2013 WATER SUCCESS STORY

Bureau of Water Quality

Summer monitoring team collects samples for national/statewide stream study

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A monitoring team from the Bureau of Water Quality is sampling stream sites across the state from July through September 2013 as part of U.S. EPA's "National Rivers and Streams Assessment" (NRSA). The study will use data from randomly-selected sampling sites to help characterize the condition of all flowing waters in the United States.

Similar to a political poll, a relatively small number of random samples can be used to characterize a much larger population. Each of the 1,800 nationwide random sites will be sampled once to collect data on physical habitat, water chemistry, enterococci, periphyton, macroinvertebrate, fish population and fish tissue mercury using EPA protocols.

Left to right) Mike Miller, Nick Ostroski, Ben Balika, April Marcangeli and Camille Bruhn prepared sampling equipment. DNR Photo.

The Water Quality monitoring team will sample a total of 25 NRSA wadeable stream sites in Wisconsin. Staff also will sample an additional 25 randomly-selected stream sites to develop a statistically-valid characterization of the state's entire wadeable stream population. In addition to the NRSA sampling parameters, with support from EPA Region 5, streambed sediment samples from all 50 WI sites will be analyzed for nutrients, metals, pesticides, and polycyclic aromatic hydrocarbons.

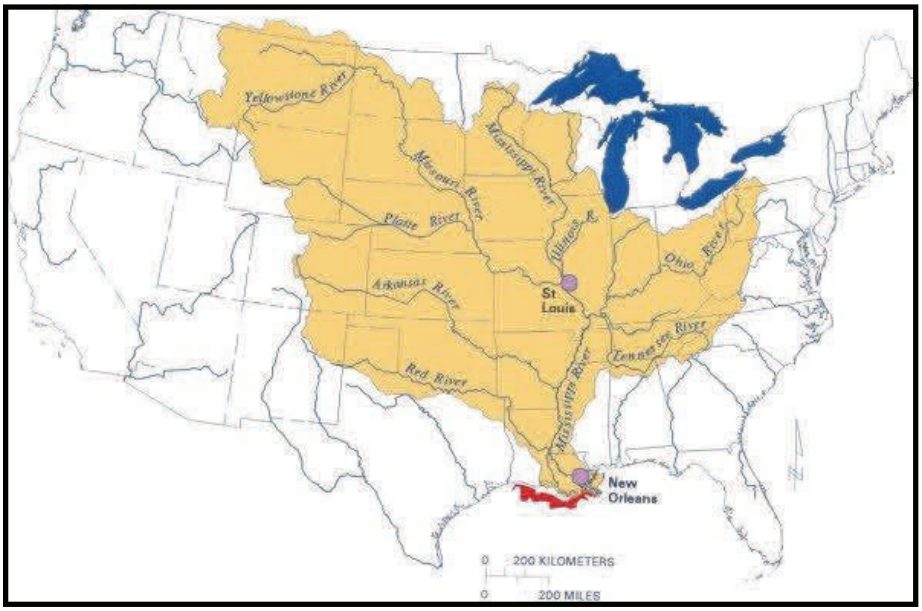
Mike Miller in the Bureau of Water Quality's Monitoring Section is the principal investigator, and the field crew is comprised of Camille Bruhn (crew leader), April Marcangeli, Nick Ostroski and Ben Balika.

Nested within the U.S. EPA's NRSA study, the U.S. Geological Survey (USGS) is conducting an intensified survey of NRSA stream sites in 2013 that are located within the Temperate Plains Ecoregion (a.k.a. the Corn Belt). This ecoregion includes most of Iowa, Illinois, Missouri and parts of South Dakota, Nebraska, Minnesota, Indiana, Ohio, Kentucky and southeastern Wisconsin.

The USGS's Midwest Water Quality Assessment is comprised of 200 random and targeted (hand-picked) wadeable stream sites. Six USGS Temperate Plains Ecoregion sites are located in Wisconsin. U.S. EPA and state crews will sample the Temperate Plains sites' habitat and biology. USGS staff will sample water chemistry 12 times

NRSA Monitoring Story Continued

over the course of the summer to better quantify sediment, nutrient, pesticide, and pathogen concentrations and loadings. The Temperate Plains Ecoregion is the major contributor of pollutants to the Mississippi River and Gulf of Mexico—see Mississippi River watershed map below.



Mississippi River Watershed and hypoxic zone shown in red. EPA map.

Monitoring data provides information to help understand water quality and nutrient loadings to the Mississippi River watershed and identify factors leading to the development of the Gulf Hypoxia or "dead zone" in the Gulf of Mexico. The hypoxic zones that develop in the Gulf with low to no oxygen are caused by excessive loadings of phosphorus, nitrogen and sediment from agriculture and other human activities.

While adult fish can move to more oxygen-rich waters, slow-moving shellfish such as mussels or crabs are often killed during hypoxic conditions in the Gulf. Disruption of the ecosystem can cause significant economic impacts to valuable fisheries. Low oxygen levels contribute to a severe decrease in ocean life which affects the ability of young fish to find food necessary to grow to adulthood. National Oceanic and Atmospheric Administration forecast models are predicting a large, record-setting hypoxic zone this summer. See "NOAA, partners predict possible record-setting dead zone for Gulf of Mexico."

The Department of Natural Resources developed a Nutrient Reduction Strategy (http://dnr.wi.gov/topic/SurfaceWater/nutrientstrategy.html)to help identify practices to reduce phosphorus and nitrogen loadings into the Mississippi River from Wisconsin. About two-thirds of Wisconsin drains into the Mississippi River system.

Numeric water quality criteria for phosphorus and other revisions to state administrative rules were enacted in 2010. The phosphorus numeric criteria were developed utilizing scientific monitoring studies of more than 240 streams and 42 rivers in Wisconsin collected during the last decade. A total phosphorus criterion of 100 µg/L is established in the water quality criteria for the Mississippi River.

(Left to right) Peggy Donnelly (EPA quality assurance officer) and DNR's Ben Balika and Nick Ostroski collected macroinvertebrate and periphyton samples. DNR Photo.