

Non-Point Source Pollution

Causes, Effects, and Solutions

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How Important is Clean Water to You and Your Community?



- Water is essential for life and plays a vital role in the proper functioning of the Earth's ecosystems.
- Clean water is essential to support numerous beneficial uses, such as water supply, water contact recreation, wildlife, agriculture, fishing, and cultural values.

What is Non-Point Source Pollution?



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- *As water from rainfall, snowmelt, and irrigation flows over and through the landscape, it picks up and carries contaminants from **many different sources** and deposits them into rivers, wetlands, lakes, and oceans. This is called **Non-Point Source (NPS) pollution**.*

Why is NPS Pollution a Problem?



- According to the U.S. Environmental Protection Agency (EPA), 40% of our nation's surveyed waterways are not clean enough to meet basic water quality standards.
- The pollution of water has a serious impact on all living creatures, and can negatively affect the use of water for drinking, recreation, fishing, transportation, commerce, and wildlife.

Water Pollution Facts

- ~ We all live in a watershed. What you do on your property does affect streams, even if you don't live on a stream. A watershed is an area of land which drains to the lowest point, usually a stream or bay.

The Most Common NPS Pollutants are:

- Siltration: soils and sediment
- Nutrients: excess fertilizers
- Pathogens (bacteria and viruses)
- Toxic chemicals and heavy metals
- Herbicides and pesticides
- Oil and grease
- Salts

Major NPS Pollutants Affecting National Water bodies

Rank	Rivers	Lakes	Estuaries
1	Sediments/ Siltation	Nutrients	Metals
2	Pathogens	Metals	Nutrients
3	Habitat alterations	Organic enrichment	Organic enrichment

From: The EPA's: The National Water Quality Inventory: Report to Congress for the 2002 Reporting Cycle. <http://earth1.epa.gov/305b/>

Nonpoint Sources of Water Pollution

Percent of NPS pollution per land use in Oregon. Source: Oregon DEQ

Land Use	%	Impacts
Urban	11.8	Toxic substances enter food chain; petroleum products and nutrients harmful to F&W.
Agriculture	38.7	Bacteria and nutrient loading of surface waters; erosion and vegetative loss occur; Temp. inc.
Forestry	17.4	Increased temp. and turbidity affect water quality; habitat area is lost from other effects.
Mining	5.2	Toxics enter surface waters; erosion can alter streams.
Construction	3.3	Toxics have long-term impacts on F&W, increased sediment erosion into surface waters.
Recreation	13.8	Pollutants such as oil, toxics, and debris can reduce and kill Fish & Wildlife.
Natural	9.7	Natural erosion, streams can handle some pollutants, but humans accelerate NPS processes.

Urban Sources of NPS Pollution

Residential sources include:

- Septic tanks
- Lawn and garden chemical use
- Stormwater systems
- Garbage/recycling Transfer stations
- Construction activities
- Vehicles
- Erosion by soil exposure or high velocities from impervious surfaces
- Golf courses
- Disposal or accidental release of various chemicals



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Agriculture, Forestry, and Mining Sources of NPS Pollution

Soil erosion is the primary NPS concern in farm, forest, and mining areas.

- **Agricultural** runoff can include sedimentation, fertilizers, herbicides, pesticides, and livestock fecal bacteria.
- **Forestry** practices affect surface waters through erosion, particularly from logging roads and skid trails.
- **Mining** affects surface waters through exposure of soils and leaching of heavy metals and chemicals to surface waters.



Recreation Sources of NPS Pollution



- Sewage from boating;
- boat and engine maintenance;
- littering; and
- pet waste pollutes our water.

What are the Effects of NPS Pollution?

- Affects surface and ground water quality
- Affects the *uses* of public waters
- Endangers and limits fish and wildlife
- Results in unacceptable environmental, economic, and social costs to communities and citizens.

The NPS pollution Effects of Soils

Soils include: sediment, silt, and suspended solids.

- Reduced sunlight penetration
- Fish breeding affected
- Food supplies covered
- Recreation limited
- Filtering apparatus of filter feeders gets clogged
- Chemicals bound to sediments are mobilized



The NPS pollution Effects of Nutrients

The effects of Nutrient loading include:

- Harmful algal blooms,
- Eutrophication and Hypoxia (low oxygen)
- Declines in wildlife and wildlife habitat.
- Contamination of drinking water



The NPS pollution Effects of Pathogens

Livestock, wildlife, and human manure contain high levels of pathogens. These wastes find their way into public waters via runoff from irrigation and rainfall.

The effects of pathogens include:

- Coliform count in water bodies increases (E. coli)
- Animal diseases transmitted to humans
- Beach & shellfish contamination and closures



Solutions to NPS Pollution



- Coordination of NPS pollution control activities between local agencies and organizations.
- Best Management Practices on all active land management projects.
- Restoring and protecting riparian process and function
- Restoring and protecting instream process and function
- Restoring and protecting wetland process and function.
- Educational outreach

Best Management Practices



- Best Management Practices (BMPs) are effective and practical, structural or nonstructural methods which prevent or reduce the movement of pollutants from the land to surface or ground water.

Solutions for the Homeowner

- Prevent and clean up automobile leaks
- Recycle toxic fluids
- Avoid lawn fertilizers and pesticides, or if you must use them, avoid during heavy rains and on paved surfaces
- Pick up pet wastes
- Maintain septic systems (pump every 2 years)
- Never pour or dump wastes into drains.

Water Pollution Facts



- Water from rain, storm drains, and ditches flows directly to streams and bays with little or no treatment. Storm drains and ditches are DIFFERENT than sewers. They are NOT CONNECTED to a treatment plant.

Solutions for Commercial Land Managers

- Obtain and follow a NPDES permits for point sources
- Clean up spills and toxic material leaks
- Apply BMPs (silt fencing, hay bales, check dams, bioswales, and berms around excavations)
- Provide proper storage and handling of fuels and toxic materials.
- Educate work force

NPS Reduction Resources

- OWEB Small Grant Team Funds
http://www.oweb.state.or.us/OWEB/GRANTS/smgrant_main.shtml
- State, City, and Tribal Water Quality Programs
- Civic Community Groups
<http://www.rivernetnetwork.org/>
<http://www.coquillewatershed.org/>

Conclusion



Small amounts of contaminants from all over the land add up to cause pollution in our waters. Yes, even the little things matter. You WILL make a difference, no matter how small, if you are willing to change the way you do some things.