

Minnesota Ground Water Association

www.mgwa.org

Newsletter

June 2017
Volume 36, Number 2

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MGWA President
Evan Christianson

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President's Letter

Thank you to everyone who was able to attend the MGWA spring conference; Management, Analysis, and Optimization of Groundwater Data. I thoroughly enjoyed all the speakers and the spark that many presentations ignited for new and exciting ways to apply groundwater data and best collect additional data. A special thanks to the brave participants of the lightning talks. This was a new format for MGWA and we didn't know what to expect. Feedback has been positive, and we look forward to trying it again in the future.

As we transition from spring to summer on the calendar we move from Minnesota's groundwater recharge season to the groundwater demand season. An early and wet spring is often the best recipe for significant groundwater recharge in Minnesota, and this year appears to be a perfect example. A look at preliminary data and anecdotal evidence indicates that this year's recharge season has been great. The frost in central Minnesota, as measured by the Minnesota Department of Transportation, was gone

in mid-February; nearly a month earlier than normal! The early frost out combined with a modestly wet spring set the stage for significant potential for recharge prior to evapotranspiration kicking into full gear.

This year's ideal spring for recharge follows one of the wettest years in recent memory for much of Minnesota. From May 2016 through April 2017 Minnesota had on average 9 inches of precipitation more than normal. Southcentral and Southeastern Minnesota had significantly more with 17.7 inches and 15.5 inches more than normal respectively.

What this year's groundwater demand season will bring is not yet known. However, based on what I heard at the spring conference I am reassured that we continue to make strides to better understand and manage our groundwater resources. In many areas of the state it is becoming clear we may need new approaches for managing groundwater resources. We are a long way from having all the answers but at least we are collecting the data and advancing the science to make more informed decisions.

Gil Gabanski, MGWA's first President

A Remembrance

by Kelton Barr

Gilbert Gabanski came to Minnesota in the early 1970s to pursue graduate work in hydrogeology and stayed to change the landscape of the groundwater profession. From his initial employment with the Minnesota Geological Survey and the Minnesota Department of Natural Resources until the early 1980s, he displayed a passion for the field of hydrogeology that led him to join with several others to found the Minnesota Ground Water Association in 1982. He was the first President of MGWA, serving until 1985.

During the tumultuous early years of the Superfund program, Gil worked for a number of consulting firms, culminating in heading his own company, GJG Environmental Consultants. In 2008 he joined Hennepin County's Department of Environmental Services while maintaining



Gibert J. Gabanski 1951-2017

his practice with GJG outside of Hennepin County. He passed on March 31st, less than

— continued on page 2

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Newsletter Deadlines

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MEMBER NEWS

Gil Gabanski Memorial Social on Thursday June 29, 2017



4:30 pm – 6:30 pm

Able Seedhouse + Brewery

1121 Quincy Street Northeast, Minneapolis

RSVP at: <https://www.eventbrite.com/e/memorial-social-for-gil-gabanski-tickets-34832363537>

Join us to remember our colleague, friend, and mentor, Gil Gabanski. Gil passed away suddenly at his home on March 31 due to heart failure. Let us gather and celebrate Gil's life, share memories of him, and connect with one another.

Gil Gabanski Remembered, cont.

two months before his planned retirement from the county.

Through his work life, he retained his commitment to helping students and recent graduates making their way into hydrogeology. When MGWA created its foundation dedicated to educating the general public in groundwater resources, he joined, first as a director, then as president of the foundation for nearly ten years. During this period, he joined with several others in MGWA to raise funds for the drilling of an artesian well in the Big Backyard of the Science Museum of Minnesota, the centerpiece of a compelling groundwater exhibit.

He volunteered at water festivals and as a judge for science fairs. He mentored students intending to practice hydrogeology and with a practiced eye reviewed and improved many students' resumes. He was generous with his time and continued to put his passion for education and paying it forward into daily practice. He served on the MGWA White Paper Work Group addressing education gaps in Minnesota's K-12 curriculum and in post-secondary schools in Minnesota and adjoining states and was one of the liaisons for the resulting White Paper.

In the first MGWA newsletter he established the tradition of some words from the president. His first column still makes for compelling reading. He ended, saying:

We will be putting together a few photo posters. If you have any photos of Gil you would like to share, please send them to Natalie Brown at nbrown@mnbrownfields.org.

This event is a cooperative effort of Minnesota Brownfields, Minnesota Section of the American Institute of Professional Geologists and the Minnesota Ground Water Association. Gil was an active member of each of these organizations.

“The Minnesota Ground Water Association invites – and challenges – you to work to solve Minnesota's ground water problems. Bring to the Association your experience and professional pride, but not your prejudices. Be generous enough to teach but willing still to learn and listen. LET'S GET STARTED.”

Those words still ring true. So long, Gil. We'll miss you.

MINNESOTA GROUND WATER ASSOCIATION

NEWSLETTER

Minnesota Ground Water Association, P.O. Box 3362, St. Paul, MN 55165

v.1, No. 1, OCTOBER 1982

The Minnesota Ground Water Association is unlike any other professional society in the state. The Association focuses not on one profession, but on one basic resource – ground water. As you are well aware, Minnesotans now face serious ground water contamination problems and, as a result, possible major public problems. Workable solutions to these problems cannot be provided by any one profession. The Minnesota Ground Water Association has been founded to bring together members of the various professions whose responsibility it is to solve our ground water problems, and to promote intelligent use of ground water resources in the state; not only hydrogeologists, but also engineers, drillers, chemists, consultants, lawyers, academicians, administrators, regulators, and contractors, working both in government and in the private sector. As many of you said in the MGWA questionnaire, what we need to get our jobs done is an exchange of information within and among the various professions.

The Board of Directors of the Association has initiated a program to bring about this exchange through general membership meetings, seminars, and the MGWA Newsletter. A general membership meeting will be held each quarter, with speakers or panel discussions on a topic of interest to a majority of the members. Meetings which are of interest to fewer members will be arranged and publicized as well, and this may be the most valuable part of the program – helping members to get the word out to those 5, 15, or 30 other people in the state whom they really need to reach. Topics and speakers can be suggested to any member of the Board. A meeting can then be arranged and announced by special mailing or through the Newsletter. The quarterly MGWA Newsletter should be used by the members – you are invited to submit or request information, to advertise, to announce meetings.

Topics for meetings and seminars were suggested in response to the MGWA questionnaire and in countless conversations I've had with members. Based on those exchanges and my experience, these are some topics for discussion at future MGWA meetings. What are the available techniques for mapping shallow, discontinuous aquifers? Who owns ground water in Minnesota? What are the criteria for selection of waste disposal sites? What are the negative effects of agriculture and mining practices on Minnesota ground water? Can the practices be changed, and at what cost? What are the options (and the cost) of each for aquifer restoration in St. Louis Park and in New Brighton? What are the probable hydrologic consequences of mining Minnesota's peat? What's the state of the art in ground water monitoring? How is surface water-ground water interaction dealt with in the law? How can we "sensitize" the enough of ground water hydrology for the general public? What institutions and groups can we work with in order to educate the public, our legislators, and one another? Teacher's groups, the media, museums, libraries?

The Minnesota Ground Water Association invites – and challenges – you to work to solve Minnesota's ground water problems. Bring to the Association your experience and professional pride, but not your prejudices. Be generous enough to teach but willing still to learn and listen.

LET'S GET STARTED.

Gil Gabanski, President

MEMBER NEWS

Jim Stark Retires from the USGS

by Jim Stark, USGS

After 39 years of public service I am retiring in May. Working for the USGS has been a privilege and a really important part of my life. It has not been just a job. I've been the Director of the Center for nine years. That's a long time as Directors go. Prior to that, I held various jobs in the Center: Studies Chief, Lead of the National Water Quality Assessment of the Upper Mississippi, Groundwater Specialist and Project Chief. Prior to my time in Minnesota, I worked for the USGS in Utah and Michigan. I have been blessed with a career that has had a great deal of variety and new experiences each day.

I'm not completely going away. I'll continue to be involved in the Lake Superior and Rainy-Lake of the Woods bi-national watershed boards. In addition, I'll stay involved in technical advisory committees focused on sustainable water supplies for the Metropolitan Twin Cities. Away from the office, I will keep busy with my family and grandkids, volunteer activities, basketball refereeing, and as a board member of the Minnesota Land Trust.

During my career I have survived many USGS reorganizations and changes in national priorities. My career has been enhanced by many bosses, mentors, and colleagues. From these individuals I have learned a great deal.

Changing priorities, evolving projects, and reviews of budgets, reports, and programs have been part of the job. The blessing, however, has been working with and being able to know many special people in the water-resource community within and beyond the USGS family. I take great satisfaction in seeing the progress that Minnesota is making in protecting and improving the waters of our State. It has been an honor for our staff to be a part of the work funded by the Clean Water, Land and Legacy Amendment to the Minnesota Constitution that protects, enhances, and restores, streams, lakes, wetlands, and groundwater. I also take great pride in seeing the contributions that the many USGS student interns have made over the years on water challenges faced by the State and the Nation.

It has been a good ride! I hope to see you around at water meetings as we celebrate the good work that you all are doing for the citizens of our great State.

Jim



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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.

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MEMBER NEWS

Eric Mohring retires from BWSR

Eric Mohring retired in May from a long career with the State, working as a hydrologist at the Minnesota Board of Water and Soil Resources (BWSR), where he spent 27 years. He stayed at BWSR for so long because he genuinely liked the people and felt that they were truly committed to what they were doing. He was a hydrologist with the Department of Natural Resources for five years before that, and before that did some time as a drill rig geologist during the early days of the Superfund with the Chicago office of Woodward-Clyde consultants.

His interests and projects over the years included applying hydrogeologic knowledge to natural resource management at the state and local government levels, wetland hydrology and soils, groundwater - surface water interactions, and engineering geology. Other odd jobs included running a well-sealing cost-share program, serving as the missing link to the history of Minnesota water resources management and outdated software, GIS work, drawing pictures with Adobe Illustrator, and flying the BWSR flag at meetings of all kinds. During his last decade at BWSR he worked mostly on wetland restoration projects, wetland hydrologic monitoring, and wetland hydrology training. He still considered himself a hydrogeologist – it's just that the groundwa-



ter he worked on kept getting shallower and shallower over the course of his career.

He will continue to live in Minneapolis with his wife, U of M geology professor Karen Kleinspehn. He will ramp up his fiddle and mandolin playing with local groups *Café Accordion Orchestra* and *New Riverside Ramblers*. Eric may return to BWSR in a part-time capacity this fall to work on special projects.

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

Anneka Munsell joins the DNR

Anneka Munsell has joined the groundwater modeling team at the Minnesota DNR. She previously worked at WSB & Associates where she managed the wellhead protection program and worked as a surface water project engineer. Prior to working at WSB she was a groundwater modeler at the Metropolitan Council, an environmental engineer at CH2M, and a groundwater modeler at the USGS. She obtained her B.S. and M.S. of Civil Engineering at South Dakota School of Mines. Anneka is currently working on developing a groundwater model for the Cold Spring area to help quantify the total impact of pumping to the Cold Spring Creek trout stream.



MEMBER NEWS

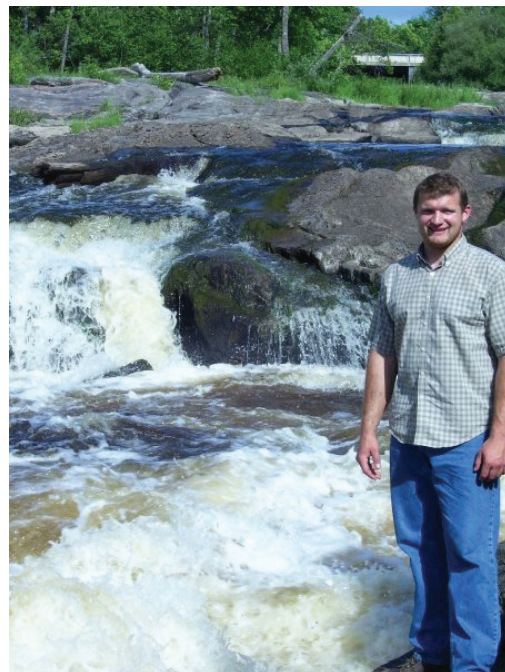
Brent Mason Joins the DNR

Brent Mason has accepted a hydrologist position with the Water Monitoring and Surveys Unit at the Minnesota Department of Natural Resources. Brent previously worked as a hydrologist with the USGS Minnesota Water Science Center where he was the lead well driller, worked on the river systems team collecting suspended sediment and bedload samples, and developed techniques for estimating suspended sediment concentrations in rivers using surrogates.

In his new position, Brent will continue drilling and installing monitoring wells throughout Minnesota and assist with the expansion of the DNR's monitoring well network.

Brent completed his B.S. in Environmental Studies (hydrogeology) from Bemidji State University and earned his master's degree in Water Resource Science at the University of Minnesota. Brent grew up in Bemidji which he says fueled his love for nature and the state of Minnesota.

Brent enjoys all outdoor activities including trapping, hunting, fishing, picking morel mushrooms, camping, and hiking.



The USGS Water Science Center Award for the Best Groundwater Report of 2016 Goes to:...

Perry Jones and co-authors were recognized for the Best Groundwater Report of 2016, for the report [Statistical analysis of lake levels and field study of groundwater and surface-water exchanges in the northeast Twin Cities Metropolitan Area, Minnesota, 2002 through 2015](#). The award recognizes excellence in groundwater reports from USGS Water Science Centers nationwide. This report is the second in a series of three USGS reports documenting groundwater and surface-water interactions in and around White Bear Lake, Minnesota. The study used a combination of innovative and novel field and statistical methods to identify and describe critical groundwater/surface water interactions in the northeast Metro region and in White Bear Lake. The results of this body of work are being used by stakeholders for important water resources decision-making. The Metropolitan Council and Minnesota Department of Health were cooperators on this project.

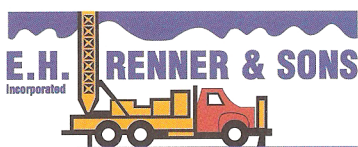
Statistical Analysis of Lake Levels and Field Study of Groundwater and Surface-Water Exchanges in the Northeast Twin Cities Metropolitan Area, Minnesota, 2002 through 2015

Chapter A of
Water Levels and Groundwater and Surface-Water
Exchanges in Lakes of the Northeast Twin Cities
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Jane de Lambert Joins MGWA Newsletter Team

Jane de Lambert will be joining the MGWA newsletter editorial team as its newest member! Jane has been a hydrologist at MDH in Source Water Protection since early 2016. Her main duties include delineating capture zones for wellhead protection plans, organizing groundwater monitoring plans for public water suppliers, and compiling historical data on abandoned public water supply wells. She is also a regular contributor to the GRAPS (Groundwater Restoration and Protection Strategies) and the Groundwater Virus Monitoring Study workgroups. Jane previously worked at MPCA where she sampled for the ambient groundwater monitoring network. She has a B.S. from the University of St. Thomas in Geology, and a Masters of Public Health in Environmental Health Science from the University of Minnesota.



MGWA Spring Conference

The datasets that are crucial for groundwater flow modeling was the central theme of the MGWA Spring Conference which was held on April 26th, 2017, at the usual venue at the University of Minnesota's Continuing Education and Conference Center in St. Paul. The conference was titled "Management, Analysis and Optimization of Groundwater Data" and attracted more than 300 participants, including many students from Minnesota and surrounding states. In keeping with the conference's theme, new technology was featured for submitting questions. The audience used an interactive mobile website called "Pigeonhole Live" to submit all of their questions to the speakers.

Technical Presentations

The morning presentations primarily featured the great geology, water level, and aquifer test data sets that are available in Minnesota. Bob Tipping from MGS and Todd Peterson from DNR opened the conference with talks outlining the data resources that are used and created during the County Geologic Atlas Parts A and B process. Technological advances since the start of the program in 1982 have allowed for the creation of large digital datasets that can be downloaded or acquired from the MGS and easily be used for many applications. Next Justin Blum entertained as well as informed the audience with his talk on the history of aquifer testing and the current effort to create an Aquifer Test Database. He gave a stern warning about dead and dark data and encouraged all members to submit aquifer test data to capture the large volume of data that otherwise runs the risk of becoming dead data. Lastly a presentation by Jason Moeckel, Glen Champion and Ian Chisholm from DNR explained the DNR's threshold approach to managing the State's water resources. Jason started by describing the DNR's Thresholds Report which was released in January of 2016. Glen described how he used a groundwater model in the Little Rock Creek area to determine pumping impacts on baseflow, and Ian described how the DNR determines what hydrology will maintain the desired state of ecosystem health for a system like Little Rock Creek. All of the morning speakers were part of a panel discussion after lunch to discuss any of the audience's questions on groundwater data.

The afternoon sessions included presentations on optimizing groundwater data collection for model construction, geospatial analysis, and a series of quick "lightning" talks. Andrew Leaf, a hydrologist with the USGS Wisconsin Water Science Center, described how data worth analysis can identify the best sites to collect more data for groundwater flow models. Adam Janzen, a

professional engineer with Barr Engineering, described several simple and advanced geospatial analyses that can be used to optimize activities at environmental sites. The conference ended with a series of short "lightning talks". Tony Runkel briefly described how the MGS is using information from multiport wells. Mark Larson from the Olmsted Soil and Water Conservation District described their efforts to identify all private wells in the county. Mindy Erickson from the USGS quickly described how they are using new machine learning techniques to model and map groundwater contaminants in the glacial aquifer system. Finally, Carrie Jenning from the Freshwater Society closed the conference by describing their recently-published report "The Water Underground -- Stretching Supplies" which recommends several approaches to sustain the state's groundwater.

MGWA Business

The membership was updated on several MGWA activities after the luncheon. Kelton Barr gave an update on the White Paper initiative. He informed the audience that the second white paper on Minnesota's Groundwater Education Gap was recently posted on the website (<http://www.mgwa.org/white-papers/white-paper-02/>), and the committee is looking for new white paper topics plus two new committee members. Mindy Erickson gave an update on the agricultural drainage paper. The workgroup has gathered and synthesized all of the information needed for the report and is currently writing the first draft. Scott Alexander, the President of the MGWA

Foundation, announced that the applications for the Hydrogeology Field Camp award are due on April 30, 2017 and Amanda Strommer and Cathy Von Euw are stepping down from the Foundation. Kelton Barr announced to the membership that the MGWA Foundation Scholarship was recently renamed the "Gil Gabanski Scholarship" in honor of his incredible mentorship and support of new hydrogeologists. Two recipients were chosen for the scholarship this year, Abby Shea and Aimee Zach. Abby currently is seeking a bachelor's degree in geology at Lawrence University, and Aimee is working on her master's degree in hydrogeology at the University of Minnesota.

For those who missed the conference talks or want to view them again, links to the presentations are available at:

<http://www.mgwa.org/mgwa-conferences/mgwa-2017-spring-conference>

by MGWA Newsletter Team

MGWA June Social Hour

It's time to take a break this summer from strenuous field work and the humdrum of office life to socialize with colleagues, friends, and students!

Come to MGWA's next social event on Thursday, June 22nd, 4:30-6:30pm at Urban Growler Brewing Co. (2325 Endicott Street, St. Paul). All appetizers are FREE, and individuals are responsible for buying their own drinks. Look for tables with MGWA signs. Free parking in the lot and surrounding street parking is available. Urban Growler is just a few blocks from the Raymond Ave Station on the Green Line light rail.

Don't forget to look for more events on the new MGWA [Facebook page!](#)

Drain Tiles and Groundwater Resources, a White Paper Update

The workgroup team has made good progress in the last few months in preparing illustrations and writing the first draft of the report. Due to the largely unstudied science of drain tiles and their effect on groundwater recharge, a large section of the report will be devoted to recommended future studies, in the form of a gaps review. The group remains on schedule and in good spirits as the project shifts into its final stages. Contact Andrew Streitz at andrew.streitz@state.mn.us, or 218 302-6617, if you have questions.

Featured Photo



MDH hydrologists Kara Dennis (left) and Luke Pickman (right) collect water samples southeast of the Twin Cities along the Mississippi River. This grab sample was taken from shore by using a long sampling device to gather water (pictured). This sample will be tested for chloride, bromide, sulfate and alkalinity. The Source Water Protection unit at MDH often samples lakes and rivers for a variety of parameters to assess the potential for surface water influence in aquifers pumped by public water supply wells.

Photo credit: Jane de Lambert



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A New Home for the School of Earth Sciences at the University of Minnesota

by Donna Whitney, University of Minnesota

After 127 years in Pillsbury Hall, the Newton Horace Winchell School of Earth Sciences (which has had various names in its history) will move in August 2017 to John T. Tate Hall (formerly Tate Laboratory of Physics), sharing this building with part of the School of Physics and Astronomy. Earth Sciences research labs and offices that are currently housed in Pillsbury Hall, Shepherd Labs, Kolthoff Hall, and the Civil Engineering Building will all move to Tate this summer. For the first time, the Institute for Rock Magnetism and the Limnological Research Center (which includes the National Lacustrine Core Facility and the Continental Scientific Drilling Coordination Office) will be in the same building as the Department of Earth Sciences. The Polar Geospatial Center, Minnesota Geological Survey, and some introductory-level teaching labs will not move to Tate.

Tate Hall consists of 5 architectural components, each built at a different time, from the late 1920s to the present. In the current renovation, the interior was demolished except for the exterior walls and interior structural columns and walls/ceilings. The oldest part of the building, on the west side, faces Walter Library across Northrop Mall. This historic part has been restored and will house most of the faculty, researcher, and administrative staff offices. Added to this in the 1950s and 1960s were two wings that extend east to Church Street, with a large auditorium in the center, as well as an old ‘tank’ (actually a tandem van de Graaf accelerator). The old center of the building was removed, and a new addition inserted between the existing wings. This ‘new’ building contains lecture halls, graduate offices, seminar rooms, and a few computational labs. In the wings on the north and south sides are research labs and additional offices. Additional research labs and storage are in the subbasement. The old and new parts of the building

are connected by a 5-story atrium with a skylight, and the atrium contains a 5-story open staircase. Hydrogeology faculty and researchers have a suite of labs, ranging from analytical (subbasement) to computational (3rd level).

Earth Sciences will have 4 teaching laboratories designed specifically for different types of teaching activities. For example, one teaching lab has been designed for activities that involve water and sediment, and another for geobiology and geochemistry. Other labs have been designed for microscope work and other ‘dry’ activities.

The building will have displays and science-themed artwork inside and out, including a landscaped garden on the Church St. side with the monumental Ely Greenstone core and several other large rocks from the Pillsbury rock garden.



Where did W-Series numbers go?

by Bob Tipping, Minnesota Geological Survey

Since its inception, the County Well Index (CWI) has used W-Series numbers to designate wells that have a location but no log – a log being a description and/or data such as a gamma log of geologic materials that the well passes through. A W-Series number is composed of a county code, a “W” and a series number unique to the county the well was in. For example, a W-Series number 123 in Washington County (county code ‘82’) is “82W0000123”. W-Series numbers provided an easily recognizable unique identifier for tracking wells with ancillary information such as water chemistry, pumping or static water elevation information, but no geologic log.

From a database management, programming and querying aspect, having a unique identifier that is a number rather than a text field improves efficiency and ease of use. To those ends, CWI is moving towards changing its unique Identifier field from a 10 character text field to a long integer. 1B numbers replace W-Series numbers as an easily recognizable unique identifier for tracking wells with no geologic log.

Here is how it works. If you are doing a well inventory for a project and after due diligence have been unable to find a six

digit unique number and associated downhole log for a well you have found, contact Minnesota Geological Survey (MGS) and they will provide a 1B number. Number assignments are coordinated through MGS to minimize the possibility of numbers being assigned more than once, or two different 1B numbers being assigned to the same well. Requirements are that you provide location information for the well such as coordinates (i.e. latitude longitude, UTM, Public Land Survey), how it was located, who located it and any construction information you can find. Important construction information includes well casing diameter and casing material, and approximate date of construction if available. A 1B number is a unique well number starting at 1,000,020,001 (“1B” for one billion). To reference in written reports, this number is referred to as “1B-xxxxx”, where xxxxx is replaced with the series number.

So where did W-Series go? Existing W-Series numbers have been converted to 1B numbers; they are still in CWI, but now in the alternate ID table. The Minnesota Well Index online application currently does not search by alternate ID, but the data are available and searchable in table format. For questions regarding 1B number assignments, please contact Bob Tipping, Emily Bauer, or Margeurite Pettus at MGS.

From the USGS WSC:

Contaminants of Emerging Concern (CECs) in the Great Lakes Basin

Two reports recently were published on CECs in the Great Lakes Basin. Sarah Elliott (MN WSC) was lead author on the first paper, in collaboration with David VanderMuelen of the National Park Service. [A regional assessment of chemicals of concern in surface waters of four Midwestern United States national parks](#) was published in Science of The Total Environment. The National Park Service presented the major findings and implications of this study in a [2-page Resource Brief](#).

Contact: Sarah Elliott, selliott@usgs.gov

The second report resulted from collaboration with the U.S. Fish & Wildlife Service. USFWS has led a multi-pronged study of risks posed by CECs to fish and wildlife in the Great Lakes Basin. As part of this study, USGS assisted with sampling and interpretation of CECs in water and sediment in U.S. tributaries to the Great Lakes. The first interpretive report from this collaboration was published in late January as the USFWS report [Contaminants of emerging concern in the Great Lakes Basin: A report on sediment, water, and fish tissue chemistry collected in 2010-2012](#). Mark Brigham, Sarah Elliott, and Kathy Lee (all with MN WSC) were co-authors. Contact: Sarah Elliott, selliott@usgs.gov.

Mercury and lake levels in Voyageurs National Park

The magnitude of lake-level fluctuations has been previously correlated to increases in mercury bioaccumulation in fish that inhabit lakes of northern Minnesota. The National Park Service had great interest in seeing if this relationship continued to hold true, particularly in light of the ongoing review of the current “rule curves” which govern lake levels in Voyageurs National Park. This interest led to a study of mercury in young-of-the-year yellow perch from large lakes in Voyageurs. [A new report](#) provides comparisons between fish mercury concentrations and the lake level and water-quality data for this assessment.

Contact: Victoria Christensen, vglenn@usgs.gov

Suspended Sediment in the Lower Minnesota River

The MN WSC’s Sediment Team has published a report, [Suspended-sediment concentrations, bedload, particle sizes, surrogate measurements, and annual sediment loads for selected sites in the Lower Minnesota River Basin, water years 2011 through 2016](#), that summarizes sediment-transport relations and sediment budgets in the Minnesota River Basin.

Contact: Joel Groten, jgroten@usgs.gov

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New ITRC Per- and Polyfluoroalkyl Substances Team

by Ginny Yingling, MDH

Earlier this year, the Interstate Technology and Regulatory Council (ITRC), a program of the Environmental Council of States (ECOS), established a Per- and Polyfluoroalkyl Substances (PFAS) Team. Over the next three years, the PFAS Team will produce technical resources and training materials to help regulators and other stakeholders improve their understanding of the current science regarding PFAS compounds. PFAS, such as perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), are a large and complex class of compounds whose prevalence in the environment have become an emerging, worldwide priority in environmental and human health. Since 2003, the Minnesota Pollution Control Agency and Minnesota Department of Health have been investigating a massive area of PFAS contaminated groundwater in southern Washington County related to past industrial waste disposal sites, as well as several other sites around the state where PFAS compounds were used in fire-fighting activities and metal plating.

The scientific community's understanding of PFAS sources, site characterization, environmental fate and transport, analytical methods, and remediation is growing rapidly. However, there is no central clearinghouse available that presents this information in a manner readily useful to those other than subject-matter experts. As a result, there is a gap in the broad technical understanding necessary for informed and expedited decisions by regulators and policy makers. This year, the ITRC PFAS Team

will produce a series of six Fact Sheets, each synthesizing key information for one of the following core subject areas: (1) History and Use of Environmental Sources, (2) Nomenclature Overview and Physico-chemical Properties, (3) Fate and Transport, (4) Site Characterization Tools, Sampling Techniques, and Laboratory Analytical Methods, (5) Remediation Technologies and Methods, and (6) Regulatory Summary. In 2018-2019, the team plans to release a detailed technical-regulatory guidance document and an internet-based training course, which will provide links to pertinent scientific literature, stakeholder points of view, technical challenges and uncertainties, and the necessary breadth and depth not given by the Fact Sheets.

The MGWA Foundation Hears the Call of the newest White Paper to Support the Education of Student Geoscientists

Coincidence? Perhaps not. Just as the second MGWA White Paper workgroup wrapped up its work on the subject of preparing the next generation of groundwater scientists, the MGWA Foundation announced funding for a class at the University on promoting practical skills for groundwater professionals. Whatever the order of cause and effect, the news is very good. The new White Paper entitled, "Minnesota's Groundwater Education Gap Preparing Students to Effectively Manage our Groundwater Resources in the Future," is now available on the MGWA website, and it covers, among other issues, the need to prepare students for work in the groundwater field. The class receiving funding from the MGWA Foundation was the Department of Earth Sciences', "Practical Skills for Professional Geoscientists". A letter thanking the MGWA Foundation for the donation is attached.

Gibson Professor Selected for the University of Minnesota's Department of Earth Sciences

Peter Kang has accepted a tenure-track position as the Gibson Professor of Hydrogeology in the Department of Earth Sciences at the University of Minnesota. Dr. Kang is currently a research affiliate at the Massachusetts Institute of Technology, where he studies anomalous transport, joint inversion for subsurface characterization, coupled flow-geomechanics, and reactive transport. He combines theory, numerical modeling, and laboratory and field experiments to tackle research problems across multiple scales. He will begin his work at the University in the summer of 2018.

The Gibson Chair in Hydrology was endowed by George and Orpha Gibson. George received his PhD in geology from the University of Minnesota in 1934, and worked for many years as a consultant in the oil business. There will be more information on the history of the Gibson Chair in the next issue of the newsletter.



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May 1, 2017

Cathy von Euw
Stantec
2335 Highway 36 West
Saint Paul, Minnesota 55113

RE: Thank you for the MGWA Grant!

Dear Cathy,

I wanted to write and say, "Thank you!" for the generous financial support that the Minnesota Ground Water Association Foundation provided to my students here at the University of Minnesota. The course, "Practical Skills for Professional Geoscientists," ultimately attracted 18 undergraduate students, representing all but one of our senior Earth Sciences majors that are scheduled to graduate later this spring. This high participation rate speaks to the general desire of our students to prepare themselves as much as possible for successful geoscience careers.

Of the 18 students enrolled in the course, 15 signed up to take the ASBOG Fundamentals of Geology Exam. We just received the exam results and were excited to learn that 12 students (80%) successfully passed the test and are now officially licensed as "Geologists-in-Training." The pass rate at the national level is only 65%, so our Minnesota students appear to be a step ahead of the rest.

All of the students are also signed up to complete their 40-hour HAZWOPER certification later this month. Thus, our students will be OSHA-certified and will be able to step into groundwater-related internships and jobs as soon as possible.

The students were also able to interact with a wide range of geoscience professionals who came to class to share their experiences so that students could better understand how they may be able to use their degrees. Guests included Keith Rapp (Pinnacle Engineering), Louis Rudnicki (Tiller Corporation), Bethany Edwards (Barr Engineering), Alexandra Prasch (Terracon), Mike Zazzera (Vieau Associates), Carrie Jennings (Freshwater Society), Harvey Thorlfson (Minnesota Geological Survey), and the late Gil Gabanski (Hennepin County).

In summary, the course appears to be a success, and I am deeply grateful to the Minnesota Ground Water Association Foundation for the helping contribute to the professional preparation of these students.

Warmest regards and thank you again!

Joshua M. Feinberg
Director of Undergraduate Studies
Associate Professor of Geology and Geophysics

MGWAF BOARD MINUTES

MGWA Foundation Scholarship Winners

The April 2017 MGWA Conference included a presentation of the annual scholarships. This is the fifth year that the scholarships have been awarded. The MGWA Foundation decided to award one \$1,000 graduate scholarship and one \$1,000 undergraduate scholarship. There were three candidates for the graduate scholarship and four candidates for the undergraduate scholarship this year. There were a number of very excellent applicants and it was a difficult decision for the scholarship committee of Cathy Villa-Horns, Stephanie Souter, Jim Lundy, Lanya Ross and Joy Loughry.

Aimee Zack is a graduate student at the University of Minnesota – Twin Cities. She is pursuing a Master of Science degree in Hydrology and expects to graduate in 2018. She is a non-traditional graduate student who works full time for Canadian Pacific Railway, where she manages several environmental remediation systems. She plans to use the knowledge she gains in her master's program to further her understanding of groundwater analytical data and groundwater research, as it applies to her work. She will use the funds from her scholarship for tuition and to attend a weekend field trip for her hydrogeology course.

Abby Shea is an undergraduate student at Lawrence University in Appleton, Wisconsin. She is pursuing her Bachelor of Arts in Geology and expects to graduate in June 2017. She previously worked as a summer intern at the Minnesota Department of Health. Abby will use the scholarship funds to offset the costs of her Senior Capstone project, which will include analyzing water samples for strontium in Manitowac County, Wisconsin. She plans to further her education by seeking a master's degree in Hydrogeology in the near future.

Congratulations to Aimee and Abby!

by MGWA Newsletter Team



Aimee Zack



Abby Shea

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, February 21, 2017

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

Location: Fresh Grounds Café, 1362 West 7th Street, St. Paul, MN
 Attendance: Evan Christianson, President; Ellen Considine, President-Elect; Ole Olmanson, Past-President; Anneka Munsell, Treasurer; Andrew Retzler, Secretary; Jeanette Leete, WRI; Sean Hunt, WRI
 Past Minutes: Approved.
 New Meeting Time: Due to future scheduling conflicts with the meeting room at Fresh Grounds Café, Board meetings will now take place the 3rd Tuesday of every month.
 Newsletter: Christianson plans to give Ronning the President's update for the upcoming newsletter this week.
 Web Page: Olmanson has transferred the old website content to the new system, and has sent Hunt an offline link to the new site to review. There are several new features with the updated website that we will benefit from (i.e., an enhanced member directory system and a rolling announcements feed on the homepage). Olmanson asked whether there are other options out there for an online shopping system with the website. Leete and Hunt have found the current shopping cart easy-to-use with our Quicken payment system. Olmanson and Hunt will continue to review the draft version of the new website, with a possible live launch at the end of February.
 Treasury: Munsell discussed the Treasury Report with the Board. The total income for the period of January 1, 2017 to February 20, 2017 is \$14,185.98; total assets for this period are \$113,351.42. Net income for this period is \$10,965.63. Leete reminded the Board that the \$40,000 still has not been transferred to the MGWAF account.
 WRI Report: Hunt updated the Board on membership numbers—7 students, 32 retirees, 327 professionals, and 26 sustaining members. Leete is compiling information for taxes.
 MGWAF Report: No updates.
 Old Business: Spring Conference: Christianson already has several agencies lined up for talks and is still working to fill one or two more. Christianson and Considine discussed having the DNR talk about the Threshold Report. Christianson is in contact with Todd Petersen as a possible speaker, and still plans to have a panel discussion at the conference. Christianson is looking to add in more non-industry professionals to describe some of their datasets. Christianson discussed the possibility of integrating lightning talks at the conference, and will look further into this to see if there is interest. A presentation by the state climatologist was also discussed amongst the Board. The Board discussed conference registration prices and possible changes that could be made. No formal changes have been made as of now.
 Education Committee: The Education white paper has been laid out, but is still awaiting some final copy editing changes before it is released to the public. The Board discussed checking for interest from membership as to reviving and participating in an Education Committee at the Spring Conference before trying to schedule a more formal meeting to discuss the idea further.
 Social Events: Olmanson will schedule a social hour for those interested in the Mankato area directly following his presentation at Minnesota State University – Mankato.

Meeting Date: Tuesday, March 21, 2017

Location: Fresh Grounds Café, 1362 West 7th Street, St. Paul, MN
 Attendance: Evan Christianson, President; Ellen Considine, President-Elect; Anneka Munsell, Treasurer; Andrew Retzler, Secretary; Jeanette Leete, WRI; Sean Hunt, WRI; Emily Berquist, MDH/MGWA Social Coordinator
 Past Minutes: Approved with revisions.
 Newsletter: Hunt has a draft newsletter ready, with an expected publication date by the end of March. A few updates to newsletter photos and text are still needed.
 Web Page: Hunt and Olmanson have implemented the new web page and it is live. Munsell mentioned that she had trouble accessing some of the old newsletters. Hunt will look into this and recommended the Board check for any other web page errors in the meantime. The Groundwater Education Gap White Paper has been added to the web page. Hunt will send out a notification to membership.
 Treasury: Munsell discussed the Treasury Report with the Board. The total income for the period of January 1, 2017 to March 20, 2017 is \$15,915.98; total assets for this period are \$114,710.13. Net income for this period is \$9,909.34. Leete plans to discuss the transfer of funds to MGWAF in two months.
 WRI Report: Hunt updated the Board on membership numbers—7 students, 33 retirees, 344 professionals, and 33 sustaining members. Hunt mailed out a second round of paper membership renewals. The announcement of the MGWA Spring Conference has been sent out to membership, and details have been added to the web page. Hunt mentioned that some online registrations have already taken place. Hunt and Leete discussed updates to the MGWA templates for brochures and forms. Member brochures have been redesigned.
 MGWAF Report: Hunt updated the Board on MGWAF events. Two grant requests have come in

MGWA BOARD MINUTES

MGWA Minutes, cont.

- and the MGWAF are planning on two scholarships this year, an undergraduate and graduate one. These scholarships should be worked into the upcoming Spring Conference.
- Old Business: Spring Conference: Christianson shared the speaker lineup and draft schedule with the Board. The Board discussed the idea of lightning talks, with the conclusion to implement them at this conference and adjust the schedule depending on lightning talk speaker interest. Christianson asked about documentation for continuing education credits, and how the MGWA has handled this in the past. Christianson will put together a lightning talks email to send out to membership and to forward along to various post-secondary schools. The Mentor-Student lunch will occur again at this conference. Christianson discussed plans to implement the Pigeonhole software throughout the conference, mainly geared towards the Q&A portion of the panel discussion. The Board agrees to try and implement this, and to possibly test run the free portion of the software at the next Board meeting. Christianson will confirm the costs and update the Board. The Board discussed ways to streamline the registration and check-in process at the conference. The nametags and folders will now be combined during check-in. Hunt would like to have speaker bios and talk summaries/abstracts by April 15th. Christianson has had one student poster registration for the conference so far. The Board plans to meet at 6pm on April 25th at Hunt's residence to help organize for the conference.
- New Business: MGWA Computer/Software: Leete informed the Board that the current MGWA laptop is having several hardware problems. The Board agreed on plans to have the hard drive wiped and to buy a new laptop, plus any necessary software. The Board plans to keep the older laptop for now, and may possibly donate it to an existing member in the future.
- Social Updates: Berquist has an offline Facebook Page for MGWA set-up, and asked the Board for any further ideas and recommendations for the page. Berquist plans to use the page to post news articles and other interesting stories regarding Minnesota groundwater, as well as posting MGWA events such as conferences and social hours. Considine motioned to approve making the Facebook Page live. Munsell seconded—motion passed. The new MGWA Facebook Page will be announced at the conference. Berquist plans to schedule the next social hour event at Groveland Tap in April prior to the conference, and will also try and schedule brief visits to the student geology clubs and organizations in the area to talk about our organization and advertise some of our events.
- Upcoming Topics: The Board would still like to meet with the Education White Paper group to discuss the idea of reviving the Education Committee. The Board also discussed ways in which to better implement new White Paper topics, and the timeline that should be followed. Christianson would like to try and have a new White Paper idea ready by the end of this summer for a Fall Conference announcement. Christianson also plans to meet with the Drain Tile White Paper group to hear about progress and to help push their paper out for the Fall Conference. The Board plans to coordinate a meeting with the MGWAF Board in the future to learn more about their set-up and to collaborate more.
- Meeting Date: Tuesday, April 18, 2017**
- Location: Fresh Grounds Café, 1362 West 7th Street, St. Paul, MN
- Attendance: Evan Christianson, President; Ellen Considine, President-Elect; Ole Olmanson, Past President; Anneka Munsell, Treasurer; Andrew Retzler, Secretary; Jeanette Leete, WRI; Sean Hunt, WRI; Tedd Ronning, Newsletter Editor; Emily Berquist, MDH/MGWA Social Coordinator
- Past Minutes: Approved
- Newsletter: Ronning and others are working on the June newsletter. Leete would like to add a story to the upcoming newsletter about the new UMN Gibson Chair and the story behind the Gibson name.
- Web Page: Hunt is continuing to clean-up the new website. Several emails were recently sent out to membership, including notices for: field scholarships, membership renewal, Gil Gabanski's passing, and availability of the latest White Paper. Olmanson combed through the links of the past newsletters to make sure all broken links have been corrected. Olmanson suggested adding a 'Register Now' button, or something similar, placed in a more visible location on our website to help better direct site visitors to conference registration. The Board agrees this would be very useful.
- Treasury: Munsell discussed the Treasury Report with the Board. The total income for the period of January 1, 2017 to April 18, 2017 is \$49,840.98; total assets for this period are \$137,595.29. Net income for this period is \$31,327.13. Munsell pointed out this is about a \$22,000 increase in net income from last month, owing to the conference. Currently there are 210 conference registrants.
- WRI Report: Hunt updated the Board on membership numbers—23 students, 35 retirees, 411 professionals, and 37 sustaining members. The Board discussed membership ideas and trends, with ideas on how to analyze the numbers further in the future.

MGWA 2017 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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MGWA BOARD MINUTES

MGWAF Report:

The Board also briefly discussed outreach ideas to boost our membership. Hunt mentioned 3 exhibitors are signed up for the conference. A new Dell laptop was purchased to replace the older MGWA laptop that was having hardware issues. Olmanson attended the last meeting. They will be raising the scholarship amounts in the future, a request for funding for the Children's Water Festival was approved, and a request for funding for the UMN-Twin Cities Department of Earth Sciences was approved for HAZWOPER training. The latest round of MGWAF student scholarships have been awarded. The MGWAF would like to obtain funds from MGWA to raise their account to \$50,000 and transfer to the Wells Fargo investment account. The remainder of the money from MGWA will go to the scholarship fund. Olmanson moves that we distribute previously allocated funds in the manner in which MGWAF requests. Munsell seconds—motion passed.

Old Business:

Spring Conference: Christianson will be finalizing the speaker abstracts within the next day or two. Christianson handed out the speaker and conference schedule. Four to five lightning talks are scheduled to take part, with four to five posters too. The Board live-tested the Pigeonhole web-based app with positive results. Leete made a request to Pigeonhole for a reduced price as a non-profit organization. The Board plans to move ahead with using Pigeonhole at the conference, and Christianson will set-up the Pigeonhole page a day before the conference. The Board plans to use this for the post-conference survey.

Education Committee: Christianson would like to set up a meeting to discuss moving forward on establishing an Education Committee again. Considine suggests meeting with the Education White Paper liaisons first to get an initial sense of their ideas. Retzler suggested using the Pigeonhole app to get feedback on who may be interested in participating in said committee.

New Business:

Social Events: MGWA will have a Social Hour tonight at Groveland Tap. Berquist contacted several schools and made signs for tonight's event. Berquist passed along contacts about the MGWA Education White Paper to a St. Thomas Geology Professor who is interested in tailoring their lessons to better suit the regional hydrogeology community. Berquist updated the Board about MGWA's Facebook page.

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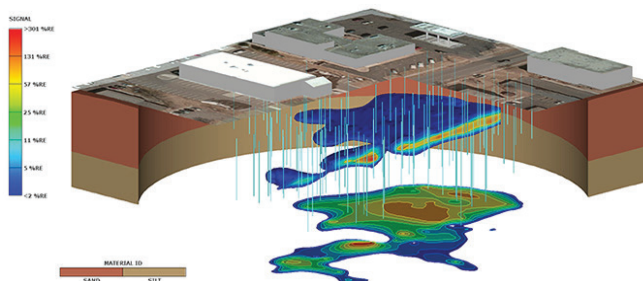
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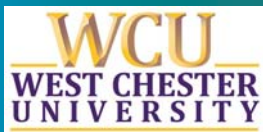
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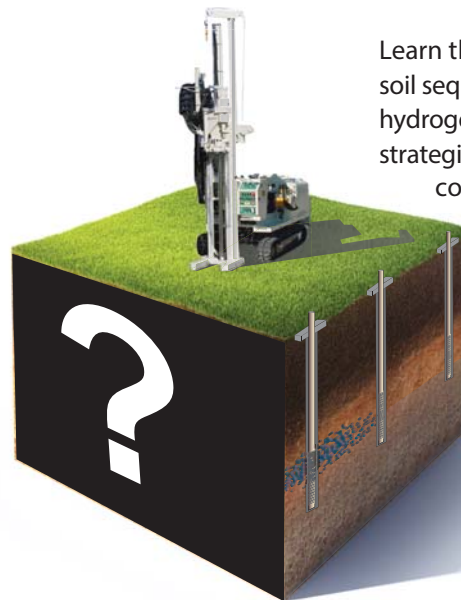
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