

Why Monitor ?

1. Identify most serious problems.
(Result in corrective actions)
2. Evaluate results in corrective actions.
3. Identify problems before they become critical.
(Save \$ and time)
4. Identify long-term trends
(i.e., Is our watershed's health improving or declining over time?)

What is Pollution ?

“The contamination of soil, water, or the atmosphere by the discharge of noxious substances.”

(American Heritage Dictionary)

“Any alteration in the physical, chemical, or biological components of air, water, or soil that threatens life.”

(Daniel D. Chiras, Environmental Science)

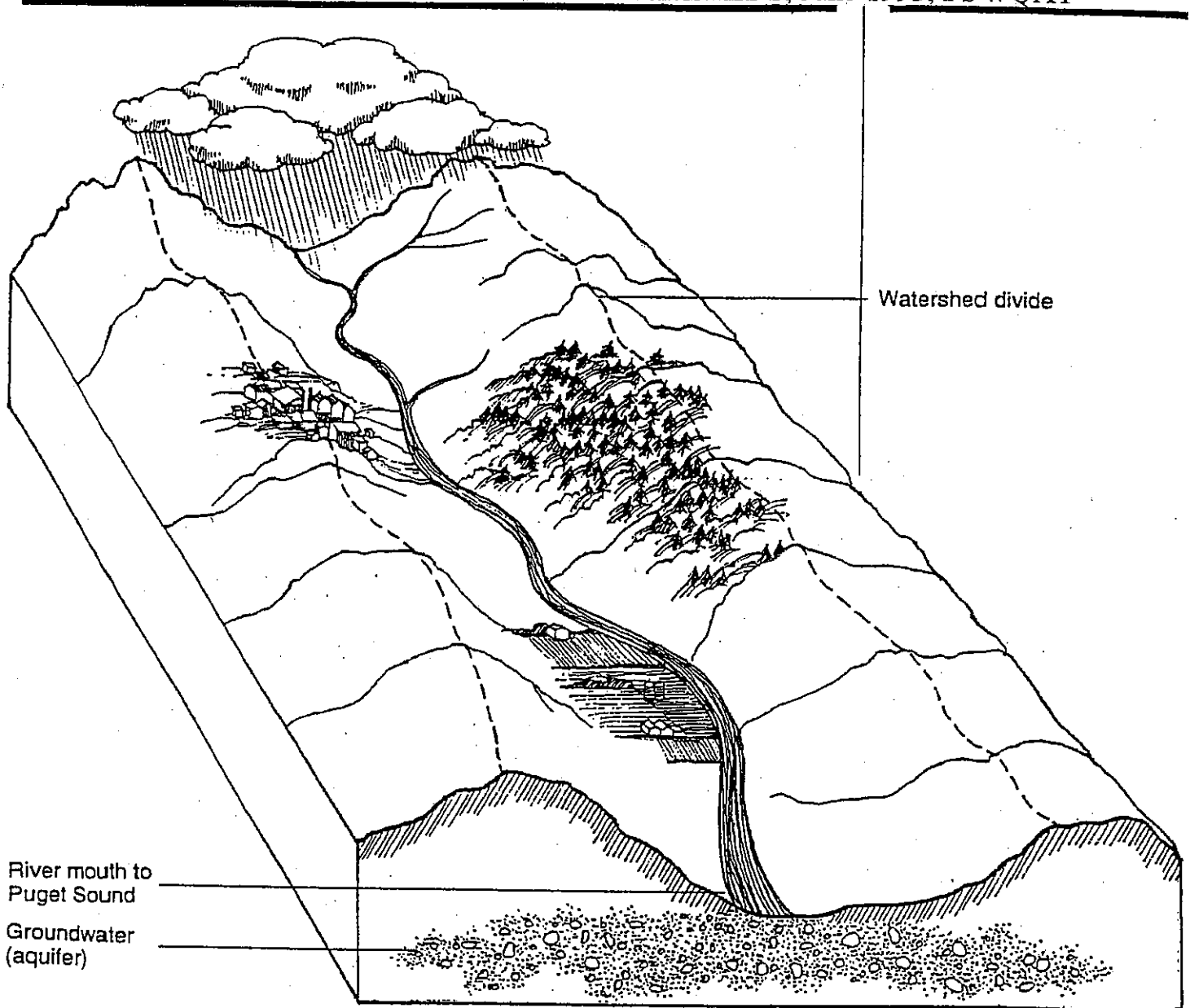
“Too much of something in the wrong place”

(James G. Speth, Earth '88, National Geographic Society)

“...such contamination, or any alteration of the physical, chemical, or biological properties of any waters of the state, ...as will, or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish, or other aquatic life.”

(Chapter 90.48 RCW, Water Pollution Control)

From: MANAGING NONPOINT SOURCE POLLUTION, An ACTION PLAN
HANDBOOK for PUGET SOUND WATERSHEDS, June 1993, PSWOAT



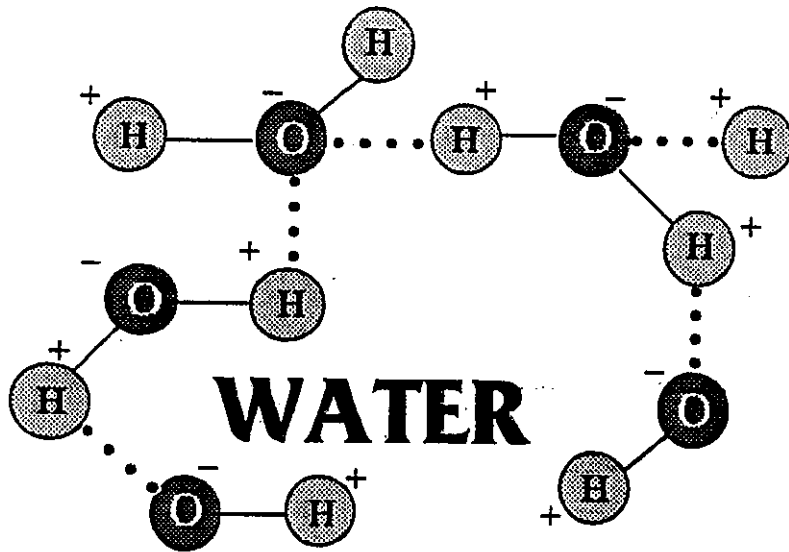
What is a watershed?

A watershed is a geographic region that drains water (and everything water carries) into a river, river system, or body of water.

Since all land within a watershed drains to a common outlet, every activity on land has the potential to affect the entire watershed.

Nonpoint source pollution can be easily carried from the land into a watershed's groundwater, rivers, and streams. This pollution can eventually find its way into Puget Sound.

THE ESSENCE OF LIFE:



Part 1

Water is amazing stuff. Earth is the only planet in the solar system with liquid water in abundance. Not coincidentally, our planet is unique in that life is also abundant. Seventy-five percent of the earth's surface is covered by water, and water makes up nearly 95 percent of the weight of living tissue. It is thought that the process of life on our planet began in ancient seas. The fluids within our bodies are a chemical and physical memory of the sea. Without water life ceases to exist.

Why does water work the way that it does?
What makes the chemistry of water unique?

In grade school we learned that a molecule of water is made up of two hydrogen atoms attached to an oxygen atom: that is, H-2-O. Chemists theorize that a water molecule actually has a shallow "v" shape, with a negatively charged oxygen at the apex and two positively charged hydrogens chemically bonded on either side of the oxygen. This means that each water molecule acts like a little magnet. Each positively charged hydrogen atom is not only bonded chemically to an oxygen atom within the molecule, but is also associated with a negatively charged oxygen atom on a nearby molecule.

These "electrostatic hydrogen bonds" tend to be strong, but are not nearly as strong as the chemical bonds within individual water molecules. So under normal environmental temperatures, individual water molecules do not stand alone, but form loose groups or "aggregations" of water molecules. That's why water, which has a molecular weight similar to many gases (methane, ammonia, oxygen, carbon dioxide, etc.) exists as a liquid at normal temperatures.

Water's "polar" nature enables it to dissolve minerals from the rocks and soils in the earth. The dissolved materials are taken up by plants and animals. Water is the medium in which essential biochemical reactions occur in living matter. Through this process complex tissues grow and are reproduced. The living tissue of some organisms is shared among other living things through feeding.

Upon death, water is the medium through which complex organic molecules in decaying tissue are broken down into the simpler inorganic nutrients from which they are originally constructed.

So the circle becomes complete. Water serves the pivotal role in all life processes within a single cell or the entire biosphere of the earth.

Besides the ability to dissolve materials, water is an important physical factor in the movement of materials. Water is heavy ("a pint's a pound, the world around") and, in motion, exerts incredible force. For hundreds of years,

humans have harnessed the energy of flowing or falling water - to drive water wheels, operate mills, and more recently to generate electricity. Humans have also suffered the destructive power of moving water during floods and hurricanes. During rainstorms runoff can move tremendous amounts of material.

Contaminated water has been a major source of human suffering and death throughout history, thus preserving water quality is more than an exercise of citizenship or life-style. It is fundamental to life itself.

Next month, read part two of *Water: The Essence of Life* and discover the effects of contaminated water on ecosystems.

Tim Determan

