



Wyoming Landscape Conservation Initiative

"Conserving world-class wildlife resources. Facilitating responsible development."



U.S. Geological Survey Water-Resource Monitoring Activities in Support of the Wyoming Landscape Conservation Initiative

The quality of the Nation's water resources are vital to the health and well-being of both our communities and the natural landscapes we value. The U.S. Geological Survey (USGS) investigates the occurrence, quantity, quality, distribution, and movement of surface water and groundwater and provides this information to engineers, scientists, managers, educators, and the general public. This information also supplements current (2013) and historical water data provided by the National Water Information System (NWIS). The USGS collects and shares data nationwide, but how those data are

used is often site specific; this variety of data assists natural-resource managers in addressing unique, local, and regional challenges.

Southwestern Wyoming (Fig. 1) contains diverse landscapes that provide habitat for an array of plant and wildlife species and that harbor vast reserves of mineral (natural gas, trona, coal, and oil) and natural (wind) resources that are actively being developed. The potential responses of aquatic habitats in this region are not fully understood in relation to potential effects from natural-resource and mineral development (herein referred to as

energy development) such as increased sediment transport, changes to surface-water quality and quantity, interactions between groundwater and surface water, and the potential to transmit diseases among and between organisms.

This lack of information about aquatic habitats has led to water-quality monitoring efforts throughout the region.

More comprehensive monitoring also will assist land managers in assessing a broad spectrum of ecosystem functions including: energy development effects on native fishes and other aquatic species; potential effects of climate change on arid stream systems; and effects of energy-development infrastructure on aquatic resources in terms of habitat disturbance primarily from road, turbine, well-pad, and transmission-corridor construction.

In addition to monitoring the ecological health of aquatic ecosystems throughout this region, assessing potential effects of energy development on consumptive water supplies is vital. The Green River near Green River, Wyoming (Wyo.), and Muddy Creek near Baggs, Wyo., are both tributaries of the Colorado River Basin and active energy development is occurring in both river basins. The Colorado

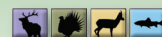


U.S. Geological Survey (USGS) monitoring station along Muddy Creek near Baggs, Wyoming. Image courtesy of Kirk Miller, USGS.

The WLCI is a long-term, science-based program to assess and enhance aquatic and terrestrial habitats at the landscape scale in southern Wyoming, while facilitating responsible development through local collaboration and partnerships.



Get Involved!



The partnerships represented by the WLCI are most effective if they include the individuals and groups who live and work in southwest Wyoming. Three great ways to get involved are project development, information sharing, and making a contribution.

Prepared in cooperation with the

USGS
science for a changing world

River supplies drinking water and irrigation for millions of people and provides industrial and commercial water supplies. Water-quality standards have been established for the Colorado River Basin, and there is specific concern regarding increased levels of dissolved-solids (DS) concentrations from energy development in southwestern Wyoming. Increased DS concentrations from the Green River and Muddy Creek could adversely affect the degree to which these standards are met and could potentially affect downstream water users.

The USGS has been monitoring the Green River in relation to irrigation projects for decades. However, in response to concerns about energy development in the region, additional monitoring efforts were implemented on the Green River and Muddy Creek. This monitoring is conducted in cooperation with State and other Federal agencies and as part of the Wyoming Landscape Conservation Initiative (WLCI). Water-quality monitoring for the Green River and Muddy Creek includes measuring stream flow, specific conductance, and the collection of water samples for laboratory analysis of DS concentrations. By examining relations between measured specific conductance and DS concentrations in water samples, USGS scientists were able to develop a web-based tool that provides real-time DS concentrations for the Green River and Muddy Creek. This tool uses continuous specific-conductance values to estimate DS. These data are used by water managers for assessing DS concentrations in the

Colorado River Basin (Clark and Davidson, 2009).

The USGS continues surface-water and groundwater data collection (including water-quality) at select streamgages and monitoring wells in the WLCI study areas of southwest Wyoming and maintains continuous monitoring efforts on upper Muddy Creek. In response to specific WLCI requests, new efforts were implemented in 2011 that include baseline groundwater data collection and subsequent monitoring of aquifers in the Normally Pressured Lance Formation. This work is ongoing; a pre-study has been funded, and field work was completed in 2012 (Sweat, 2013). The USGS also has provided Sublette County Conservation District with algal community data to augment existing water-quality and macroinvertebrate monitoring in the New Fork River watershed.

The USGS is working to leverage current funding and seeking new support to continue monitoring efforts in the WLCI study area. Ensuring that continuous monitoring efforts are sustained and emerging research needs are met will support the WLCI and partner agencies in their efforts to assess and address critical questions and concerns related to protection, restoration, and understanding of aquatic and riparian habitats in southwestern Wyoming.

Partners

Wyoming Department of Environmental Quality, Wyoming State Engineer's Office, Medicine Bow Conservation District, U.S. Bureau of Reclamation Upper Colorado Region,

U.S. Bureau of Land Management Rawlins Field Office, U.S. Bureau of Land Management State Office, U.S. Bureau of Land Management Pinedale Field Office, U.S. Geological Survey Cooperative Water Program, U.S. Geological Survey National Streamflow Information Program, and the U.S. Geological Survey Hydrologic Benchmark Network.

References Cited

- Clark, M.L., and Davidson, S.L., 2009, Specific conductance and dissolved-solids characteristics for the Green River and Muddy Creek, Wyoming, water years 1999–2008: U.S. Geological Survey Scientific Investigations Report 2009–5168, 18 p., available at <http://pubs.usgs.gov/sir/2009/5168/>.
- Sweat, M.J., 2013, Groundwater well inventory and assessment in the area of the proposed normally pressured Lance Natural Gas Development Project, Green River Basin, Wyoming, 2012: U.S. Geological Survey Data Series 770, 18 p., online only at <http://pubs.usgs.gov/ds/770>

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The WLCI has an agreement with the Wyoming Community Foundation/WLCI to manage contributions for WLCI work. Donations can be made through www.wlci.gov or send a tax-free contribution to:

Wyoming Community Foundation/WLCI
P.O. Box 20088
Cheyenne, WY 82003
www.wycf.org

Partnerships

The WLCI partnership formally includes the Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Forest Service, Natural Resources Conservation Service, National Park Service, Wyoming Department of Agriculture, Wyoming Game and Fish Department, local conservation districts, and local county commissions. Additional groups and individuals participate as well.



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