



2018
year in review

Wisconsin Geological & Natural History Survey

DIVISION OF EXTENSION

We provide objective scientific information about the geology, mineral resources, and water resources of Wisconsin



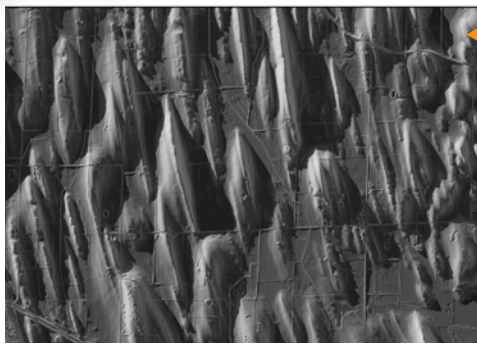
LAURA SCHACHTER

MODELING EFFECTS OF CLIMATE CHANGE ON TROUT HABITAT

Groundwater flow into the Marengo River provides the cool water trout need to thrive. However, a changing climate is predicted to decrease groundwater flow and increase stream temperature. We are modeling how the environment may change the headwaters of the Marengo River watershed for the U.S. Forest Service. This will help the Forest Service manage trout habitat as the climate changes.

SOUTHWEST WISCONSIN GROUNDWATER AND GEOLOGY (SWIGG) STUDY

WGNHS is working with counties in southwest Wisconsin to improve our understanding of drinking water quality. Random sampling of more than 300 private wells in this area indicates widespread contamination by bacteria or nitrate or both. Our goal is to determine how groundwater quality is related to local hydrogeologic properties and well construction.



STEVE MAUEL, LIDAR

DRUMLINS YIELD CLUES TO WISCONSIN'S ICE AGE

Northern Jefferson County is peppered with teardrop-shaped hills and WGNHS has begun mapping the deposits that form these drumlins. We are finding that shallow bedrock may have influenced their orientation and distribution. In addition to understanding Wisconsin's Ice Age past, surficial geologic maps are necessary to understanding and managing our water, aggregate, and other natural resources.

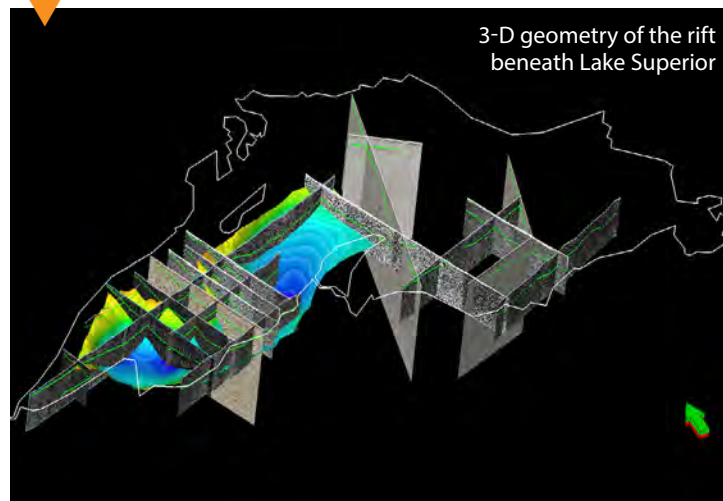
HELPING MUNICIPALITIES FIX WELL WATER PROBLEMS

Wisconsin utilities spend millions of dollars on their water supply wells. We use borehole geophysics to help remediate rather than replace some of those wells. Geophysical logs can be used in wells with water-quality concerns to identify problem areas in the aquifer or in the casing, within the well.



DECODING THE MIDCONTINENT RIFT UNDER LAKE SUPERIOR

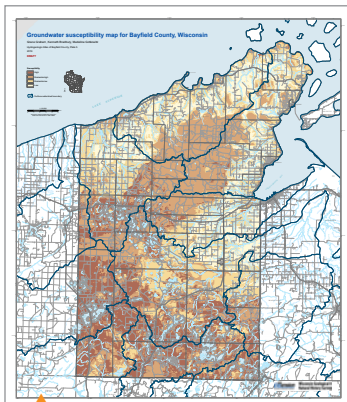
About 1.1 billion years ago, the earth's crust nearly ripped apart, forming the Midcontinent Rift. For the next 22 million years, volcanoes along the rift—which cuts through northwest Wisconsin—spewed lava, forming huge deposits of basalt. Mineral-rich water flowed through the holes and cracks of the basalt, leaving copper, nickel, platinum, and other metals behind. We're collaborating with the USGS to answer questions about how the rift formed and to assess its economic resource potential beneath Lake Superior.



ESTHER STEWART

EXPLORE OUR PROJECTS

[wgnhs.org/
research/projects](http://wgnhs.org/research/projects)



BUILDING BACKGROUND GEOLOGY FOR CENTRAL SANDS STUDY

With the USGS, WGNHS is characterizing the geology and hydrology in the Central Sands around Plainfield, Long, and Pleasant Lakes. We have profiled lake water chemistry and lakebed characteristics from canoes, installed lakebed seepage meters and piezometers, conducted geophysical surveys, and explored the geology with geoprobe and rotonsonic drilling. Our work will inform the groundwater model and DNR's analyses.



CATHERINE CHRISTENSEN

CREATING THE BAYFIELD COUNTY ATLAS

To help guide land-use planning decisions, Bayfield County commissioned WGNHS to prepare an atlas of groundwater maps. In addition to a map showing groundwater susceptibility, the atlas will include a countywide database of water wells, a water-table map and depth to the water table, and a map showing groundwater recharge areas.



MIKE PARSEN

MAPS HELP TOWN IMPLEMENT GROUNDWATER PROTECTION RULE

Kewaunee County is in an area where thin soils and fractures in rocks allow contaminants to move rapidly into the groundwater. When the county passed an ordinance creating restrictions on manure spreading, WGNHS produced a set of geological and groundwater resource maps to help guide implementation of the new rules in the Town of Lincoln.



MIKE PARSEN



DAVE HART

CONTAMINANTS IN WETLANDS—TRACKING THEIR SOURCES

Fieldwork doesn't end when winter rolls in. In this study, we sampled five wetlands in Door County throughout the year to help identify sources of contaminants. Effluent from septic systems and pesticides both have the potential to move through the thin soil layer into the groundwater aquifer. Sorting out the sources and providing the information to land-use managers will help protect these wetlands.

UPGRADING THE GROUNDWATER MONITORING NETWORK

A network of wells crisscrossing the state is routinely monitored to keep tabs on Wisconsin's groundwater levels over the long term. Data from these wells helps scientists assess and plan for long-term changes in our water resources. In 2018, WGNHS received funding from the USGS to maintain and repair 16 wells and drill or replace four additional wells in the network.

2018 FUNDS

\$2.4 million

24 employees
20 students, interns

SPENDING



REVENUE



ERIC CARSON

MAPPING THE DRIFTLESS AREA

WGNHS is nearing completion of an 8-year project mapping the surficial geology of six southwestern Wisconsin counties. This work provides new insight into the nature and distribution of unconsolidated sediments at the surface throughout this portion of the Driftless Area. Surficial geologic maps are essential to understanding our water and aggregate resources and in making land-use decisions that minimize people's impact on both.

LAKE MICHIGAN BLUFF FAILURE

When water levels rise in Lake Michigan, waves eat away the base of bluffs, causing landslides. Using drones to record visual changes and monitors to detect bluff movement, we're helping to create a model that predicts where collapses are likely to occur.



LUKE ZOET



PAT MCLAUGHLIN

WISCONSIN'S CORE REPOSITORY— LIBRARY OF ROCKS

The holdings in our core repository continue to grow as we pursue our geologic research. Our geologists collect and describe rocks, core, well cuttings, and other geologic data. These samples are curated in our repository and organized in our databases for future research.



SARA STATHAS for WISCONSIN
WATER RESOURCES INSTITUTE

UNDERSTANDING FOLDED ROCKS IN DODGE COUNTY

As we finish mapping the bedrock geology of Dodge County in southeastern Wisconsin, we are finding deeply buried folds shaped like those seen in the Baraboo Hills. In Dodge County, the folds have minerals along their limbs similar to those observed in the lead-zinc district of southwestern Wisconsin. These observations are giving us a picture of deformation and mineralization across southern Wisconsin which informs our understanding of Wisconsin's geologic history and mineral resources.



Wisconsin Geological and Natural History Survey

University of Wisconsin–Madison Division of Extension
3817 Mineral Point Road | Madison, Wisconsin 53705
608.262.1705 | WisconsinGeologicalSurvey.org
Kenneth R. Bradbury, Director and State Geologist

An EEO/AA employer, University of Wisconsin provides equal opportunities in employment and programming, including Title VI, Title IX, and the Americans with Disabilities Act (ADA) requirements.