

# UPDATE

## MISSOURI AND HEART RIVER CONFLUENCE STUDY



Year two of the Missouri and Heart rivers confluence study is already yielding interesting information.

Record flooding on the Missouri in 2011 caused dramatic changes to the channel of the river, especially below Bismarck at the confluence of the Missouri and Heart River. In 2012, because of concerns about the large sandbar that was left at the confluence after the flood, and its potential to exacerbate flooding conditions in the south Bismarck area, especially from ice jams, the State Water Commission and Lower Heart Water Resource District dredged an approximately 1,000 foot pilot channel through the sandbar in an effort to restore the previous backwater channel.

It was hoped that the pilot channel would be effective at reducing the flood risk from ice jams at that site, however other than visually assessing the channel from the surface, there was not a good way to determine how the pilot channel and surrounding area was actually changing over time. This challenge led to the idea to conduct an annual survey of the river channel in the confluence area.

The annual survey, which started in 2015, utilizes the State Water Commission's Survey Crew, boat, and bathymetry equipment, to collect elevation information about the channel and sandbars on the river. While technologies such as Light Detection and Ranging data (LiDAR) are very useful in determining elevations

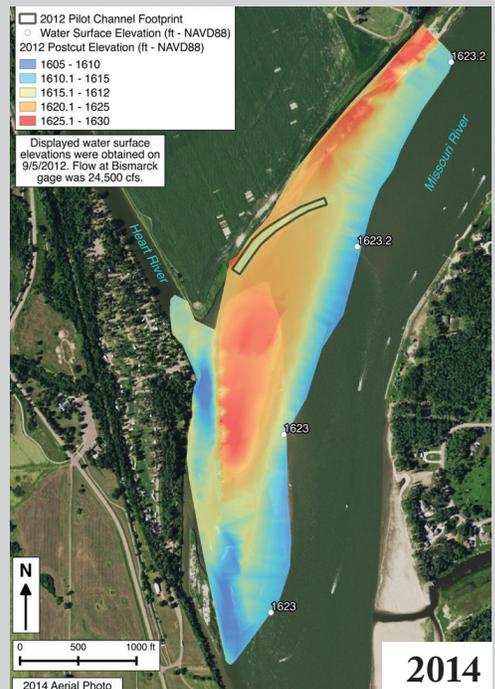
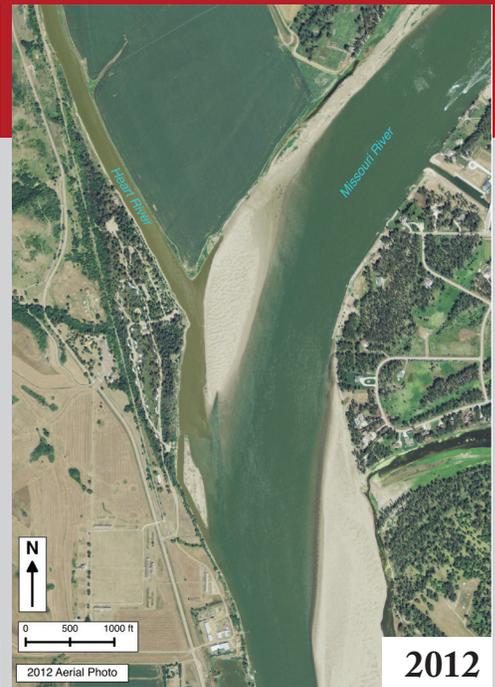
on dry land, LiDAR is unable to provide topography below water surfaces. Bathymetry tools provide information on the topography of land below the water surface.

Bathymetry allows water resource professionals to deepen their understanding of the forces that drive changes in sedimentation and erosion in water courses; such as the Missouri and Heart River confluence, which is even more complex due to the backwater effects of Lake Oahe. Ultimately, such an understanding may lead to the ability to develop models capable of predicting changes in the river, and helping natural resource professionals to better serve the public in planning and development.

While the results of the 2016 survey are still being processed, preliminary results indicate that the pilot channel has contributed to erosion of the large sandbar at the confluence. Thus reducing the chances of an ice jam. It also looks like Missouri River water continues to flow through that area just downstream of the Heart River (between the large sandbar and the Missouri River west bank).

“The results we see are intriguing. This type of study, encompassing a series of years at the confluence, has not been conducted before,” said Water Resource Engineer, Laura Ackerman. “Collecting this kind of information is an important step in understanding how the river channel changes.”

Over the coming years, the Water Commission intends to continue its monitoring of the confluence’s evolution, with the intent to develop an understanding of these complex processes to better serve the people of North Dakota.



The confluence in 2010, 2012, 2013 after the pilot channel, and bathymetry data from 2014. In the 2013 photo, the location of the pilot channel can be seen outlined in green. The bathymetry image shows the elevation of the channel bottom, with red being higher and blue lower.



North Dakota State Water Commission  
Garland Erbele, P.E., State Engineer  
900 East Boulevard Ave. • Bismarck, ND 58505  
(701) 328-2750 • <http://swc.nd.gov>

The State Water Commission does not discriminate on the basis of race, color, national origin, sex, age, or disability in employment or the provision of services.

# 2016 Discover Today's MISSOURI RIVER watershed institute



2016 Watershed  
Institute Participants.

Both formal and non-formal educators from around the state gathered at Bismarck State College, on July 10-15, for the North Dakota State Water Commission's, Discover Today's Missouri River Watershed Institute.

The Watershed Institute is held annually in different watersheds of North Dakota. Through hands-on, critical thinking experiences, participants gained a valuable and unique perspective on current water resource issues of the Missouri River watershed. Participants are exposed to a wide variety of educational lesson plans and techniques, behind the scenes tours of various water projects, and were engaged in a wide variety of natural resource-related activities.

The Missouri River Watershed Institute was offered as a three graduate credit workshop that allowed participants to earn credits toward professional development. To gain a grade for the Institute, participants had to demonstrate enhanced knowledge of contemporary water resources concerns and issues in the Missouri River watershed. Participants left with a greater understanding of how the Missouri River watershed plays an important role in North Dakota's social and economic well-being.

"I always knew that the Missouri River was important, but I don't think I realized just how important it was, and the hard work it takes to maintain it!" - Troy Kinn, West Fargo

"The activities were very hands on, which the students really enjoy. We were kept engaged and on task. Great ideas to take back to schools for our students!" - Tim Kraft, Karlsruhe, ND

Planning for the 2017 Discover Today's Souris River Watershed Institute on July 9-14 has already begun. Information about the Institute is available by contacting Tina Harding, Water Education Program Manager, at (701) 328-4833 or [tinamharding@nd.gov](mailto:tinamharding@nd.gov).

## Highlights of the Institute Included:

**Tesoro Oil Refinery**

**BNI Coal & Energy**

**Harmon Lake & Square Butte Creek**

**Stream Bottom Assessments**

**Benthic Macroinvertebrate Assessments  
& a Biotic Index**

**Water Quality Chemical Assessments**

**Stream Reach Assessments**

**Fort Lincoln State Park**

**Garrison Dam, Lake Sakakawea &  
Lake Audobon**

**The Garrison Fish Hatchery**

**Aquatic Nuisance Species Prevention**

**Sovereign Lands**

**Bismarck Water Treatment Plant**

**Endangered Species Habitat & Restoration**

**Double Ditch**

**Missouri River Boat Cruise**