

Aquatic biodiversity, threats, importance and conservation

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OUTLINE

- ❖ Biodiversity
- ❖ Aquatic biodiversity
 - ❖ Aquatic Biodiversity- both marine and freshwater
 - ❖ Importance of aquatic Biodiversity
 - ❖ Threats to the diversity
 - climate change
 - exotic species invasion
 - water pollution
 - Over exploitation of species
 - Habitat destruction
 - flow modification
- ❖ Conservation Approaches



Biodiversity

All the different species of animals, plants, fungi, and microbial organisms living on Earth and the variety of habitats in which they live.

Each species is adapted to its unique niche in the environment, from the peaks of mountains to the depths of deep-sea hydrothermal vents, and from polar ice caps to tropical rain forests



Aquatic biodiversity

Aquatic biodiversity can be defined as the variety of life and the ecosystems that make up the freshwater, tidal, and marine regions of the world and their interactions

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Aquatic biodiversity Includes:

1-freshwater ecosystems,

including lakes, ponds, reservoirs, rivers, streams, groundwater, and wetlands

2- marine ecosystems,

including oceans, estuaries, salt marshes, seagrass beds, coral reefs, kelp beds, and mangrove forests

Aquatic biodiversity includes: all unique species, their habitats and interaction between them. It consists of phytoplankton, zooplankton, aquatic plants, insects, fish, birds, mammals, and others



Importance of Aquatic Biodiversity

1-Aquatic biodiversity has enormous economic and aesthetic value and is largely responsible for maintaining and supporting overall environmental health.

2- Humans depend on water resources for food and medicine

3- Important for recreational and commercial purposes such as fishing and tourism

4- organisms also rely upon the great diversity of aquatic habitats and resources for food, materials, and breeding grounds.



THREATS TO AQUATIC BIODIVERSITY

- 1) climate change
- 2) exotic species invasion
- 3) water pollution
- 4) Over exploitation of species
- 5) Habitat destruction
- 6) flow modification



1-CLIMATE CHANGE



- Global warming will cause sea level rise.
- As a result higher temperature decreases the ability of water to dissolve oxygen.
- Humans have been increasing the amount of CO₂ in the atmosphere by burning enormous amount of fuels
- High temperature causes some damages such as:
 1. **Turtle nests** in Florida produce 90% of females due to higher temperatures, if the temperature rises by 1 ° C or more, no males will be produced there.
 2. **Coral reefs** require particular environmental conditions for growth and water temperatures from 23–29 °C are optimal for growth.



2- EXOTIC SPECIES INVASION

- Invasive species can dramatically change the structure and function of aquatic ecosystems by changing biodiversity and eliminating vital components of the food chain.
- These species are harmful to native biodiversity in a number of ways.
- , as competitors, predators, parasites, or by spreading disease.
- There are many exotic species that were transported to new places by ship or by mistake by seafarers



3-WATER POLLUTION

- Pollutants in the air, water, and soil can affect organisms in many ways, from altering the rate of plant growth to changing reproduction patterns, leading to extinction.



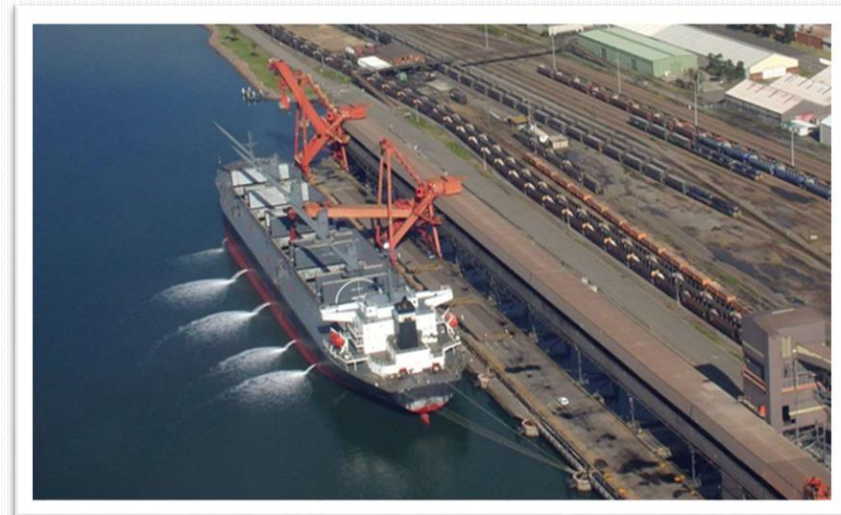
They are four forms of pollutants

1- **Toxic pollutants** - such as minerals, acids and phenols, cause death if present in high concentration and affect the reproductive function of fish

2- **suspended solids** - affect the breathing processes

3- **Seewage and organic pollutants** - They cause deoxygenation due to eutrophication causing mortality in fishes.

4- **Thermal pollution** - It cause increase in ambient temperature and reduce dissolved oxygen concentration leading to death of some sensitive species.



4-OVER EXPLOITATION

- Overexploitation can lead to resource depletion and put a number of **threatened** and **endangered** species at risk for **extinction**.
- humans exploit over 400 species as food resources from the marine environment.
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5-HABITAT DESTRUCTION

- Loss of habitat is the major reason why aquatic biodiversity is declining.
- Describes the emergences of discontinuities (fragmentation) or the loss (destruction) of the environment inhabited by an organism.



6-flow modification

Flow alteration is any change in the natural flow regime of a river or stream or water level of a lake or reservoir induced by human activities.



Conservation Approaches

- 1-** Aquatic areas that have been damaged or suffered habitat loss or degradation can be restored. e.g. Pacific Northwest salmon populations)
- 2-** A biosphere reserve is a specific area within a body of water where fishing is prohibited or other restrictions are placed in an attempt to protect plants, animals and habitats
- 3-** Regional dynamic management and regulates the factors that affect aquatic biodiversity by balancing conservation and economic and social needs within the aquatic area
- 4-** Watershed management is an important approach to conserving water diversity

5- Planting trees in the catchment area prevents soil erosion and reduces the problem of slipping into the water body, which leads to the survival of aquatic organisms

6- Preventing the establishment of factories, chemical plants and thermal power stations near water resources

7- Classification of endangered species is one of the methods used to protect biological diversity

8- Increasing public awareness is one of the most important ways to preserve aquatic biodiversity. Through educational programs





**THANK
YOU!**

