

Water Resources and Sources of Water Pollution

by

Dr. Khaled H. El-Ezaby

Associate Professor of Environmental Pollution

I- Water Resources:-

a- Surface water

>Fresh water (Rivers and Fresh lakes)

>Brackish water (Lakes)

>Saline water (Oceans & Seas)

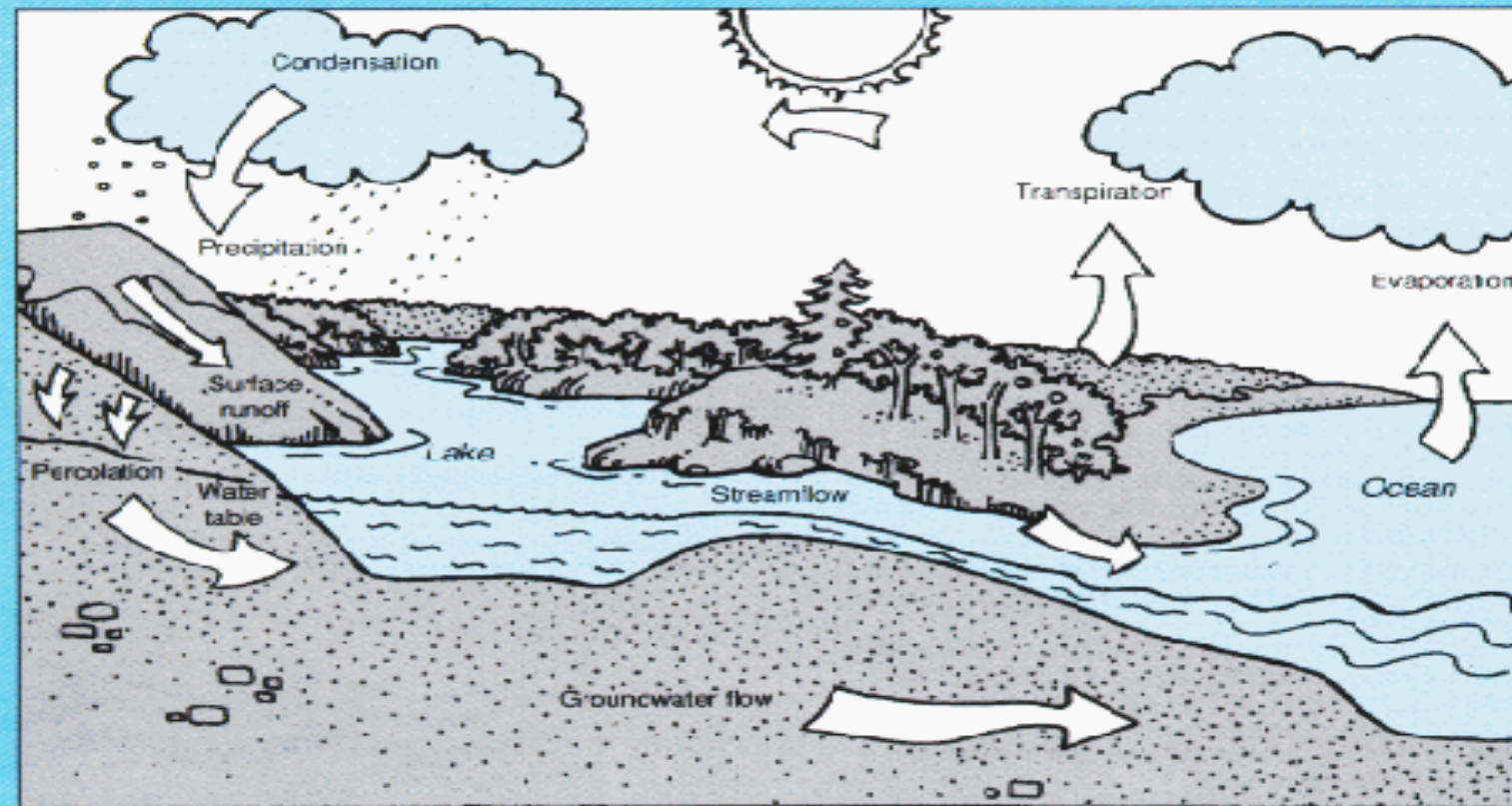
b- Underground water (Wells & Springs)



II-The hydrologic cycle (Water Cycle):

Figure 1

The hydrologic cycle



III- Water pollution:

Water pollution is the presence of any material (contaminant) in water that is harmful to human, animal and plant, or affects its taste or odour.

Sources of Water Pollution:

- **1- Domestic water pollution**
- **2- Industrial water pollution**
- **3- Agricultural water pollution.**



4- Radioactive water pollution.

5- Thermal water pollution.

6- Shipping water pollution.

Main Sources of Water Pollution:

1. Domestic water pollution

(Municipal wastewater or Sewage):

It includes waste water from homes and commercial establishments. 70% of this wastewater is transmitted by sewers to municipal waste water treatment plant, while the remaining 30% released as a raw sewage into waterways or septic tanks for waste disposal.



Sewage composed mainly of oxidizable **organic** matters. The organic matters when discharged directly into waterways without treatment gets oxidized by bacterial decomposition to ***nitrate, phosphate, carbon dioxide and water.***

As this type of decomposition needs the use of dissolved oxygen, it places an oxygen demand on the water. Because of this tendency to consume oxygen in the decomposition process, a common indicator used to monitor this type of input organic pollution in receiving waters has been the ***BOD (Biological “Biochemical” Oxygen Demand)*** test.

**** *The higher the organic matter content, the lower the oxygen content in water (oxygen depletion)  The higher BOD result.***

2. Industrial water pollution.

The types of industrial wastewaters are widely varied according to the type of the industry (its raw materials and processing). The wastewaters discharged from the different industries might be have organic, inorganic or microbiological content , depending on the type of the industry and in turn lead to different impacts on the receiving water.

3. Agricultural water pollution:

Agricultural wastes which discharged into waterways by the drainage water include:

- **Wastes generated by farm animals**, which add organic pollution to the water stream.
- **Inorganic fertilizers**, which cause first inorganic pollution followed by organic pollution.

- Soil erosion, which decreases the transparency of the water that limits the photosynthesis. In addition, the sediments carried into fresh water systems tends to clog the gills of fish, causing suffocation.

- **Pesticides** that have been used to combat the pests, when sprayed on cropland they remain in the soil for long periods of time. During periods of heavy rain or when the crops are irrigated, they tend to be carried, into surface, marine or ground water systems causing organic pollution to the drinking water supplies.