

Unit – III

Thermal Pollution

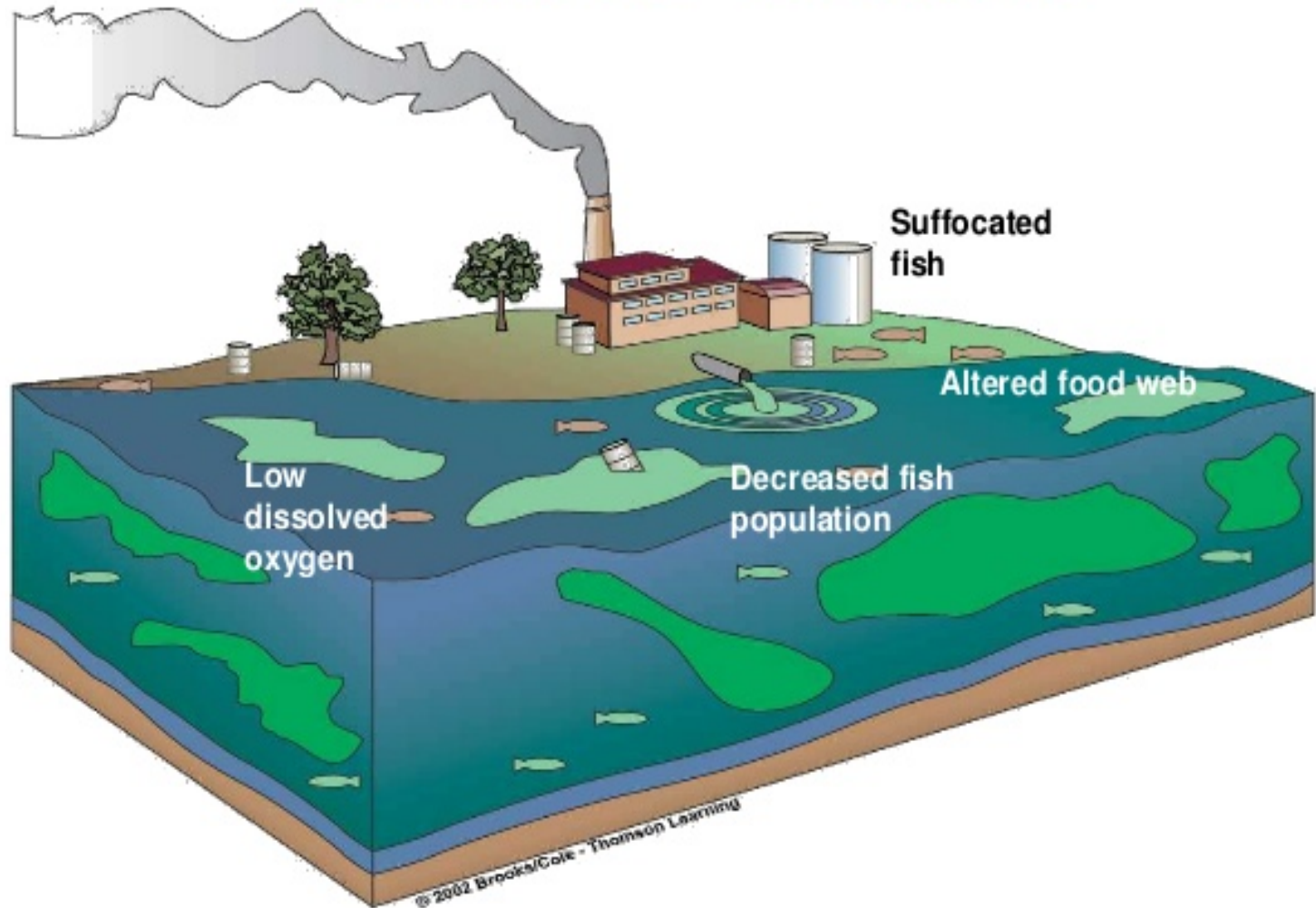
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Sources of Thermal Pollution

- The **discharge** of **warm water** into a river is usually called a thermal pollution.
- Hot water from industrial **process**.
- It occurs when an **industry** removes water from a source, uses the water for **cooling purposes** and then **returns** the heated water to its **source**.
- This heated water, which is at least **15°C** higher than the normal is discharged back into the water body.

Thermal Pollution



Harmful Effects

- **Oxygen** solubility in water decreases.
- **Metabolism** of fish increases.
- **Thermal additions** can **promote** the **growth of certain fish** near power plant. However sudden plant shutdown can cause death of fish **adapted** to living in warmer waters.
- **Tropical marine animals** are generally unable to withstand a temperature increase of **2 to 3⁰C** and most **sponges, mollusks** and **crustaceans** are eliminated above **37⁰C**.
- Change in the **diversity** of fauna and **ecological imbalance** of the river.

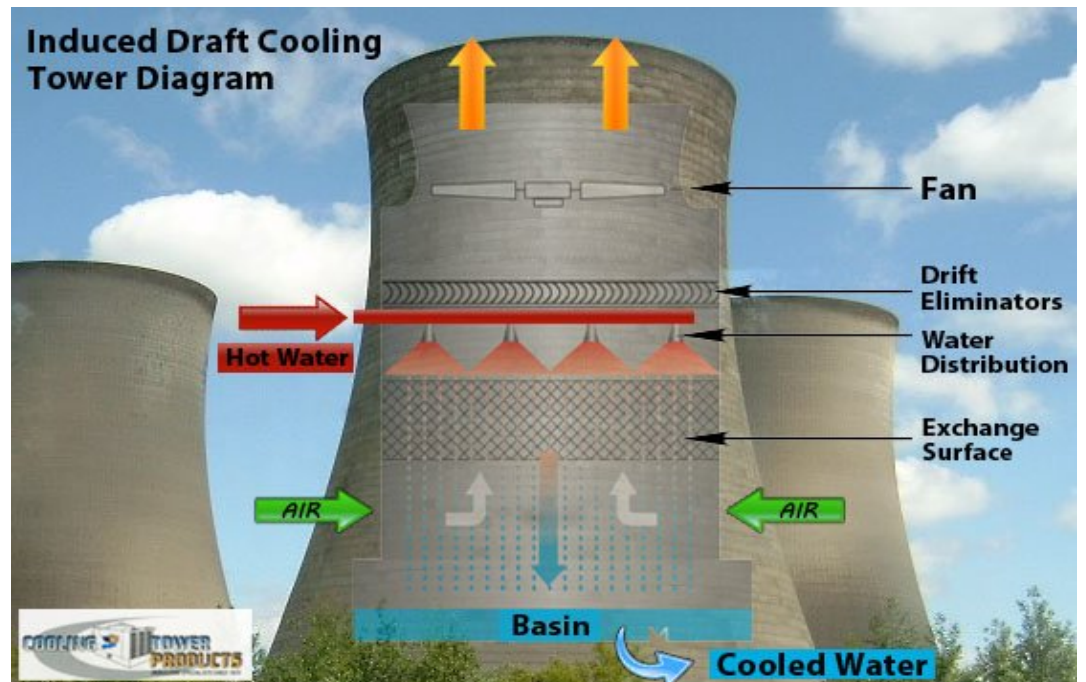
Control Measures

- **Cooling Pond** - a large **shallow** pond. Hot water is pumped into one end of the pond and cooler water is removed from the other end. The **heat** gets dissipated into the **atmosphere**.
- **Cooling Tower**
 - Warm water is **sprayed downward** over **vertical sheets** as thin film. **Cool air** enters through base of the tower and **rises upwards** causing **evaporative cooling**. The waste heat is dissipated into the atmosphere.
 - The cooled water is collected at bottom and **recycled** back to power plant or **discharged** into river.
 - Take up less area than cooling pond.
 - Disadvantage (both methods) is large amount of water is lost by evaporation.

Cooling Pond



Cooling Tower



THANK YOU!!!

