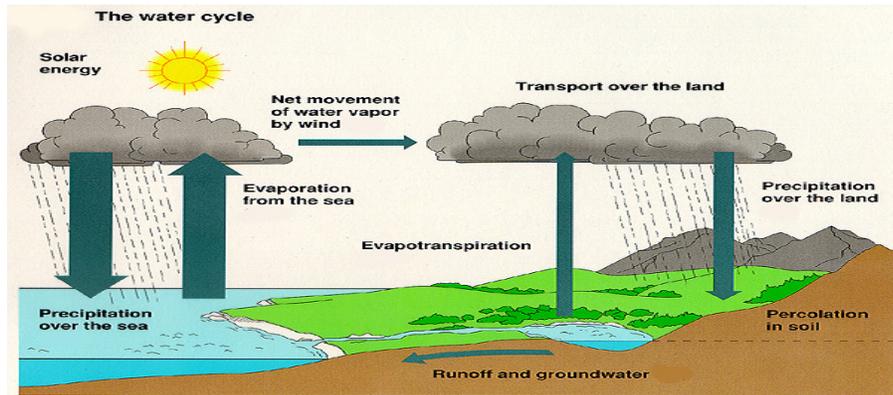


4.0 Human activities affect aquatic environments.



Water is recycled around the world through the **water cycle**. This doesn't mean that any one area will always have the same amount of water. In fact, it means just the opposite. No one area can expect the same amount of water year after year. This is because of other natural cycles and human intervention (use) that can cause changes to occur.

4.1 How Humans Use Water

There are **direct** (*domestic or personal use*) and **indirect** (*industrial and agricultural*) ways that humans use water. Many indirect uses can have negative effects on Earth's water supply.

Negative effects may include:

- Pollution of surface and groundwater
- Depletion of groundwater supply

There are benefits and costs to using water.

The Major Uses Of Water

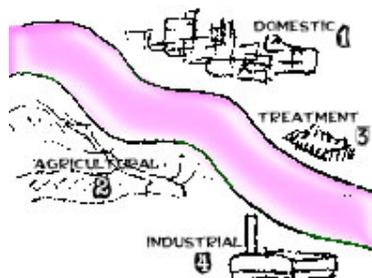
Water Use	Direct/Indirect	Benefit (+)	Cost (-)
Agriculture (irrigation)	73% - indirect	Food Economy Jobs	Soil salinity Decreases vegetation Depletes groundwater supplies
Industry (coolant, solvent, washing, diluting pollutants)	22% - indirect	Jobs Consumer Products Services	Pollution contributor Depletes groundwater supplies
Domestic	5% - direct	Convenience Jobs	Cost

Practices And Technologies Affect Water Quality

Power stations – can discharge warm water into lakes or rivers (thermal pollution) killing organisms that cannot tolerate the increased temperature.



Runoff – from **farmland** contains fertilizers that can cause excessive plant growth. It may also contain toxic chemicals (pesticides and herbicides) that can kill living organisms.



Runoff – from **cities** contains large amounts of oil and salt, which can affect plants and animals in the water.

Factories – may add toxic chemicals (which can cause tumors, birth defects, sterility and even death) or, add to the thermal pollution problem.

Habitat destruction takes away the places where animals and plants can live and interact in an aquatic ecosystem.

Sewage – contains large amounts of nitrogen, which causes micro-organism populations to increase. These micro-organisms use up the oxygen in the water and many organisms can die as a result.

Oil Spills – from ships transporting oil from place to place can cause harm to plants and animals in, on or near the water.



4.2 Measuring Impacts

One way to help guard against problems with water quality is to monitor the water supply. To **monitor** means to observe, check, or keep track of something for a specific purpose

Monitoring and Assessing **Water Quality**



Town and city water supplies have to be monitored on a regular basis to ensure that the quality of the water remains high. Water technicians (*freshwater biologists*) regularly measure the level of chemicals in the water and the numbers and kinds of different species of organisms. They also make observations on how it looks and smells. In this way they can identify potential problems in the water supply and adjust the treatment of the water to eliminate them. Research scientists use monitoring techniques (evidence of toxins in the water and living organisms) to help them develop technologies to help protect the environment.

Ongoing Monitoring

Ongoing monitoring of a site helps scientists observe change. The information they gather is then interpreted and suggestions are made to help the ecosystem recover. This can be through regulations to limit human activities in this ecosystem or develop technologies, which can address the problem and protect the environment. The studies they undertake are long-term and all encompassing, so that as many of the interactions as possible that are affected, will be addressed.

Problem Solving Needs More Than Science And Technology

Problem solving requires a strong **commitment** from people. They need to decide what needs to be done and then commit themselves and others to get it done. In many cases the solutions will require money and a way to raise it so the solution can be implemented without delay.

A Success Story

The Thames River, in England, used to be an open sewer. It was so polluted by the sewage, toxins, and dead animals it contained, that people decided something needed to be done because of **PUBLIC HEALTH** issues. It is now clean and clear, with some types of fish that use to live in it now returning.

People Working Together

Water systems everywhere need to be monitored and cleaned up if they are causing a problem. The solutions to many of the problems may already be available, or new technologies should be developed to address the concern. Most importantly people must work together to solve the problems, because our water supply is our life source and without it, we will all perish.