

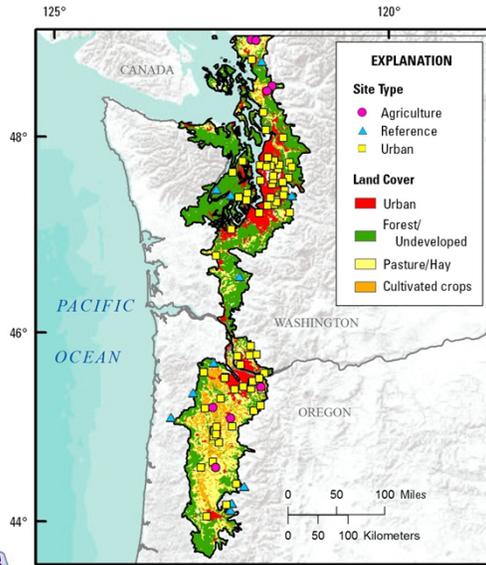
The Pacific Northwest Stream Quality Assessment (PNSQA)

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A Regional Approach to Stream Quality Assessment

In 2015, the USGS National Water-Quality Assessment Program (NAWQA) is assessing stream quality across the Pacific Northwest. The goal of the Pacific Northwest Stream Quality Assessment (PNSQA) is to assess the quality of streams in the region by characterizing multiple water-quality factors that are stressors to aquatic life and the relation of these stressors to ecological conditions, with the highest priority on the effects of urban runoff. Findings will provide communities and policy makers with information on which human and environmental factors are the most critical in controlling stream quality and, thus, provide insights about possible approaches to protect or improve stream quality.



Land cover from National Land Cover Database, 2006, Web Mercator Projection World Geodetic System of 1984 (WGS 84). Basemap image is the intellectual property of Esri and is used herein under license. Copyright © 2014 Esri and its licensors. All rights reserved.

The PNSQA study will be the third regional study by the NAWQA program and it will be of similar design and scope as the first two in the Midwest (MSQA) in 2013 and the Southeast (SESQA) in 2014 (Van Metre and others, 2012; 2014).

Study Objectives

- ❖ Assess the status of ecological conditions; the geographic distribution of spring seasonal concentrations of contaminants, nutrients, and sediment; and the toxicity of water and sediment in wadeable streams in the region.
- ❖ Determine the relative influence of nutrients, contaminants, sediment, and streamflow on aquatic biota, ecological conditions, and toxicity during spring runoff conditions in sampled streams.
- ❖ Identify and evaluate natural and anthropogenic factors affecting the occurrence of stressors and ecological conditions in the sampled watersheds.
- ❖ Develop statistical models to predict concentrations of contaminants, nutrients, and sediment, and, if possible, ecological conditions in perennial streams in the region.

For Additional Information

Visit the NAWQA website to access reports, water-quality data, and maps: <http://water.usgs.gov/nawqa>

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The Approach

Eighty-eight sites will be sampled across the region for up to 10 weeks during April, May, and early June 2015 for contaminants, nutrients, and sediment. This water-quality “index” period will culminate with an ecological survey of habitat, algae, benthic invertebrates, and fish at all sites. Sediment will be collected during the ecological survey for analysis of sediment chemistry and toxicity testing. The sites are distributed so as to capture water-quality conditions across an urban gradient. The design concept is that sampling across these variations in environmental settings will yield data spanning ranges of many specific stressors (for example, contaminants), which will in turn allow us to better understand the effects of those stressors on stream ecology.

Week of	April 13	April 20	April 27	May 4	May 11	May 18	May 25	June 1	June 8	June 15	June 22
Weekly water-quality (WQ) sampling at 62 urban sites											
Weekly WQ at 18 low development sites											
Eco survey											



Study Components

- Ecological Condition Assessment**—Algae, fish communities, and benthic macroinvertebrates sampled and physical habitat assessed
- Water Sampling**—Collected weekly for up to 10 weeks; analyzed for nutrients, suspended sediment, major ions, and 240 dissolved pesticides and degradates
- Integrated Sampling**—Passive polar organic chemical integrative samplers (POCIS) samplers deployed for 7 weeks; analyzed for pesticides and degradates, pharmaceuticals, and wastewater indicator compounds
- Sediment Sampling**—Streambed sediment sampled during ecological sampling; analyzed for trace elements, PAHs and halogenated organic compounds
- Continuous Monitoring**—Dissolved oxygen, pH, water temperature, specific conductance, nitrate, dissolved organic matter, and chlorophyll will be monitored at 12 sites; supplemented with monthly samples of nutrients and periphyton biomass
- Daily Pesticide Sampling**—Small-volume automated pesticide samplers deployed at 7 sites to assess temporal variations in 240 pesticides and degradates; daily and weekly composite samples will be analyzed
- Toxicity Testing**—Water and sediment samples used to conduct toxicity testing on relevant local species