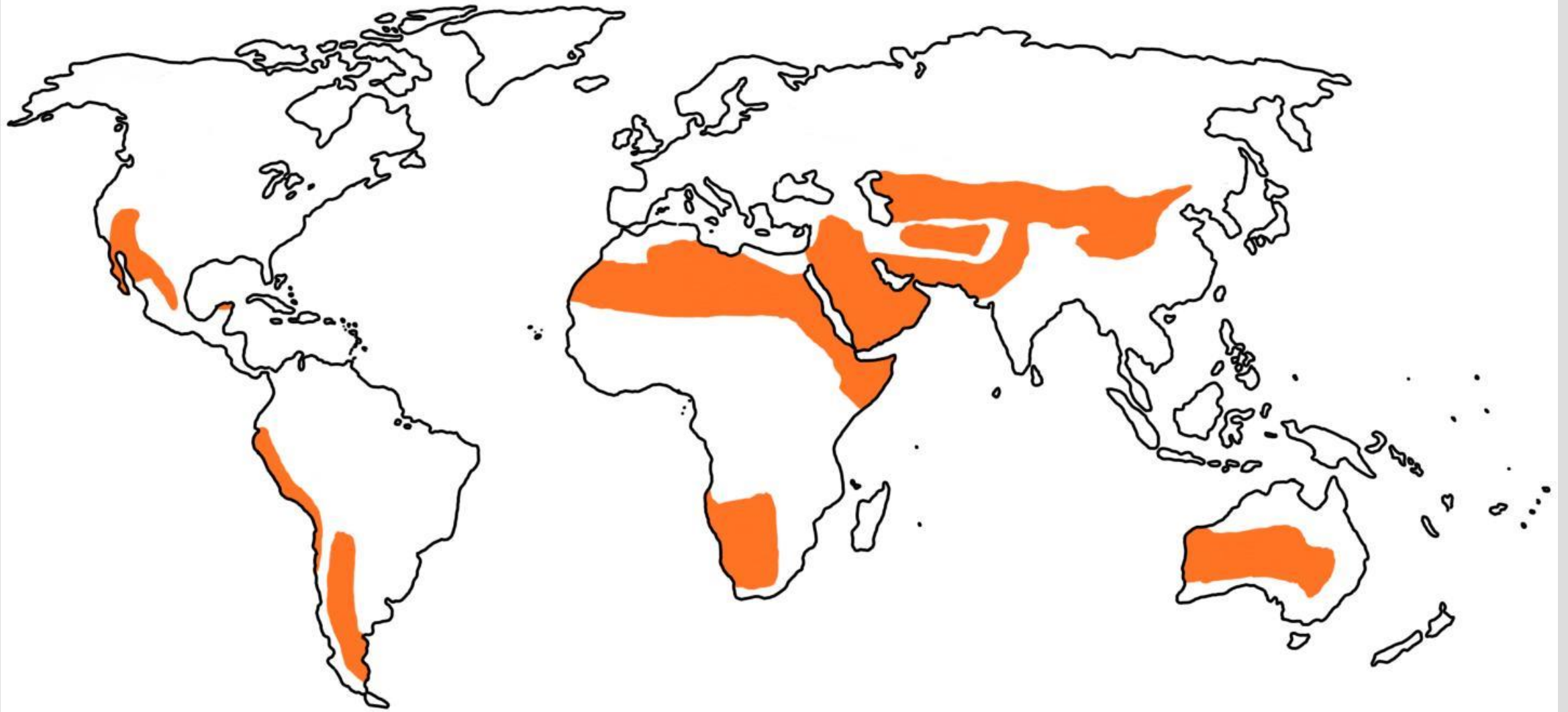
Adaptation



DESERT

- **General Description:** Dry, hot biomes usually found in/near tropical latitudes.
 - **Climate:** Hot and dry; may have cold nights (especially if it's a desert at a high altitude)
 - **Vegetation:** Cacti and some shrubs with waxy coatings (ex: creosote bush)
- **Where it's found:** In or near tropical latitudes (near equator)
 - **Examples:** US's Mojave Desert (Southwest)
- **Animal adaptations:** Thick scaly skin, lack of feathers and fur to keep from getting too warm, active at night when it is cooler.
 - **Temperate:** Camouflage and burrowing because there aren't a lot of places to hide (burrowing also protects from winter)
 - **Savanna:** Camouflage and/or speed (co-evolution)

Desert biome around the world



OTHER THINGS TO KNOW

- Cover around 20% of Earth in sand
- Largest hot desert is the Sahara Desert

RAINFOREST



Has the most water of any land biome

Lots of undergrowth, like ferns



Has layers, and the lower layers are very shaded

Greatest biodiversity of any land biome



Adaptation



Adaptation



RAINFOREST

- **General Description:** Wet biome with very little year-round change in temperature.
 - **Climate:** Wet. Tropical: Warm year-round. Temperate: Cool year-round.
 - **Vegetation: Layers** – Top: Emergent (extremely tall trees). 2nd: Upper canopy (forms a roof). 3rd: Lower canopy (layer of shorter trees). Bottom: Understory (only 5% of the light makes it here; shade-tolerant plants, such as ferns).
- **Where it's found:** Tropical or temperate latitudes
 - **Tropical examples:** Amazon (in South America), Congo river basin (in Africa)
 - **Temperate examples:** Pacific Northwest in the US (coastal Washington, Oregon, and Alaska)
- **Animal adaptations**
 - Camouflage to stay hidden from the large number of predators (high biodiversity)
 - Long arms and prehensile tails help monkeys climb

OTHER THINGS TO KNOW

- Tropical Rain Forest- Covers 2% of the Earth while 50% of the plants and animals live there
- Considered to be the lungs of the Earth