

YEAR IN REVIEW

2019

EXPLORE OUR PROJECTS

wgnhs.wisc.edu/research/projects

Wisconsin Geological and Natural History Survey

WE PROVIDE OBJECTIVE SCIENTIFIC INFORMATION ABOUT THE GEOLOGY, MINERAL RESOURCES, AND WATER RESOURCES OF WISCONSIN



Sarah Bremmer



Wisconsin Geological and Natural History Survey
DIVISION OF EXTENSION
UNIVERSITY OF WISCONSIN-MADISON

STAFFING UP TO GET THE JOB DONE

From web development to mapping, from hydrogeology to core photography, 2019 saw the beginning of new outside funding for several Survey projects and new Division of Extension funding for initiatives to support our efforts. Seven new staff members joined the Survey to help out.



Anna Fehling



Maureen Muldoon



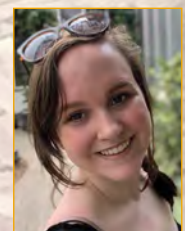
Ian Orland



David Sibley



Eric Stewart



Kacie Stolzman

29 employees; 22 students, interns



CARSYN AMES

RESCUING CORE

Rock core is a precious commodity that is rich in data but costly to collect. When the Minnesota Geological Survey needed space in their repository, they contacted us to see if we wanted core from north-eastern Wisconsin. We jumped at the opportunity to add 68 boxes of core to our collection—now over 677,000 feet—for researchers to study.

EXPLORE OUR SPRINGS INVENTORY

Completion of the first comprehensive catalog of Wisconsin's springs in 60 years was marked this year by the release of a web application that lets users explore the data and view photos of each spring. We also published two reports outlining the project's methods, results, and best practices. (wgnhs.wisc.edu/springs-web-app)



GRACE GRAHAM

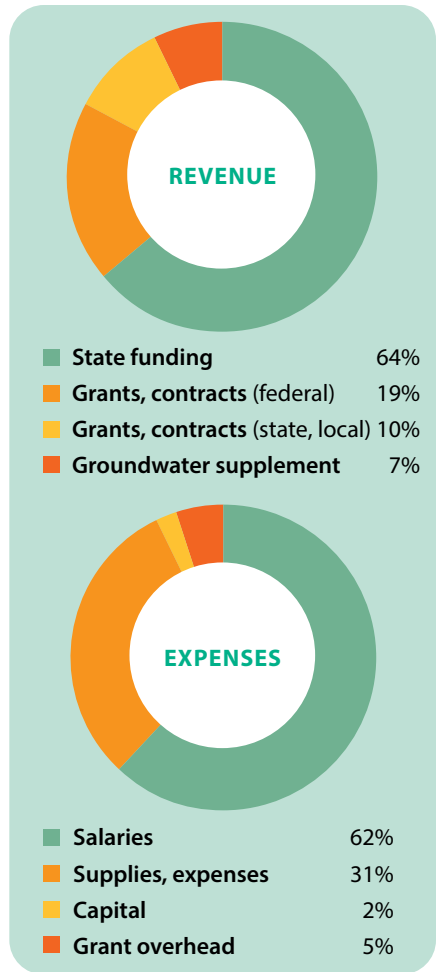


MIKE PARSEN

MONITORING FLUCTUATING GROUNDWATER LEVELS

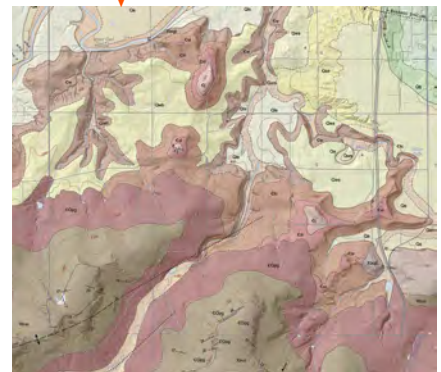
As parts of Wisconsin experience drought and other areas are struck by intense storms, groundwater levels respond by going down or up. We know because we have been monitoring Wisconsin's groundwater since 1946 with help from the U.S. Geological Survey and the Wisconsin Department of Natural Resources. This data provides an important long-term record of fluctuations in groundwater levels.

2019 FUNDS \$2.5 MILLION



GEOLOGIC MAPS—THE CORE OF OUR MISSION

Mapping informs our understanding of the geologic history of an area. This allows us to predict and identify how the rocks and other deposits affect the area's natural resources. Our maps underpin groundwater models, support highway construction projects, and augment environmental studies.





DARIN/CARQUESTGUY (FLICKR.COM)

ASSESSING GROUNDWATER CONTAMINATION IN SOUTHWEST WISCONSIN

Two rounds of water sampling in southwest Wisconsin revealed that 42% and 27% of wells tested were contaminated with fecal matter, nitrate, or both. The results helped increase awareness of problems with clean drinking water across the state. We are helping to assess how the geology and well construction characteristics affect groundwater quality.

DOES A CLAY LAYER PROTECT GROUNDWATER?

Limestone can slowly weather into a dense red clay. This layer, known as the Rountree Formation in southwestern Wisconsin, may help shield groundwater from surface contaminants. We're mapping the formation and investigating its role in groundwater protection.



ELMO RAWLING



BEACHES, SANDBARS, AND HARBORS

Storms, fluctuating lake levels, and human disturbance all combine to move sediment along the shore towards harbors where it can block ports during low lake levels. How these processes interact is not well understood for Wisconsin's small harbors. Understanding the basics of sediment transport is fundamental to learning how to minimize the costs of dredging and potential port closures.

ICE COVER AND STORM-INDUCED EROSION ON THE GREAT LAKES

Ice along the shore can protect a coastline from winter storm damage. Coastal managers need to prepare for changing erosion rates and patterns in a changing climate that includes less shore ice and more and stronger winter storms. This study will help explain how reduced and variable shore ice cover affects erosion that alters the coastal landscape.



LUKE ZOET

PROJECTS IN 64 COUNTIES

• FIELD WORK

2,466
feet of geoprobe
core drilled

409
feet of rotonic
core drilled

535
feet of rock
core drilled

745
feet of cuttings
collected

• CORE REPOSITORY

677,200
feet of
rock core

17,400
rock
thin sections

15,100
rock
hand samples

11,335
water well
cuttings

GRACE GRAHAM



INVESTIGATING AND INVENTORYING A NATIONAL FOREST

The Chequamegon-Nicolet National Forest sprawls across northern Wisconsin. We are assisting the U.S. Forest Service with a resource inventory by investigating the hydrogeology of the sand barrens on the Bayfield Peninsula, evaluating fluctuating water levels in Drummond area seepage lakes, and monitoring groundwater levels in the forest's Medford unit.

DECODING LONG-TERM CLIMATE CHANGE

During multiple glaciations, the upper Mississippi River has been filled with sand and gravel that was subsequently eroded away—mostly. Raised beaches, or terraces, preserve a partial record of these long-ago cyclical events. We are tracing terrace tops and their buried bases to gain insight into how often floods occurred and how sediment was moved. Understanding these terraces will help scientists understand the effects of long-term climate change.

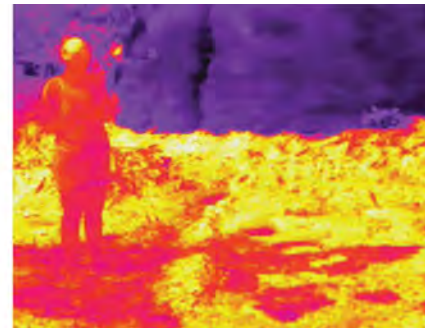
USING DRONES TO LOCATE HEAT SIGNATURES

Springs on a lake bottom, seeps on a shoreline bluff, and shallow bedrock have two things in common—they're hard to study due to difficult access and they have a thermal contrast with their surroundings. Using an infrared camera mounted on a drone, we're able to get to out-of-the-way places quickly to locate, photograph, and map springs, seeps, and shallow bedrock.

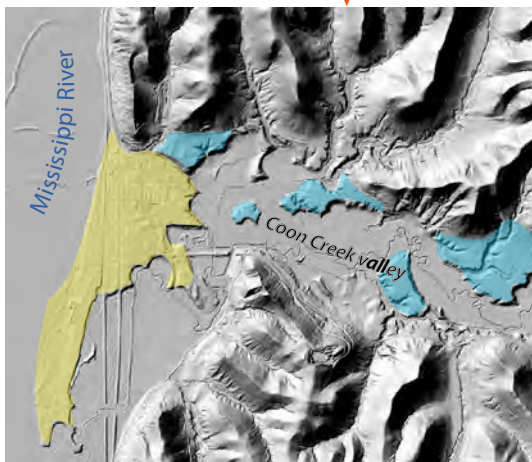


NEW PUBLICATIONS

The end of 2019 marked the end of Map Sales at the Survey. It also marked a new initiative to increase publications and a renewed commitment to free downloads of Survey materials. New publications in 2019 included water quality assessments, a groundwater flow model, a hydrogeologic atlas and glacial field trip guidebook. Visit our website (wgnhs.wisc.edu) for links to all of our publications.



DAVE HART



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