Putting science to work: From cleaning up Hanford to protecting the planet

This is the second of a 12-part series that showcases some of the scientific challenges PNNL has tackled over its 50-year history and the role played by its aquatic research laboratories overseen by the U.S. Department of Energy’s Office of Science and has been managed by Battelle since its inception in 1965. Through this enduring partnership—and by working closely with scientists and engineers at PNNL—Battelle and its predecessors have spent decades understanding how contaminants move through the environment, especially at sites like Hanford where the Cold War weapons programs were conducted. Today, PNNL researchers are still studying the hazards migrating from Hanford’s tank waste project. In response to the 1989 Exxon Valdez oil spill in Alaska, the PNNL team in Sequim conducted ecological assessments and other studies. Then PNNL followed up later to gauge the success of cleanup activities.

As early as 1979, PNNL researchers were sampling and analyzing pollutants from industrial centers—such as carbon-steam-coal-fired plants—and studying the accumulation and transformation of pollutants in the atmosphere. The data is used to develop regional air pollution models to better determine and resolve the environmental impacts of pollution.

On the international front, PNNL left efforts to confirm and maintain information on the 1986 Chernobyl Nuclear Power Plant accident in Ukraine. Scientists analyzed the levels of radiation after the plant arrived in the United States and used research aircraft to collect air samples of the fullest.

At the Marine Science Laboratory in Squaxin, Wash., PNNL scientists have spent more than 45 years conducting research related to marine and coastal resources, environmental chemistry, water resources management, and marine biology.

Beyond Hanford

When a 65-foot crack was discovered in the Wanapum Dam in February, Grant County Public Utility District called on PNNL’s aquatic research experts to determine whether lowering the water for the repair effort would harm local salmon.

PNNL researchers evaluated adult salmon passage through the quickly modified fish ladder along the Columbia River, and the results provided the assurance needed to allow it to continue operating through the smolt migration season and dam repair process.

“[This is] just one example of how we draw upon our scientific heritage to address a broad range of current and ecological challenges,” said Judd Virden, associate laboratory director for PNNL’s Energy and Environment Directorate. “We have nearly 1,000 professionals committed to researching for a healthier planet, including wildlife and habitat restoration, sustainable development, land and water resource management, and balancing the operational needs of industries with environmental stewardship.”

PNNL may be better known locally for supporting DOE by developing ways to treat and dispose of tank wastes from the Cold War weapons programs. More recently at Hanford, PNNL researchers developed a novel high-performance computing code that provides a view of a process with an unencumbered view of the subsurface. This makes it easier to diagnose and in underground waste storage tanks, potentially saving DOE a project $5 billion below the 10-year project’s waste treatment.

Beyond Hanford

Late last year, researchers Richard Fisher studied factors that enhance or reduce survival of Great Basin Cutthroat trout, which inhabit unique streams throughout the state. Researchers followed the fish over several years to better understand the factors affecting survival. This research contributed by employees, retirees and the community to protecting the planet.

“Looking forward, I am proud that PNNL will continue to be a major player in science to enable the world to live through prosperity, rely on and secure our indispensable team of experts at PNNL address many of America’s most pressing issues in energy, the environment and national security through advances in basic and applied science. With an annual budget of about $1 billion and nearly 4,300 staff members, Battelle is the largest employer in the Tri-Cities.”

To learn more about PNNL at www.pnnl.gov and through stories to commemorate 50 years of scientific discovery contributed by employees, retirees and the public at www.celebrate.pnnl.gov.