

MODULE –II

Environmental pollution

2.6 Thermal pollution

- **Causes of thermal pollution**
- **Consequence of thermal pollution**
- **Control of thermal pollution.**



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ENVIRONMENTAL POLLUTION

2.6 Thermal pollution

Thermal pollution is the degradation of water quality by any process that increases the ambient water temperature. Thermal pollution refers to the release of warm H₂O into the water body. It is the undesirable change in the temperature of the water body. Thermal pollution increases water temperature, causing a change (lowering) of dissolved oxygen levels. This disrupts the body of water's ecological balance, resulting in the suffocation of some plant and animal species while encouraging the overgrowth of others.

Causes of Thermal pollution

1. Nuclear power plants Industries, nuclear & thermal power plants use water to cool machinery and then discharge the warmed into a stream.
2. Research institutes, nuclear experiments and explosions discharged a lot of unutilized heat into nearby H₂O stream
3. Emissions from nuclear reactor & processing installation are also responsible for increasing the temp of water bodies.
4. Coal-fired power plants: Coal – fired power plants are the major source of thermal Pollutants
5. The heated effluents decrease the dissolved oxygen content of water.
6. It results into killing of fish and other aquatic flora & fauna.
7. Industrial effluents: Due to disposal of heat water into the sea, it increases the Steam temp to a level, at which natural dissipation of heat will be in efficient.
8. Domestic Sewage: Discharge of domestic sewage into the water body decreases the dissolved oxygen content.
9. Water temperature rises when trees and tall vegetation providing shades are cut down.

10. Soil erosion caused by construction, removal of stream side vegetation, poor farming practices, overgrazing and recreation increases the amount of suspended solids in the water.
11. Thermal pollution can also occur through earthquakes.

Consequence of thermal pollution

1. Dissolved oxygen content decreases in warm water.
2. Warm water prevents the penetration of oxygen into deep cold waters.
3. The toxicity of pesticides and detergents increases with increase in temp.
4. Metabolic activities of organisms increase in warm H₂O but warm water contain less oxygen. Hence organisms are affected.
5. Warm H₂O disturbs spawning of animals.
6. Fish migration is affected by warm H₂O.
7. Blue green algae dominate in H₂O bodies due to thermal pollution.
8. Sponges, molluscs & crustaceans are eliminated at temp above 37⁰ c. This results in a change in the biodiversity.
9. Thermal pollution interfere with biological activities & reproduction system.
10. Change in temp change the seasonal variation.

Control of thermal pollution.

Thermal pollution is controlled by three methods.

- Cooling ponds
- Cooling towers
- Spray pond

1. Cooling pond:

The hot water obtained from industries is stored in ponds. Here natural evaporation cools the water. After cooling, the water is drained into natural water bodies.

2, Cooling towers

The hot water is passed through a system of coiled pipes kept in a tower. The hot water is allowed to flow down under from the top of the tower. Cool air is allowed to flow over the pipes upward from the bottom of the tower.

3,Spray ponds

The hot water from the industries are sprays through nozzles (sprayers) into fine water droplets. Heat is dissipated from these droplets and the water is collected in spray ponds.

4.Artificial lakes

Artificial lakes are man made bodies of water which offer possible alternative to once through cooling.The heated effluents can be discharged into the lake at one end and the water for cooling purposes may be withdrawn from the other end.The heat is eventually dissipated through evaporation.

