



Applying knowledge to improve water quality

Pacific Northwest

Regional Water Program

A Partnership of USDA CSREES
& Land Grant Colleges and Universities

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PNWWATER 081

Stormwater Management Directory

Non-point source pollution (NPS) has a more significant negative effect on water quality than point source pollution. Non-point source pollutants include contaminants that enter waterways from streets, parking lots, roof gutters, agricultural fields, and intensively managed forest lands. It is much easier to identify point sources of pollution through monitoring and to correct associated potential problems than to successfully reduce impacts from non-point sources.

In our region land-use changes brought about by fast population growth often result in polluted waterways that put fish and wildlife in peril and reduce the quality of life of citizens living in these highly-impacted areas. The Land Grant Institutions in our region have researchers who develop strategies to mitigate water quality problems associated with fast growth. Specifically, some of these investigations deal with minimizing automobile-caused pollution, sediment runoff from construction sites and developments, pet wastes, and other practices found in urbanizing areas that degrade water quality.

Traditionally, stormwater has been rapidly removed from urban areas by funneling water into pipes which empty into the nearest waterway or holding pond within a fenced-off area. This water is laden with pollutants that degrade the quality of our rivers. Even if held in a holding pond, the stormwater runoff is a problem as it may attract mosquitoes.

As communities expand, the percentage of land that can absorb water from rainfall events decrease, resulting in an increase in stormwater runoff. In an ideal world, communities should have very few impervious surfaces; however, it is common for up to 70 percent of the land area in urban communities to be impervious to rainfall resulting in high amounts of water runoff.

Low Impact Development is a construction technique that lessens the footprint of buildings and parking lots, leaving trees to absorb and slow rainwater, and the installation of swales or other catchment methods to divert and distribute runoff before it flows into storm drains and streams. Using distributive methods such as these replace the need for engineered infrastructure, eliminating the 'end of the pipe' damage. For an example, consider a community consisting of smaller house lots designed for ease of maintenance, leaving greenbelt community spaces.

Many jurisdictions place a percentage limit on impervious surfaces allowed within a development. A large box store zoning ordinance may specify distributive methods for the parking lot and roof areas. Swales fed by cut curbs and planted with vegetation that will absorb the water, filtering out pollutants and slowing runoff before leaving the property all become part of the planning process. Shopping malls with acres of parking lot can manage stormwater runoff by choosing to construct wetlands between parking lots to filter runoff.

Established, older buildings in cities have a different set of problems with stormwater. There is no readily available land to develop for runoff management. Some cities are experimenting with eco or green roofs. Green roof installations reportedly capture up to 60 percent of rain events and slow the velocity of the remaining 40 percent.



Large parking areas impervious to rainfall, resulting in water runoff.



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:
360-392-4328

dburns@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/>

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Homeowners have many techniques available to treat or intercept stormwater on their property. Disconnecting downspouts and constructing rain gardens to catch, slow, and filter rainwater is a popular method. Removing sidewalks and replacing with permeable paths of asphalt or small gravel will allow the rainwater to soak into the soil. Eliminating much of the lawn surrounding a home and replacing it with native trees and shrubs, and using permeable asphalt or pavers for the driveways can slow or reduce runoff.

Pacific Northwest Land Grant Institution scientists and faculty investigate stormwater management issues, Best Management Practice effectiveness, and collaborate with local governments to install water-wise gardens and Low Impact Development pilot projects to transform stormwater from a problem to a resource.

Resources:

Oregon State University

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VTP29 *After the Rain: Urban Runoff*

VTP21 *We All Live Downstream*

Washington State University

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DVD0126 *Stormwater Management from a Watershed Perspective*

Hinman, Curtis, et al. *Low Impact Development: Technical Guidance Manual for Puget Sound*, available:

http://www.psat.wa.gov/Programs/LID/lid_cd/LID_resources.htm

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#39 *Ag Knowledge UI Helps Northwest Growers Farm Without Plows*

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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.