

## PNNL technologies may help prevent blackouts

Communities from Michigan to New York are just beginning to recover from the massive power outage of August 14. The blackout stranded people, shut down manufacturing plants and caused many significant problems.

In the future, such blackouts may be prevented through the use of new technologies. Experts at Pacific Northwest National Laboratory have long been aware of the serious issues facing the nation's electricity delivery system and are focusing on the development of innovative solutions.



***PNNL engineers are designing smart chips for household appliances that would continually monitor power grid fluctuations and, under periods of grid stress, would shut down appliances for a short period of time to give grid operators time to stabilize the system.***

PNNL calls its concept for the energy system of the future GridWise™. It draws upon new technologies enabling collaboration among generators, the grid and customer loads to collectively increase the stability and cost effectiveness of the power system. As part of GridWise™, PNNL engineers are designing smart chips that would be fitted on household appliances and would continually monitor fluctuations in the power grid. When the grid is under high periods of stress, a grid-friendly appliance would identify these fluctuations and, within milliseconds, automatically shut down for a short period of time to give grid operators time to stabilize the system. It could even turn on momentarily to absorb excess power from fluctuations during a crisis. For more information on PNNL's grid of the future, see PNNL's Web site at <http://www.pnl.gov/news/2003/03-30.htm>.

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## Threatened juvenile salmon get scientific assistance

Ten of thousands of culverts under Pacific Northwest roadways may be preventing young salmon from swimming upstream to the habitat required for their growth and development.

To find a more "fish friendly" design for future stream crossings and for the thousands of culvert retrofits expected to be completed in coming years, the Washington State Department of Transportation hired Pacific Northwest National Laboratory to design and install a culvert test bed in southwestern Washington.

The one-of-a-kind culvert test bed system is at the Washington Department of Fish and Wildlife's Skookumchuck Hatchery near Tenino, Wash. The system allows scientists to adjust and measure the hydraulic conditions—water velocity, turbulence and depth—of various culvert designs. By assessing different slopes and flow regimes, scientists can determine how these conditions influence fish behavior and their ability to pass through a variety of culvert designs being considered as retrofits. For more information on the culvert test bed, see PNNL's web site at <http://www.pnl.gov/news/2003/03-29.htm>.



## **PNNL scientist selected for WASL committee**

PNNL scientist Eric Nyberg is serving on the Washington Assessment of Student Learning (WASL) standard setting panel for science. Members of the panel help determine expectations for student performance in science based on each committee member's experience and expertise. About 30 committee members each for eighth grade and tenth grade will review test items and reflect on student performance. This spring marked the first statewide administration of the science WASL to eighth and tenth grade students in the public school system.

At PNNL, Nyberg has been involved with science education reform since 1993. He was a recipient of the PNNL Director's Award for Outstanding Contributions to Science and Engineering Education in 1996. Nyberg is a staff scientist in PNNL's Material Sciences Division.

## **FRAMES software is flexible**

Researchers at Pacific Northwest National Laboratory have developed a new version of FRAMES, an easy-to-use software that allows users to plug in sets of related models and data from almost any field. Developed specifically for environmental issues, FRAMES 2.0 also can be used with financial, educational, biological and many other data sets.

FRAMES allows people to focus on the models and the data, not the interface. For each scenario, the FRAMES user selects icons representing the models and databases desired and creates a graphic display of the modeling scenario. Each time a parameter or a scenario changes, the user simply adds the new data and presses the "go" button. Because the models and databases are easily managed through FRAMES, the user has less risk of using out-of-date information. In addition, FRAMES saves time and money by allowing researchers to drag and drop information. No specialized programming knowledge is needed to operate FRAMES.

To learn more about FRAMES, see PNNL's Environmental Technology Directorate Web site at <http://mepas.pnl.gov/FRAMESV1>.

## **Washington Technology Center addresses lack of seed capital**

The Washington Technology Center (WTC) announced a new program targeted to provide companies outside the Puget Sound access to critical early stage "seed capital."

Under the \$250,000 award from the U.S. Department of Commerce Economic Development Administration and matched by WTC, this two-year program will help investors and companies in communities like Yakima, Spokane, Tri-Cities, Bellingham, Port Angeles, Wenatchee and Vancouver gain access to seed capital—the next stage of company financing beyond family and friends.

"Most early startup ventures that might try and commercialize our technologies have to rely on seed capital to get started," said Mike Schwenk, manager of PNNL's Economic Development and Communications Directorate. "Being able to find this outside a major metropolitan area is not easy. A program like this should help."

Findings from WTC-led statewide focus groups as well as the *2003 Index of Innovation and Technology for Washington State*, published annually by WTC, indicate that this stage of financing is lacking outside Seattle. WTC investor workshops in Spokane, the Tri-Cities and Bellingham also supported the conclusion that access to seed capital is a major issue for communities outside Seattle.

WTC is a state science and technology organization that funds and fosters industry-university collaborations. WTC connects entrepreneurs and scientists who often need each other to bring commercially promising ideas to fruition. Pacific Northwest National Laboratory maintains a collaborative relationship with WTC. For more information on WTC see its web site at <http://www.watechcenter.org/>. Visit PNNL's economic development web site at <http://www.pnl.gov/edo/>.

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