**EUTROPHICATION**

**The main causes of eutrophication are**

\* natural run-off of nutrients from the soil and the weathering of rocks
\* run-off of inorganic fertilizer (containing nitrates and phosphates)
\* run-off of manure from farms (containing nitrates, phosphates and ammonia)
\* run-off from erosion (following mining, construction work or poor land use)
\* discharge of detergents (containing phosphates)
\* discharge of partially treated or untreated sewage (containing nitrates and phosphates)

**The main effects of eutrophication are an**

\* increase in plant and animal biomass
\* increase in growth of rooted plants, e.g. reeds
\* increase in turbidity (cloudiness) of water
\* increase in rate of sedimentation
\* development of anoxic conditions (low oxygen levels)
\* decrease in species diversity
\* change in dominant biota (e.g. carp replace trout and blue-green algae replace normal algae) and an
\* increase in the frequency of algal blooms.

**Some of the main consequences of eutrophication are**

\* increased vegetation may impede water flow and the movement of boats
\* the water may become unsuitable for drinking even after treatment
\* decrease in the amenity value of the water (e.g. it may become unsuitable for water sports such as sailing)
\* disappearance of commercially important species (such as trout)

**A reduction in the extent of artificial eutrophication can (in principle) be achieved by**

\* reducing the use of phosphates as builders in detergents
\* reducing the use of nitrate containing fertilizers
\* using tertiary sewage treatment methods to remove phosphate and nitrate before discharge of the effluent into rivers and lakes
\* directing waste water away from lakes to rivers and the sea
\* aerating lakes and reservoirs to prevent oxygen depletion particularly during algal blooms
\* removing phosphate-rich plant material from affected lakes
\* removing phosphate-rich sediments by dredging.



