

PNNL teams with King County to balance growth and natural resources

Scientists at Pacific Northwest National Laboratory are working with King County, Wash., which includes the expansive Seattle metropolitan area, on a new approach to planning and resource management. PNNL staff members are working with the county's Department of Natural Resources and Parks to develop a computational modeling system that predicts the potential impacts of urban activities—including growth—on the area's watersheds, lakes, estuaries and rivers.

The Integrated Water Resource Modeling System (IWRMS) will offer a modular, distributed software architecture that can be accessed via individual computer workstations.

Once IWRMS is operational, the county will be able to integrate additional data and models—everything from simulations of urban growth and land-use effects on watersheds to water flow and quality in rivers, lakes and estuaries—into the system. The resulting tool will enable the county to better understand how potential development actions might affect water resources and other environmental elements.

IWRMS could be used to evaluate diverse scenarios such as drinking water withdrawal from urban lakes or discharge of treated water on agricultural fields. The goal of the system is to provide a flexible modeling environment the county can adapt to a variety of scenarios, enabling it to produce scientifically valid modeling results in a timely fashion.

National laboratory contributes to power grid alliance



The Grid Friendly™ controller uses data from the power grid to balance energy supply and demand.

Battelle recently joined a coalition of six other corporations in forming the GridWise™ Alliance, a collaboration for realizing the vision of an electric power grid that leverages information technology to improve power generation, distribution and consumption. Battelle will provide scientific and technological expertise through Pacific Northwest National Laboratory, which it operates for U.S. Department of Energy.

One example of a potential GridWise Alliance technology is the Grid Friendly™ appliance controller, a credit card-sized circuit board developed at PNNL that could be installed in refrigerators, air conditioners, water heaters and other household appliances and that could temporarily shut down these appliances for a brief period without inconveniencing the consumer. The device would continually monitor the power grid and, when significant fluctuations were identified, could automatically turn the appliance off for up to a few minutes. If millions of these controllers were installed in household appliances across the country, the combined and instantaneous reduction of demand on an overloading grid could alleviate pressures that lead to major blackouts. For more information on the GridWise Alliance, see <http://www.pnl.gov/news/2003/03-38.htm>.

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PNNL wins record grant for proteomics center

Pacific Northwest National Laboratory has won a five-year, \$10.2 million grant from the National Institutes of Health to support a center for basic research in proteomics. This is the largest NIH award in PNNL's 38-year history.

The grant designates PNNL as an NIH research resource center and will establish PNNL as a base for proteomics research worldwide. It will fund development of advanced instrumentation for studying the large and complex protein sets, which allow all living things to function.

The ability to measure proteins, especially those present in trace amounts, and to observe changes in them is the key to understanding molecular-level cell function and disease progression, treatment and prevention. The award will enable PNNL staff to collaborate on important biomedical projects with top NIH-supported researchers and expand their investigations into more complex mammalian systems relevant to human diseases. For more information on the NIH grant, see <http://www.pnl.gov/news/2003/03-37.htm>.

Moving Army logistics forward

Pacific Northwest National Laboratory staff are working with the U.S. Army's Logistics Transformation Agency (LTA) to help transform the way the Army supports our nation's troops.

The backbone of a successful war is logistical support—from providing the right types of material to getting that material to combatants in a timely and reliable matter. PNNL staff work on-site at the LTA in Fort Belvoir, Va., to help identify advanced and emerging technologies that could support Army modernization and make logistics functions more efficient, timely and less costly while not adversely affecting the force's combat effectiveness. The PNNL team's search for technologies encompasses national laboratories, federal agencies, various branches of the armed forces, universities and private industry, both nationally and internationally.

During the war in Afghanistan, for example, weight-in-motion (WIM) technology was identified to speed up loading of Apache helicopters onto C5 aircraft. Currently all combat vehicles must be weighed and balanced before loading for deployment. To do this, a soldier must drive a vehicle onto a scale and perform calculations manually.

WIM, a combination of advanced sensors, microtechnology and artificial intelligence, performs all the calculations in an automated system. Now a vehicle can be driven over the system at 5-15 miles per hour without stopping. Instead of taking 30 minutes for each vehicle with a 20 percent error rate, it's now 30 seconds per vehicle with a zero percent error rate.

PNNL scientist selected for National Academy Symposium



Cynthia Bruckner-Lea, a senior scientist from Pacific Northwest National Laboratory, participated in the National Academy of Engineering's ninth annual Frontiers of Engineering symposium. The three-day symposium, held in September, highlighted 83 of the nation's top young engineers who are "performing leading-edge engineering research and technical work."

Bruckner-Lea joined PNNL in 1992 and heads research programs in bioanalytical sensor systems, including a biodetection project funded by the Department of Homeland Security, and efforts to develop a Biodetection Enabling Analyte Delivery System, or BEADS, technology for environmental monitoring. She has authored more than 20 scientific publications in peer-reviewed journals and holds three patents in the area of bioanalytical chemistry and microfluidics.

The National Academy of Engineering was established in 1964 and is an independent, nonprofit institution that serves as an adviser to government and the public on issues in engineering and technology. More information on the symposium is available at <http://www.nae.edu/frontiers>.

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