

Science.

Technology.

Innovation

Hydrology at PNNL

At Pacific Northwest National Laboratory (PNNL), we deliver breakthrough science and technology to meet key national needs, applying our capabilities to meet selected environmental, energy, health and national security objectives, strengthen the economy, and support the education of future scientists and engineers.

A career in hydrology at PNNL is a chance to make a positive difference in the future of our environment and our world.



From protecting our rivers to reducing acid rain, hydrologists at PNNL are working on understanding and improving our environment.

The Hydrology Group at PNNL conducts research that covers a broad range of water resource issues:

- We assess the impacts of climate change, hydropower, and irrigation on watershed health.
- We measure and predict the quantity of precipitation that infiltrates the soil surface and eventually recharges the aquifer.
- We measure and predict the movement of fluids, gases, and contaminants through the soil and vadose zone.
- We measure and predict the movement of groundwater and the transport of contaminants to streams and rivers.
- We analyze complex problems involving rivers systems, especially the impacts of dams and their operation.

A career in hydrology at PNNL is a chance to make a positive difference in the future of our environment and our world. From protecting our rivers and natural salmon habitat to reducing acid rain, the Hydrology Group at PNNL is leading efforts on projects nationwide.

**Pacific Northwest
National Laboratory**

Operated by Battelle for the
U.S. Department of Energy



Research in Hydrology

At PNNL, hydrologists conduct research on water and nearly everything it touches, from snow accumulation in the mountains, to the movement of water in the soil. Here are just a few examples.

Vadose Zone and Transport Modeling

At a nuclear weapons site, we used an advanced computer code, with a waste release module and reactive chemistry and transport, for safety assessments of a low-activity waste disposal site, projected over 20,000 years!

We developed an advanced numerical simulator (STOMP) to predict flow and transport of contaminants under multiphase flow conditions. Applications have involved nonaqueous-phase liquids such as TCE, CCl₄, and petroleum, as well as radionuclides and other contaminants.

Predicting Impacts to Salmon Survival

To better understand the impacts of hydroelectric dams on salmon survival, our scientists have coupled reservoir and aquatic ecosystem models to predict dissolved gas concentrations down-stream at hydropower dams. The U.S. Army Corps of Engineers used these exposure predictions to determine impacts on juvenile salmon migrating within the Columbia and Snake River systems.

Watershed Management

In a project for the forest products industry, we developed a Geographic Information System-based decision support tool to evaluate economic and environmental tradeoffs for timber harvest options. The tool predicts hydrologic response of a watershed, including changes in runoff production and flow routing. This tool can be applied to other industries faced with land-management decisions.



Because water is a critical global resource, researchers at Pacific Northwest National Laboratory are involved in a broad range of water resource issues. For example, our researchers assess the impacts of climate change, hydropower, and irrigation on watershed health.

Facilities

Research at PNNL involves state-of-the-art computer systems and facilities.

Multifluid Research Laboratory

The MFRL has experimental capabilities for conducting multiphase flow experiments in batch, column, and multi-dimension flow cell setups. The laboratory has automated data collection capabilities and specialized measurement devices.

Soil Physics Laboratory

The Soil Physics Laboratory is fully equipped to measure a suite of physical and hydraulic properties and it has unique equipment for automated measurements of soil water tensions and water contents using small tensiometers and specialized probes.

Student Opportunities

We welcome students and teachers at all education levels to consider fellowship opportunities with us. Visit PNNL's Science and Engineering Education website (<http://science-ed.pnl.gov/index.stm>).

An opportunity to work with the Hydrology Group at PNNL is an opportunity to use your educational experience. Whether your area of study is environmental engineering, civil engineering, remote sensing, spatial analyses, applied math, or computer science, realize your full potential here.

Jobs at PNNL

We welcome scientists and engineers from a variety of science backgrounds to help solve hydrology-related problems. Visit the PNNL Jobs website (<http://jobs.pnl.gov/>) for details on currently available job opportunities.

Be a Part of PNNL!

PNNL, operated by Battelle, is one of the Department of Energy's national laboratories. The labs were created to augment America's academic and industrial research infrastructure.

The labs possess many of the world's top scientists and engineers, as well as superior laboratories and equipment.

For more information, contact

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