Fresh water ecosystems: meaning, types and their properties

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Introduction

The world's demand for fresh water is high, though there is a limited supply. How can we be more responsible with this crucial resource and its ecosystems?

Key Words

- **DETRITUS:** Matter produced by decay or disintegration of living material.
- **LENTIC:** The vertically layered nature of a lake.
- **LITTORAL:** The region of a lake near the shore.
- **LOTIC:** Flowing water, as in rivers and streams
- **WETLAND:** A shallow ecosystem where the land is submerged for at least part of the year.

Introduction

Fresh water starts out as water vapor that has evaporated from the surface of oceans, lakes, and other bodies of water. When this vapor rises, it leaves salts and other contaminants behind and becomes “fresh.” The water vapor collects in drifting clouds that eventually release the water back to Earth in the form of rain or snow.

After fresh water reaches the ground through precipitation, it flows downhill across a landscape called the watershed to lakes, ponds, rivers, streams, and wetlands.

More than half of all freshwater on our planet seeps through soil and between rocks to form aquifers that are filled with groundwater. The top surface of an aquifer is called the water table, and this is the depth where wells are drilled to bring fresh water into cities and homes

Sources : Earth's aquatic ecosystem

It include lakes and ponds, rivers, streams, springs, bogs, and wetlands. They can be contrasted with marine ecosystems, which have a larger salt content. Freshwater habitats can be classified by different factors, including temperature, light penetration, nutrients, and vegetation.

- Lakes
- Ponds
- Rivers
- Wetland

Component

The major components of a freshwater ecosystem are producers (plants with roots and phytoplankton), consumers (zooplankton, fish, and turtles), and decomposers (bacteria and fungi). Their interaction with abiotic components (penetration of light, water currents, dissolved nutrient concentrations, and suspended solids) forms an aquatic ecosystem. The producers supply O_2 to the aquatic systems through photosynthesis. This O_2 is then used by the producers, consumers and decomposers through aerobic respiration. The CO_2 enters an aquatic system from the atmosphere and through aerobic respiration by producers, consumers, and decomposers and it's removed by photosynthesizing producers. The concentrations of dissolved O_2 and CO_2 in water vary greatly with depth because of differences in the photosynthesis and aerobic respiration rates.

Sources: https://www.lenntech.com/aquatic/introduction.htm#ixzz6VWwrqoSL

Freshwater Resources Budget

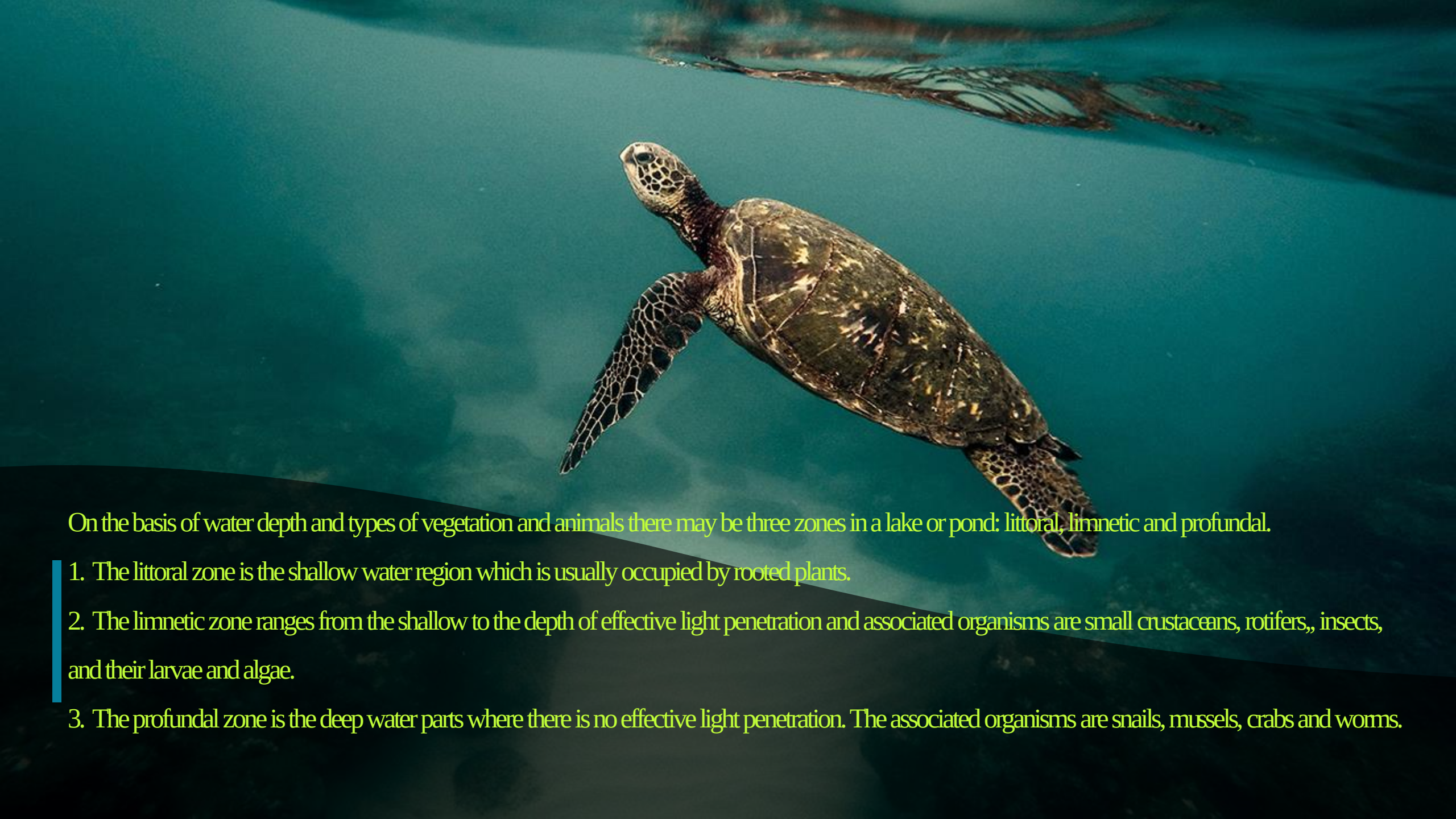
It is interesting to know that there are nearly 14 x 10^8 cubic km of water on the planet, of which more than 97.5% is in the oceans, which covers 71% of the earth's surface. Wetlands are estimated to occupy nearly 6.4% of the earth's surface. Of those wetlands, nearly 30% is made up of bogs, 26% fens, 20% swamps, and 15% flood plains. Of the earth's fresh water, 69.6% is locked up in the continental ice, 30.1% in underground aquifers, and 0.26% in rivers and lakes. In particular, lakes are found to occupy less than 0.007% of world's fresh water (Clarke, 1994).is available in rivers, lakes and reservoirs.

India Water Budget

Overall, every year, precipitation in the form of rain and snowfall provide over 4000 cu km of freshwater to India, of which 2047 cu km return to oceans or is precipitated. A small percentage is stored in inland water bodies and groundwater aquifers. Topographic constraints, distribution pattern, technical limitation, and poor management do not allow India to harness its water resources efficiently.

Types of Fresh Water Ecosystem

- Freshwater ecosystems can be divided into two parts
- lentic ecosystems (still water) and lotic ecosystems (flowing water).
- Limnology (its branch freshwater biology is a study about freshwater ecosystems)



On the basis of water depth and types of vegetation and animals there may be three zones in a lake or pond: littoral, limnetic and profundal.

1. The littoral zone is the shallow water region which is usually occupied by rooted plants.
2. The limnetic zone ranges from the shallow to the depth of effective light penetration and associated organisms are small crustaceans, rotifers,, insects, and their larvae and algae.
3. The profundal zone is the deep water parts where there is no effective light penetration. The associated organisms are snails, mussels, crabs and worms.

Threats to fresh Water

Prime Threat

Five broad threats to freshwater biodiversity include overexploitation, water pollution, flow modification, destruction or degradation of habitat, and invasion by exotic species.

Supplementary Threat

Recent extinction trends can be attributed largely to sedimentation, stream fragmentation, chemical and organic pollutants, dams, and invasive species. Common chemical stresses on freshwater ecosystem health include acidification, eutrophication and copper and pesticide contamination.

Message

Conserve water, conserve life.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घर-घर में बूंद-बूंद पानी बचाएंगे तो भविष्य का कल देख पाएंगे.

THANK YOU