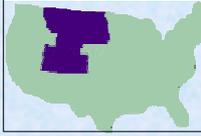


Integrating Water Research, Outreach, and Teaching in the Northern Plains & Mountains Region



The Northern Plains and Mountains Regional Water Quality Project is working to integrate research, education and extension programs to address high priority water issues. Current regional initiatives include management of watersheds and rangelands, educating youth and teachers on watershed functions, implementing Best Management Practices for improving water quality, providing support for AFO/CAFO nutrient management programs, providing training in remote sensing and geospatial tools, and educating landowners about water quality and conservation. Project accomplishments rely heavily on partnerships and leveraged funding with numerous federal, regional, state, and local organizations with similar goals related to water resources. Annual leveraging of funds commonly generates at least two dollars for every dollar spent from the regional budget.

Example Outputs and Impacts of Regional Initiatives include:

Best Management Practices

- Presenting workshops on youth water education, manure management, GIS, and precision farming
- Developing a precision farming manual, GIS decision support systems, remote sensing for crop assessment, and a septic tank video
- Conducting research on remote sensing, the fate and transport of agricultural chemicals, and implementing educational programs concerning pesticide and fertilizer BMPs
- Developing and implementing a model that provides flexible nitrogen management strategies that can be adopted without a loss of yield or quality

Education

- Youth water quality education programming including: watershed festivals, 4-H camp presentations, and watershed monitoring
- Providing K-12 education on watershed functions, links between land use and water quality, teacher training and support, website development and macro invertebrate monitoring
- Producing a Stream Side Science Curriculum for 9th Grade Earth Systems Science Program
- Utah State University and Montana State University offer on-line watershed education courses and resources, including a water quality resource guide for 4-H educators
- These programs continue to reach over 14,000 youth and 1,200 teachers, learning about water quality and watershed functions

Watershed / Rangeland Management

- Developing program materials on watershed and riparian zone management, coal bed methane product water issues, and best management practices for rangelands
- Utilizing applied research on arsenic, culminating in a method to remove arsenic from drinking water
- Developing and distributing approximately 3000 decks of Western Grasses playing cards to assist landowners in managing grazing areas
- Developing a volunteer monitoring program of watershed and rangeland vegetation conditions, resulting in two ranching groups winning the 2004 Environmental Stewardship Award

Water Management / Conservation

- Initiating education/research projects on TMDL and small watershed planning, as well as issues related to the urban/agriculture interface
- Developing a well water diagnostic tool in cooperation with conservation districts and the Montana DEQ
- Constructing three wetland ecosystem demonstration facilities to research the role of wetland plants in phytoremediation of coal bed methane product water
- Development of educational materials and training programs addressing impacts of coal bed methane development and management of CBM production waste
- Implementing irrigation water management workshops for Extension and NRCS personnel

Geospatial Applications for Water Quality Protection

- Conducting workshops on GPS/GIS, pesticide assessment maps, pesticide application certification, nitrogen management, and animal waste management
- Developing monitoring protocols and water quality standards at the request of state legislatures and environmental agencies
- Development of mapping tools to assess aquifer sensitivity, land use and water quality, and impervious area development
- Collaborating with the Colorado Agricultural Chemicals and Groundwater Protection Program to test wells on private lands in Colorado for 120 property owners

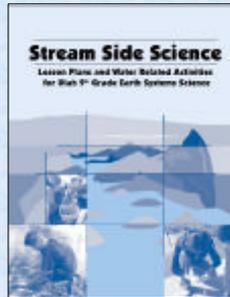
Manure / Nutrient Management

- Developing and implementing a Comprehensive Nutrient Management Plan (CNMP) workbook for training workshops, including web-based training that targets agricultural professionals
- Two hundred and forty livestock operations have participated in these workshops, influencing 270,000 cattle that produce 400,000 tons manure per year
- Training over 100 agricultural professionals to use this CNMP workbook curriculum
- Addressing drought issues including rangeland, livestock management, and grazing on small acreages
- Applied field research is investigating the fate and transport mechanisms of P, N, and antibiotics contained in manure being applied to land

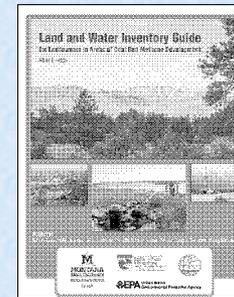


Region 8 continues to develop and improve its regional website, which serves as the repository for regional water quality information and resources, providing direct linkages to other regional and national sites, as well as providing information to diverse clientele.

www.region8water.org



The Stream Side Science Curriculum is a set of 11 water-related activities and lesson plans correlated directly to the 9th grade Earth Systems Science Core. A collaborative effort between Utah State University, Montana State University, Colorado State University, and the University of Wyoming continues to create additional water-related educational courses and resources, including a water quality resource guide for 4-H educators.



Region 8 has developed a natural resources inventory guide to empower landowners, natural resource managers, and tribal members in coal bed methane development areas to:

- Understand potential CBM benefits, impacts, and issues
- Understand the rights and responsibilities of landowners and CBM developers
- Inventory current conditions of resources
- Use this inventory for negotiation
- Understand management practices to protect land and water resources
- Learn how to identify situations in which more detailed monitoring is necessary

Water Quality Coordinators

Dr. Jim Bauder (Montana State University), Troy Bauder (Colorado State University), Dr. David Clay (South Dakota State University), Nancy Mesner (Utah State University), Dr. Ginger Paige (University of Wyoming), Dr. Bruce Seelig (North Dakota State University), Dr. Quentin Skinner (University of Wyoming), Virgil Dupuis (1994 Regional Coordinator), Dr. Reagan Waskom (Regional Water Quality Coordinator, Colorado State University), and Matt Neibauer (Assistant Regional Coordinator, Colorado State University).