

World Biomes

Overview of Chapter

Earth's Major Terrestrial Biomes

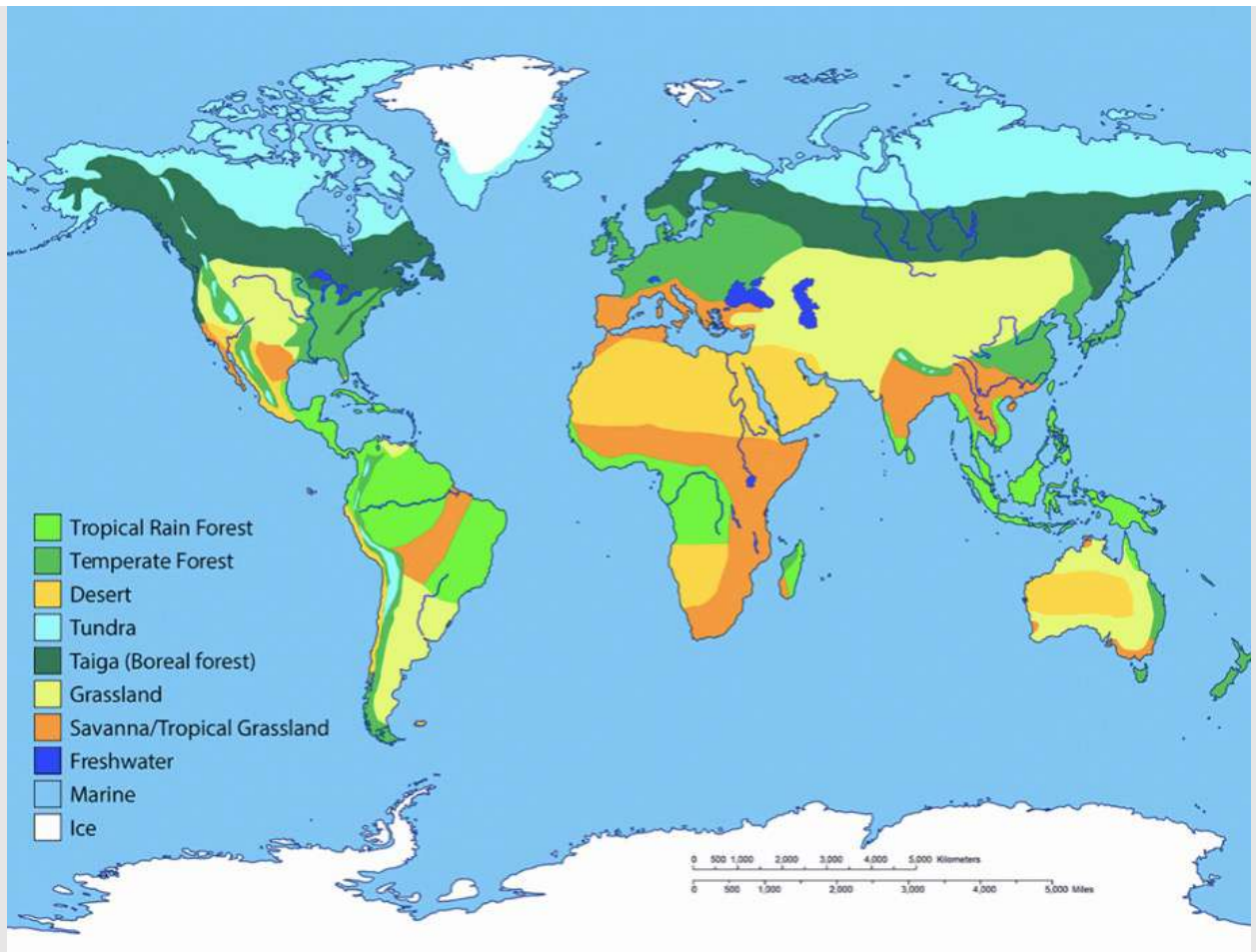
1. Tundra
2. Boreal Forests
3. Temperate Rainforest
4. Temperate Deciduous Forests
5. Grasslands
6. Chaparral
7. Deserts
8. Savanna
9. Tropical Rainforests

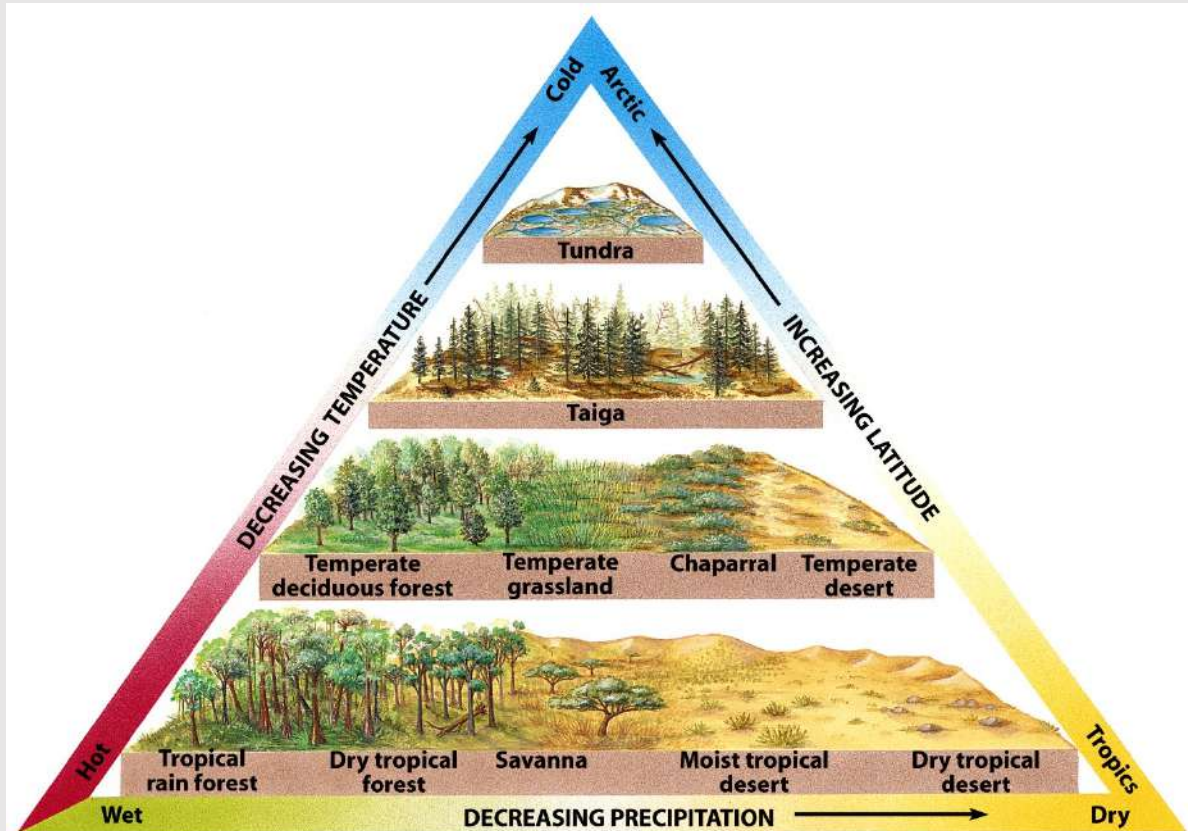
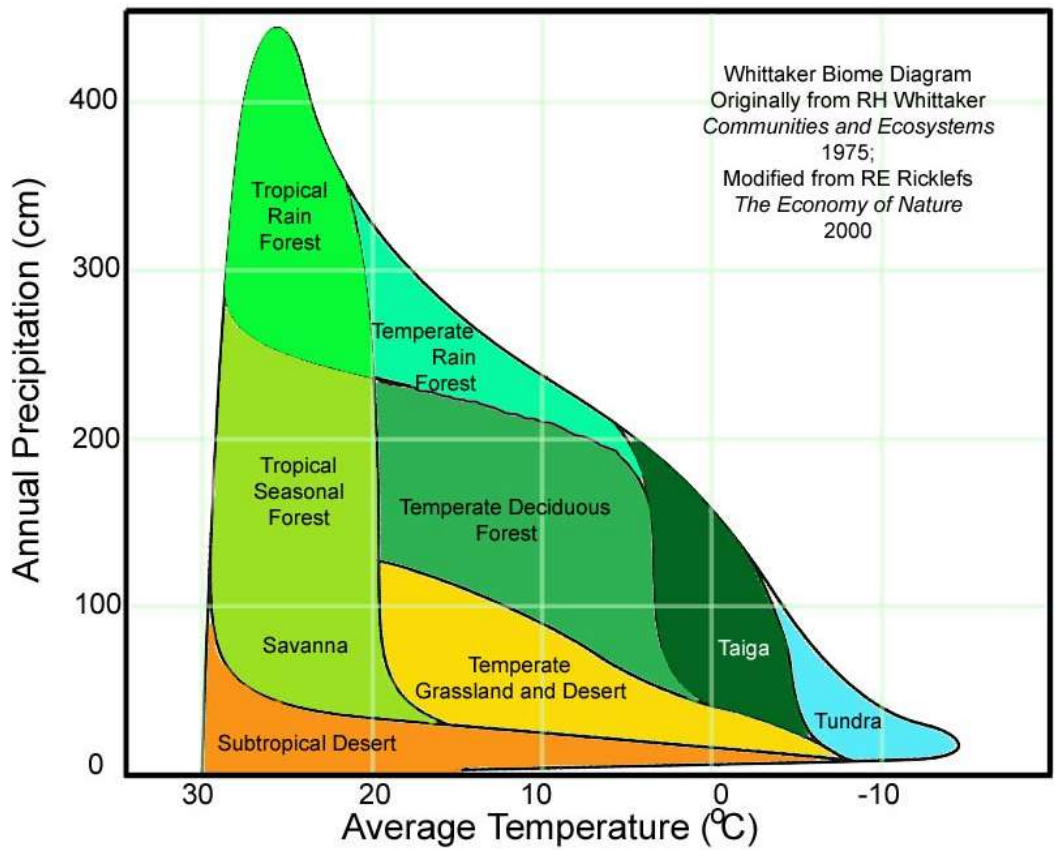
Aquatic Biomes

1. Freshwater Ecosystems
2. Estuaries
3. Marine Ecosystems

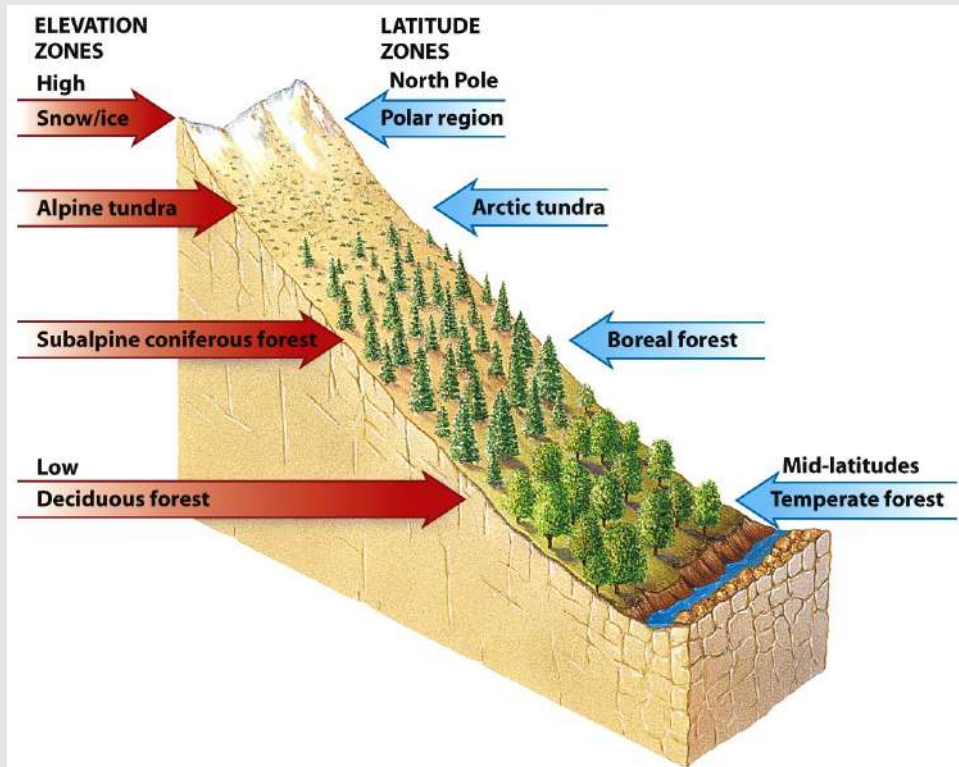
Earth's Major Biomes

- Biome
 - A large, relatively distinct region with a similar climate soil, plants, and animals, regardless of where it occurs in the world
 - Nine major terrestrial biomes
- Location of each biome is primarily determined by:
 - Temperature (varies with both latitude and elevation)
 - Precipitation
- Biomes can also be affected by
 - Winds, rapid temperature changes, fires, floods, etc.





Vertical Zonation



Tundra

- Treeless biome in the far north with harsh, cold winters and extremely short summers
- Precipitation
 - 10-25 cm/yr
- Temperature
 - Short growing season
 - 50-160 days



Tundra

- Nutrient poor soils with little organic material
 - Permafrost present
- Low species richness
 - Veg is mostly grasses and sedges
 - Very simple food web
- Low primary productivity



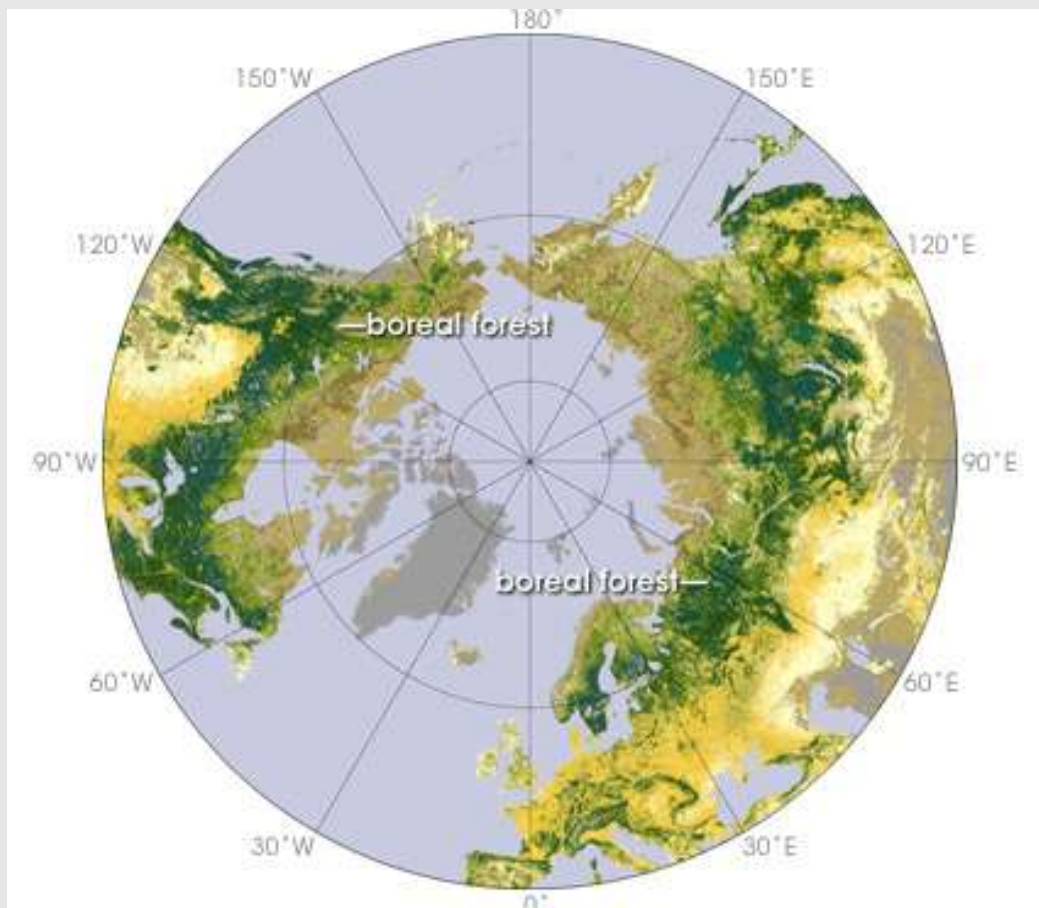
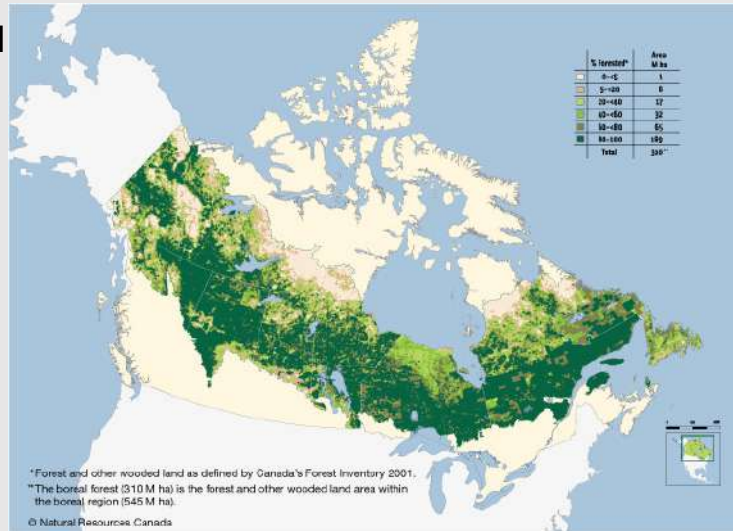
Alpine Tundra

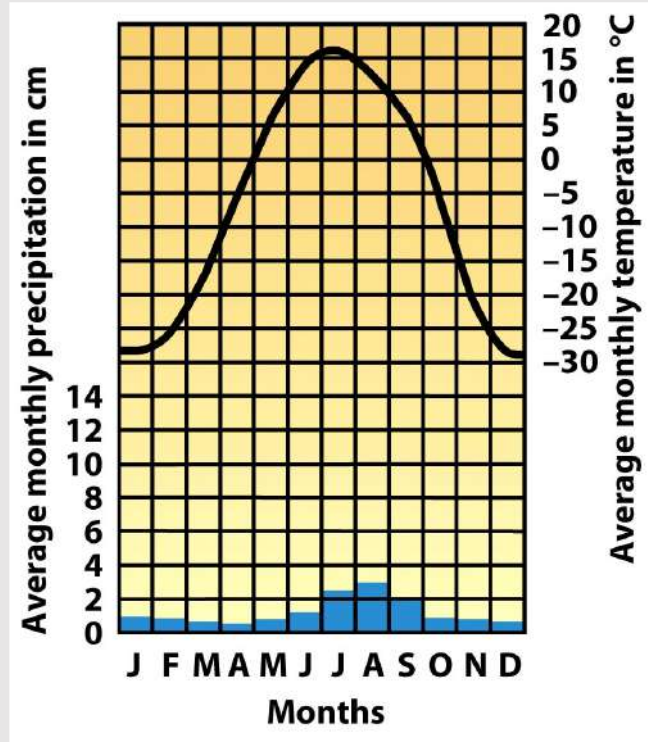
- Alpine tundra is a treeless biome found at high altitudes in mountains worldwide.
- It is characterized by low temperatures, short growing seasons, and harsh winds.
- The vegetation is adapted to the harsh conditions, with low-growing plants that have small leaves and animals often a thick covering of hairs or fur.
- The alpine tundra is home to a variety of animals, including small mammals, birds, and insects.
- Helps to regulate the water cycle.
- The alpine tundra is a fragile ecosystem, and it is susceptible to damage from human activities.
- It is also sensitive to climate change.



Boreal Forests

- A region of coniferous forests in the northern hemisphere
 - Just south of tundra
- Covers 11% of earth's land
- Growing Season
 - A little longer than tundra
- Precipitation
 - ~ 50 cm/yr





- Soils are acidic and mineral poor
- Vegetation comprised of drought resistant conifers
 - White spruce
 - Balsam fir
 - Eastern larch
- Mostly small animals and migrating birds
- Some large animals are present
 - Wolves, bear, moose



Fox



Lynxes



Bear



Squirrel



Reindeer



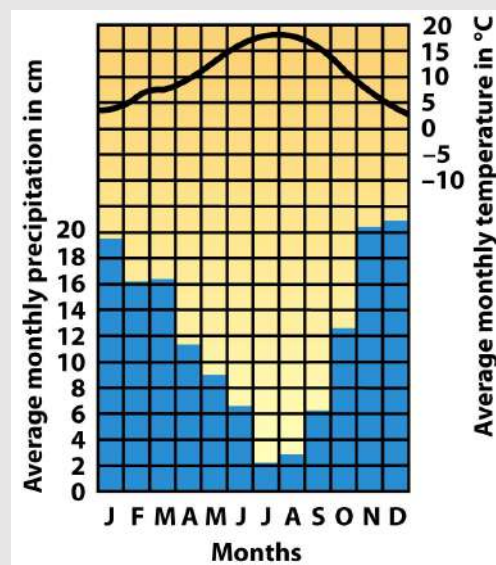
Moose



Wolf

Temperate Rainforest

- Coniferous biome with cool weather, dense fog and high precipitation
 - Ex: Northwest US
- Precipitation
 - > 127 cm/yr
 - Heaviest in winter
- Temperature
 - Winters are mild
 - Summers are cool

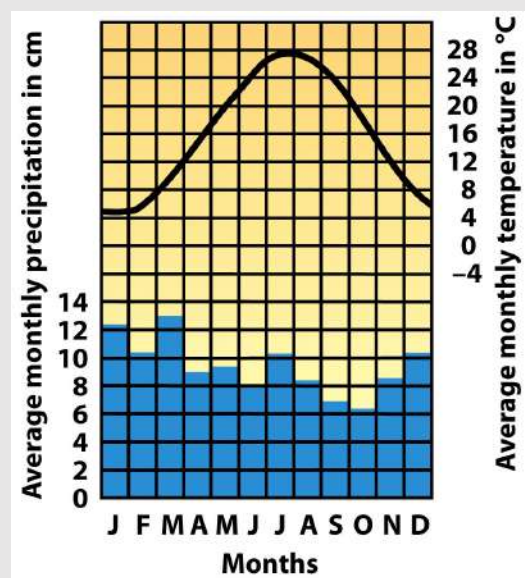


- Soils are nutrient-poor, but high in organic material (dropped needles)
 - Cool temperatures slow decomposition
- Dominant Vegetation
 - Large evergreen trees
 - Old-growth forest
- Variety of cool climate animal life
- High species richness
- Heavily logged



Temperate Deciduous Forests

- Forest biome that occurs in temperate areas with a moderate amount of precipitation
 - 75-150 cm/yr
- Precipitation
 - 75-150 cm/yr
- Temperature
 - Seasonality
 - Hot summers and cold winters





Lichen



Moss



Fern



Maple



Oak



Birch



Beech

- Topsoil is rich in organic material and underlain by clay
- Vegetation is primarily deciduous
 - Oak, maple, beech
- Animals
 - Deer, bear and small animals
- Most of this biome land area has been regenerated after farming & timber harvest



Bird



Owl



Woodpec...



White-tailed
deer



Raccoon



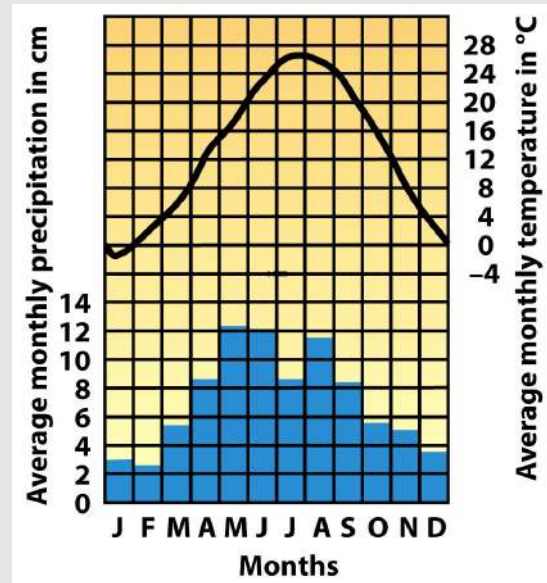
Opossum



Porcupine

Grassland

- Grasslands are biomes with hot summers and / or cold winters and less precipitation to support trees
- Precipitation
 - 25-75 cm/yr
- There are two different types of grasslands
 - tall-grass, which are humid and very wet
 - short-grass, which are dry, with hotter summers and colder winters than the tall-grass
- 90% of this biome has been lost to farmland

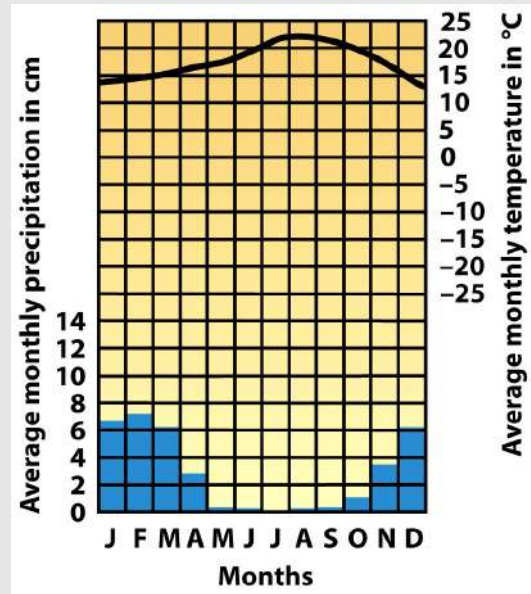


- Grassland biomes can be found in the middle latitudes, in the interiors of continents. They can have either moist continental climates or dry subtropical climates.
- In Argentina, South America, the grasslands are known as **pampas**. The climate there is humid and moist. Grasslands in the southern hemisphere tend to get more precipitation than those in the northern hemisphere, and the grass tends to be the **tall-grass variety**.
- In the middle of North America is a huge area of land which was once covered with grasses and colourful wild flowers. The French called the rolling plains of grass "**prairie**"
- There is a large area of grassland that stretch from the Ukraine of Russia all the way to Siberia. This is a very cold and dry climate because there is no nearby ocean to get moisture from. Winds from the arctic aren't blocked by any mountains either. These are known as the Russian and Asian **steppes**.



Chaparral

- Also called a Mediterranean Climate
 - Ex: Southern California
 - Ex: Greece
- Temperature
 - Mild, moist winters
 - Hot, dry summers
- Frequent fires



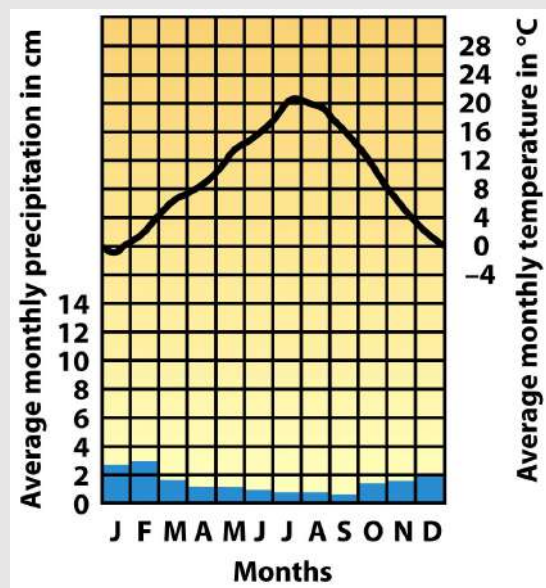
- Soil is thin and often not fertile
- Vegetation
 - Dense growth of evergreen shrubs
 - Lush during the growing season
- Animals
 - Mule deer, chipmunks, many species of birds

- Fire plays a big role in maintenance of this biome
- Lot of seeds are fire tolerant and some may even be activated by fire.



Deserts

- Biome where lack of precipitation limits plant growth
- Temperature
 - Can vary greatly in 24-hr period, as well as yearly (based on location)
- Precipitation
 - < 25 cm/yr

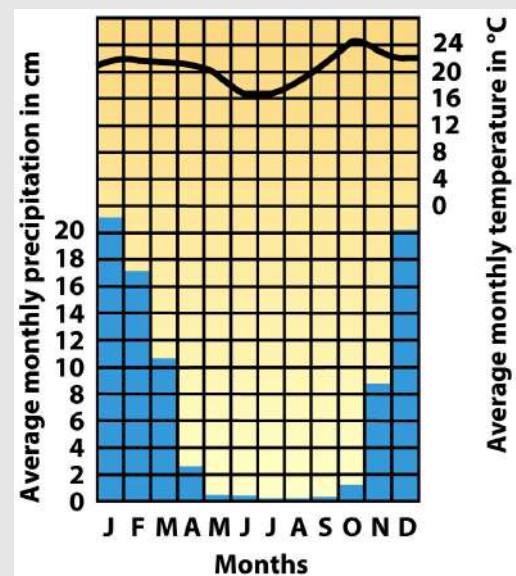


- Soils low in nutrients, high in salts
- Vegetation sparse
 - cactus and sagebrush
- Animals are very small to regulate temperature



Savanna

- Tropical grassland with widely scattered trees
- Temperature
 - Varies little throughout the year
- Precipitation
 - Seasons regulated by precipitation, not temperature
 - 76-150 cm/yr

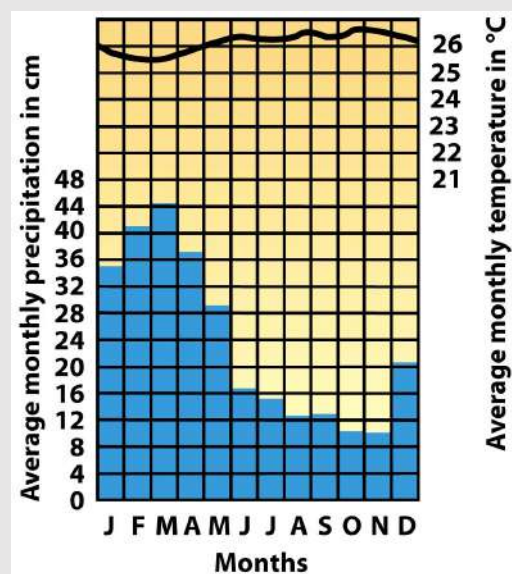


- Soil low in nutrients due to leaching
- Vegetation
 - Wide expanses of grass
 - Occasional Acacia trees
- Animals
 - Herds of hoofed animals
 - Large predators- lions, hyenas, etc.

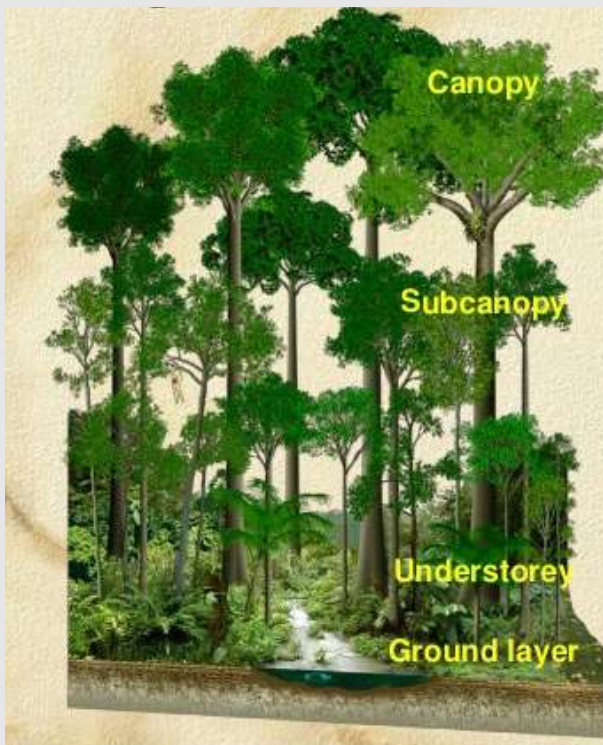


Tropical Rainforest

- Lush, species-rich biome that occurs where climate is warm and moist throughout the year
- Precipitation
 - 200-450 cm/yr
- Very productive biome
- Most species-rich biome



- Ancient, weathered, nutrient-poor soil
 - Nutrients tied up in vegetation, not soil
- Vegetation
 - 3 distinct canopy layers
- Animals
 - Most abundant insect, reptiles and amphibians on earth



🗨️ **Tropical rainforests** are complex and can be divided into four distinct **strata** representing zones of different vegetation.

🗨️ The strata are:

- Canopy
- Subcanopy
- Understorey
- Ground layer.

🗨️ In addition, **epiphytes** (perching plants) and **lianes** (climbing vines) occupy several strata in the forest.

Aquatic Biomes

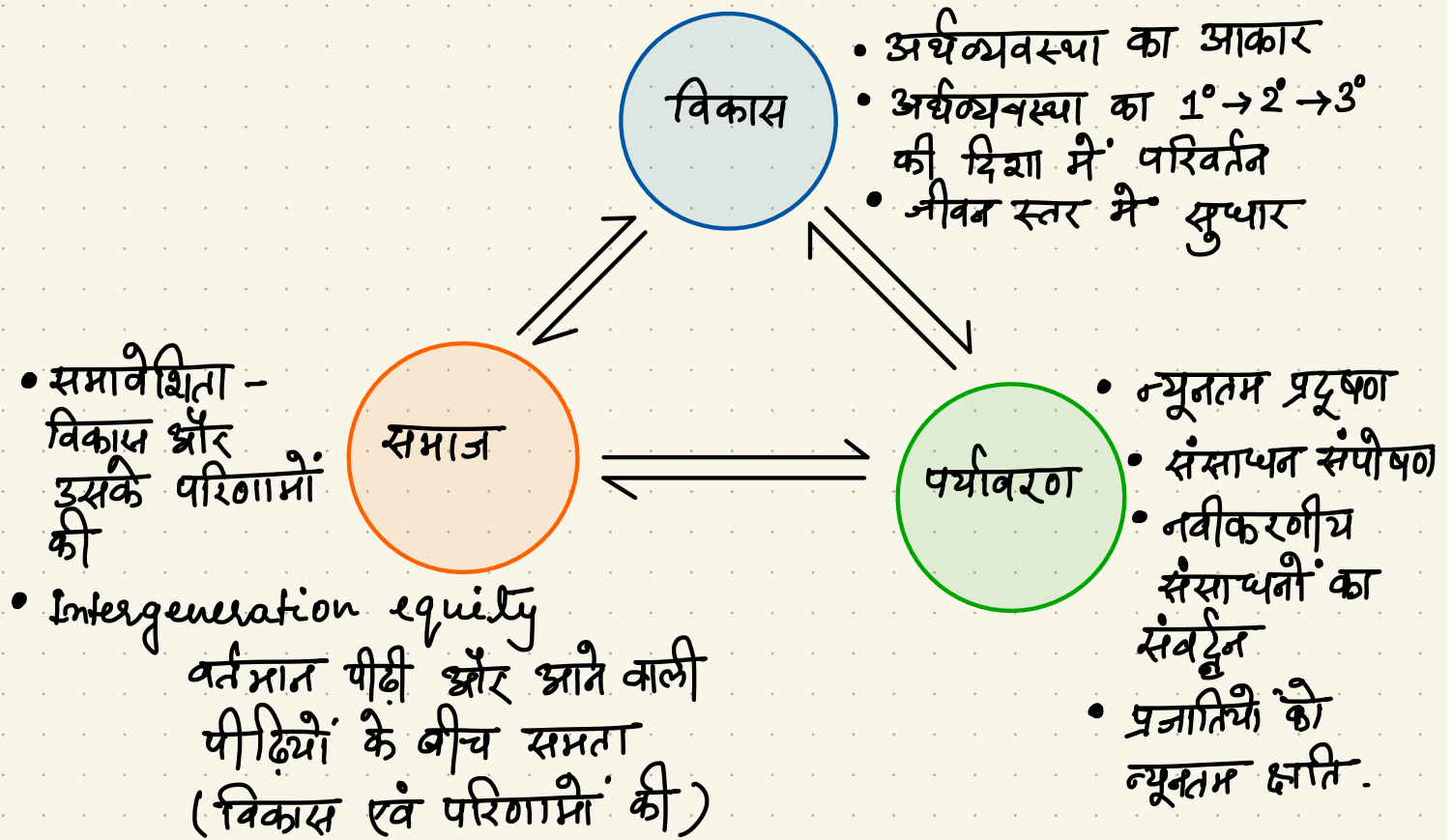
- Fundamental Division
 - Freshwater
 - Saltwater
- Aquatic Ecosystems also affected by
 - Dissolved oxygen level, light penetration, pH, presence/absence of currents
- Three main ecological categories of organisms
 - Plankton- free floating
 - Nekton- strong swimming
 - Benthos- bottom dwelling



Thank You

Sustainable Development

(सतत विकास)



"विकास का एक ऐसा मॉडल जिसमें विकासोन्मुख गतिविधियों का सामाजिक हितों और पर्यावरणीय हितों के साथ समन्वयन एवं संतुलन हो."

↓
जिससे विकासोन्मुख गतिविधियाँ सतत रूप से चलती रहें और सामाजिक और अर्थव्यवस्था के हितों का संपीषण होता रहे.

अब तक के मुख्य milestone

1) Brundtland Commission

- World Commission on Env. and Development — औपचारिक नाम
- संयुक्त राष्ट्र संघ के द्वारा स्थापित, 1983 में
- कार्यकाल : 1983 - 1987
- अध्यक्षता : Gro Harlem Brundtland
(नार्वे की भूतपूर्व PM)
- 1972 के स्टॉकहोम सम्मेलन के 10 वर्ष पूर्ण होने के उपलक्ष्य में ↓
UN Conference on Environment & Development (UNCED)
- 1987 में Report का प्रथम भाग प्रकाशित :
Our Common Future
(हमारा साझा भविष्य)
- इसके द्वारा sustainable development को परिभाषित भी किया गया —
अगली पीढ़ियों के हितों की रक्षा करते हुए, वर्तमान पीढ़ी की आवश्यकताओं की पूर्ति.

2) Rio Earth Summit, 1992 { UNFCCC को अपनाया गया
CBD को अपनाया गया
UNCCD पर चर्चा हुई
(UN Conference on Sustainable Development)

(UNCED का successor = उत्तराधिकारी)

Agenda - 21

21 वीं सदी में प्रवेश करने के पूर्व सतत विकास के एक स्तर को अर्जित करने की इच्छा तथा लक्ष्य

4 भागों में विभाजित

- 1) Section I : सामाजिक एवं आर्थिक पहलू
- 2) Section-II : पर्यावरण एवं संसाधनों का संरक्षण एवं संवर्द्धन
- 3) Section-III - हितधारक समूहों की भागीदारी
- 4) Section IV - क्रियान्वयन का फ्रेमवर्क

3) September 2000 में UN का एक विशेष सत्र आयोजित → Millenium Summit

→ Millenium Development Goals अपनाए गये .

- 2000 - 2015 तक प्रभावी
- सिर्फ विकासशील देशों के लिए लक्ष्य निर्धारित
- Extreme poverty तथा अन्य नुई मुद्दों पर बल .

4) 2002 :

The Johannesburg Declaration on Sustainable Development and the Plan of Implementation, adopted at the World Summit on Sustainable Development in South Africa in 2002 --

सतत विकास पर एक समग्र कार्ययोजना .

4) 2015 : संयुक्त राष्ट्र संघ के द्वारा SDG
(Sustainable Development Goals) अपनाया
गया.

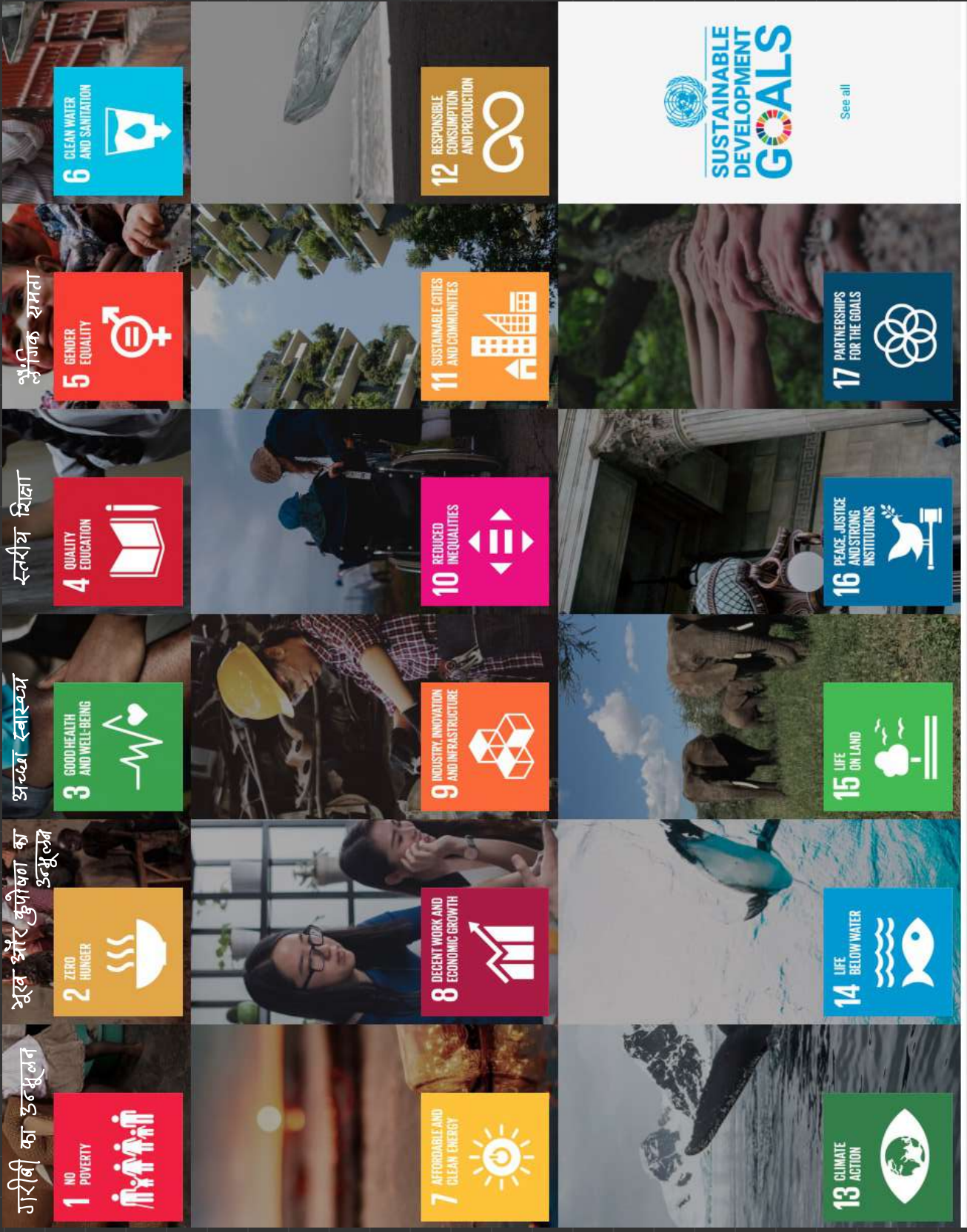
- ✓ — बहुमुखी
- ✓ — पर्यावरण एवं समाज दोनों पर ही बल
- ✓ — विकसित और विकासशील दोनों ही
के द्वारा अनुसरण .

• 17 उद्देश्य
• 169 लक्ष्य



~ 5500
कार्य बिंदु

इनका 2030
तक अंतिम
करना है.



SUSTAINABLE
DEVELOPMENT
GOALS

See all

Ganga River Dolphin

(Platanista gangetica)

- राष्ट्रीय अलीय जंतु , 2009-10 से
- गंगा और ब्रह्मपुत्र में पाया जाता है .
- व्हेल की ही तरह एक स्तनधारी (mammal) जीव
- भिन्न प्रजातियाँ खारे और मृदु जल के लिए अनुकूलित होती हैं

यह दुनिया की चार मीठे पानी की डॉल्फिन में से एक है- अन्य तीन हैं:

चीन में यांग्ज़ी नदी से अब 'बाईजी' विलुप्त होने की संभावना है,
पाकिस्तान में सिंधु का 'भुलन', और
लैटिन अमेरिका में अमेज़न नदी का 'बोटो'।

ये चारों प्रजातियाँ केवल नदियों और झीलों में ही निवास करती हैं।

