



Applying knowledge to improve water quality

Spring 2004
PNWWATER 034

Pacific Northwest Regional Water Program

A Partnership of USDA CSREES
& Land Grant Colleges and Universities

Regional Expertise Directories

Your Pacific Northwest Water Quality Team has developed regional expertise directories for six national theme areas. These six developed theme-based directories are: (1) nutrients and pesticides, (2) animal waste management, (3) drinking water and human health, (4) water conservation and agricultural water management, (5) environmental restoration, and (6) water policy. These directories can be found at our web site: <http://www.pnwwaterweb.com>.

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Nutrient and Pesticide Management

Overview
Pesticide and fertilizer use is almost everywhere across the Pacific Northwest's developed and agricultural landscapes. In order to provide larger harvests of affordable foods, farmers often supply crops with proper nutrients (fertilizers) and protect them from pests (weeds, insects, fungi, etc.) by applying pesticides. In maintaining their landscapes, homeowners use to use many household, lawn, fertilizer and pesticides that do not always get applied in the most proper application methods. Human and animal health problems can result through exposure to herbicides and farm chemicals. Environmental pollution can occur when these chemicals enter waterways and groundwater systems. Nutrients and pesticides can enter surface and ground water through atmospheric movement of rainfall, irrigation return flows, runoff from urban and agricultural land, stormwater runoff, and leaching through soils. Groundwater contamination from pesticides and nutrients is a difficult long-term issue due to the impermeability of glazing (poorly-drain) aquifers. Responsible agricultural producers and homeowners employ methods to avoid proper application of chemicals to minimize potential exposure to people, animals, and the environment. The land grant universities of the Pacific Northwest region engage in a broad range of research activities, outreach, and training programs to assist agriculturalists, pesticide applicators, and homeowners in properly managing nutrients and pesticides, for optimal production and environmental stewardship. The universities provide research-based educational materials on soils, plant choices, irrigation management techniques, fertilizer, and pesticide use and a range of other related topics.

Outcomes

- Home producers and producers are more aware of dangers from improper management of pesticides and nutrients
- Return irrigation flows to rivers are cleaner
- Groundwater is protected from contamination
- Landowners and agricultural producers better manage chemicals used to reduce landscapes and to grow crops

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Animal Waste Management

Overview
The potential for transport of nutrients and pathogens from livestock and dairy production operations to the environment is a significant issue in the Pacific Northwest. In order to stay economically competitive, many livestock and dairy production operations have increased the number of animals utilizing the same land base. In addition, the number of non-commercial farms has been rapidly increasing throughout much of the region. Adoption of animal waste best management practices can reduce the transport of nutrients and pathogens from farms and contribute to improved water quality. Improved management and utilization of animal wastes can occur through proper collection, storage, treatment, and land application. Such strategies can benefit farmers by reducing disposal problems and reliance on commercial facilities, as well as improving water retention and fertility of soils. The Pacific Northwest Regional Water Quality Program provides a broad range of research-based educational materials devoted to animal waste management and utilization. Cooperative Extension regularly conducts outreach programs with livestock producers on a wide range of best management practices.

Desired Outcomes

- Commercial and surface water is better protected from contamination by animal wastes
- Livestock production economics are improved by implementation of whole farm nutrient management strategies
- Producers have a greater knowledge of nutrient cycles and environmental concerns
- Livestock producers are considered good stewards of the environment

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Drinking Water and Human Health

Overview
Pollutants such as pesticides, nitrates and pathogens entering groundwater and surface waters are health hazards to the community. Ground water is the primary source of drinking water for most of the private and many of the public water supplies in the Pacific Northwest, except for Alaska. In Alaska, while larger public water systems utilize ground water, surface water is the primary source outside larger cities. Groundwater is generally more reliable with its quantity and quality than surface water. As a result it is generally less expensive and more reliable to develop a groundwater source. Public water supplies are regularly inspected and more reliable to develop a groundwater source. Falling onsite sewage systems, excessive fertilizer or animal manure applications are a particular threat to human health, especially in areas where surface waters or shallow well supplies are used for drinking, recreation and shellfish harvesting. The region's four Land Grant Universities have a broad range of research, extension and outreach programs.

Desired Outcomes

- Public water supplies are regularly inspected and more reliable to develop a groundwater source
- Falling onsite sewage systems, excessive fertilizer or animal manure applications are a particular threat to human health, especially in areas where surface waters or shallow well supplies are used for drinking, recreation and shellfish harvesting

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**Water Conservation and
Agricultural Water Management**

Overview
Pacific, Northwest and Alaska rivers, lakes and groundwater sources provide water for industry, agriculture, residential use and recreation, as well as support a diversity of ecosystems. Increased demands from an expanding population, industrial growth, increases in agricultural production and ecosystem management have resulted in localized, temporary shortages of available water. Agriculture is the single largest water user. However, inefficient irrigation methods are being replaced by modern science-based water saving techniques. Additionally, efficient water management techniques are being used for agricultural operations. Regionally, there is an ongoing, community watershed planning effort in which many local Cooperative Extension faculty are actively engaged. The Pacific Northwest Water Quality Coordination Program has a broad range of research activities, educational materials and outreach programs to assist agriculturalists and others in managing water quality and quantity.

Desired Outcomes

- Agricultural water users implement water-saving irrigation methods
- Individuals employ water conservation techniques
- Water conservation initiatives lead to the need for increased numbers of water storage systems
- Water resources are better managed
- Soil erosion is reduced to sustainable levels

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Environmental Restoration

Overview
In our efforts to domesticate our lands and water to the benefit of man, we have inadvertently degraded their ability to provide other uses. For example, by altering riparian areas and wetlands, we have affected their ability to provide fish and wildlife habitat as well as provide stream bank stability, flood protection, and water quality protection. Throughout the Pacific Northwest there are significant efforts underway to restore landscapes and ecosystems to better protect water quality and fish and wildlife habitat. The four land grant universities are actively engaged in research activities and outreach efforts that directly relate to watershed restoration. The universities have also developed a wide range of research-based educational materials on soils, plants, planting techniques, land management, and other topics directly related to environmental restoration.

Desired Outcomes

- Ecological systems are restored
- Restoration efforts are more successful
- Water resources are better protected
- Individuals have a greater knowledge and ability to implement restoration activities

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Water Policy and Economics

Overview
A recent survey conducted by land grant universities in the Pacific Northwest indicates that over 90 percent of respondents consider clean drinking water, clean rivers and clean groundwater a high priority issue. An additional 84 percent of survey respondents indicate that having enough water for agriculture is high priority despite the fact that over 90 percent of Pacific Northwest residents live in urban areas. Over two-thirds of Pacific Northwest residents are also water for power generation, water for economic development, wetland protection, prevention of salmon extinction, and watershed restoration are also high priority issues.

Water is undeniably one of the most important natural resources found in the western United States. It is fundamental to the survival of our native flora and fauna and the survival of our own species as well. Here in the West, water laws have evolved in a climate of scarcity which has made friendly neighbors bitter enemies, caused the desert to bloom and caused the demise of many a fishery, including some of the largest salmon runs in the world.

Because water rights have historically protected users not rivers, it is important for river conservation efforts to focus on ways to put water back into our river systems.

The understanding of western water law hinges on the doctrine of prior appropriation, which allocates water based on seniority. First in time, first in right is a central theme where water is scarce; most "senior" users get the first go at the water trough. Prior appropriation rights are very specific about water use — amounts, locations and duration.

Under current western law, water rights can be issued to anyone who is putting the water to a "beneficial use." Beneficial uses include human consumption, irrigation and hydropower. In some Northwest states, "beneficial use" does not include the preservation of streamflows, which benefits fisheries, wildlife and riparian corridors of significant biological diversity. Water rights are transferable and can be bought, sold or leased.

Because water rights have a requirement that is referred to as "use it or lose it," which mandates that appropriated water must be used or it will be considered abandoned and the water right can be lost permanently. Under this system, water users such as farmers, are not encouraged to conserve water. Some water rights holders have been persuaded to temporarily transfer their water rights to streamflow (for example under contract with Oregon Water Trust) in order to avoid permanent loss of their water right when faced with the "use it or lose it" policy, where water right holders must use their right or sell/lose it to another user.

The Pacific Northwest land grant universities have a long history of curricula and research in resource management and economic issues, including water policy and water economics. These issues interface with programs in agriculture, wildlife and fisheries, soil conservation, forestry, sociology, land use policy, and urban planning.

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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/index.html>

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: Michael Cochrane:
360-392-4299

mcochrane@nwic.edu or

<http://www.nwic.edu/>

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/>

For more information contact
Jan Seago at 206-553-0038 or
seago.jan@epa.gov

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.

These directories were developed for our local, state, regional and federal partners. Each directory contains a summary statement of the issue in the Pacific Northwest, a list of desired outcomes, and contact information for the four most pertinent research and/or extension contacts for the specific issue at the land grant universities in Alaska, Idaho, Oregon and Washington. These directories also list the most relevant regional and state publications related to the specific theme area. Publication contact information for all four states is also provided. It is our intention to update the .pdf version (on the web site) of these directories every six months.



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.