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# Aquatic and Terrestrial Ecosystem

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An illustration of an aquatic ecosystem. The background is a deep blue ocean with light blue ripples. In the center, the word "AQUATIC" is written in large, bold, yellow capital letters. Below it, the word "ECOSYSTEM" is written in black capital letters on a white rectangular banner. The scene is populated with various marine life: several clownfish with orange and white stripes, a large orange and white striped fish, a smaller orange fish, and a dark grey stingray swimming in the upper part. On the left, there are colorful coral reefs in shades of green, blue, and purple. Small white bubbles are scattered throughout the water.

AQUATIC

ECOSYSTEM

## Aquatic Ecosystem

- The aquatic ecosystem definition states it is a water-based environment, wherein, living organisms interact with both physical and chemical features of the environment.
- These living creatures whose food, shelter, reproduction, and other essential activities depend on a water-based environment are known as aquatic organisms.
- The physicochemical characteristics of an aquatic ecosystem determine how well it functions and how long it can support life forms.
- In the same way as sediments in aquatic ecosystems provide substrate, nutrients, and a home for live aquatic resources, sediments in aquatic ecosystems are equivalent to the soil in terrestrial ecosystems.
- The nature of water and quality of sediment has a direct or indirect impact on the functioning of an aquatic ecosystem.

## Salient features of the aquatic ecosystem

- Freshwater or saltwater can be used to make them.
- They serve as a home for a variety of aquatic animals.
- The majority of the vegetation is made up of algae and corals.

## Types of Aquatic Ecosystem

In general, there are two types of aquatic ecosystems, namely

Marine ecosystems

Freshwater ecosystems.

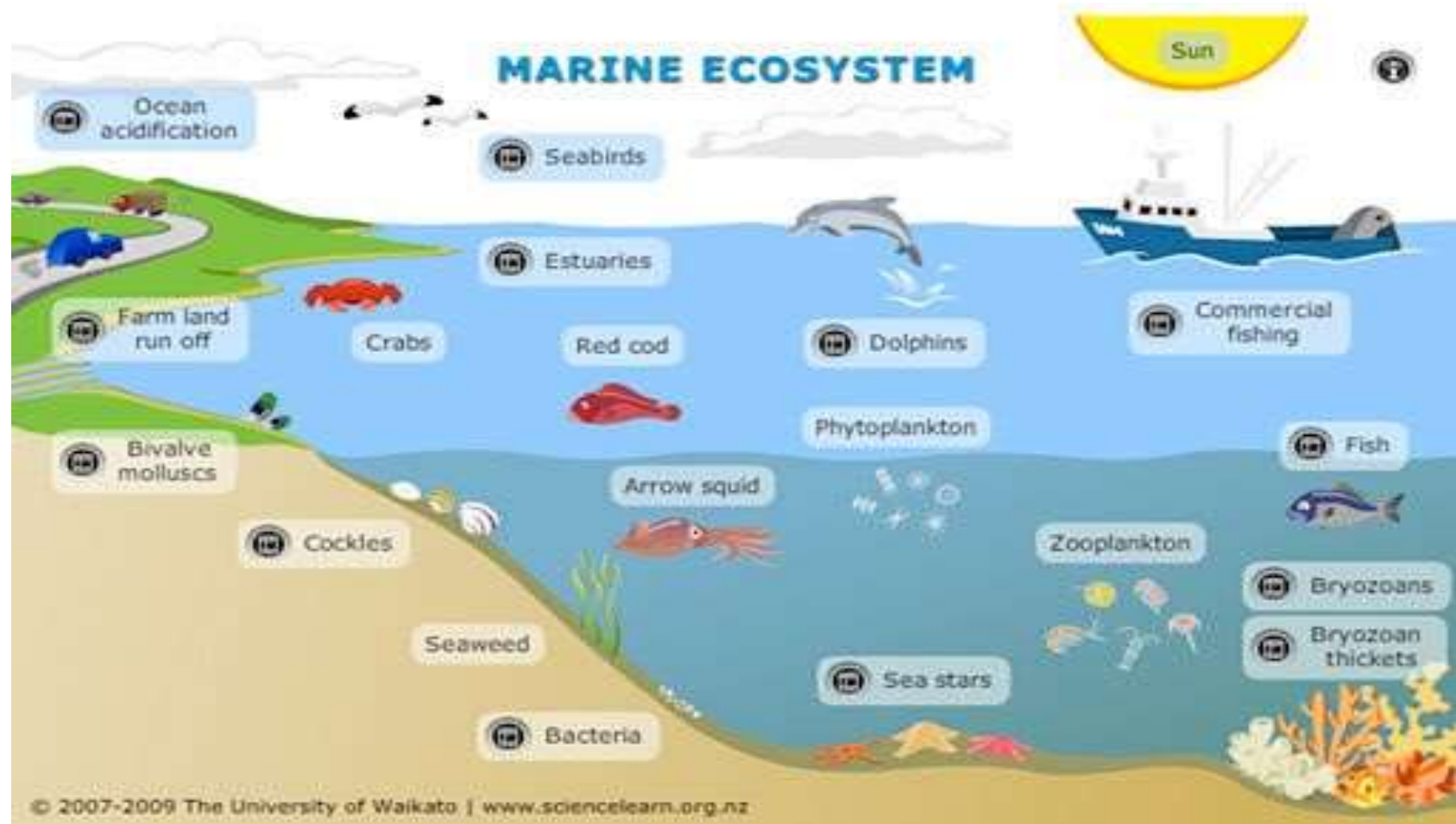
## Marine Water Ecosystem

This particular ecosystem is the largest aquatic ecosystem and covers over 70% of the earth's total surface. This ecosystem is relatively more concentrated in terms of **salinity**. Nonetheless, the body of aquatic organisms is well-adjusted to saline water, and they may find it challenging to survive in freshwater.

Types of Marine ecosystem

- **Ocean Ecosystem**
- **Estuaries**
- **Coral Reefs**
- **Coastal Ecosystem**

# MARINE ECOSYSTEM



## Ocean Ecosystem

- Pacific Ocean, Atlantic Ocean, Indian Ocean, Arctic Ocean, and the Southern Ocean are the five major oceans on earth.
- The Pacific Ocean is the largest and deepest of these five, while the Atlantic is the second largest in terms of size.
- Also, the Southern Ocean harbors the largest population of Krill (a small shrimplike planktonic crustacean) among them.
- Other than that, the oceans serve as home to aquatic organisms like – turtles, crustaceans, plankton, corals, shellfish, blue whale, sharks, tube worms, reptiles, etc.



# Estuaries

- Typically, it is the meeting point of a sea and rivers, which makes the water slightly more saline when compared to freshwater and more diluted when compared to the marine ecosystem.
- Biologically, estuaries are considered to be productive as they stimulate primary production and trap plant nutrients.
- Some examples of estuaries include – tidal marshes, river mouth, and coastal bays.

## Coral Reefs

These are referred to as the Rain Forest of Oceans as they harbor a wide diversity of aquatic flora and fauna.

A coral reef is an aquatic ecosystem made up of corals that form reefs. Coral polyps are held together by calcium carbonate in the formation of reefs.

Warm, shallow, clear, sunny, agitated water is ideal for most reefs.

# CORAL REEFS



## Coastal Ecosystem

- Coastal ecosystems are formed when land and water meet.
- The structure, variety, and energy flow of these ecosystems are all unique.
- The bottom of the coastal environment is dominated by plants and algae.
- Insects, snails, fish, crabs, shrimp, lobsters, and other animals make up the fauna.
- It is one of the major aquatic ecosystems and is quite distinct in terms of structure and diversity.

## FRESHWATER ECOSYSTEM

- This aquatic ecosystem covers less than 1% of the earth's surface and is broadly divided into – wetlands, lentic and lotic ecosystems.

**Types of fresh water ecosystem are:**

- **Swamps and Wetlands**
- **Lentic system - like ponds and lakes**
- **Lotic system- like river and stream**

## Swamps and Wetlands

These are marshy areas that are often covered in water and harbor a variety of flora and fauna.

Wetlands are known to be a home of water lilies, marshes, swamps, Northern Pikes, dragonflies, Green Heron, etc.

## Lentic Ecosystems

It includes standing water bodies like ponds and lakes and is a home to both floating and rooted plants, algae, and **invertebrates**.

All standing water habitats, such as lakes and ponds, are included in lentic ecosystems.

Algae, rooted and floating-leaved plants, and crustaceans like crabs and shrimp live in these habitats. Frogs and salamanders, as well as reptiles like alligators and water snakes, can be found here. Salamanders, frogs, water snakes, and alligators are commonly found

in lentic ecosystems.

## Lotic Ecosystems

These aquatic ecosystems are characterized by rapid flowing water moving in one direction.

Eg., Rivers and streams.

Streams are river flowing down the hills.

They are a hub of a wide variety of insects like beetles, mayflies, and stoneflies, among others. Also, it harbors species like river dolphins, beavers, otters, eel, minnow, and trout.



# River ecosystem



# TERRESTRIAL ECOSYSTEM

Terrestrial ecosystems are exclusively land-based ecosystems.

There are different types of terrestrial ecosystems distributed around various geological zones. They are as follows:

1. Forest Ecosystems
2. Grassland Ecosystems
3. Tundra Ecosystems
4. Desert Ecosystem

## Forest Ecosystem

A forest ecosystem consists of several plants, animals and microorganisms that live in coordination with the abiotic factors of the environment.

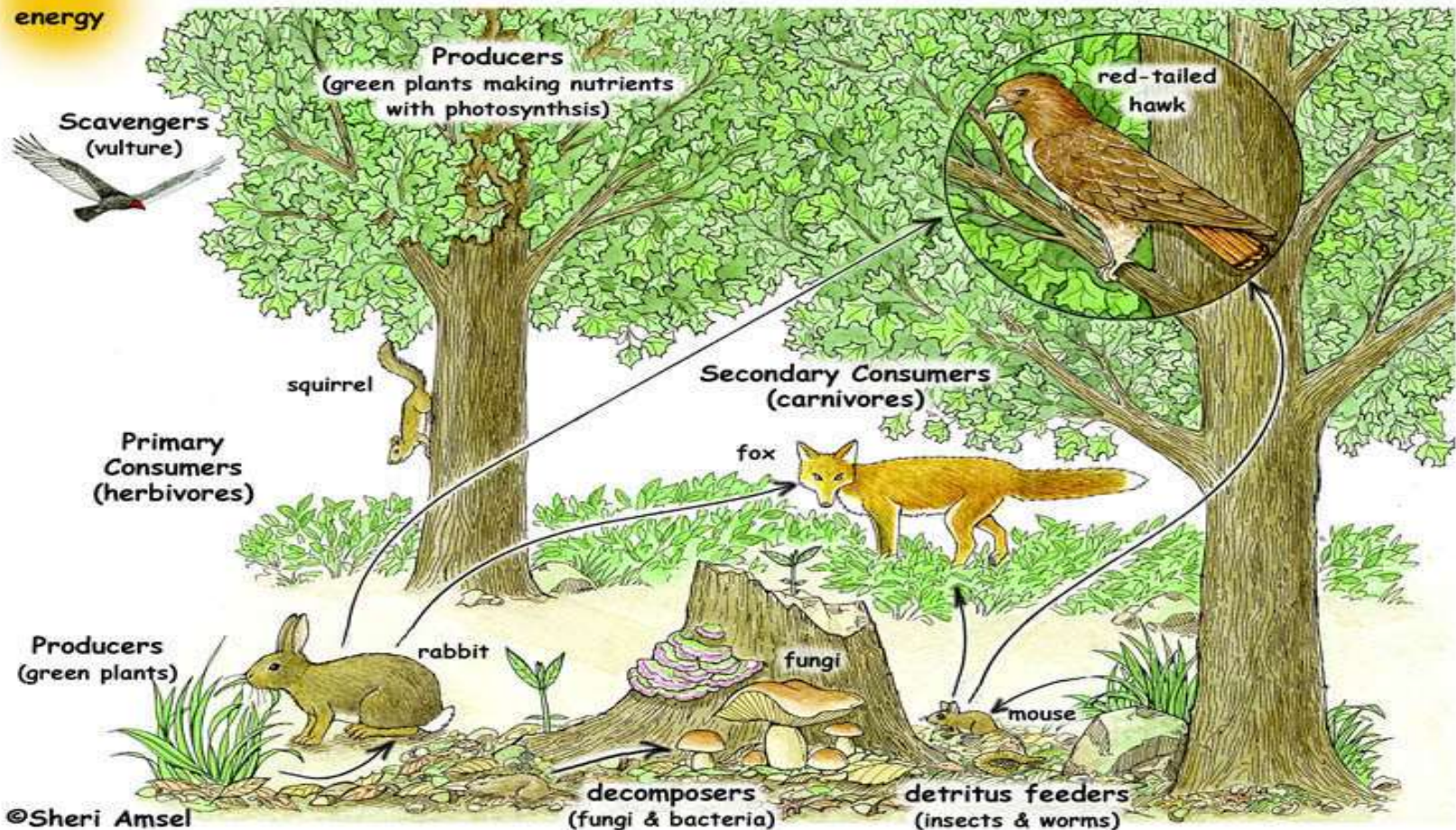
Forests help in maintaining the temperature of the earth and are the major carbon sink.

Eg., National parks

Wild life sanctuaries

# Forest Food Web

solar energy



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## Types of forests

### 1. Rain forests:

Evergreen forests,

Rain fall (150-200 cm).

Two types : tropical and temperate rain forests.

### 1. Deciduous forest:

Moderate rain fall (75-150cm)

Broad leaves

Teak tree is abundant

Two types: tropical and temperate deciduous forests

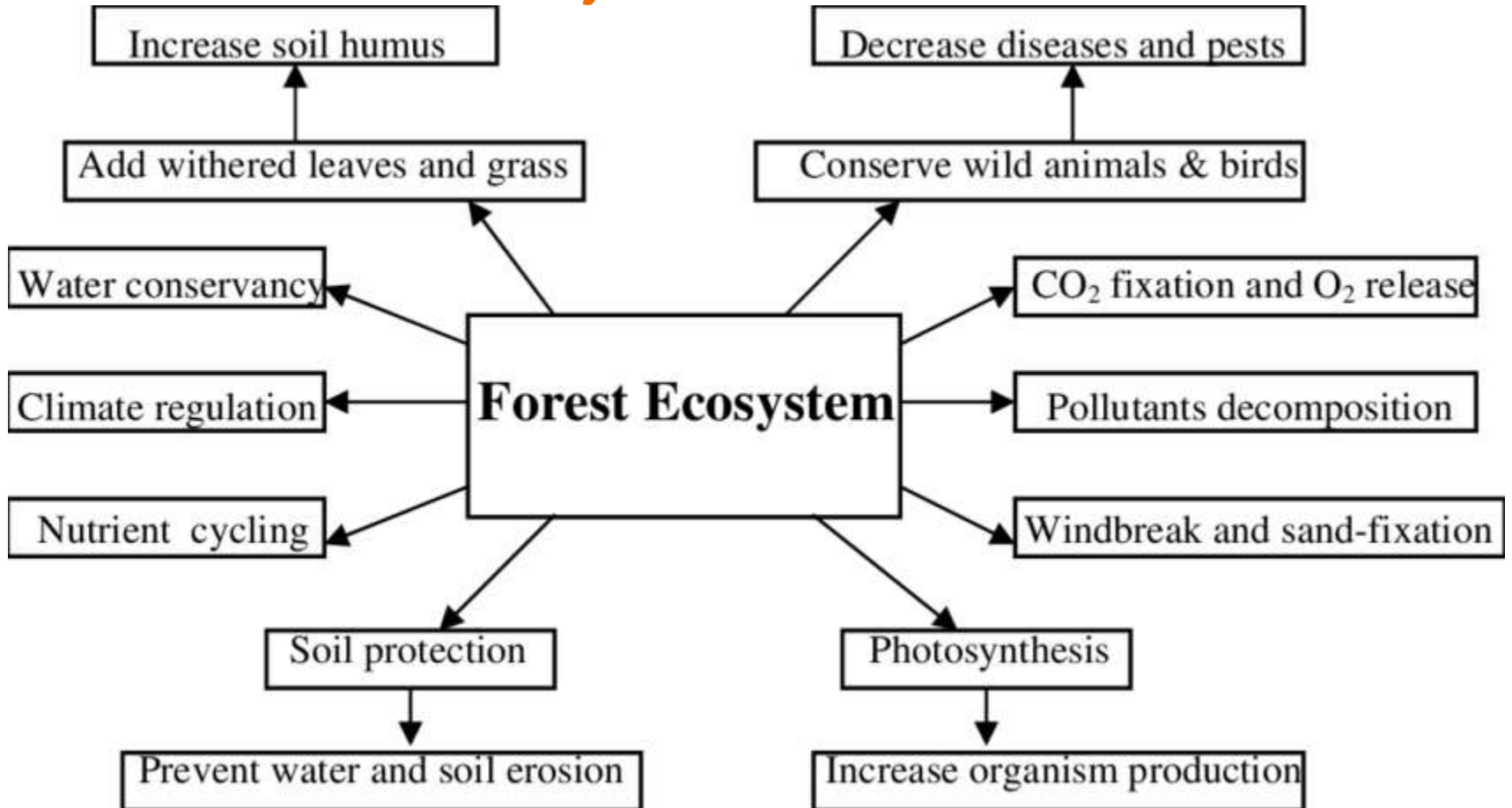
### 1. Coniferous forests: trees with needle like leaves

Low rainfall (35-100cm)

Pine trees are abundant



# Benefits of forest ecosystem



# Grassland ecosystem

- Grasslands are areas dominated by grasses.
- They occupy about 20% of the land on the earth surface.
- Grasslands occur in both in tropical and temperate regions where rainfall is not enough to support the growth of trees.
- Grasslands are found in areas having well-defined hot and dry, warm and rainy seasons.
- Grasslands are one of the intermediate stages in ecological succession and cover a part of the land on all the altitudes and latitudes at which climatic and soil conditions do not allow the growth of trees.
- The types of plants that grow here greatly depend on what the climate and soil are like.
- Grasslands cover areas where rainfall its usually low and/or the soil depth and quality is poor.



**Main grass are;**

**Brachiaria**

**Setaria**

**Sporobolus**

**Cynodon**

**Desmodium**



**Primary consumer  
(Grasshopper)**



**Secondary consumer  
(Birds)**



**Tertiary consumer  
(Snake)**



**Producer (Grass)**



**Decomposers**

**Grassland  
Ecosystem**



## **Name of the grassland**

North America-Prairies

Eurasia (Europe and Asia)-Steppes

Africa-Savanna

South America -Pampas

India-Grassland, Savanna

Brazil-Campos

# Desert Ecosystem

Around **One-Third** of the Earth's surface is covered in **Deserts**.

Antarctica is the only **continent** in the world which is entirely covered by a **Antarctic desert**.

Desert is one of the most dried land areas on this planet that receives very little precipitation annually. It is a land with very less rainfall throughout the year measured less than 50 cm a year.

## **TYPES OF DESERT ECOSYSTEM**

- *Hot and dry*
- *semi-arid*
- *coastal*
- *cold desert*

## 1. Hot and Dry Desert Ecosystem-

These kinds of the desert ecosystem have hot and dry **climatic conditions** through the air and have very low annual rainfall. The hot desert ecosystem is basically found in Central America, South Asia, North America, Africa, Australia etc. There are extreme variations in temperature and soil is rough and harsh.

## 2. Semi-arid desert ecosystem-

This desert ecosystem is quite similar to the Hot and Dry desert ecosystem. This kind of ecosystem has hard rocks, stable ground, less sand dunes. Temperature is not as extreme as a hot and dry desert ecosystem. Great Basin is an example of Semi-arid desert

### **3. Coastal desert ecosystem-**

The Atacama Desert in Chile and Namib in Africa are a good example of Coastal desert ecosystem.

Such desert ecosystems are found near the coastal lines of big water bodies like oceans and seas and are generally affected by the ocean currents. Winter fogs are common here. They are more hospitable than other desert ecosystem and therefore they have a more flora and fauna than others.

### **4. Cold desert ecosystem-**

This desert ecosystem comprises of abundant rainfall throughout the winters and less in summers and generally has chilling winters with snowfall. The summers are short, moderately hot and moist here. These are usually covered with snow dunes. Such desert ecosystem can be found in Greenland, Antarctica, and Nearctic realm.