



**2007 OSU Federal Agenda (Federal FY 2008)**  
**Proposal Category I: New Project**

**A. Summary Information**

**Name of Project:** Establishment of the Joint Northwest Water Institute (JNWI)

**Amount of Funding Requested:** \$1,500,000 per year for 5 years; total: \$7,500,000

**If this is a shared project, how much is for the entire project and how much would come to OSU?**

All of the requested \$7,500,000 will come to OSU. Our partners, Idaho National Laboratory (INL) and Pacific Northwest National Laboratory (PNNL) will seek as-yet undetermined amounts (their deadlines do not occur until early 2007).

**Likely Sources of Federal Funds for this Project:**

National Aeronautics and Space Administration (NASA) and possibly the U.S. Department of the Interior (DoI). Both our partners have strong relationships with NASA; DoI is a possibility because of its strong resource-management role. We plan to make a presentation before the Deputy Assistant Secretary of the Interior for Water and Energy.

**Summary of the Project:**

**Introduction**

The Snake-Columbia Basin is the Northwest's primary water system; its streams and aquifers provide water, power, transportation, recreation, food, ecosystem maintenance, and waste dilution services. Surface water in the basin is fully appropriated and ground water is locally overexploited and subject to contamination. The specters of increasing population growth, the expiration of the USA-Canada Columbia River Treaty, and global warming loom on the horizon. All have the potential to adversely affect the region's economy and water and other natural resources. Global warming is already altering the hydrologic landscape, changing the distribution of Cascades snowpack and spring snowmelt.

In addition, energy and water in the Northwest are inextricably linked and demand joint consideration. Hydroelectric power is the obvious example, but thermoelectric power generation also requires water. Ground water must often be extracted at great energy expense. Water distribution systems and waste water treatment require energy. Even if the region should decide to invest in biofuel production, substantial amounts of water may be required for the crops.

It is clear that the region needs to develop and use sophisticated tools to manage its water and energy resources. The synergy produced by a consortium of PNNL, INL, and OSU will create a powerful entity that will assist federal, state, and local agencies perform their daunting tasks in providing water and energy to their growing constituencies at reasonable cost with minimal environmental degradation.

**Description**

PNNL, OSU, and INL will coordinate a program to capture and integrate funds for each institution toward the establishment of a three-state water resources management science, technology, and policy initiative. This water initiative will deliver knowledge- and technology-based solutions to current and emerging regional water management issues including energy and water conflicts, outdated and ineffective legacy water rights frameworks, water quality, aquatic ecosystem and riparian ecotone degradation, log-jammed salmon habitat recovery efforts (and budgets), competition, and policy paralysis. This joint initiative will proffer a scientific water resource assessment and management platform that will provide a basis for dramatically improved knowledge of water quantity, quality, distribution, and timing. This basis will ensure that the NW

makes the most of available water and will change the debate from one of conflict and distributive bargaining to knowledge-based optimization (i.e., dynamic regional water mass balance).

This approach will strongly emphasize the relationship between energy and water in our region and beyond, and will ultimately provide a means to deliver additional power and economic development societal benefits in a context of adaptive, sustainable management, rather than presenting the problem in terms of fundamental and inevitable conflict and hard, arbitrary constraints between natural resource and economic development interests.

The three principals agree that an external advisory board will be extremely valuable to the JNWI. The essential purpose of this advisory board will be to win and exert political influence and support for a scientific water management platform that supports sustainable development of the NW region. Ample technical advice can be brought to bear on water problems through the technical activities of the Institute. PNNL, OSU, and INL will each nominate and cooperatively vet candidates for the advisory board.

The JNWI will be a “virtual” institute created by the alliance of the Northwest Water Institute (PNNL), the Snake River Institute (INL), and the Institute for Water and Watersheds (OSU). The three institutions will seek funding to develop and pursue joint activities, some of which represent a continuation and significant expansion of those conducted under the aegis of the expiring Pacific Northwest Regional Collaboratory (PNWRC). OSU will have major responsibility for the watershed applications project, collaborating in the development decision-support systems, conflict management, and education and outreach. Note that these activities can be conducted in the absence of any funding received by PNNL and INL, should their efforts to obtain JNWI-specific funding fail.

### ***Deliverables***

The JNWI will produce the following deliverables:

- Comprehensive regional water budget
- Forecasting models for supply, demand, and interactions among all water uses (economics, ecosystems, surface water – ground water interactions; energy; water quality and quantity)
- Scientific basis for environmental flow requirements
- Integrated assessments and decision support for the water-energy system

### ***Concluding Remarks***

The JNWI will accomplish the following:

- Resolve regional water resource management issues common to federal, state, tribal, local, environmental, and private interests
- Accelerate deployment of “next-generation” science and technology to address emerging complex water resources management issues
- Provide a scientific basis for improved water and energy resource management policy;
- Address the energy-water nexus
- Assist the federal government in preparing for the expiration of the Columbia River Treaty, which expires in 2024, but which requires a renewal/non-renewal decision by either party in 2014
- Establish a legacy of excellence in collaborative resource management research and technology development in the Northwest.

### **OSU Contact:**

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### **Partners (individuals, businesses, or organizations) that will be contributing to the work conducted under this request.**

- 1) Pacific Northwest National Laboratory; Dr. Richard Skaggs; [Richard.Skaggs@pnl.gov](mailto:Richard.Skaggs@pnl.gov)
- 2) Idaho National Laboratory; Dr. Paul Wichlacz; [Paul.Wichlacz@inl.gov](mailto:Paul.Wichlacz@inl.gov); 208-526-1292

**Please list any organizations and/or community leaders who have already expressed support for this project:** None as of yet.

**B. Additional Information****1) How does the project complement the long-term strategic development of the department and college? Is there support from all department/colleges involved?**

The strategic goals of the IWW, which is a campus-wide organization, are to:

- Enable capture of new, high-value opportunities for research, education, and outreach
- Provide coordination of water and watershed activities at OSU
- Engage OSU faculty and students with external stakeholders throughout the State
- Connect a diverse student body with relevant issues across the State
- Establish a set of shared water and watershed collaboratories supporting research, teaching and outreach

The proposed project will support each of these, but especially the first two. The project will also strengthen the IWW on its way to becoming *the* place for water and watersheds at OSU.

It should be noted that the IWW, as a campus-wide organization, actually exists to serve the other units at OSU. As such, this project will benefit the myriad colleges, schools, and departments that comprise the IWW. Faculty, staff, and students of these other units will be the ones performing the research of the JNWI, so they are supportive of this effort.

**2) How does this proposal fit within OSU's strategic plan?**

The Water and Watersheds Initiative, which created the IWW, was the direct result of OSU's Strategic Plan. In particular, this proposal fits very well within three of the five thematic areas of the Strategic Plan:

- Understanding the origin, dynamics, and sustainability of the Earth and its resources
- Managing natural resources that contribute to Oregon's quality of life, and growing and sustaining natural resources-based industries in the Knowledge Economy.
- Optimizing enterprise, technological change, and innovation.

Because the work will support students and faculty in a variety of disciplines – engineering, geosciences, forestry, agriculture, economics, biology, policy - the proposal also contributes heavily to a fourth theme:

- Building and maintaining a strong curriculum and basic inquiry in the arts and sciences that contributes to all parts of the University

**3) Is there a partnership arrangement with other institutions including private industries, and if so, have the appropriate alliances been built and approved at those institutions?**

Both the Idaho National Laboratory and Pacific Northwest National Laboratory have approved this partnership and the mechanisms (MOUs) for implementing agreements with both are in place.

**4) Please describe any partnerships the project may involve with other local, state, or federal agencies.**

We anticipate partnering with a number of governmental agencies:

- Federal: Bonneville Power Administration, Corps of Engineers, Bureau of Reclamation, Bureau of Land Management, Fish and Wildlife Service, Forest Service, Geological Survey, Energy
- State: Water Resources, Environmental Quality, Forestry, State Lands, Agriculture, Fish and Wildlife, Energy [and ID and WA equivalents]
- Local: Various agencies (e.g., City of Portland, Multnomah County, Washington County, Deschutes County, etc.)

Formal partnership arrangements have not yet been established.

**5) Are there other interested parties who are willing to provide letters of support through their delegation?**

We anticipate receiving letters of support from the Idaho and Washington Water Resources Research Institutes (the submitter, the IWW, fulfills that role for Oregon). We will also seek such letters from each state's Departments of Water Resources; Environmental Quality; Energy; Forestry; Agriculture; Fish and Wildlife; Natural Resources; and State Lands. In addition, regional power and water purveyors, utilities, and trade associations (e.g., Portland General Electric,

PacifiCorp, Portland Water Bureau, Northwest Energy Efficiency Alliance, Northwest Public Power Alliance) will be requested to provide letters of support.

**6) Is the federal agency that might be called upon to fund the project aware of the proposal? Does it have a line item in its budget for this type of project? What is the name of the budget line?**

To my knowledge NASA is not formally aware of this project, although some individual NASA employees are aware of it. NASA does not have a line item in its budget for this type of project. The Deputy Assistant Secretary for Water and Energy at the U.S. Department of the Interior is aware of this project, but there is no line item in the Interior appropriations bill for it.

**7) Why is this project is a priority for the state or region?**

Oregon and the entire Northwest face uncertain futures with respect to water and energy resources. The Snake/Columbia Basin is the Northwest's primary water system, providing water, power, transportation, recreation, food, ecosystem maintenance, waste dilution services, and wildlife. The streams and aquifer systems sustain the region's industry, agriculture, ecosystems, and population. Surface waters are fully appropriated, yet demand continues to increase, threatening both present and future users. Ground water pollution and unsustainable withdrawals are also threats. Population growth in the region shows little sign of abating, increasing the need for energy and water. Superimposed upon all this is the reality of global warming, which is already changing the nature of the region's all-important mountain snowpacks, which are so essential to sustain streams and provide recharge to aquifers. Global warming will also change other components of the hydrologic cycle – precipitation, evapotranspiration, recharge, runoff - in other, as-yet undetermined ways.

Another complication is the expiration of the Columbia River Treaty between Canada and the USA. Although the treaty expires in 2024, 2014 is the earliest date by which either party can notify the other that it wishes to terminate the agreement. The USA lags far behind Canada in developing the information necessary to make a decision by 2014.

Energy and water are inextricably linked and vital to the region's economy and to its citizens' health and welfare. Providing abundant, clean water depends on the availability of clean, inexpensive, and sustainable energy. Likewise, energy security goals cannot be reached without simultaneously addressing the use of water for power, emissions scrubbing, and energy resource production. As both these critical resources are produced, transported, and consumed, they impact all of our natural resources. Concomitantly, satisfying the region's water needs requires energy for supply, purification, distribution, and treatment of water and wastewater. The magnitude of the challenge facing us - to manage the energy and water security nexus - is enormous since the projected demand for both energy and water is expected to grow substantially over the next 25 years.

The JNWI will provide the tools so that energy and water managers, policy-makers, and decision-makers can plan future needs with far less uncertainty than at present.

**8) What is the national significance of the project? What specific federal responsibility does the funding of this project or activity advance?**

Energy and water are two of the most important components of the USA's economy and security. The country's well-being depends on ample, sustainable supplies of both. Although each region of the USA has different energy and water resources, the two quantities are strongly interrelated. Indeed, the U.S. Department of Energy has conducted three "Energy-Water Nexus Roadmap Workshops" – one for the East, Midwest, and West – during the past 18 months. The Department of the Interior has its "Water 2025" project. The JNWI will be able to help the entire nation, not just the Northwest, deal with water and energy problems because the tools it will develop and apply can be adapted to other regions having different hydrologic and energy environments. The consortium itself can also serve as a template for creating similar organizations in other regions.

The Federal government is heavily involved in resource characterization and management. Entities with these responsibilities primarily include Department of Agriculture agencies (e.g.,

Forest Service, Natural Resources Conservation Service); Department of the Interior agencies (Fish and Wildlife, Parks, Geological Survey, Bureau of Reclamation, Bureau of Land Management); Department of Energy (Bonneville Power Administration); Federal Energy Regulatory Commission; Environmental Protection Agency; Department of Defense (Corps of Engineers). The Department of State is also a stakeholder because of its primacy vis-à-vis renegotiation of the Columbia River Treaty with Canada, as is the International Joint Commission.

**9) Are we in the forefront or are other institutions leading this effort?**

In the Northwest OSU is close to the top in this arena. Only the University of Washington might be considered ahead of us. The fact that PNNL and INL chose to partner with us and not other NW institutions speaks volumes as to OSU's leadership in this field.

**10) Does the project require facilities funding?**

No facilities funding is requested.