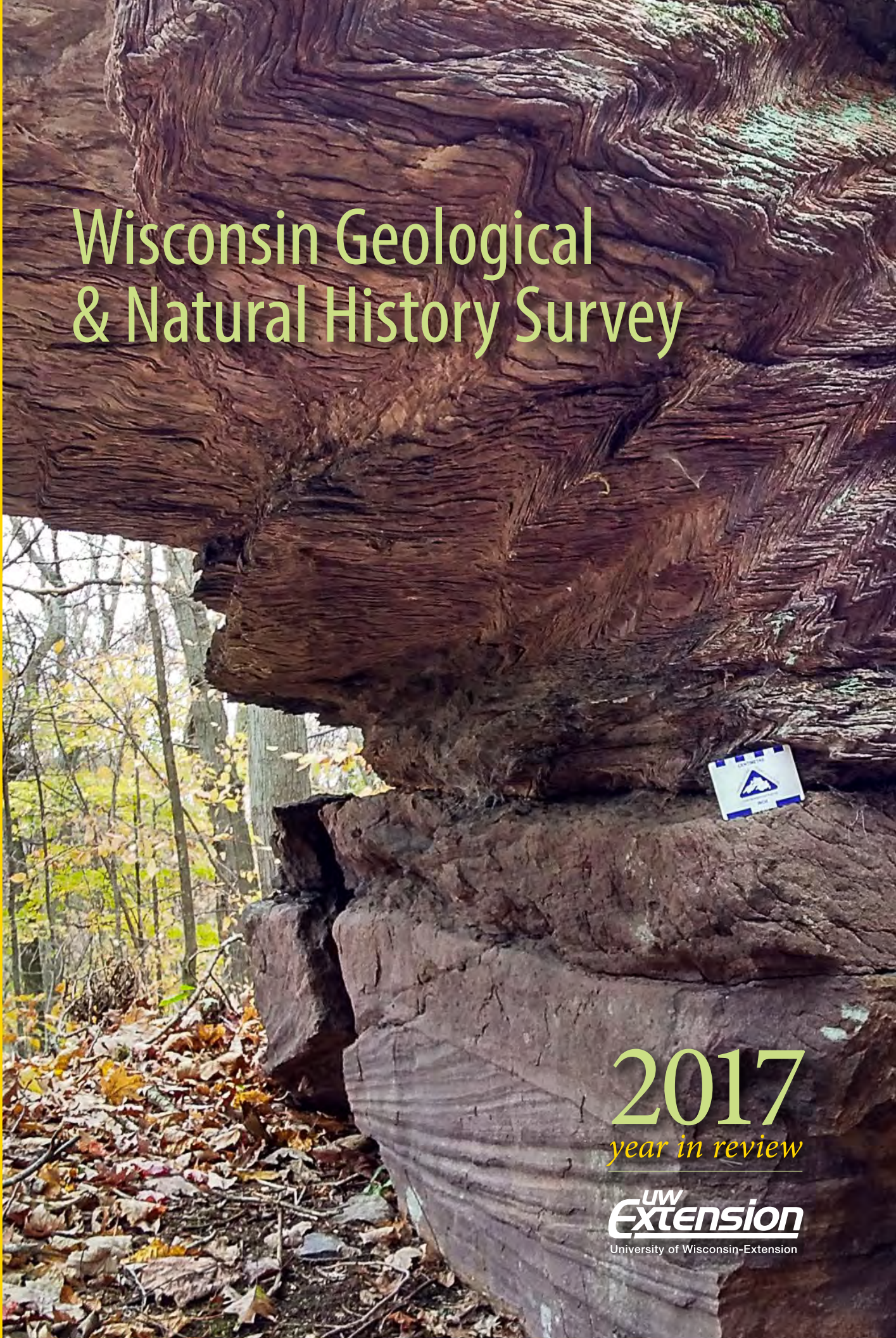
Wisconsin Geological & Natural History Survey



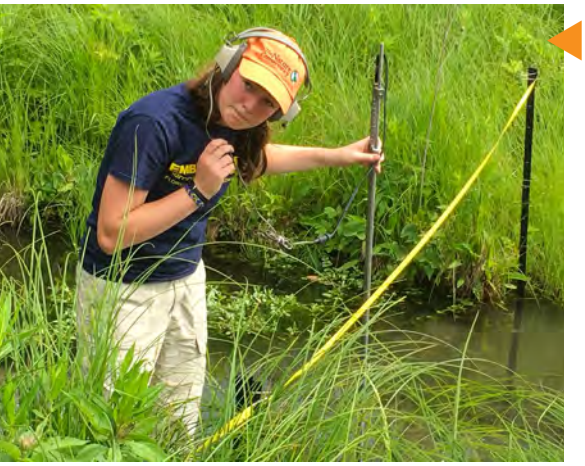
2017

year in review

UW Extension

University of Wisconsin-Extension

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



DAVE HART

PARTNERING WITH THE NATURE CONSERVANCY (TNC)

WGNHS is producing a groundwater model of a priority wetland near Lulu Lake. TNC is providing funding and is bringing high school students into the field to collect the data that is critical to the model. The model will help decision-makers decide the best way to protect this special place in the Mukwonago basin. (WALWORTH COUNTY)

ESTHER STEWART

MAPPING THE BARABOO HILLS

In 2017, WGNHS continued mapping the rocks, folds, and faults that created the ancient mountains that are now only remnants in the Baraboo Hills. As we piece together the shape of Wisconsin's basement rock in the subsurface, we are finding pockets and valleys in the Precambrian surface. Those low spots trap poor water quality that is tapped by deep wells in the overlying Cambrian aquifer. (COLUMBIA, DODGE, SAUK COUNTIES)

BILL BATTEN

KATHY ROUSHAR

BEDROCK DRILLING—THE CORE OF OUR WORK

WGNHS collected approximately 1,600 feet of rock core in the 2017 drilling season. The core provides valuable data for our geologic mapping program that focuses on areas of scientific interest and societal needs. The work is supported by funding from the USGS STATEMAP Program. (DODGE, DOOR, TREMPEALEAU COUNTIES)

The breadth, depth, and positive impact of the Wisconsin Geological and Natural History Survey is something Wisconsin residents can be proud of.

SCOTT VALITCHKA
Kompas Business Partners

THE RIVER THAT FLOWS UPHILL

WGNHS has documented that millions of years ago the lower Wisconsin River flowed easterly across the Driftless Area from Prairie du Chien. The ancient river flowed east—what is now uphill—until it was "pirated" to become part of Mississippi River as we know it today.

ERIC CARSON

COVER IMAGE:
PRECAMBRIAN OUTCROP, BAXTER'S HOLLOW
ESTHER STEWART

BILL BATTEN

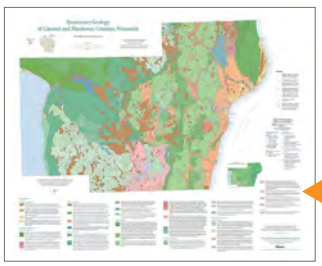
JAY ZAMBITO

SULFIDE NODULES — NATURAL TOXINS

We have found that when sulfide nodules like these occur near the water table, private wells may be contaminated with metals. As we map the bedrock in west-central Wisconsin, we are also tracking the horizontal and vertical distribution of these minerals. This information will help well drillers and well owners. (BUFFALO, PEPIN, TREMPEALEAU COUNTIES)

NITRATE IN GROUNDWATER

With funding from the Wisconsin DNR, WGNHS is studying changes in nitrate through time and space in groundwater below agricultural fields of different soil textures. Our research will allow us to separate natural causes from man-made. (SAUK COUNTY)



GLACIAL GEOLOGY OF CALUMET AND MANITOWOC COUNTIES

Map and report available at **wgnhs.org**.

INDUSTRIAL SAND POTENTIAL AND GROUNDWATER QUALITY

We mapped the rock that contains frac sand as well as the rock that overlies it. We found that the cover rock—which is commonly excavated, piled on-site, then used as fill during reclamation—can sometimes be a potential source of natural groundwater contamination. (BUFFALO, PEPIN, TREMPEALEAU COUNTIES)

PETE CHASE

BIG DATA FROM SMALL STREAMS

Good groundwater models include the interactions between groundwater and surface water and the best models have the best data. Scientists from WGNHS, USGS, UW–Madison, and Beloit College are collecting data from representative streams. This work collects multiple stream parameters in a single pass and provides snapshots of groundwater/surface water interactions. (ASHLAND, DANE, GRANT, PORTAGE, VILAS, WALWORTH COUNTIES)

ESTHER STEWART

2017
by the numbers

Field work

WORKING ON PROJECTS IN 69 COUNTIES

1,600 feet of rock core drilled
3,476 feet of geoprobe core drilled
197 monitoring wells measured
20 municipal wells logged

Core repository

MAINTAINING A ROCK LIBRARY

660,000 feet of rock core
17,400 rock thin sections
15,100 rock hand specimens
11,300 water well cuttings

Education and outreach

ANSWERING YOUR QUESTIONS

27,500 publications downloaded
15,300 educational contacts
3,000 Facebook likes
1,800 Twitter followers
109 talks and professional papers

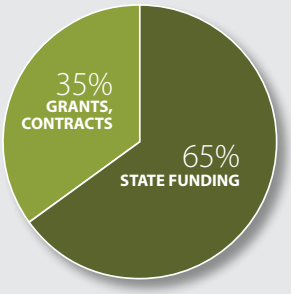
Geologic data

MAKING OUR DATA AVAILABLE

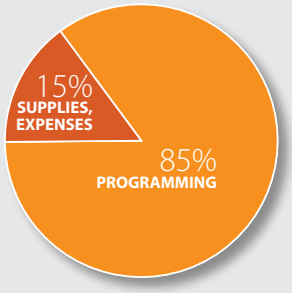
633 mineral reports and historical well records scanned
286 legacy drillholes geolocated

2017 TOTAL REVENUE $2.4 MILLION

FISCAL YEAR



Where our money came from



How the money was used

24 employees, 31 students and interns

KEN BRADBURY

KARST MODEL OPENS WINDOW INTO GROUNDWATER

WGNHS designed and produced a three-dimensional model—using painted foam—that shows surface water and groundwater flow in caves, sinkholes, and the fractured rock of eastern Wisconsin. The model encouraged lots of questions and provided some answers for farmers, UWEX colleagues, and the general public. (KEWAUNEE COUNTY)

GROUNDWATER-LEVEL MONITORING NETWORK

Since 1946, WGNHS and USGS have jointly operated Wisconsin's groundwater-level monitoring network. Scientists and land-use managers routinely use these long-term data to evaluate the response of groundwater levels to drought, floods, pumping, or other changes. With funding from USGS, we also evaluated and repaired seven of the 93 wells in the network. (STATEWIDE)

JEFF MILLER/UW-MADISON

LUKE ZOET

GEOLOGY OF THE CENTRAL SANDS

WGNHS collaborated with geoscientists from UW–Madison and UW–Oshkosh to map glacial tunnel channels and the surface geology of western Waushara County. The information will be used to help characterize the aquifers that feed lakes in the Central Sands and will support groundwater modeling of the area. This project is funded by the USGS Great Lakes Geologic Mapping Coalition. (WAUSHARA COUNTY)

SUE SWANSON

INVENTORYING SPRINGS

We completed our inventory of Wisconsin springs. We now have 415 springs from around Wisconsin in our database. This project continues with long-term seasonal monitoring of eight reference springs for flow, water quality, and ecology. (STATEWIDE)

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Wisconsin Geological and Natural History Survey

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