

Water-related research by state entity (85-2-105, MCA):
Current and future projects at the Montana State Water Center

I. Background:

- One of 54 institutions housed at Land Grant Universities across the country. The 54 institutions (often referred to as Water Resource Research Institutions) make up NIWR (National Institutes for Water Resources).
- Founded by the passage of the 1964 Water Resources Research Act.
- Housed at Montana State University: Duncan Patten, Director; John LaFave (MBNG/MT Tech), and William Woessner (UM) as Associate Directors, Stephanie McGinnis, Assistant Director.
- Mission: facilitate training of water scientists and engineers by supporting research throughout the Montana University System. Information source about water in Montana through, in part, a regular newsletter. Training and outreach through development of instructional programs for students, teachers, elected officials and water and wetland professionals. The Water Center also helps coordinate and support the annual meeting of the Montana branch of the American Water Resources Association at which over 140 students, faculty, professionals and agency scientists attend.

II. Funding for the Montana Water Center

- Basic funding comes from the USGS 104b program as associated with annual funding of the Water Resources and Research Act. Funding has gradually declined: ca. \$92K in 2008-12, \$56K in 2013. All USGS 104b funds must be matched 2:1, non federal to federal.
- Grants and Federal Earmarks have supported several programs (see research and outreach section).
- No other state support (unlike most other states).

III. Research and Outreach Programs over the past several years.

- Whirling Disease Research (completed 2009)
- Native Fish Habitat Research (completed 2010)
- Water/wastewater Treatment Training (completed 2011 and responding to EPA RFP)
- Wetland Professional Training Courses (September 17-19, 2013)
- Participation in Annual Water School for water and wastewater treatment professionals (Bozeman October 1-3, 2013)
- Annual meeting of the Montana branch of the AWRA (Bozeman October 2-4, 2013)

IV. Faculty and Student Research Supported by Water Center (examples from 2013)

- Kevin Chandler (PI) and Jon Reiten, Montana Bureau of Mines and Geology, Billings Montana. 2013. "Methods for estimating wetland evapotranspiration through groundwater flow modeling of diurnal groundwater fluctuations".
- Glen Shaw, Department of Geological Engineering, Montana Tech, Butte. 2013. Using ²²²Rn and Isotopic Tracers to Trace Groundwater-Lake Interactions
- Geoffrey Poole, Department of Land Resources and Environmental Sciences, Montana State University, Bozeman. 2013. Assessing Hydrologic, Hyporheic, and Surface Water Temperature Responses to Stream Restoration.
- Andrew Wilcox, Assistant Professor Department of Geosciences, University of Montana. 2013. Thresholds in fluvial systems: Flood-induced channel changes on Montana rivers.

V. Student Research Supported by Water Center (examples from 2013):

- Jared Bean, University of Montana. 2013. Evaluating hydrogeomorphic controls on bull trout spawning habitat in mountain streams, Northwestern Montana.
- Katie Davis, Montana State University. 2013. An Investigation of Natural Treatment Systems in Cold Climates: Wastewater Treatment at Bridger Bowl Update.
- Michael LeMoine, University of Montana. 2013. Invisible impacts of changing stream conditions: nongame fish assemblage response to changing stream temperatures.

VI. On-going Faculty Research Supported by the Water Center (2013-14) (One supported due to reduced budget).

- Katie Hailer. Do Sediments in the Warm Springs Ponds Operable Unit Act as A Sink for Organic Wastewater Compounds?

VII. On-going Student Research Supported by the Water Center (2013-14) (Four supported at \$1,000 each because of reduced budget... one example).

- Heidi Clark, Montana State University, Bozeman. Student Fellowship: Rephotography as a tool to Understand the Effects of Resource Use on Rivers of the Greater Yellowstone Region.

VIII. On-going and Future Goals of the Water Center

- Facilitate development of an “across state” searchable data base on local water conditions.

Examples: Coordinated state mapping of surface and ground water and drought and vegetation conditions using data from existing sources (e.g., USGS surface water, State groundwater data from MBMG and state library, drought from Governors drought

committee sources, vegetation conditions from UM scientists, climatic data from State Climate Center (UM) and climatologist.

- Facilitate and leverage water research and outreach opportunities related to some of the states critical water and resource issues, for example:

Oil and natural gas exploration and effects of extraction and transport (e.g., contamination of water sources, effects of pipelines on rivers). Working with MBMG Billings and The Center for Riverine Science and Stream Re-naturalization at UM.

Community preparation for extreme climate conditions: drought, flood, etc. Working with Watercourse which is within the Water Center

Enhance below surface coal methanogenesis using produced water. Working with the Center for Biofilm Engineering at MSU Bozeman

- Reestablish training materials programs for small system waste water and water operators.