



WATER QUALITY

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The State of Water in Oregon

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This publication identifies drinking water sources in Oregon, threats to quality and quantity of these sources, and ways to protect the water supplies from contamination.

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Oregonians are proud of the environmental resources of the state and are motivated to protect them for future generations. There is increasing concern and awareness of issues related to the quality and quantity of water available to Oregonians for drinking, bathing, cooking, and other domestic uses; home and

agricultural irrigation; fish and wildlife; industry; recreation; and other uses.

small pore spaces and cracks of underground rock, sand, and gravel deposits. Groundwater moves very slowly, usually only a few feet per month or year.

Where Oregonians get their water

Ground water is the source of water for all wells and springs. It begins as rain or snow that falls to the ground, enters the soil, and percolates downward until it reaches the water table. Many people envision groundwater as something similar to lakes and rivers flowing in vast underground caverns. However, most ground water is found in aquifers—the

Surface water is in lakes, streams, reservoirs, and surface depressions that capture and hold water. Because it is visible, surface water may seem the major source of drinking water. Actually, less than 3 percent of the earth's fresh water is in streams, lakes and reservoirs. The other 97 percent is underground. Stream and lake water is not protected so must be assumed to be contaminated with small organisms which pose a health risk. It also may contain chemical contaminants. Surface water is not recommended for domestic use without appropriate treatment.

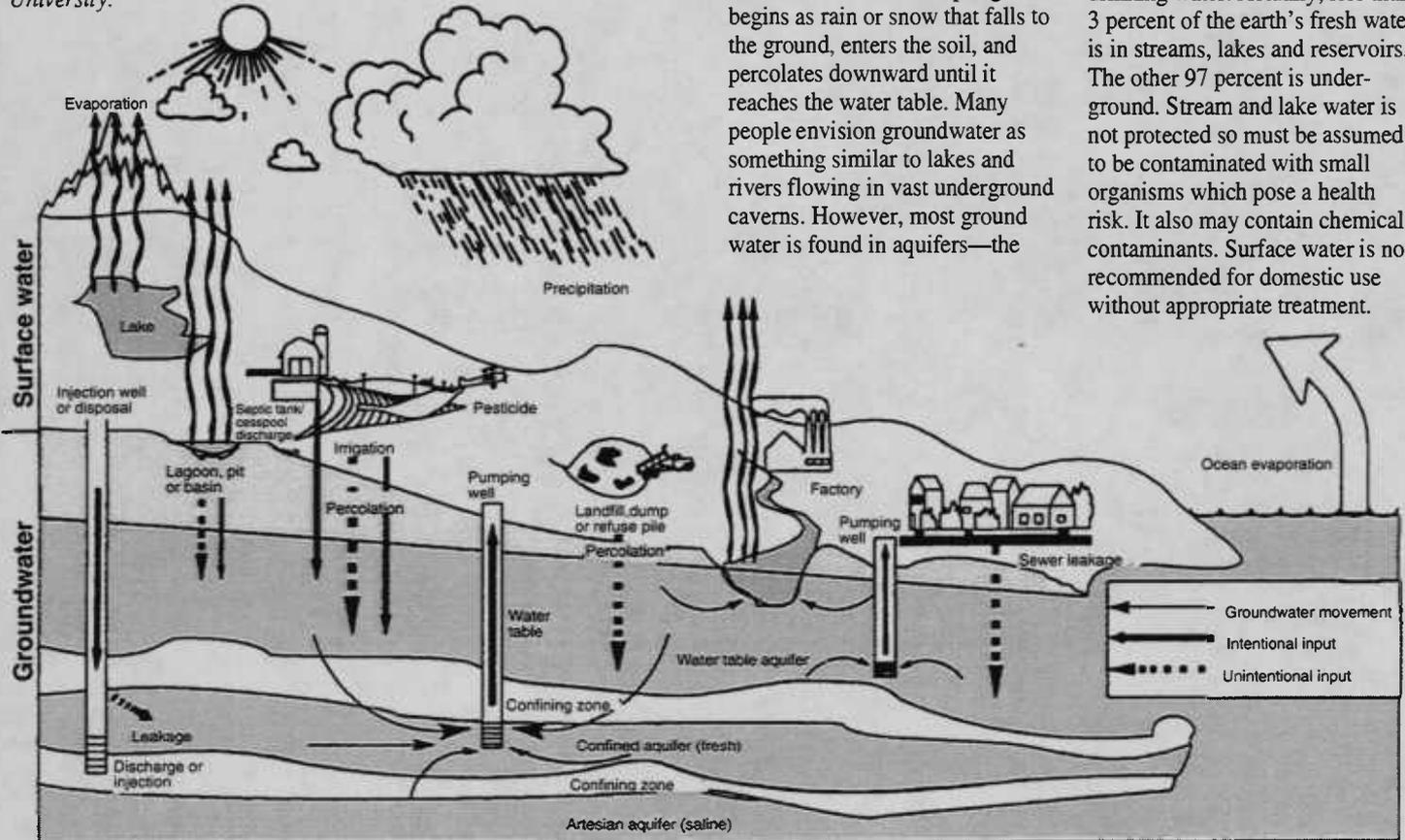


Fig. 1—Water recycles over and over as rain or snow falls to earth, percolates into the ground or evaporates into the atmosphere, and returns again to earth. This process is called the hydrologic cycle. As water moves through the hydrologic cycle, there is a potential for both purification and contamination. (Illustration by Karen Mahler, University of Idaho Department of Plant, Soil, and Entomological Sciences.)



OREGON STATE UNIVERSITY EXTENSION SERVICE



WATER QUALITY

Public water systems in Oregon must regularly monitor surface and ground water sources for all regulated contaminants and provide testing records to customers upon request. Oregon law requires that water meet or exceed standards before it is released into the distribution system.

Drinking water standards are set by the Oregon State Health Division in compliance with the U.S. Environmental Protection Agency. Copies of current standards are available from county health departments or in SP 53-414, "Oregon Drinking Water Standards," available from county Extension offices.

Although these standards provide a high degree of health protection to users, they fall short of ensuring that drinking water is completely free of contamination. Unregulated contaminants may be present. In addition, there is concern that smaller communities may be unable to meet emerging standards due to age of the treatment systems, expense, or inadequate staffing.

Private water systems consist of a source that is used by three or fewer service connections. About one-fourth of Oregon's population depends upon private wells for domestic water. The quality of private wells is highly variable. Private water supplies are not regulated by law in Oregon. However, there are standards for well construction and lending institutions require water tests before approving property loans. Public water quality standards provide a good basis for evaluating the quality of private water supplies. But in the case of a

private supply, the responsibility for providing good quality drinking water lies entirely with the owner.

Threats to Oregon's water supplies

Drought

Oregon does not have a surplus of water. While most of western Oregon generally receives abundant annual rainfall, the central and eastern regions normally have low rainfall. When rain and snow falls are below normal, water supplies in central, eastern, and parts of southern Oregon, as well as the metro area, may be severely limited. Several counties have experienced recent extended periods of drought. In the wetter coastal areas of the state, water storage is minimal and peak water demands coincide with low summer flows.

Overpopulation of selected areas

About 5,900 water wells are drilled each year in the state. A new well taps into our underground water supplies approximately once every 1 1/2 hours for domestic, farming, commercial, and water testing needs. Increasing population can place excess demands on water supplies. There are water capacity issues in some coastal regions, and the state has identified critical groundwater areas in eastern Oregon and in the Willamette Valley.

Competing demands for water supplies

Conflicts are on the horizon regarding allocation and use of the state's water resources. Agriculture, municipalities, transportation, fish and wildlife, hydroelectric generation, and recreation interests have a stake in how water is used.

Contaminants

Many contaminants are dissolved in water or readily follow the same paths that water takes. Factors that determine whether a substance reaches a water supply are the geology of an area, soil conditions, precipitation, condition of wells and plumbing, and the characteristics and occurrence of the contaminants themselves.

How? These contaminants may come from obvious sources such as a chemical spill on the ground or a leaking underground storage tank. They also may come from very ordinary, everyday activities. Improper use, storage, or disposal of yard and garden products, household chemicals or automobile products may leach contaminants to groundwater. Waste oil that gets to the storm drain after an oil change on the family car can contaminate a nearby stream. Practically any activity that goes on above ground can have an effect on water.

Who? No single group of individuals is responsible for what is happening to our water supplies. Homeowners and renters, as well as farmers, city dwellers, and industries generate wastes that make their way to our drinking water sources.

General categories of drinking water contaminants

Pathogens—Bacteria, viruses, and microscopic plants and animals cause or are capable of causing disease. One of the most common drinking water safety tests involves testing for coliform. Presence of coliform bacteria may indicate an unsanitary condition and presence of disease-causing agents.

Nitrates—Sources of nitrates include septic systems, livestock wastes, and nitrogen fertilizer used on lawns and farm fields. Levels above 10 parts per million of nitrate in water can cause methemoglobinemia (blue baby disease) in children younger than 2 years old. This sometimes fatal medical condition restricts the blood's oxygen-carrying capacity, causing the baby to appear blue. Nitrates do not appear to have health effects on older children or adults at this level, but standards are set to protect infants.

Heavy metals—Heavy metals can cause permanent brain and organ damage. Lead is the metal which has received the greatest attention and may pose the greatest risk because of the potential for leaching from older plumbing systems into the household water supply. Even low levels of lead in a drinking water source can lead to damage of the brain, kidneys, nervous system, and red blood cells. Additional information about lead in water is available from the Extension office. Other heavy metals of concern include mercury, arsenic, barium, cadmium, and chromium.

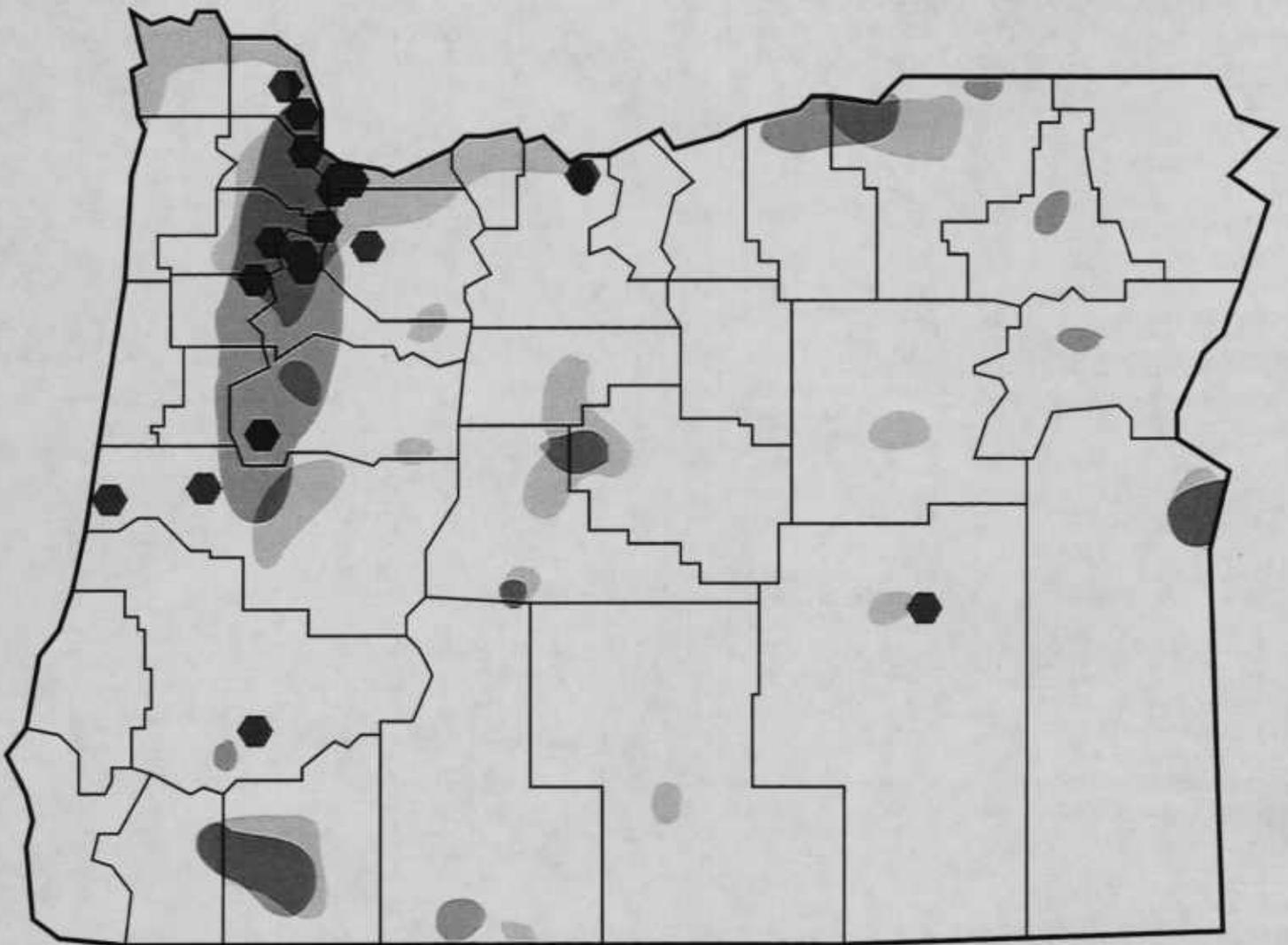


Fig. 2—Water contaminants in Oregon.

 Arsenic, a heavy metal, is naturally occurring in groundwater in several areas of the state. Arsenic also may occur in areas of the state where it was used to extract gold in mining processes.

 Nitrate has been found in ground water in several areas of Oregon. Natural soil nitrogen may be the source of some nitrate, although concentrations greater than three parts per million usually indicate other sources. These sources include septic tank effluent, fertilizers, animal manure, industrial wastes, landfills, and sewage sludge.

 Volatile organic chemicals (VOCs) are ingredients in many household, commercial, and industrial products including spot removers, drain openers, air fresheners, solvents, dry cleaning agents, degreasers, and grain fumigants. They also are used in the manufacture of detergents, dyes, insecticides, and some decaffeinated coffees. Because of their broad distribution and use, VOCs may enter groundwater from a variety of sources.



Sulfates and salts—High concentrations of sulfates and other dissolved salts can cause gastrointestinal problems in people and animals. Salts also may be of concern to those on a sodium-restricted diet. Some water treatment devices may increase sodium levels.

Chemicals—Chemical solvents, some substances in petroleum products, and pesticides have been identified as harmful water contaminants. Volatile organic chemicals (VOCs) are a broad group of organic chemicals used primarily in industry as solvents, cleaners, and degreasers.

Minerals—Calcium and magnesium are the common minerals that contribute to water hardness. Water that contains large amounts of minerals may not affect personal health, but may be less desirable for household use. Some minerals (iron, for example) also stain laundry and water fixtures. Other minerals such as copper cause staining at low levels but pose a health risk at higher levels.

Specific contaminants have been found in Oregon by the Department of Environmental Quality (DEQ) Domestic Well Testing Program. Contaminants have been detected in some private wells, but not all wells. Map boundaries are

likely to be modified in the future as additional data become available.

To find out what's in your water

Public system users can request a copy of test results from your water supplier.

Private system users can determine what contaminants are in your water supply only by having it tested. County health departments and OSU county Extension offices have lists of state-approved water testing laboratories as well as the water quality standards you will need to compare with your test results. Ask for Oregon Water Quality Standards, or at county Extension offices, SP 53-414, "Oregon Drinking Water Standards."

Testing for every possible contaminant is both unnecessary and expensive. Private well owners should test yearly for coliform bacteria and nitrate. The presence or absence of bacteria or nitrate indicates the safety of your water supply.

Test for sulfate, chloride, iron, manganese, pH, total dissolved solids (TDS), lead, hardness, and corrosion index if there is some indication of a problem or if you are concerned.

If you are expecting a baby, test for nitrate at the beginning of your pregnancy and discuss the results with your doctor.

Other situations when water testing is important:

- If you make changes in your water source or water treatment system
- Before buying a new house with a well
- If your well head becomes flooded or submerged
- Following a chemical spill or leak within 500 feet of your well
- If your neighbors have found contamination
- Before buying any water treatment device
- If you live in an area that has detected certain contaminants

To protect your drinking water

- Use and dispose of household, shop, lawn and garden, and auto care products according to label directions
- Maintain wells and well heads in good condition
- Protect the area around wells to prevent contamination
- Support legislation that encourages the use of state-of-the-art solid waste management and waste water treatment
- Remember that anything that goes into storm drains runs directly into streams, lakes, and rivers
- Be sure that any unused or abandoned wells in your area are sealed and plugged. Never use an old well as a disposal pit
- Become involved in community efforts to solve water disposal problems and develop water protection plans

To protect Oregon's water quality

There are many specific things we can do to prevent contamination. First, we must realize that water is a shared resource, used simultaneously by many individuals, municipalities, and businesses. Second, we must understand that each of us contributes to the pollution threat.

