



Applying knowledge to improve water quality

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Pacific Northwest

Regional Water Program

A Partnership of USDA CSREES
& Land Grant Colleges and Universities

Drinking Water Standards



Over 99 percent of Pacific Northwest residents consider clean drinking water the most important water quality issue in the region. Contaminants in drinking water always are a cause for concern. However, it is important to distinguish between the acute and chronic effects of harmful substances in our drinking water supply.

Acute effects. Acute effects appear shortly after ingestion of contaminated water, usually within several days to several weeks. These effects usually appear soon after exposure to a toxic substance. For example, a farmer who accidentally spills a pesticide may shortly thereafter suffer nausea, dizziness, and vomiting.

In the Pacific Northwest and the rest of the USA the most commonly detected drinking water problem is bacterial contamination caused by improper well construction and maintenance. Bacterial contamination is a common cause of acute toxicity, producing symptoms as mild as an upset stomach and diseases as serious as dysentery, typhoid fever, and hepatitis. Household cleaners and garden chemicals are other examples of contaminants that can produce acute effects.

Chronic effects. Chronic effects appear after longer incubation periods, possibly even after a number of years. Chronic effects result from exposure to a substance over months or years. For example, a coal miner who breathes traces of coal dust for many years may later develop serious respiratory problems.

Over time, some drinking water contaminants can damage the liver, kidneys, heart, and other body organs. Health officials are almost always concerned about the chronic effects of drinking water contaminants such as low-level nitrates, radon, lead, and volatile organic chemicals. Such effects may include cancer or damage to the central nervous system.

Drinking Water Standards

The Environmental Protection Agency (EPA) standards for drinking water fall into two categories – primary standards and secondary standards.

Primary Standards. Primary standards are based on health considerations and are enforced by the EPA. These standards protect you from three classes of toxic pollutants: pathogens, radioactive elements, and toxic chemicals. Common pathogens found in drinking water include some bacteria (can cause typhoid fever, cholera, hepatitis) and protozoa (*Cryptosporidium*, *Giardia*). Radioactive elements that could present problems in drinking water include radon, uranium, and radium. Toxic chemicals that could be found in drinking water include inorganic chemicals (nitrates, lead, arsenic, mercury, selenium) and organic chemicals (over 200 kinds of volatile and synthetic organic compounds). Primary standards set a limit, called the maximum contamination level (MCL), on the highest allowable concentration of a contaminant in drinking water supplied by municipal water systems. The MCL is usually expressed in milligrams per liter (mg/l), which is the same as parts per million (ppm).

If your home drinking water is provided by a municipal (city) or community (provides water to more than 15 homes) water system (about 78 percent of Pacific Northwest residents), your water is safe because federal regulations



Pacific Northwest Regional Water Quality Coordination Project Partners

Land Grant Universities

Alaska

Cooperative Extension Service
Contact Fred Sorensen:
907-786-6311

<http://www.uaf.edu/ces/water/>

University Publications:

<http://www.alaska.edu/uaf/ces/publications/>

Idaho

University of Idaho
Cooperative Extension System
Contact Bob Mahler: 208-885-7025

<http://www.uidaho.edu/wq/wqhome.html>

University Publications:

<http://info.ag.uidaho.edu/Catalog/catalog.html>

Oregon

Oregon State University
Extension Service
Contact Mike Gamroth: 541-737-3316

<http://extension.oregonstate.edu/>

University Publications:

<http://extension.oregonstate.edu/catalog/>

Washington

Washington State University
WSU Extension
Contact Bob Simmons:
360-427-9670 ext. 690

<http://wawater.wsu.edu/>

University Publications:

<http://pubs.wsu.edu/>

Northwest Indian College
Contact Dan Burns:
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Water Resource Research Institutes

Water and Environmental Research
Center (Alaska)

<http://www.uaf.edu/water/>

Idaho Water Resources
Research Institute
<http://www.boise.uidaho.edu/>

Institute for Water and
Watersheds (Oregon)
<http://water.oregonstate.edu/>

State of Washington
Water Research Center
<http://www.swwrc.wsu.edu/>

Environmental Protection Agency

EPA, Region 10
The Pacific Northwest
<http://www.epa.gov/r10earth/>

Office of Research and Development,
Corvallis Laboratory
<http://www.epa.gov/wed/>

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The Project

Land Grant Universities, Water Research Institutes, and EPA Region 10 have formed a partnership to provide research and education to communities about protecting or restoring the quality of water resources. This partnership is being supported in part by the USDA's Cooperative State Research, Education, and Extension System (CSREES).

Our Goal and Approach

The goal of this Project is to provide leadership for water resources research, education, and outreach to help people, industry, and governments to prevent and solve current and emerging water quality and quantity problems. The approach to achieving this goal is for the Partners to develop a coordinated water quality effort based on, and strengthening, individual state programs.

Our Strengths

The Project promotes regional collaboration by acknowledging existing programs and successful efforts; assisting program gaps; identifying potential issues for cross-agency and private sector collaboration; and developing a clearinghouse of expertise and programs. In addition, the Project establishes or enhances partnerships with federal, state, and local environmental and water resource management agencies, such as by placing a University Liaison within the offices of EPA Region 10.

require your public water system to test for substances regulated by the EPA. However, if you obtain your water from a private well or surface water source (about 22 percent of Pacific Northwest residents) you are responsible for ensuring the safety of your drinking water. A homeowner would do this by having their private water source tested for coliform bacteria and nitrates on a regular basis (once a year).

Secondary Standards. Secondary standards cover contaminants that cause offensive taste, odor, color, corrosivity, foaming, and/or staining. The concentration limit is called the secondary maximum contaminant level (SMCL). Secondary standards are not enforced because these contaminants do not adversely impact human health. If your water suffers from one of these secondary contaminants, consumers often buy home treatment devices such as specific filters attached to sink faucets. There are many private businesses that sell treatment devices that address secondary contaminants.

Safe Drinking Water Act

The Safe Drinking Water Act of 1974 was passed by Congress to ensure that consumers in the USA have safe drinking water. This law, enforced by the Environmental Protection Agency, has resulted in consumers having the safest and highest quality supply of drinking water in the world.



National Water Quality Program Areas

The four land grant universities in the Pacific Northwest have aligned our water resource extension and research efforts with eight themes of the USDA's Cooperative State Research, Education, and Extension System.

1. Animal Waste Management
2. Drinking Water and Human Health
3. Environmental Restoration
4. Nutrient and Pesticide Management
5. Pollution Assessment and Prevention
6. Watershed Management
7. Water Conservation and Management
8. Water Policy and Economics

CSREES is the Cooperative States Research, Education, and Extension Service, a sub-agency of the United States Department of Agriculture, and is the federal partner in this water quality program.