WATER QUALITY IN AQUACULTURE

WATER QUALITY VARIABLES

- **Temperature:**
  - The metabolic rate of aquatic organisms is also related to temperature, and in warm waters, respiration rates increase leading to increased oxygen consumption and increased decomposition of organic matter.
  - Growth rates also leading to increased water turbidity, macrophyte growth and algal blooms, when nutrient conditions are suitable.

THE METABOLIC RATE AND GROWTH OF AQUATIC ORGANISMS IS ALSO RELATED TO TEMPERATURE

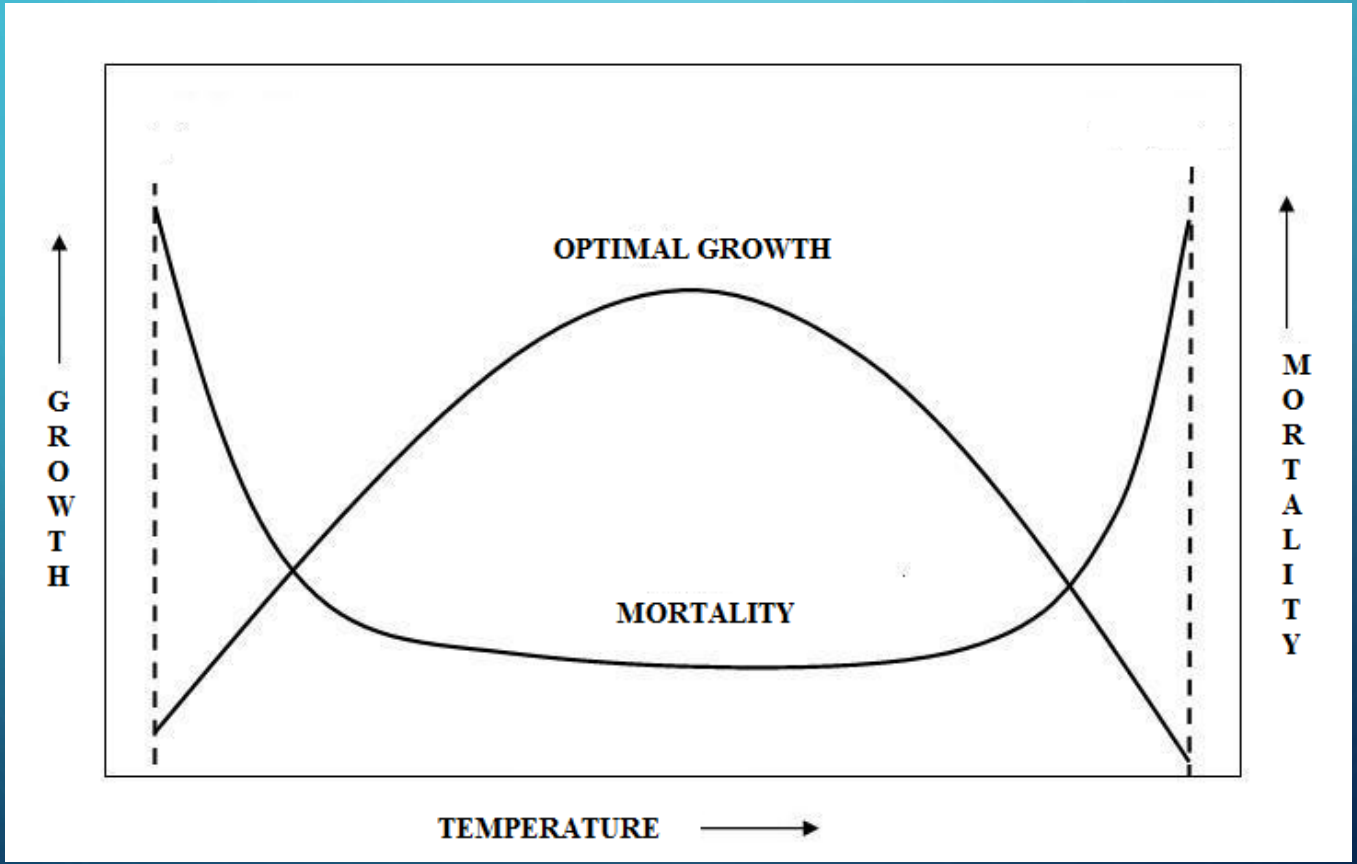
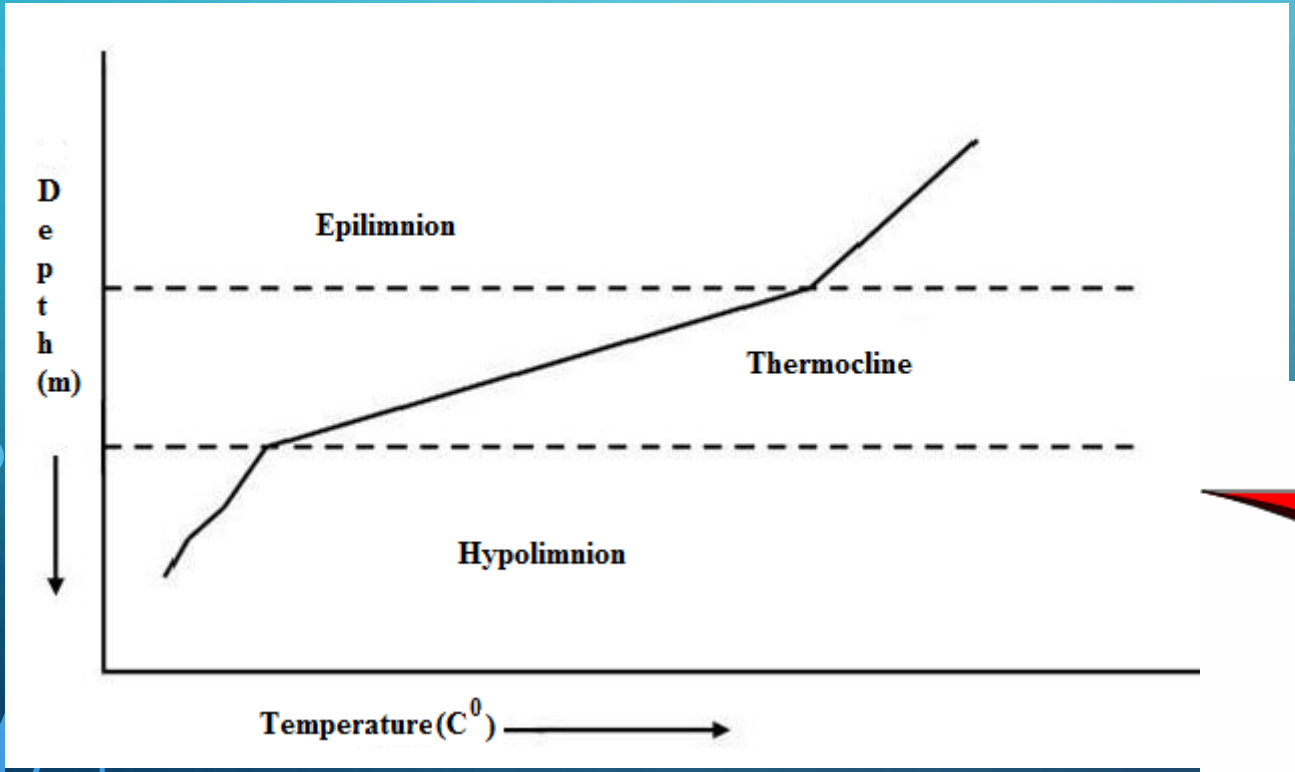
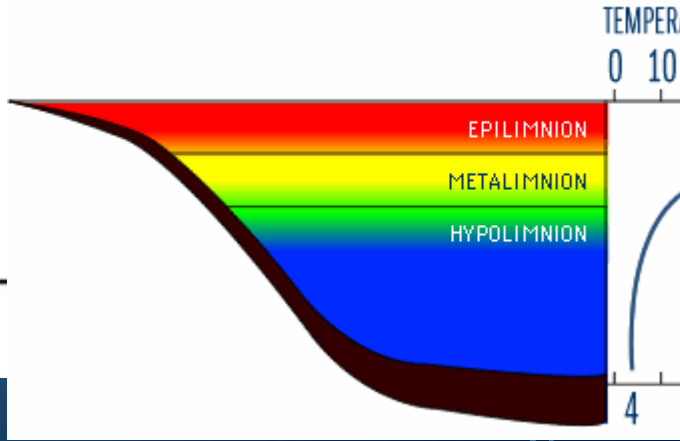


Figure 1. Relation between fish growth and water temperature

For a detailed understanding of biological and chemical processes in water bodies it is often necessary to take a series of temperature measurements throughout the depth of the water, particularly during periods of temperature stratification in lakes and reservoirs.





- Figure 2. Thermal stratification in fish pond.

ACCORDING TO WATER TEMPERATURE SOME FISH SPECIES LIVE OR DIE:

- Fish adapted in cold water lives (≤15°C),
- Fish adapted in warm water lives(≤ 24 °C)
- Fish adapted in hot water lives (≥ 25 °C)

COLOUR

- The colour and the turbidity of water determine the depth to which light is transmitted.
- Colour controls the amount of primary productivity that is possible by controlling the rate of photosynthesis of the algae present.
- The visible colour of water is the result of the different wavelengths not absorbed by the water itself or the result of dissolved and particulate substances present.
- It is possible to measure both true and apparent colour in water.

COLOUR

- Natural minerals such as ferric hydroxide and organic substances such as humic acids give true colour to water.
- True colour can only be measured in a sample after filtration or centrifugation.
- Apparent colour is caused by coloured particulates and the refraction and reflection of light on suspended particulates.
- Polluted water may, therefore, have quite a strong apparent colour.

COLOUR

- Different species of phyto- and zooplankton can also give water an apparent colour.
- A dark or blue-green colour can be caused by blue-green algae, a yellow-brown colour by diatoms or dinoflagellates and reds and purples by the presence of zooplankton such as *Daphnia* sp. or copepods.

ODOUR

Water odour is usually the result of labile, volatile organic compounds and may be produced by phytoplankton and aquatic plants or decaying organic matter.

Industrial and human wastes can also create odours, either directly or as a result of stimulating biological activity.

Organic compounds, inorganic chemicals, oil and gas can all impart odour to water although an odour does not automatically indicate the presence of harmful substances.

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