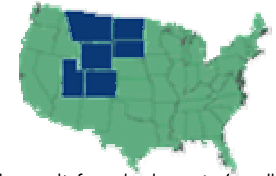


# Coordinated Agricultural Water Quality Programming for the Northern Plains & Mountains Region



The dominant water quality concerns in the Region associated with agriculture include nutrients, salinity, pesticides, microbial pathogens, and sediment. Most of these same problems also result from development of small acreages and urban lands in fast growing areas of the Region. Rapid energy development further contributes to water quality concerns. Problems occur in both surface and ground water resources. As population growth continues, demands on finite water resources and the risk of adverse impacts on the quality of those resources steadily increase. Additionally, severe drought has affected much of the Western U.S. during the last three years. Emerging water quality issues in the Region include sodic and saline discharge water from coal bed methane development, pharmaceuticals and antibiotics in animal waste effluents, selenium, and atmospheric deposition of contaminants in watersheds. Through collaboration and partnership with federal and state agencies and local stakeholders, the regional program has leveraged an additional \$4M to respond to water quality concerns.

### Mountain to Basin Riparian Areas: Maintaining and Protecting Water Quality

**Issue:**  
 In the semi-arid West, riparian zones provide multiple values and functions: controlling point and non-point pollution, providing wildlife and livestock habitat, enhancing fisheries, and providing recreational opportunities. This limited but essential resource supports a high percentage of such activities and as a result has been significantly altered.

**Regional Program Response:**

- ✓ U of WY documents riparian value in "Wyoming Watersheds & Riparian Zones".
- ✓ USU Extension is a partner in the Utah Riparian Management Coalition, which provides educational and technical assistance to watershed projects throughout the state.
- ✓ Riparian research at USU includes restoration of riparian communities, the role of animal behavior in grazing management, and monitoring and assessment of riparian ecosystems.
- ✓ The Center for Riparian Ecology and Management (CREAM) at CSU provides expertise in physiological ecology, plant-animal relationships, restoration ecology, hydrology, water quality, and soils.

### Coal Bed Methane Development: An Emerging Water Quality Issue

**Issue:**  
 Managing the tremendous amount of water of variable quality introduced into semi-arid environments by Coal Bed Methane development.

**Regional Project Response:**

- ✓ Researchers at MSU are conducting a series of greenhouse and field experiments to find positive solutions for the management and beneficial use of CBM product water.
- ✓ Adoption by the Montana Department of Environmental Quality of surface water quality standards for irrigable waters of Montana based on research at MSU.
- ✓ At the U of WY, CBM research investigates pond storage of CBM water; stream channel sediment and CBM product water interaction; and plant species interactions with CBM product water.
- ✓ In Colorado, workshops utilizing regional expertise address landowner concerns and rights regarding CBM development.
- ✓ A technical conference, "Living With Coal Bed Methane", will be held in Billings, MT Jan 22-23, 2004, presented jointly by the Montana and Wyoming Chapters of Soil & Water Conservation Society (SWCS) with support from the regional project.

### Geospatial Tools and Water Quality Protection

**Issue:**  
 Reliable water resource characterizations through the use of geospatial tools improve the effectiveness of water quality protection programs.

**Regional Program Response:**

- ✓ Satellite imagery derived maps of center pivot irrigation in Colorado help improve knowledge of irrigation distribution and relationship to ground water resources
- ✓ NDSU and CSU provide their Departments of Agriculture assessments of aquifers with respect to potential contamination from agricultural chemicals.
- ✓ Educational offerings at MSU, NDSU and CSU include on-line courses, mapping workshops, undergraduate courses, and summer workshops for K-12 teacher training.
- ✓ NDSU and the US Fish & Wildlife Service collaborate to use water resource assessment tools for endangered species protection and Integrated Pest Management (IPM) plans for local management areas.
- ✓ MSU delivers land resource information through the Montana Agricultural Potential System (MAPS).

### Best Management Practices for Improving Water Quality

**Issue:**  
 Safeguarding water quality through stewardship and land management is an ongoing challenge to agricultural producers and small acreage managers.

**Regional Program Response:**

- ✓ CSU assesses effects of selenium leaching on irrigated lands and provides workshops and demonstrations on improved water management practices.
- ✓ NDSU, in partnership with the North Dakota Depts. of Health and Agriculture, delivers educational programs to producers and the public on management of lands over highly sensitive aquifers.
- ✓ SDSU provides training to producers in the use of GIS maps and software to make improved management decisions regarding nitrogen, phosphorus and herbicide applications.
- ✓ CSU partners with the Colorado Depts. of Public Health & Environment and Agriculture to deliver educational programs on localized BMPs for agriculture.

### Animal Nutrient Waste Management

**Issue:**  
 Managing manure from Animal Feeding Operations as a valuable nutrient to prevent water pollution

**Regional Program Response:**

- ✓ A web-based Comprehensive Nutrient Management Plan workbook assists producers in the Region comply with the USDA/EPA United National Strategy for Animal Feeding Operation.
- ✓ Research at CSU on minimizing the environmental impact of agricultural pharmaceuticals provides the basis for outreach programs on this emerging issue.

### Watershed Education

**Issue:**  
 There is a need for greater understanding of how streams, lakes and wetlands function and how activities in a watershed affect the health of water bodies.

**Regional Program Response:**

- ✓ USU youth education programming supports the "Governor's Watershed Initiative", promoting active involvement in watershed management.
- ✓ Students and teachers reached by USU progress from monitoring to stewardship: trash clean-up, fencing, tree planting, water body adoption.
- ✓ U of WY partners with state and federal agencies to facilitate training for volunteer monitoring programs established by the Wyoming Association of Conservation Districts.
- ✓ CSU offers 2 online courses in their "Water on the Web" series for water professionals, extension agents and homeowners, covering topics including water resources, law, management and conservation.

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