

# Minnesota Ground Water Association

www.mgwa.org

## Newsletter

**September 2017**  
**Volume 36, Number 3**

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- ◆ Undergrad Scholarship Update, page 4
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*MGWA President  
Evan Christianson*

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### President's Letter

Minnesota's geology and hydrology provided a means for the state to become one of the largest agricultural producers in the nation. According to the USDA, Minnesota ranks 5th in the nation for the total value of agricultural products sold; ranking 4th in crops and 7th in livestock. Productive glacial and alluvial soils and adequate precipitation provided ample opportunity for the early farmer. However, agriculture has changed over time, becoming more industrialized and relying on more than nature itself to produce a profitable harvest. While modern agriculture is more efficient and productive, these gains have often come at the cost of negatively impacting water resources. Fertilizers and pesticides are showing up at increasing rates in water supply wells, increases in irrigation pumping has affected baseflow to streams, and the growth of drain tile use results in water leaving the landscape faster than ever.

In many cases the basic mechanics of how agriculture can impact groundwater resources is well understood. However, the magnitude and time scales related to many of the impacts

have yet to be fully quantified. If we don't understand how big the problems are or the time scales associated with them, it can be difficult to develop and/or justify new regulation or management to control future impacts and identify solutions to the existing problems.

The MGWA fall conference will be held on November 15th and will focus on the impacts of agriculture on groundwater. We will shed some light on the problems we face today in Minnesota and across the country, what's currently being done to address these issues, and what might be needed in the future. Be sure to watch your inbox and the MGWA webpage for full details about the conference coming soon. As we did at the spring conference, we will be offering lightning talks and posters in addition to our main speaker lineup. If there are projects you have been working on I encourage you to share with either a poster or lightning talk. These are a great way to spread the word about all the great work MGWA members do.

I hope to see you in November.

*Evan Christianson*

### Featured Photo

#### York Blind Valley Dye Trace

*by Jeff Green*

The York Blind Valley is located in southern Fillmore County in the Root River watershed. It is the largest blind valley in Minnesota at over a mile long, with a surface drainage basin of about 12 square miles. A blind valley terminates abruptly at a point where its stream sinks, or once sank, underground. As sinks develop higher up the blind valley, the original valley termination may be dry under most flow conditions.

In October 1993 a dye trace was done as part of the Fillmore County Geologic Atlas Springshed mapping project. On that date, the surface stream's terminal sink was about mid-point in the valley.



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### MGWA Web Page

Visit [www.mgwa.org](http://www.mgwa.org) for MGWA information between newsletters and to conduct membership and conference transactions.

## Newsletter Deadlines

Issue	Due to Editor
December '17	11/04/2017
March '18	02/02/2018
June '18	05/04/2018
September '18	08/03/2018

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## MEMBER NEWS

### Mindy Erickson joins the USGS National Water Quality Assessment Project Team

Dr. Mindy Erickson moved to a new assignment within USGS. In May she joined the National Water Quality Assessment (NAWQA) project team as the Principal Aquifer Analyst for the Glacial Principal Aquifer. In this new role she will apply at the national scale her decades of experience and expertise related to the occurrence and mobilization of arsenic and other natural contaminants in Minnesota and upper Midwest groundwater.

Mindy's major technical work for the next few years will be creating statistical models and then 3-D probability and geochemistry maps. The models and maps will aid understanding and visualization of 1) geochemical controls important to mobilizing natural contaminants (redox conditions and pH) and 2) probabilities of elevated concentrations of natural contaminants (arsenic, manganese) throughout the nationwide glacial aquifer system – from Washington to Maine. This fall Mindy's Minnesota arsenic project team will complete similar statistical modeling and mapping of probability of elevated arsenic in Minnesota groundwater, in cooperation with the Minnesota Department of Health. Results of the Minnesota arsenic project will be presented locally this fall at the [Water Resources Conference](#) and at the annual meeting of the [Society of Environmental Toxicology and Chemistry](#).

In addition to her technical work for NAWQA, Mindy will coordinate data collection from various NAWQA groundwater networks, design and implement new studies, and conduct assessments of groundwater quality within the Glacial Principal Aquifer. She will also coordinate activities with her counterparts for other principal aquifers and with other NAWQA modeling teams.



### Jim de Lambert Joins Carlson McCain, Inc.

Jim de Lambert is pleased to announce that he has accepted a position at Carlson McCain, Inc. as a senior project manager and hydrogeologist. Jim began his career 34 years ago at Bruce A. Liesch Associates, Inc. where he was fortunate to have Bruce Liesch as a mentor and to work with many talented scientists and engineers over the years. At Carlson McCain, Jim is working on a variety of projects involving environmental hydrogeology and water resources with a focus on water supply development, permitting and protection. Jim also enjoys his role as a volunteer. In 2009, he was appointed by the City of St. Louis Park to the Bassett Creek Watershed Management Commission where he has been the Chair since 2014. Jim also serves on St. Louis Park's Charter Commission.





## MEMBER NEWS

### Annie Felix-Garth Joins BWSR

On May 3, Annie Felix-Garth joined BWSR (Minnesota Board of Water and Soil Resources) as the new Water Programs Coordinator. Annie provides programmatic oversight and guidance for county water planning, watershed district water planning, and SWCD planning programs. She is BWSR's lead staff for groundwater planning and policies, as well as BWSR's representative to the Environmental Quality Board.



### Geoff Delin has retired!

After 38 years with the USGS Geoff Delin has retired. He started in 1979 as a hydrologic technician in the Minnesota District. As a technician his duties included operating the bore-hole geophysical logging unit, operating the auger rig, collecting groundwater quality samples, and supervising contract drilling operations. After transitioning to a hydrologist position Geoff worked on the Upper Midwest Regional Aquifer System Analysis study, then led studies of glacial and bedrock aquifers throughout Minnesota. Geoff was one of the first hydrologists to use the then "new" MODFLOW code.

Geoff became a member of MGWA in 1983 and has presented his work at many of our conferences. He was the Minnesota District's groundwater specialist from 1994-2008.

In 2008 Geoff moved to Denver where he served as a groundwater specialist for the central part of the country. He was an instructor for the Groundwater Field Methods class as well as the Groundwater/Surface-Water Interaction Class. Geoff served on 48 technical groundwater review teams during his service as groundwater specialist. Throughout his career Geoff authored or co-authored more than 70 peer-reviewed reports and gave presentations at more than 30 technical conferences.

Geoff plans to continue to serve the USGS in an Emeritus capacity following retirement to complete some research for the Bemidji project as well as help with USGS training.

Geoff and his wife Ruth plan on some international travel, hiking and enjoying the Colorado Rocky Mountains, as well as spending more time with their children and grandchildren.



*Jared Trost presents Geoff with a plaque from USGS*



*True to their word, Geoff and Ruth travelled to Australia and New Zealand this year.*

## 2017 MGWA Board

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### The primary objectives of the MGWA are:

- ◆ Promote and encourage scientific and public policy aspects of groundwater as an information provider.
- ◆ Protect public health and safety through continuing education for groundwater professionals;
- ◆ Establish a common forum for scientists, engineers, planners, educators, attorneys, and other persons concerned with groundwater;
- ◆ Educate the general public regarding groundwater resources; and
- ◆ Disseminate information on groundwater.

## MGWA's Corporate Members

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Links at [www.mgwa.org](http://www.mgwa.org)

## Abbreviations and Acronyms

- ◆ ASTM – American Society for Testing and Materials
- ◆ DNR – Minnesota Department of Natural Resources
- ◆ MDA – Minnesota Department of Agriculture
- ◆ MDH – Minnesota Department of Health
- ◆ MGS – Minnesota Geological Survey
- ◆ MPCA – Minnesota Pollution Control Agency
- ◆ USEPA or EPA – United States Environmental Protection Agency
- ◆ USGS – United States Geological Survey

## MEMBER NEWS

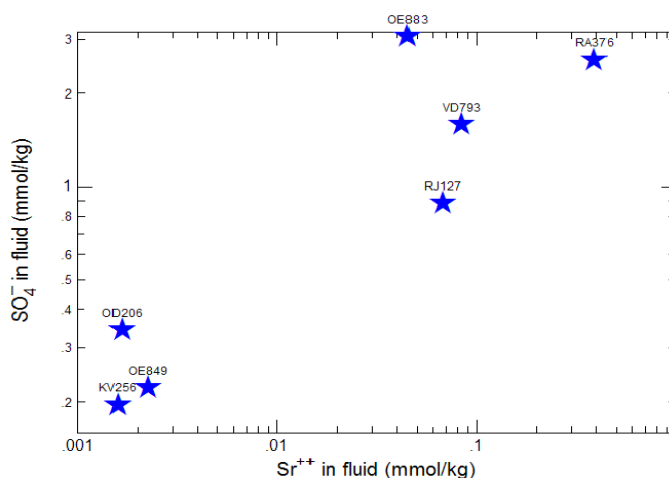
### MGWA Undergraduate Scholarship Update

by Abby Shea

Although I am a Minnesota girl through and through, I have spent the last four years of my life across the border in Wisconsin at Lawrence University. All seniors at Lawrence are required to complete a Senior Capstone project in their major in order to graduate. The Senior Capstone is designed to be a culmination of your college education and represent your best work. Although Lawrence geology majors complete their projects in the winter (Jan-March) trimester of their senior year, planning begins in the spring trimester of their junior year. This gave me the opportunity to plan my project well enough in advance to do my own research project from start to finish, as well as the chance to apply for the MGWA scholarship to fund the laboratory costs for my samples. Although I had chosen my topic (strontium [Sr] in eastern Wisconsin groundwater), as my junior year came to a close, I was still a bit weary of how exactly my project would pan out and I wasn't sure it was actually going to happen. However, that summer I had the wonderful opportunity of a summer job at MDH with the Source Water Protection folks, which, via the work I helped with and simply talking about my goals and potential project with others, reassured me that this topic was what I wanted to do and that I was more than capable of the task at hand. Once the school year got started, I worked with my advisor Andrew Knudsen and UW-Green Bay professor John Luczaj (whose research I was going to build upon) to work out the kinks and continue the planning of the project. I decided to focus on a single county for sample collection and traveled to Manitowoc County, WI to sample various private wells for Sr levels.

Previous work on the emerging concern of high Sr concentrations in eastern Wisconsin drinking water focused primarily the Cambrian-Ordovician aquifer, with limited data from the Silurian aquifer. Most of this research focused on the introduction of Sr into the dolostone in this location, as well as inferences as to how the Sr dissolves into the groundwater. Since limited Silurian data exists, the information about and implications from Cambrian-Ordovician data is used to explain the existence of high Sr concentrations in both aquifers. Drinking water samples were collected from the Silurian aquifer to attempt to understand the similarities and differences between the contamination in the two aquifers. After analysis of the samples, the previously established hypothesis of the dissolution of a Sr-bearing sulfate mineral ( $\text{SrSO}_4$ ) leading to high levels of Sr in drinking water in eastern Wisconsin was validated and there does not appear to be any significant differences between the two aquifers. In fact, the results strengthen the hypothesis by showing corresponding phenomena in two different aged aquifers. The only difference between the results from the two aquifers lies in the extreme values of many Cambrian-Ordovician samples. This likely reflects a significant hydrogeologic difference between the two aquifers, but the presence of Sr and its connection to  $\text{SrSO}_4$  is similar.

I will potentially be continuing this work on a broader scale in my graduate work at UW-Green Bay over the next few years with Professor Luczaj. Thank you MGWA for helping me complete this project that not only lead to a successful Senior Capstone, but also to the opportunity to pursue graduate school!



XY plot of strontium vs sulfate concentrations in the drinking water samples collected. Figure shows strong linear relationship between the two. Each blue star represents one sample/well.

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# MGWA FALL CONFERENCE

**November 15, 2017**  
8 am - 4:30 pm

University of Minnesota, St. Paul  
Continuing Education and  
Conference Center

## The Effect of Agriculture on Groundwater Resources

The effect of agriculture on groundwater resources has been a lingering but growing concern in agricultural regions across the nation for decades. Fertilizers and pesticides are showing up at increasing rates in water supply wells, increases in irrigation pumping have affected baseflow to streams, and the growth of drain tile use lets water leave the landscape faster than ever.

In Minnesota, regulatory changes have brought the effect of agriculture on groundwater to the headlines once again. Some examples include: the 2015 buffer law, proposed rules regarding nitrate in groundwater, and potential implementation of stricter controls of agricultural irrigation in some parts of the state.

The immense scale of these issues, in time, geography, and economics, make them difficult to study and even harder to manage or fix. The MGWA Fall Conference will present a sampling of some of the latest research related to agriculture's impact on groundwater resources. We will shed some light on the problems we face today in Minnesota and across the country, what's being done to address these issues, and what might be needed in the future.

### Call For Posters And Lightning Talks:

If you would like to present a poster or a short and direct five minute talk pertaining to Minnesota groundwater, please contact Evan Christanson (952)832-2957 by November 3rd.

For conference registration information contact WRI by phone at (651)705-6464 or email: [office@mgwa.org](mailto:office@mgwa.org).

## Two New MGWA Officers Sought for 2018

The MGWA board needs to fill two officer positions – Secretary and President-Elect – for 2018. The Secretary is responsible for recording the meeting minutes and provides general oversight of membership services. The President-Elect takes a leadership role in the planning of one or more of the MGWA meetings while “learning the ropes” of MGWA leadership. Here is a chance for you or someone you nominate to get in on the front end of groundwater resource protection in Minnesota.

The Secretary serves a two-year term and the President-Elect serves a year before becoming President in 2019, followed by a year as Past-President. The Past President is the MGWA liaison to the MGWA Foundation.

E-mail nominations to the MGWA at [office@mgwa.org](mailto:office@mgwa.org).

## SPEAKERS INCLUDE

### WILLIAM SIMPKINS

Iowa State University  
The “Bootprint” of Intensive Agriculture in Iowa:  
Groundwater, Drainage, and Litigation

### JEFFREY PETERSON

University of Minnesota  
Economics of Irrigation and Groundwater Depletion

### KEVIN KUEHNER

Minnesota Department of Agriculture  
From Field to Stream: Measuring Nitrate Loss in  
Southeast Minnesota

### YUSONG LI

University of Nebraska  
Impacts of Climate Change on Nitrate Transport  
Beneath a Center-Pivot Irrigated Corn Field

### DAVID LEGVOLD

Farmer/Educator  
Farm-Based Research on Altered Hydrology of  
Minnesota Agricultural Lands: Study of Saturated Buffer  
Technology in Tile Water Nitrate Abatement

### DAVID RINDAL

Minnesota Department of Health  
MDA-MDH Community Public Water System Well  
Pesticide Reconnaissance Study

### KIM KAISER

Minnesota Department of Agriculture  
Nitrate-N in Private Wells at the Township Scale

### TIM COWDERY

U.S. Geological Survey  
The Hydrologic Benefits of Wetland and Prairie Restoration in Western Minnesota: Lessons Learned at the  
Glacial Ridge National Wildlife Refuge, 2002–15



### Mark your calendars:

Two meetings that may be of interest to MGWA members are occurring in the Twin Cities this fall:

#### **SETAC North America 38<sup>th</sup> Annual Meeting: 12-16 November 2017, Minneapolis Convention Center**

<https://msp.setac.org/>

Local and state government employees of Minnesota receive a 50% discount off their full or single day (Monday–Wednesday) meeting registration.

The Society of Environmental Toxicology and Chemistry (SETAC) is a not-for-profit, worldwide professional organization comprised of more than 6,000 individuals and institutions in 100 countries dedicated to the study, analysis and solution of environmental problems, the management and regulation of natural resources, research and development, and environmental education. The mission is to support the development of principles and practices for protection, enhancement and management of sustainable environmental quality and ecosystem integrity.

### Earth Science Week 2017

The theme of Earth Science Week 2017 is “Earth and Human Activity.” This year’s event, the 20th annual Earth Science Week celebration, promotes awareness of what geoscience tells us about human interaction with the planet’s natural systems and processes.

Earth Science Week 2017 learning resources and activities are engaging young people and others in exploring the relationship between human activity and the geosphere (earth), hydrosphere (water), atmosphere (air), and biosphere (life). This year’s theme promotes public understanding and stewardship the planet, especially in terms of the ways people affect and are affected by these Earth systems.

#### **Focus Days**

Earth Science Week is happy to announce special days focusing on specific themes during the week-long celebration, October 8-14, 2017.

*Sunday, October 8*

[International Earthcache Day](#). Explore the world with this GPS scavenger hunt!

*Monday, October 9*

[Earth Science Literacy Day](#). Learn the fundamentals of geosciences with Earth Science: Big Idea, a video series developed to explain why Earth science literacy is important.

*Tuesday, October 10*

[No Child Left Inside Day](#). NCLI Day encourages students to go outside and research Earth science in the field like a professional geoscientist.

#### **Minnesota Water Resources Conference: 17-18 October, St. Paul RiverCentre**

<https://cce.umn.edu/minnesota-water-resources-conference>

Immerse yourself in innovative, practical, and applied water resource engineering solutions, management techniques, and current research about Minnesota’s water resources. The Minnesota Water Resources Conference is an opportunity to address:

- ◆ lessons learned from the implementation of engineering projects
- ◆ best practices discovered in the design and application of water resource management techniques
- ◆ implications of water policy decisions
- ◆ research into current and emerging issues

[Earth Observation Day](#). Engage students and teachers in remote sensing as an exciting and powerful educational tool.

*Wednesday, October 11*

[National Fossil Day](#). The fifth annual National Fossil Day is dedicated to promoting the understanding and appreciation of fossils.

*Thursday, October 12*

[Geoscience for Everyone Day](#). Do your part to help young people from underrepresented communities explore exciting careers in the geosciences.

*Friday, October 13*

[Geologic Map Day](#). Hosted by the U.S. Geological Survey, Association of American State Geologists, National Park Service, Geological Society of America, and ESRI in partnership with AGI, this special event promotes awareness of the study, uses, importance of geologic mapping for education, science, business, and a variety of public policy concerns.

*Saturday, October 14*

[International Archaeology Day](#). Hosted by the Archaeological Institute of America, this special event is a celebration of archaeology and the thrill of discovery.





## Ronning Steps Down from the Newsletter Team

Having served as the Editor-in-Chief since 2009, Tedd Ronning is leaving the MGWA Newsletter Team. "Working on the newsletter has given me a chance to work with a talented and fun group of people. It's also provided me exposure to a number of issues that I wouldn't normally encounter in my work. I encourage members to get involved with the newsletter either by contributing articles or volunteering to work on the team. It's a great way to help the organization."

*Tedd at work*



## New Members for the White Paper Committee

Carrie Jennings and David Crisman are joining the MGWA's White Paper Committee this fall, replacing retiring committee members Kelton Barr and Mark Collins. Carrie and David join Mindy Erickson and Andrew Streitz on the committee that oversees the White Paper program. Both Kelton and Mark are founding members of the committee, and helped guide the development of the Association's first three white papers.

**Dr. Carrie Jennings** is the Research and Policy Director at Freshwater. She applies her understanding of regional geology,

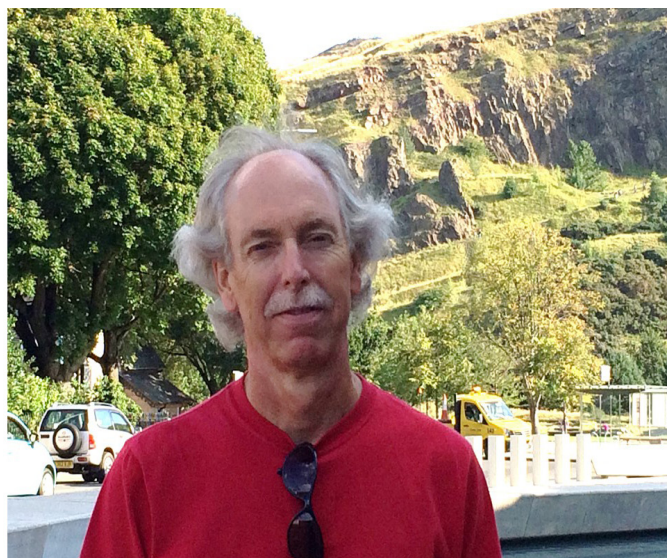
member of the faculty in the Natural Resources Science and Management Graduate Program and the Water Resources Center at the U of M. She has taught a field-oriented glacial geology course for the last 22 years and mentors graduate students across the U.

Jennings has twice been elected Town Board Supervisor and has served on the Planning Commission for Eureka Township, Dakota County. She keeps water and the environment a priority in ordinance writing and planning in this agricultural community.



*Carrie Jennings showing her enthusiasm for rocks and ice* hydrogeology and landscape evolution to the policy that Freshwater promotes in the areas of non-point source pollution and groundwater sustainability. Jennings has mapped the surficial geology of half of the state during a 24-year field geologist career; 22 with the Minnesota Geological Survey and 2 with the DNR, Division of Lands and Minerals. Prior to joining Freshwater she was the Science Reports Lead for the County Geologic Atlas program at the DNR.

Jennings maintains a strong connection with the U of M where she did her MS and PhD. She is Adjunct in Earth Sciences, a  
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*David Crisman in front of Arthur's Seat in Scotland*

**David Crisman's** career has centered on the topics of contaminant assessment and remediation. His interest in the field began in school where his thesis focused on water - basalt chemical interactions, and the impact of this groundwater on native copper deposits in Upper Michigan. The study was initiated by the, now, long closed Department of Energy Hanford radioactive waste burial project in Eastern Washington.

Upon leaving school, David was one of the original members of the MPCA Superfund unit at a time when the State Superfund law had just passed, and few cleanup standards and rules had been adopted. He then moved on to consulting during the boom years of leaking underground storage tanks. In the early 1990s he joined the H.B. Fuller Company, a global specialty chemical manufacturer, to assess facility properties in a Phase 1 & 2

— continued on page 8

## White Paper Committee Members, cont.

approach, with the goal to remediate any contamination found. This project experience led him next to learning water rules in many countries and, in a few countries without rules, helping to invent new ones! In eighteen years at H.B. Fuller his positions progressively advanced to include environmental compliance and environmental health & safety compliance, though remediation work always remained an important part of his job description.

Recently, he took two years off after H.B. Fuller before returning to environmental compliance work at GE Water and Process Technologies in Minnetonka. The company makes filtration products and equipment for the water marketplace, with a focus on reverse osmosis technologies.

Over the years, David has experienced the intersection of science, and public and corporate policy as both a benefit and a detriment. He sees the MGWA's efforts to publish White Papers on water topics is an important role in this public discussion, and he invites other MGWA members to contribute in this endeavor.

by MGWA Newsletter Team



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## Featured Photo, cont.



The dye was detected 9.6 miles away at Odessa Spring on the Upper Iowa River, east of Granger, MN. That trace is the longest yet done in Minnesota and also proved that 11.7 square miles of Root River watershed was being pirated to the Upper Iowa River watershed.

In June 2008 a large storm opened the entrance to Holy Grail Cave, about halfway between the York Blind Valley and Odessa Spring. In May 2009 a dye trace from inside the cave also reached Odessa Spring. During high flows water in Holy Grail Cave can be observed rising up, flowing through cave passages and then sinking back down into an underground river.

On May 24<sup>th</sup>, 2017, a group of scientists from the Minnesota Caving Club, DNR, and the University of Minnesota conducted another dye trace from the York Blind Valley and determined that the underground river in Holy Grail was the same flow, not a separate tributary to the groundwater flow to Odessa Spring.



opportunities  
in changing  
times

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\*Environmental Business Journal  
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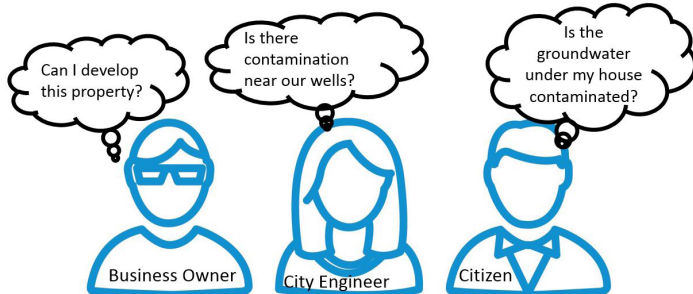


### Mapping groundwater contamination: accessible data to protect resources

By Hans Neve, Minnesota Pollution Control Agency

Contamination of groundwater affects our use of the resource and is a concern for many. Information about where groundwater is known to be contaminated could be more accessible. Currently, most of the groundwater quality data in the MPCA's remediation programs is not stored in an easily accessible data system.

#### The existing data accessibility gap



MINNESOTA POLLUTION CONTROL AGENCY

The MPCA received a Legislative Citizen Commission on Natural Resources (LCCMR) grant in July 2017 to make our groundwater data from Superfund sites more accessible to the public. With this funding the MPCA is beginning a three-year project that will make our groundwater information accessible in a new way.

#### What we will do



MINNESOTA POLLUTION CONTROL AGENCY

The project will compile groundwater data from MPCA's Superfund program data into a central database and will produce a web-based interactive map and supporting data files. Year 1 will include extracting groundwater testing data from individual MPCA files to populate our centralized EQuIS water-quality database. In year 2, areas of groundwater contamination will begin to be mapped using the compiled data. Finally, in year 3 a web-based data and map portal exploration portal will be completed.

It is important that we receive input and feedback from interested partners as we move forward with this exciting project. We will be forming a project advisory group during the first year of the project. Please contact Hans Neve at MPCA if you are interested in participating on the advisory group.

Contact email: [hans.neve@state.mn.us](mailto:hans.neve@state.mn.us)

Link to LCCMR work plan: [http://www.lccmr.leg.mn/projects/2017/work\\_plans\\_june/\\_2017\\_03h.pdf](http://www.lccmr.leg.mn/projects/2017/work_plans_june/_2017_03h.pdf)

## What Kind of Science Do You Need?

Groundwater and Waste Water Testing | Phase 1 & 2 ESA's  
Water Resource Planning | Soil, Water, and Vapor Sampling  
Industrial Hygiene | Hazardous Materials Inspections

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## NEW PUBLICATIONS / LINKS

### Minnesota Geological Survey's 2016-2017 Annual Report

The Minnesota Geological Survey has released their annual report for 2016–2017, available at the link below. MGWA members might be interested to see the progress in the development of County Geologic Atlases, a description of their funding sources, and this photo of MGS staff as of June 2017. [http://www.mnngs.umn.edu/Minnesota Geological Survey Annual Report 2016-2017.pdf](http://www.mnngs.umn.edu/Minnesota%20Geological%20Survey%20Annual%20Report%202016-2017.pdf)



### Minnesota Groundwater Tracing Information

*From the DNR:*

The DNR has made decades of groundwater tracing data and related information available through a joint project with the University of Minnesota. It includes results from dye trace studies primarily conducted across the southeastern portion of Minnesota. Over 100 historic and recent dye trace reports are on the [DNR Dye Tracing](#) webpage.

Groundwater tracing using fluorescent dyes has proven to be an effective method for understanding groundwater flow, travel times, and interconnections between groundwater and surface water. Dye tracing involves introducing dye into sinkholes or sinking streams and observing if, when, and where it emerges. The information is used to determine groundwater flowpaths and the extent of the springshed. This information is intended to be used in conjunction with both the [Minnesota Karst Features Database](#) and the [Minnesota Spring Inventory](#).

Visit [mndnr.gov/groundwatermapping](http://mndnr.gov/groundwatermapping) for more information about springs, dye tracing, karst and other DNR County Geologic Atlas Program projects.

### GRAPS team publishes North Fork Crow River Watershed report

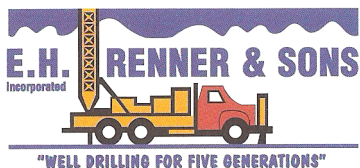
Groundwater Restoration and Protection Strategies (GRAPS) reports are designed to help prioritize and target local efforts to restore and protect groundwater resources as part of local water planning. While groundwater is not broken into watersheds like surface water, several state agencies have worked together to compile information and strategies for groundwater below surface water watersheds. A GRAPS report uses existing state data and information about groundwater and land-use practices that affect groundwater in the watershed to identify key groundwater quality and quantity concerns. The interagency team has recently completed the GRAPS report for the North Fork of the Crow Watershed.

Link to report: [http://www.health.state.mn.us/divs/eh/water/dwp\\_cwl/localimplem/grapsnfcw.pdf](http://www.health.state.mn.us/divs/eh/water/dwp_cwl/localimplem/grapsnfcw.pdf)

Link to MDH GRAPS website: [http://www.health.state.mn.us/divs/eh/water/dwp\\_cwl/localimplem/index.html](http://www.health.state.mn.us/divs/eh/water/dwp_cwl/localimplem/index.html)

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## MGWAF BOARD MINUTES

### Meeting Date: Tuesday, March 23, 2017

**Directors Present:** Scott Alexander, Cathy von Euw, Eric Mohring, Stu Grubb, Stephanie Souter, and Amanda Strommer (via conference call). Others Present: Jennie Leete and Sean Hunt, MGWA Management

**Past Minutes:** Approved

**Treasury:** On 3/17/2017 the Foundation's Endowment balance was \$181,138.89 and the Pfannkuch fund balance was \$30,656.56. Interest earned in past quarter was \$9761.27, while Wells-Fargo investment fees were \$420.17. One thousand dollars each was granted to Red Lake SWCD and to Macray East Parents Club. Sources of income were donations (\$25), profit from selling the Weatherguide Calendar (\$130) and MGWA member participation in Amazon Smile (\$10.49). Current financial management goal is to maintain non-endowment funds separate from endowment funds while reducing the number of accounts we maintain. The Pfannkuch fund can be moved to Wells Fargo Investments once the balance reaches \$50,000. MGWA has informed MGWAF that \$40,000 will be available to the Foundation from MGWA's 2015 Conferences and from fundraising efforts. MGWA typically dedicates donated funds to the Endowment. Eric moved that MGWAF request \$20,000 from MGWA, for the purpose of adding \$20,000 to HOP fund (to bring it to \$50,000 and allow it to become a managed investment), and request that the remaining \$20,000 remain unrestricted to be used for grants and scholarships. Cathy seconded the motion and all were in favor.

**Fundraising:** MGWA Conference Exhibitor Payments are dedicated to Student Support and the Foundation organizes exhibitor participation at conferences. Cathy von Euw will email potential vendors.

**New Proposals:** Grants approved:  
UM Hazwoper class – \$2000  
2017 Metro CWF – \$2500

**New Business:** Scholarship Policy for Hydrocamp Award  
The application will be finalized by March 24. The University of Minnesota hydrogeology field camp has an enrollment of 33 students from whom we could expect several applicants. Applications will be due April 30th. Two \$1500 scholarships will be offered. Cathy moved that the HOP field camp application be approved for distribution. Ole seconded the motion and all were in favor. Sean will add the materials to the MGWA website so the information will be widely available. 2017 Scholarships The Scholarship Committee has recommendations ready for the board's approval: Abby Shea (undergrad) and Aimee Zack (grad). Stephanie moved that the recommendations of the scholarship committee be accepted and all were in favor. Lanya moved that travel expenses (mileage and hotel) be reimbursed if needed. Eric seconded the motion and all were in favor. Scholarship Program Discussion on how to increase applicants. Increase scholarship amounts, number of scholarships. Stephanie will follow up with the committee on whether they would recommend an increase in the number or amount of the scholarships. The directors agreed that MGWAF will set up a formal budget for annual grants/scholarships at the June meeting, planning out over a 4- or 5-year period.

### Kara Dennis Joins the MGWA Foundation Board

Kara Dennis recently joined the MGWA Foundation Board as treasurer, replacing Cathy von Euw, who is moving to Switzerland this summer. Kara has been a hydrologist at the MDH since 2015, in Well Management. Kara is responsible for reviewing permits for proposed monitoring wells, geothermal systems, elevator borings, and reviewing exploratory borings plans. She also works on several educational outreach programs at MDH. Prior to her arrival at MDH, Kara worked as a research assistant at Lamont Doherty Earth Observatory at Columbia University in New York. Kara has a Bachelor of Arts degree in Geology from Macalester College and a Master of Science degree in Earth Sciences from Syracuse University.



### MGWA Foundation Board of Directors

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*The MGWA Foundation is a 501(c)3 charitable organization. Donations to the Foundation are deductible on your state and federal income tax returns.*

## MGWA BOARD MINUTES

### Meeting Date: Tuesday, May 16, 2017

<b>Location:</b>	Fresh Grounds Café, 1362 West 7th Street, St. Paul, MN
<b>Attendance:</b>	Evan Christianson, President; Ellen Considine, President-Elect; Ole Olmanson, Past-President; Anneka Munsell, Treasurer; Andrew Retzler, Secretary; Sean Hunt, WRI
<b>Past Minutes:</b>	Approved.
<b>Newsletter:</b>	Christianson stated the next newsletter is in the works and should be expected to go out sometime after Memorial Day in June.
<b>Web Page:</b>	Hunt updated the membership directory. Christianson asked about member zip codes to get a sense of our membership spatially. Olmanson will get member zip codes to Christianson.
<b>Treasury:</b>	Treasury: Munsell discussed the Treasury Report with the Board. The total income for the period of January 1, 2017 to May 14, 2017 is \$57,575.98; net income for this period is \$29,404.12. The Board discussed the profits and expenses for the Spring Conference, as well as other venue options for the future.
<b>WRI Report:</b>	WRI Report: Hunt has the conference web page up-to-date, and all of the conference feedback has been processed. Hunt updated the Board on membership numbers—441 professionals, 39 sustaining, 35 retired, and 26 students.
<b>MGWAF Report:</b>	MGWAF Report: The \$40,000 transferred from MGWA will be used the following way: \$20,000 tied up for the scholarship funds, and \$20,000 will be liquid. MGWAF is getting close to awarding two \$1500 scholarship awards for field camp.
<b>Old Business:</b>	Spring Conference Feedback Review: Olmanson suggested that the Mentor Lunch could be revamped and enhanced somehow in the future. Hunt mentioned they used to have students and mentors meet beforehand to help keep it more organized. The Board reviewed feedback from the conference attendees. Overall, feedback was positive. The Board agreed that we should ask the University in the future to have a specific room set aside for the posters, as the room this time was a bit hidden away. Hunt will also have a “Posters” sign made up for next conference. Christianson would also like to focus on getting a better mix of speakers from both genders. The Board discussed lightning talks and possibly enhancing or expanding them in the future. Olmanson suggested asking for abstracts early on to get a sense of topics. Considine suggested encouraging students for lightning talks. The Board discussed the panel and Pigeonhole, and whether or not it is worth upgrading to the next level in the future. Olmanson suggested we could stick with the cheaper Pigeonhole option and just reuse the one allotted question and answer session between each talk.
<b>New Business:</b>	<u>Fall Conference:</u> Christianson suggested having subtopics at the Fall Conference, with one of them being irrigation. Olmanson mentioned impact of ethanol on groundwater as a talk topic. Christianson would like to have a speaker on buffers. Munsell suggested having someone speak on the Des Moines nitrate trial. Olmanson suggested a speaker for drain tile, as well as a professor from Oklahoma for lysimeter work in the Morris area. Christianson suggested giving the white paper group extra time, as their topic will directly correspond with the theme of this conference. Considine recommended discussing case law in Nebraska for how they use groundwater. The Board will continue discussing the Fall Conference to further finalize the details. <u>MGWA Operations Manual Update:</u> Christianson suggested a summer-long project to update the manual. Christianson will try and find an electronic copy to edit in Google Docs. <u>White Paper Review:</u> The Board discussed whether or not they should directly ask for certain elements from the White Paper group, and have a set form of expectations. Retzler suggested having the White Paper group submit their paper in a manuscript-like format that will make the copy-editing process easier. <u>Social Events:</u> Berquist notified the Board via email of a social hour planned for Thursday, June 22nd at Urban Growler.

The MGWA Board meets once a month, currently over lunch, on the third Tuesday at Fresh Grounds on W 7th Street in St. Paul.

Members are welcome to attend and observe

## Save These Dates

### MGWA Conferences

11/15/2017

04/26/2018

11/15/2018

### Meeting Date: Tuesday, June 20, 2017

<b>Location:</b>	Fresh Grounds Café, 1362 West 7th Street, St. Paul, MN
<b>Attendance:</b>	Evan Christianson, President; Ole Olmanson, Past-President; Anneka Munsell, Treasurer; Andrew Retzler, Secretary; Sean Hunt, WRI
<b>Past Minutes:</b>	Approved. Anneka Munsell, Treasurer; Andrew Retzler, Secretary; Jeanette Leete, WRI; Sean Hunt, WRI; Tedd Ronning, Newsletter Editor; Emily Berquist, MGWA Social Coordinator; Kara Dennis, MGWAF
<b>Past Minutes:</b>	Approved with changes.
<b>MGWAF Elections:</b>	Olmanson moves to approve Kara Dennis as the new MGWAF Treasurer; Munsell seconds—motion passed. Olmanson moves to approve Stephanie Souter as the new MGWAF Secretary; Munsell seconds—motion passed. Newsletter:
<b>Web Page:</b>	Hunt added the newsletter to the site and updated portions of the MGWAF sidebar. Hunt reported that the new website content management system is all working well.
<b>Treasury:</b>	Munsell discussed the Treasury Report with the Board. The total income for the period of January 1, 2017 to June 20, 2017 is \$58,260.98; net income for this period



## MGWA BOARD MINUTES

### MGWA Minutes, cont.

- is \$29,461.57. Total assets for the same period are \$104,286.50. The Board discussed the profits and expenses for the Spring Conference. Hunt will send out copies of the Treasury Report to the Board later today.
- WRI Report:** Hunt found a digital copy of the MGWA Operations Manual and placed it on the Google Drive for the Board to access. Hunt shared the latest membership numbers with the Board: 455 professionals, 39 sustaining, 35 retired, 27 students. Christianson and Hunt discussed the past changes to the corporate membership, and whether or not that may factor into the rise in membership numbers. Hunt does not believe that is a factor.
- MGWAF Report:** Olmanson discussed the previous MGWAF meeting with the Board. A new Treasurer and Secretary were voted on, and the decision to bring in Wells Fargo to help manage the MGWAF accounts is earning an 11% return currently. MGWAF discussed adding a new scholarship or increasing the amounts of the current ones. The Board is uncertain whether the full \$40,000 from MGWA has been officially moved over to the MGWAF accounts. Hunt will inquire whether this has occurred. Olmanson stated that MGWAF is also interested in a joint meeting with MGWA, and that Christianson and Scott Alexander (MGWAF) could plan something out. Two \$1500 field camp scholarships were awarded and approved via email.
- Old Business:** Fall Conference Early Planning: Christianson is working on finding out-of-state speakers, with 3 potential speakers in the works. The speakers, from Iowa, Nebraska, and South Dakota, could discuss buffer strips, groundwater economy, and evapotranspiration. The Board discussed the idea of two lightning talk sessions. Olmanson suggested two sessions might be a better fit for the Spring Conference when there may be more student interest. Olmanson said we could take in suggestions for talks and have the Board vote on them if there are more talks than time allotted. Munsell suggested notifying membership and students to submit ideas about 2 months ahead of time. Munsell also commented that Burnsville would like to give a talk about their wellhead protection program at a future conference. Olmanson discussed vendors for the Fall Conference and how we can try to get ahead of the game for setting them up and possibly incorporating more vendors in-line with the conference topic. Ronning asked about ethics training and if it will be incorporated into the conference. Christianson would like to do a separate ethics training session, possibly tied in with a Social Hour event, and commented that Barr Engineering has adequate space for one. Olmanson commented that two one-hour sessions could be done in the calendar year. Munsell suggested doing an ethics training sessions the day after the conference for anyone travelling who wishes to participate.
- Social Events: Berquist reminded the Board of a Social Hour at Urban Growler this Thursday, June 22nd from 4:30pm-6:30pm. Berquist updated the Board on the status of the Facebook page. Currently there are 84 followers. There has been good reaction towards the news articles shared on the page. Next Thursday, June 29th is the memorial event for Gil Gabanski. Christianson commented that MGWA, along with Minnesota Brownfields and the Minnesota Section of AIPG, contributed money to put on the event. Berquist will make a Facebook event for Gil's memorial. Hunt and Olmanson said they would double-check whether a link to the Facebook page is on the MGWA website. Berquist commented that she would like to plan a field trip for August, and asked about field trip expense planning and requesting funds. Hunt suggested talking to him and Leete once more is known about the field trip details and what expenses might be expected. Munsell suggested a field trip event to the Science Museum. Dennis suggested having a Social Hour event directly following the conferences. Hunt said it is possible to have alcoholic beverages at the UMN conference venue, but that it does require a fair amount of planning and coordinating to be approved. Christianson received the zip codes of MGWA members from Olmanson and shared with the Board a map of member concentrations in the state based on zip code. Other than the Twin Cities metro, members are also concentrated in Rochester, Duluth, and along the I94 corridor. Berquist suggested doing a Social Hour event in Rochester in the future. Dennis suggested adding a question to the conference feedback about how far the member travelled to attend the event.
- MGWA Operations Manual Update: Christianson plans to review and revise the current MGWA Operations Manual on Google Drive, and would like Board members to help revise their particular sections in the manual. Hunt said that many of the items about membership fees and the interactions with MGWAF or the White Paper Committee would need to be updated, added, or removed. Christianson stated revisions should be completed by September. Munsell asked whether MGWA has product sales, in which Hunt replied that we did in the past.
- Meeting Schedule: The MGWA Board will not meet during July, and instead will have their next meeting in August.

### MGWA 2018 Membership Dues

Sustaining Member	\$65
Professional Member:	\$45
Retired Member	\$25
Full-time Student Member	\$20
Newsletter (printed and mailed)	\$20

Membership dues rates were revised at the July 1, 2015 meeting of the MGWA Board.



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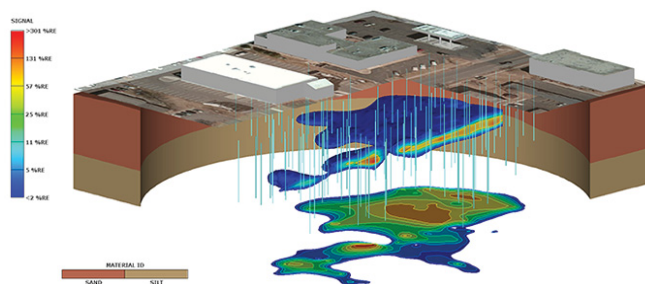
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