

## MARINE ECOSYSTEM

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Environmental Geography.

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The biosphere is a giant ecosystem, within which smaller ecosystems can be identified. . An ecosystem can be huge as entire forest or as small as acuarium, depending on the need and basis of classification .

Ecosystem can be broadly divided into two :- (i) Aquatic (ii) Terrestrial. .Global aquatic system falls into two broad classes –Fresh water ecosystem and salt water ecosystem . Aquatic ecosystem may be classified as marine ecosystem which includes open sea ecosystem and coastal region ecosystem . Marine ecosystem accounts for about two-thirds of all biomes of the globe as sea covers 75% of the total geographical area of the world . The volume of surface area of marine environment lighted by the sun is small in comparison to total volume of water. Both seashore and banks are homes of many organism but far off open oceans also have a variety of plant and animal community. This eco-system provides the world a great amount of food .

Marine ecosystem may be generally defined as a spatially explicit unit of ocean that includes all the organism,

along with all the components of the abiotic environment within its boundary . Marine ecosystem contains water detritus, hundreds of kinds of organism including bacteria phytoplankton ,zoo plankton ,fishes ,mammals, birds and fishes. No general theory can be described to the functioning of marine ecosystem . The organisms that inhabit marine ecosystem are diverse . The economically important organisms are algae ,sponges, snails, barnacles ,mussels, crab ,fish. Marine ecosystems provide many important services associating with their regulatory and habitat functions. They control pollution. provides storm protection, flood control ,habitat for species and stabilize shoreline . They support biodiversity in coastal and open ocean habitats . Marine ecosystem provide many resources fo survival of mankind . Landuse change, climatic change . invasion of non native species and other anthro - pogenic activities affect biodiversity.

### **Physico-chemical aspect of marine environment**

The most important physical feature which influence marine life are light , temp, pressure ,salinity , tides and currents .

- (a) **Light** - Light regulates the pattern of distribution of marine animals and contribute to organic production.The autotrophic primary producers exploit the light energy in phosynthetic production of food for primary macro- consumers of marine ecosystem.Light

determines the diurnal migration of marine organisms and also regulates color pattern of marine organisms. Deep sea fauna are colorless and there is absence of functional eyes in deep sea animals .

- (b) **Temperature** –The range of temperature is much less than land, Arctic waters are 27<sup>0</sup> F much colder than tropical waters 81<sup>0</sup> F .Currents are warmer and colder. Seasonal and daily changes are larger in coastal waters than others . The surface of colder water is coolest at dawn and warmest at dusk .Unlike fresh waters seawater does not have a density maximum at 4<sup>0</sup>C rather it becomes denser downwards ,
- (c) **Pressure** –Pressure in ocean varies from 1atm at the surface to 1000 atm at depth. Pressure changes in sea is great .Certain organisms are restricted to surface where pressure is not great but certain marine organisms are adapted to life at great depths as whales .

The ocean is divided into two main divisions: =

### **Ocean**

1. Pelagic
2. Benthic (Below 6000m)

**Pelagic** is divided into:-

Neritic (Continental Shelf)

Oceanic Provinces

**Benthic** is divided into:-

Littoral

Sub-littoral

Deep sea zone

The upper illuminated zone of open ocean is called epipelagic zone. Euphotic-pelagic ocean is named epipelagic zone. The Aphatic pelagic provinces is divided into Mesopelagic ,Bathypelagic and Abysopelagic (no Light ).

### **( I) Biotic Components**

**Producers** – The phytoplanktons are the primary producers in the photo zone and form base of trophic structure of marine food chain, Phytoplanktons involve in sun synthesis thus they are primary producers The planktons are food for many minute organisms. Seaweeds as dinoflagellates and the diatoms are important and grow in abundance where temperature is normal. Both produce organic carbon of the sea as well as green algae .Though consumption is high yet they grow rapidly .

**Primary Consumers** – Zoo planktons are the heterotrophic primary consumer animals and form trophic level II of the food chain . Zoo planktons are both vegetarians and non vegetarian organism

because they feed on phytoplanktons . Zoo planktons include permanent members as well as transient during larvae stage. Common planktonic forms are foraminifera and radiolarian. The largest animals are the nektons. Food is not abundant at great depths so fishes consume as much as they can when they get a chance .

**Secondary Consumers** –It comprises of nekton fishes and Benthos animals. They feed on herbivores zooplanktons of Trophic level II.

There is absence of light in the Benthic zone. Consequently in the absence of vegetation the organisms depend on dead bodies .Food is

plentiful in the bottom of the sea where there is deep seawater. Soft ooze ,made of organic remains are found.

### **Respiration**

Respiration is carried out by all living organism .The energy released from respiration is used for carrying on life processes.

### **Decomposition**

The dead organic matter is decomposed by micro-organism . The ecosystem works in a harmonious way by the process of producers,consumers and decomposers

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