

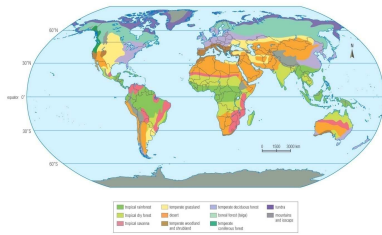
SNC1D BIOLOGY

SUSTAINABLE ECOSYSTEMS

☞ Aquatic & Terrestrial Ecosystems
(P.16-17)

Biomes

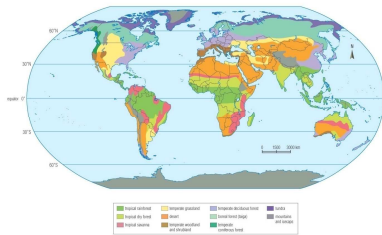
From colourful coral reefs to frigid mountaintops, Earth has many different environments. Average temperatures in each environment vary, as do precipitation and land or water characteristics. Each environment has distinct life forms living in it, forming unique and complex communities.



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Biomes

*Areas of the world that have a similar climate and similar organisms are known as **biomes**. Desert, coral reef, tundra, and tropical rainforest biomes are common and have distinct features. Similar ecosystems appear where there are similar abiotic conditions such as temperature, moisture, and light.*

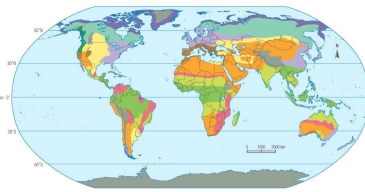


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Biomes

BIOME

- ❖ large geographical region defined by climate with a specific set of biotic and abiotic features
- ❖ desert, coral reef, tundra, ...



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Biomes

NOTE!

Five major terrestrial biomes are found in Canada and one of the reasons we are able to describe the characteristics of any of these biomes is that these large systems are in a state of **equilibrium**. This means that energy flows through the ecosystem, and nutrients are recycled through food webs in a constant manner. Photosynthesis and cellular respiration are balanced. When an ecosystem is in equilibrium, populations are healthy and stable. The organisms in these biomes have adapted to life in those climates. However, human activity can upset the state of equilibrium of an ecosystem.


EQUILIBRIUM

- ❖ when the biotic and abiotic parts of an ecosystem remain relatively constant over time

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Terrestrial Biomes


Terrestrial biomes are land-based ecosystems. Climate (which includes temperature, precipitation, ...) is the most important factor that determines the location and makeup (vegetation) of a terrestrial biome.



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Terrestrial Biomes

NOTE!
Canada's five terrestrial biomes (tundra, boreal forest, mountain forest, grassland, and temperate deciduous forest) are defined by their dominant vegetation.




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Terrestrial Biomes

TERRESTRIAL BIOMES


- ❖ land-based
- ❖ location and makeup (vegetation) are defined by climate



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Aquatic Biomes


Aquatic biomes are water-based ecosystems. There are two basic regions of aquatic biomes – freshwater and marine. Freshwater regions consist of ponds, lakes, streams, rivers and wetlands and marine regions include oceans, coral reefs and estuaries.



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Aquatic Biomes

NOTE!
Rivers and streams are unique among ecosystems because they are continuously moving so organisms living here must either swim continuously or attach themselves to something.




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Aquatic Biomes

AQUATIC BIOMES

- ❖ water-based
- ❖ freshwater and saltwater (marine)



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Comparing Terrestrial & Aquatic Ecosystems

It is not easy to compare terrestrial and aquatic systems because there is such a large variety of these environments. But some of the similarities and differences include:

Similarities

- in both terrestrial and aquatic environments the ecosystems include communities made up of a variety of species
- within both terrestrial and aquatic communities there are populations at the different trophic levels
- a great deal of mutual interdependence exists between species in both terrestrial and aquatic environments
- in undisturbed terrestrial and aquatic ecosystems equilibrium is reached, i.e. very few major changes are observed over a period of time

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 **Comparing Terrestrial & Aquatic Ecosystems**

It is not easy to compare terrestrial and aquatic systems because there is such a large variety of these environments. But some of the similarities and differences include:

Differences

- because aquatic environments are so rich in nutrients they support more life than equivalent terrestrial ecosystems
- aquatic environments are more stable than terrestrial environments, with smaller fluctuations in temperature and other variables
- oxygen (because much less is present) can be a limiting factor in aquatic environments but not with terrestrial environments
- light can be a limiting factor in some aquatic habitats, but in most terrestrial environments there is hardly ever a shortage of light
- terrestrial animals are influenced far more by gravity, while water supports aquatic organisms


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 **Comparing Terrestrial & Aquatic Ecosystems**

COMPARING TERRESTRIAL & AQUATIC ECOSYSTEMS

- ❖ similarities include:
 - variety of species
 - numerous trophic levels
 - organisms dependent on each other
 - sustainable if left undisturbed
- ❖ differences include:
 - aquatic supports more life (more nutrients)
 - aquatic is more stable (temperature, ...)
 - oxygen & light can be limiting aquatic factors
 - gravity has greater effect on terrestrial organisms


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 **✓ Check Your Learning**

1. Describe at least three human activities that threaten (a) terrestrial habitats and (b) aquatic habitats.

(a) habitat change, pollution, overexploitation, climate change, ...
(b) same as above

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 **Check Your Learning**

2. Which of the following is a key abiotic factor for some terrestrial ecosystems but not for aquatic ecosystems? Explain.



- rainfall
- nutrients
- elevation
- temperature

rainfall – aquatic system already has lots of water

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 **Check Your Learning**

3. Lakes and ponds are classified based on their nutrient levels. If **oligotrophic** bodies of water (clear and deep) are low in nutrients and **eutrophic** bodies of water (murky and shallow) are high in nutrients, what does “**eutrophication**” mean? What causes it?





eutrophication is an increase in the amount of nutrients in a body of water – it can be (a) human caused (i.e. untreated sewage effluent, farm run-off carrying fertilizers, ...) or (b) natural and the effects can be devastating

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 **Check Your Learning**

4. Which body of water shown would support a larger biodiversity? Why?




bottom one – appears to be eutrophic (murky & shallow) which means it would be high in nutrients and thus have more organisms

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 **Check Your Learning**

TEXTBOOK
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WIKI (BIOLOGY)
 1DBIOL - QUIZ2 (Nutrient Cycles)

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