

**REQUEST FOR PROPOSALS**  
**University of Wyoming Office of Water Programs**  
**Water Research Program**  
**FY2014**

The UW Office of Water Programs invites faculty members and affiliates of the University to submit research proposals under the Wyoming Water Research Program (WRP). Proposals responding to the research areas described below are sought.

**Proposal submission due date:** Thursday, Oct. 3, 2013, by 5:00 P.M.

**Tentative project start date:** March 1, 2014.

Research proposals are intended to yield findings in support of practices in Wyoming that advance the beneficial use of water in the state for all entities and economic sectors that are dependent on effective water management. Preparing students for effective careers in the water management field is an important priority to the state and the WRP, thus student participation is an important component of all research projects funded by the program. Proposals for research projects of one to three years in duration will be accepted.

All researchers interested in submitting proposals must contact the Director of the UW Office of Water Programs for formatting requirements, mandatory Excel sheet for preparing budgets, submission guidelines, and other information.

Greg Kerr  
Director - Office of Water Programs  
University of Wyoming  
1000 E. University Ave.  
Department 3295  
Laramie, WY 82071  
Email: rrek@uwyo.edu  
Ph: (307) 766-6656  
Fax: (307) 766-6307

**REQUEST FOR PROPOSALS**  
**University of Wyoming Office of Water Programs**  
**Water Research Program**  
**FY2014**

The Office of Water Programs/Water Research Program welcomes proposals covering a wide range of areas involved in Wyoming's water resources.

**General areas include, but are not limited to the following:**

**Surface water hydrology**  
**Groundwater hydrology**  
**Water quality**  
**Biological Processes**  
**Irrigation**  
**Climate/Hydrologic Processes**  
**Engineering**  
**Economics/ Social Sciences**

**In addition to addressing these general areas, stakeholders also have provided the following examples of more specific water related topics of concern:**

**Energy-Plan Strategy for Produced Water**

Governor Matthew Mead has issued a document "Leading the Charge: Wyoming's Action Plan for Energy, Environment and Economy." In this document, 16 strategies are listed. Innovative Water Treatment and Management Incentives is listed as Strategy 9C. Oil and Gas development in Wyoming raises issues associated with the disposal and treatment of the water produced to facilitate production of oil and gas. To help fulfill the objectives of this strategy, and take a proactive approach to address the interdependence of water and energy development, research is needed in the following areas:

- Treatment and use of water produced by industrial and agricultural operations
- Improved regulatory standards for reuse
- Investment in reuse technology
- Incentives for third-party investment
- Development of industrial uses for produced water
- Development of advanced water treatment facilities for recovery and reuse

**River and Stream Conveyance Losses**

Proper accounting of stored and natural flows becomes an important component in the administration and enforcement of Wyoming water laws and is vital to any regulation that may occur. Both short term and long term conveyance losses are important quantities to measure in order to understand the distinction between natural and stored flows.

### **Effects on Stream Flows and Water Quality from Irrigation Return Flows**

Previous studies indicate that significant quantities of water are stored during early summer irrigation and then slowly released back to riparian areas and streams during the following months, supplementing late summer flows. Quantification and documentation of return flows are needed. Important questions to be answered include (1) what is the contribution of return flows to sustained late-season flow (baseflow), (2) what is the quality of the return-flow water, (3) how do changes to water quality affect riparian and aquatic communities receiving this water, and (4) how do return flows vary in quantity, quality, and timing?

### **Irrigation Efficiency Improvements Through Irrigation System Operations Management Opportunities**

Improving the efficiencies of large canals to better match on-farm efficiencies is desired. Most large irrigation projects in Wyoming were constructed by the Department of the Interior, Bureau of Reclamation. These canals were designed to accommodate flood irrigation practices. Due to labor savings, flood irrigation practices are yielding to the use of center-pivots, side-roll irrigation systems, gated pipe, installation of piped laterals, and surge valves which have drastically improved on-farm efficiencies. The purpose of this research would be to determine whether delivery system efficiencies could be improved by using mechanical automated checks in combination with lower canal flows to discourage operational waste due to filling canals to an elevation needed to service farm turnouts and irrigation laterals. Other issues include seepage losses versus canal head and whether opportunities may exist within canal reaches to lower operating levels to discourage seep and to determine whether the “checked” canal may be used as a re-regulation facility. Economics (benefit vs. cost), quantitative impacts to groundwater recharge, effects on water quality and aquatic communities in associated streams, and other related issues could be addressed.

### **Guernsey Reservoir Silt Run**

During mid-summer of each year the US Bureau of Reclamation conducts a rapid draw-down of Guernsey Reservoir on the North Platte River. This rapid draw-down results in large quantities of accumulated silt in the reservoir being sloughed into the river downstream. The purpose of this activity is to help seal irrigation canals and increase the efficiency of water delivery. A special exemption in Wyoming’s water quality standards allows for the silt run. An independent socio-economic/environmental analysis of the silt run would be beneficial to allow decision makers to determine whether silt run benefits outweigh costs.

### **Aquifer Recharge/Groundwater Management**

Research regarding safe yields, recharge rates, and use impacts of highly utilized aquifers in Wyoming.

### **Wastewater Treatment**

Research in the area of enhanced treatment of domestic waste using stabilization pond systems.

### **Oxbow Storage Properties/Opportunities**

Information is desired on the potential benefits/costs of diverting high river flows for storage in old river channel and oxbow features. Potential benefits to examine could include, but not be limited to: augmenting return flows during low flow periods by diverting in high flow, supplemental water supply, fish and wildlife habitat, recreation, and flood control. Costs evaluated could include not simply the possible expense of the diversion and storage, but the impact of this new use on the functions the old channels and oxbow features already perform, including flood control. Ideally, the investigation should look at the use of old river channel and oxbow features on Wyoming rivers that include at least one river with a major dam or dams and one that has not been significantly dammed.