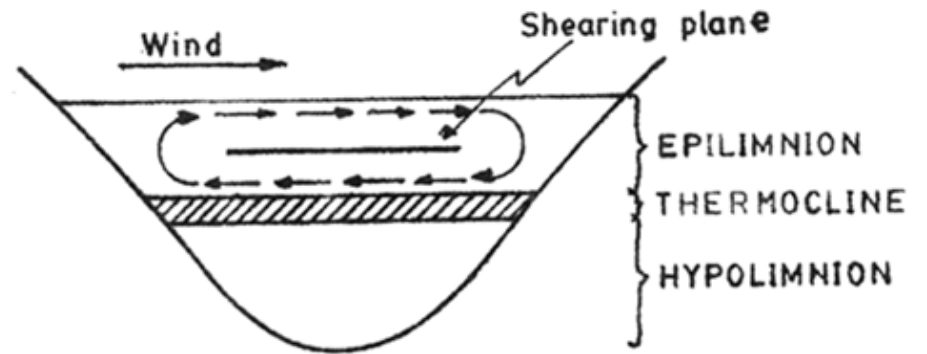
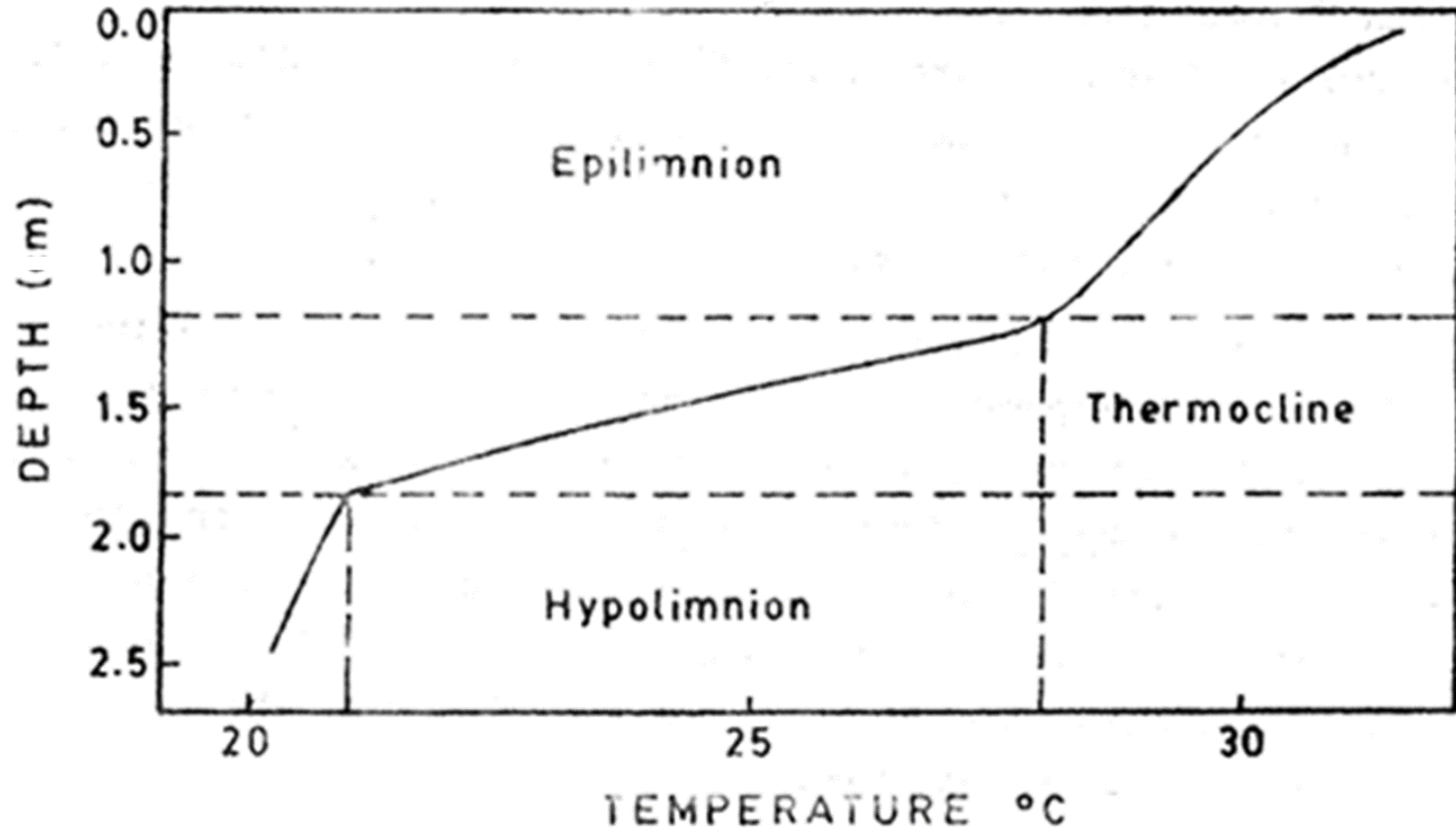


# **Aquaculture**

**Dr. Mujtaba A.Tahir**

# Temperature Relations of Large Bodies of Water

- most of the radiant energy of light is absorbed as heat by the surface and upper layers of water in the fish ponds, (because of the high concentration of dissolved organic and particulate matter on the top layer of water)
- lower water layer becomes cooler.
- This at times is quite beneficial, for during the hottest part of the day the fish can move down safely to the lower layers.
- Mixing of the layers would however take place due to wind action.
- Since water heated by sun remains in the epilimnion itself (mixing due to wind action restricted to the upper zone itself) there is a sharp difference in the physico-chemical and biological characteristics of epilimnion and hypolimnion.



Thermal stratification in a fish pond (after Boyd, 1979)

# Temperature Relations of Culturable Organisms

- All animals have a temperature range, the 'biokinetic range', within which they can live indefinitely , limited by the upper and lower tolerance limit.
- beyond these critical temperatures the animals may live for a brief period resistance time but would eventually die (lethal zone)