MINNESOTA GIS/LIS CONSORTIUM
TWENTY-EIGHTH ANNUAL CONFERENCE & WORKSHOPS

DULUTH
MINNESOTA
OCTOBER 3-5, 2018
DULUTH ENTERTAINMENT & CONVENTION CENTER

“Bridging Boundaries”
28TH ANNUAL CONFERENCE & WORKSHOPS
MINNESOTA GIS/LIS CONSORTIUM

46° 46' 52.8"N
92° 05' 53.7"W

350 Harbor Dr
Duluth, MN
55802

46.7815880
-92.098226
CONFERENCE HIGHLIGHTS

This program announces the 28th Annual Minnesota GIS/LIS Consortium Conference and Workshops, “Bridging Boundaries,” October 3-5, 2018 in Duluth, Minnesota. The event will feature local keynote speakers, 17 instructor-led workshops, technical sessions, panel discussions, technology demonstrations and project updates. All are geared toward students and professionals interested in learning more about geographic information systems and land information systems technology in Minnesota and beyond.

Highlights include:

• 17 instructor-led workshops that feature a variety of topics.
• Esri Hands on Lab: The HOLL (Hands-On Learning Lab) is a training resource provided and developed by Esri Training Services. The lab is an excellent way to introduce ArcGIS® software users to a variety of Esri® solutions and training opportunities while learning to use Esri software.
• GIS instruction and workshops for K-12 teachers, followed by a Networking event that will bring GIS professionals and teachers together for a chance to become Geo-Mentors.
• A vendor reception featuring complimentary hors d’oeuvres, a cash bar and a variety of prizes.
• Conference session and discussion groupings to reflect the geographic and land information systems industry including: technical, asset management, custom applications, web maps, data collection, data visualization, demographics, lightning presentations, parcels, process improvement, project management, Python and much more.
• The student assistantship program that allows students to attend the conference in exchange for their assistance throughout the conference.
• The student scholarship competition for undergraduate and graduate student competitors.
• Networking opportunities, including entertainment events and the Thursday evening event.
• The Geolounge will be available to sit back, relax, check email and network with other attendees.

Please join us and spread the word about Bridging Boundaries. The 2018 Minnesota GIS/LIS Conference and Workshops will be packed with quality learning, networking and socializing experiences!
ABOUT THE MN GIS/LIS CONSORTIUM

The Minnesota GIS/LIS Consortium is a forum for communicating information to and improving cooperation among those interested in Geographic Information Systems (GIS) and Land Information Systems (LIS) in the state of Minnesota. Members include GIS users in local, state and federal government agencies, educational institutions, business and industry. Membership is FREE. The Consortium hosts a statewide conference each year and establishes committees that are responsible for specific GIS/LIS-related issues in Minnesota. Opportunities to participate in Consortium activities are available through volunteer work with committees, conferences and workshops. For more information on current Consortium activities and volunteer opportunities, please visit our website, www.mngislis.org, or stop by our booth during the conference.

28TH MN GIS/LIS ANNUAL CONFERENCE AND WORKSHOPS

To register for the conference, please visit our conference site at www.mngislis.org/conference and click on the “Registration” link. We accept payment by credit card (Visa and MasterCard), purchase order and check.

For Payment by Credit Card:
The registration process will allow you to enter credit card information directly into a secure system for payment. Both Visa and MasterCard are accepted.

For Payment by Purchase Order or Check:
Alternatively, you can include a purchase order number with the registration or pay by check separately. Upon completion of the registration process, an invoice will be prepared based on your registration selections. For purchase order registrations, please provide a copy of this invoice to your accounts payable department. Also include a copy of the registration invoice with your check or signed purchase order (made payable to MN GIS/LIS) and mail it to:

MN GIS/LIS Consortium
1000 Westgate Drive, Suite 252 • St. Paul, MN 55114

Please note: Registrations based on purchase orders are considered complete when the purchase order number is received.

REGISTRATION FEES WILL BE AS FOLLOWS:

**Half-day Workshops**
- Payment received by Sept. 7 ................. $135
- Payment received after Sept. 7 .......... $170
- Payment On-Site ........................................ $180

**Conference**
- Payment received by Sept. 7 ................. $275
- Payment received after Sept. 7 ........... $310
- Payment On-Site ........................................ $330

**Presenter**
- Payment received by Sept. 7 ................. $230
- Payment received after Sept. 7 ........... $310
- Payment On-Site ........................................ $330

**Student**
- Payment received anytime .................. $45

KEY DATES:

• Online registration opens 7/26
• Hotel Conference rates end 9/2
• Early registration ends 9/7
• Online registration closes 9/28
• Pre-Conference Workshops: 10/3
• Conference days: 10/4 and 10/5

Refunds:
Full refunds (less $40 administrative charge) will be issued with a written cancellation notice received by September 24, 2018. To send a cancellation notification via fax to the MN GIS/LIS Consortium, please use 651-290-2266. Notifications received after September 24, 2018 will NOT receive a refund, nor will no-shows at the conference.

Problems with Registration:
If you encounter problems registering for this event, please contact us at conference@mngislis.org or call 651-203-7242.

On-site registration will be available at the conference.
## 2018 GIS/LIS CONFERENCE AT-A-GLANCE

### TUESDAY, OCTOBER 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 9:30 p.m.</td>
<td>Social Networking – Hoops Brewing</td>
</tr>
</tbody>
</table>

### WEDNESDAY, OCTOBER 3

<table>
<thead>
<tr>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>8:00 a.m.</td>
<td>Conference Registration Desk Open; Light Refreshments in Lobby</td>
</tr>
<tr>
<td>9:00 – 10:30 a.m.</td>
<td>Half-Day Morning Workshops</td>
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<tr>
<td></td>
<td><strong>Workshops</strong></td>
</tr>
<tr>
<td>WK001</td>
<td>Introduction to Collector for ArcGIS</td>
</tr>
<tr>
<td>WK002</td>
<td>Esri Mobile Hands-On Workshop</td>
</tr>
<tr>
<td>WK003</td>
<td>Story Maps 101</td>
</tr>
<tr>
<td>WK004</td>
<td>UAS and GIS: Enabling Drone Tech. for the Geospatial Professional</td>
</tr>
<tr>
<td>WK005</td>
<td>Exploring the New Utility Network using ArcGIS Pro</td>
</tr>
<tr>
<td>WK006</td>
<td>Expand your Python GIS capabilities</td>
</tr>
<tr>
<td>WK007</td>
<td>Introduction to Remote Sensing in a QGIS Environment</td>
</tr>
<tr>
<td>WK008</td>
<td>Parcel Fabric 101 - An Introduction to the Parcel Fabric</td>
</tr>
<tr>
<td></td>
<td><strong>Hands-On Learning Lab – Board Room</strong></td>
</tr>
<tr>
<td>10:30 a.m.</td>
<td>Refreshment Break</td>
</tr>
<tr>
<td>10:45 a.m. – 12:00 p.m.</td>
<td>Half-Day Morning Workshops Continued</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td>Lunch and Keynote, Matt Winbiger &amp; Gabe Zago, Lake Superior Ballroom</td>
</tr>
<tr>
<td>1:30 – 3:00 p.m.</td>
<td>Half-Day Afternoon Workshops</td>
</tr>
<tr>
<td>WK009</td>
<td>Leaflet: Make a Web Map in a Snap</td>
</tr>
<tr>
<td>WK010</td>
<td>Intermediate Collector for ArcGIS Concepts</td>
</tr>
<tr>
<td>WK011</td>
<td>An Introduction to QGIS 3</td>
</tr>
<tr>
<td>WK012</td>
<td>Introduction to ArcGIS Online and more</td>
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<td>WK013</td>
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<td>WK016</td>
<td>Cartographic Skillsets in ArcGIS Pro</td>
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<tr>
<td>WK017</td>
<td>Parcel Editing with ArcGIS Pro (Non-Parcel Fabric)</td>
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<tbody>
<tr>
<td>2:00 – 5:00 p.m.</td>
<td>Exhibit Hall Open, Edmund Fitzgerald Exhibit Hall</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Refreshment Break</td>
</tr>
<tr>
<td>3:15 – 4:30 p.m.</td>
<td>Half-Day Afternoon Workshops Continued</td>
</tr>
<tr>
<td>4:30 – 5:30 p.m.</td>
<td>Wednesday Welcome Reception</td>
</tr>
<tr>
<td>7:00 – 10:00 p.m.</td>
<td>Social Event with NSGIC, Great Lakes Aquarium</td>
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<tbody>
<tr>
<td>7:30 a.m.</td>
<td>Conference Registration Desk Open; Light Refreshments in Lobby</td>
</tr>
<tr>
<td>7:30 a.m.</td>
<td>Conference Mentor Meet and Greet at the Geolounge</td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>Conference Welcome, Lake Superior Ballroom</td>
</tr>
<tr>
<td>8:30 a.m.</td>
<td>Opening Keynote Session, Caroline Torkildson</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Morning Break: Exhibit Hall, Geolounge, Poster Gallery, and Web-Maps Open</td>
</tr>
<tr>
<td>10:30 a.m. – Noon</td>
<td>Concurrent sessions:</td>
</tr>
</tbody>
</table>

**Sessions**

- **SESSION 1**: Project Management
- **SESSION 2**: 3D Geomatics Committee Update
- **SESSION 3**: Cadastral
- **SESSION 4**: Field Data Collection
- **SESSION 5**: Teaching & Learning
- **SESSION 6**: Architecture/Infrastructure
- **SESSION 7**: Undergrad Student Competition

**Hands-On Learning Lab – Board Room**

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### Noon
1:30 – 3:00 p.m.
- Awards Luncheon
- Concurrent sessions:

<table>
<thead>
<tr>
<th>SESSION 8</th>
<th>SESSION 9</th>
<th>SESSION 10</th>
<th>SESSION 11</th>
<th>SESSION 12</th>
<th>SESSION 13</th>
<th>SESSION 14</th>
<th>SESSION 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightning</td>
<td>Story Maps</td>
<td>Forestry</td>
<td>Methods &amp; Tools</td>
<td>Collaboration</td>
<td>Asset &amp; Work Management</td>
<td>Undergrad Student Competition</td>
<td>Graduate Student Competition</td>
</tr>
</tbody>
</table>

#### Esri Hands-On Learning Lab – Board Room
3:00 p.m.
- Afternoon Break
3:30 – 5:00 p.m.
- Last Call: Poster Gallery; People’s Choice Vote
3:30 – 5:00 p.m.
- Concurrent Sessions:

<table>
<thead>
<tr>
<th>SESSION 16</th>
<th>SESSION 17</th>
<th>SESSION 18</th>
<th>SESSION 19</th>
<th>SESSION 20</th>
<th>SESSION 21</th>
<th>SESSION 22</th>
<th>SESSION 23</th>
<th>SESSION 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLSS Panel</td>
<td>Drones &amp; Imagery</td>
<td>Data/Metadata</td>
<td>Open Source &amp; Web Mapping</td>
<td>Survey123</td>
<td>Hydrology</td>
<td>Mapping Phenology</td>
<td>Job Panel</td>
<td>Esri Apps</td>
</tr>
</tbody>
</table>

#### Esri Hands-On Learning Lab – Board Room
5:00 – 7:00 p.m.
- Exhibitor Showcase in Edmund Fitzgerald Exhibit Hall
6:15 – 6:45 p.m.
- Exhibitor and GIS/LIS Raffle (must be present to win), Exhibit Hall
7:15 p.m.
- Thursday Night Social Event with NSGIC, Grandma’s Sports Garden

### FRIDAY, OCTOBER 5

6:15 a.m.
- 5k Fun Run/Walk
7:30 a.m.
- Conference Registration Desk Open; Light Refreshments in Lobby
8:00 a.m.
- Exhibit Hall Opens, Edmund Fitzgerald Exhibit Hall
8:30 – 10:00 a.m.
- Concurrent sessions:

<table>
<thead>
<tr>
<th>SESSION 25</th>
<th>SESSION 26</th>
<th>SESSION 27</th>
<th>SESSION 28</th>
<th>SESSION 29</th>
<th>SESSION 30</th>
<th>SESSION 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIS Leadership</td>
<td>Map Accessibility</td>
<td>Research Discussion</td>
<td>Natural Resources</td>
<td>Project Management 2</td>
<td>Utilities</td>
<td>Crowdsourcing</td>
</tr>
</tbody>
</table>

#### Esri Hands-On Learning Lab – Board Room
10:00 a.m.
- Morning Break; exhibit hall closes at Noon
10:30 a.m. – Noon
- Concurrent sessions:

<table>
<thead>
<tr>
<th>SESSION 32</th>
<th>SESSION 33</th>
<th>SESSION 34</th>
<th>SESSION 35</th>
<th>SESSION 36</th>
<th>SESSION 37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Maps Panel</td>
<td>Remote Sensing</td>
<td>Mobile GIS</td>
<td>Grab Bag 2</td>
<td>Transportation</td>
<td>Emergency Management &amp; Response</td>
</tr>
</tbody>
</table>

#### Esri Hands-On Learning Lab – Board Room
Noon
1:30 p.m.
- Lunch and Special Presentation: “Outdoor Activities of the North”
- MN GIS/LIS Annual Business Meeting – Gerry Sjerven, Board Chair
Wednesday, October 3
12:15 – 1:15 p.m.
The Evolution of Geospatial Thinking in School: How Students Investigating Place Has Changed
Matt Winbigler & Gabe Zago

From USGS quadrangles to squeaky metal globes to Rand McNally road maps to Google Earth and ArcGIS, how we let students explore the world has changed dramatically over time. One pattern that remains constant is that students love to find where they live on maps. Geospatial thinking usually starts with wondering where am I right now or where and who do I care about the most. Students have a strong sense of place and the best thinking and problem solving starts with their own surroundings, homes and communities. Advances in technology, teaching and learning has brought real data, content creation and digital sharing tools into the hands of students. How can educators and GIS professionals engage students in not only exploring their own community issues but also connecting issues, ideas and people on a global scale?

Matt Winbigler has been teaching middle school earth and life science in Cloquet for twelve years. As an outdoor educator in Alaska and Northern Minnesota, he has guided youth in exploring their environment. Through his work as a multidistrict leader, Matt provides geospatial learning opportunities to teachers. As a technology integration specialist, he moved Cloquet forward with the implementation of a 1:1 iPad teaching and learning initiative, which made ArcGIS and digital resources accessible to all students. Matt is a graduate of the University of Minnesota Duluth with a degree in teaching Earth and space science, geology and outdoor and environmental education. He holds a Masters degree in teaching natural science, outdoor and environmental education from Hamline University, where he was awarded the Teach Locally Think Globally Award in 2011. Matt is most excited about riding Duluth’s incredible mountain bike trails with his wife and two daughters.

Gabe Zago is an 8th grader at Cloquet Middle School who loves technology, maps and meteorology. He is an active leader in his school and a key member of the student council. Gabe is fearless when it comes to jumping in and exploring the world and people around him.

Thursday, October 4
8:30 – 9:30 a.m.
Reinventing My Life Through GIS
Caroline Torkildson

I will take you on a journey. Mine began when I went back to college to earn my M.S. in GIS at St. Mary’s University of Minnesota. Earning my degree helped me reinvent my life in my 40s and live the life I imagined. I will take you trekking in Nepal, to the top of Kilimanjaro, speaking on a cruise-ship off Patagonia, riding a camel in the Sahara Desert, and following in the footsteps of explorer Annie Peck in Europe and Peru.

Caroline ‘Siffy’ Torkildson is a geographer, cartographer, life-long star-gazer, author, and publisher for Sacred World Explorations. She taught environmental education in Madagascar while serving in the U.S. Peace Corps, worked at two science museums, for an international mapping firm, as a researcher for the U.S. Forest Service and U.S. Environmental Protection Agency, and taught an introduction to the history of women explorers at Southern Oregon College, as well as astronomy at the Eisenhower Observatory in Minnesota. She has published two travel anthologies, a travel guide book, as well as a travel-memoir and is working on a book about the adventurer, Annie Peck. Torkildson has published in Ripcord Adventure Journal, and Panorama: the Journal of Intelligent Travel, and has won a Traveler’s Tales Solas Award. Torkildson has B.A. and M.A. degrees in geography from Humboldt State University in California, as well as a M.S. in Geographic Information Science from St. Mary’s University of Minnesota. In her search for sacred landscapes and dark skies, Siffy has explored the Himalaya, Sahara, Madagascar, Europe, Alaska, Patagonia, and Peru. She is a member of the Society of Woman Geographers as well as the International Dark Sky Association.

Friday, October 5
12:45 – 1:30 p.m.
Outdoor Activities of the North
Sam Cook

Sam Cook joined the Duluth News Tribune in 1980 and retired in April 2018. He served as outdoors writer and also wrote a weekly column of general. He is now a freelance writer and continues to write a weekly column for the News Tribune. His outdoors stories and columns covered a wide range of topics. Depending upon the season, he might have written about deer hunting or blueberry picking, walleye fishing or an invasion of northern owls. He has covered dog-sledding and ski expeditions to the North Pole, paddled rivers to Hudson Bay, paddled an inflatable kayak past grizzlies and caribou in Alaska’s Brooks Range and has traveled by dog-sled across Canada’s Great Slave Lake. He is perhaps happiest paddling in the canoe country and hunting pheasants behind his yellow Labs. Cook lives in Duluth with his wife, Phyllis.
The MN GIS/LIS Consortium Conference Mentor Program is in its 9th year! This is an opportunity for students and young professionals to connect with experienced professionals and potential employers at the conference. The mentor program brings networking to a personal level and allows the mentees to gain insight on conference navigation, career advice, resume review, and professional stories through conversation with an assigned mentor. Coordinated and meaningful introductions between young GIS professionals and potential employers can have a real impact on retaining Minnesota graduates within the state.

From a mentor: “I always learn something new from the mentees, and it is a rewarding experience.”

From a mentee: “This was my first MN GIS/LIS conference and having a mentor willing to introduce you to his/her colleagues is a tremendous asset while networking.”

The mentor program involves a small commitment of time on Thursday of the conference. Mentors first meet with mentees in the Geolounge (Lake Superior Ballroom) at 7:30am on Thursday for ½ hour. Then we ask that Mentors and Mentees sit together (along with the Mentor’s colleagues) at the welcome/plenary session and again at the Thursday lunch. We provide some optional conversation starters to aid in discussion. What you do beyond this initial networking is up to you both to decide!

For more information or to sign up, please contact Stacey Stark: slstark@d.umn.edu

The Consortium’s scholarship program recognizes graduate, undergraduate, and community college students for their excellence in GIS studies. The annual conference provides an opportunity to highlight their achievements and showcase their work through a scholarship competition. Each year the scholarship program invites qualifying schools to name one Student Scholar per degree program (undergraduate / graduate / community college).

Student Scholars receive the following:

- A free registration to the annual MN GIS/LIS conference
- A certificate recognizing the student as a GIS/LIS Student Scholar
- An invitation to participate in the Student Scholarship Competition

The Student Scholarship Competition consists of three separate events:

- Community College Poster Presentation Competition
- Undergraduate Oral Project Presentation Competition
- Graduate Formal Paper and Oral Presentation Competition

The 2018 student scholars (as of press time) are:

**GRADUATE GIS PROGRAMS**
- Megan Sisko – University of Minnesota, Twin Cities
- Tucker Robeson – St. Mary’s University
- Jessica Meyer – St. Cloud State University
- Devon Libby – Minnesota State University, Mankato

**UNDERGRADUATE GIS PROGRAMS**
- Garrett Benz – University of Minnesota, Duluth
- Alice Ready – University of St. Thomas
- Wing Yi (Pinki) Wong – University of Minnesota, Twin Cities
- Katie Jolly – Macalester College
- Soren Peterson – South Central College
- Greta Dupsaff – Gustavus Adolphus College
- Asami Minei – Minnesota State University, Moorhead
- Arman Bajracharya – St. Cloud State University
- Riley Finnegan – Minnesota State University, Mankato
- Crystal Sucher – Bemidji State University

**COMMUNITY COLLEGE GIS PROGRAMS**
- Alicia Hallfrisch – Fon du Lac Community College
- Donna Speath – Itasca Community College

Thank you to everyone who has helped shape the 28th Annual Conference into a success — and a special thank you to the Conference Planning Committee; without their help, this event would not be possible.

Aaron Menza
Brandon Keinath
Brian Mustonen
Carolyn Adams
Charlie Moore
Darryl Holman
David Lonetti
Drew Lundgren
Eric Kopras
Geoff Maas
Gerry Sjerven
Jacob Monson
Jake Rodel
Jane Mueller
Jared Hovi
Jason Menard
Jenny Miller
Jon Schwichtenberg
Josh Gumm
Kim Sundeen
Kitty Hurley
Kristi Nixon
Leah Sperduto
Mark Kotz
Michelle Trager
Mike Dolbow
Molly Shoberg
Norman Anderson
Peter Wiringa
Ryan Bergstrom
Ryan Stovern
Scott Freburg
Stacey Stark
Stephanie Bayum
Tami Maddio
Tanya Mayer
Zeb Thomas

A big thank you to the staff at Ewald Consulting, who skillfully help manage the MN GIS/LIS Consortium and this conference.
ENTERTAINMENT

MN GIS/LIS CONFERENCE DISCOUNT CARDS

Several area businesses have offered discounts to conference attendees who use their discount cards while in Duluth. Attendees will receive the card at the time you pick up your name badge from the registration desk. Please visit these businesses during your visit to Duluth and take advantage of the great discounts they are offering.

TUESDAY

SOCIAL NETWORKING
7:00 - 9:30 p.m. | Hoops Brewing Company
325 S Lake Ave, Duluth, MN 55802

Once you’ve arrived in town, join your colleagues for networking, refreshments, and appetizers at Hoops Brewing Company, conveniently located within walking distance of the DECC and the Canal Park hotels. Tours of the craft brewery production will also be given. They have a variety of delicious beer selections as well as non-alcoholic beverages to choose from.

WEDNESDAY

WELCOME RECEPTION
4:30 p.m. | Geolounge/Lake Superior Ballroom

SOCIAL NETWORKING
7:00 - 10:00 p.m. | Great Lakes Aquarium
353 Harbor Dr, Duluth, MN 55802

Whether you’re just arriving to Duluth or enjoying time after a long day of workshops, stop by the Welcome Reception in the Lake Superior Ballroom for some light refreshments starting at 4:30 p.m. Later, join us for the social event at the Great Lakes Aquarium, hosted by the folks from the National States Geographic Information Council (NSGIC). A cash bar will be available and food will be provided.

THURSDAY

EXHIBITOR RECEPTION
5:00 - 7:00 p.m. | Edmund Fitzgerald Exhibit Hall - DECC City Side

Visit the exhibition hall to have some appetizers and meet with exhibitors who make the conference possible. Stop by each booth to view and participate in any special vendor prize drawings, and preview the prizes donated for the Education Raffle. A cash bar will also be available.

EDUCATION FUND RAFFLE & DOOR PRIZES
6:15 p.m. | Edmund Fitzgerald Exhibit Hall - DECC City Side

Education Fund: Prizes are donated by many of our exhibitors and individuals with proceeds going toward the Minnesota GIS/LIS Consortium Education Fund. You may choose which prize drawing(s) to enter. Tickets can be purchased at the MN GIS/LIS booth at $1/ticket. Enter to win a specific prize by dropping tickets in the bin at the donating vendor’s booth. You do not need to be present at the drawing to win these prizes.

Door Prizes: Door prize drawings for additional Minnesota GIS/LIS Consortium purchased prizes will be conducted during breaks Thursday and Friday as well as the conclusion of the event. You may drop a colored ticket (distributed with your name badge) into the designated bin at the MN GIS/LIS booth. You must be present to win these prizes.

THURSDAY NIGHT SOCIAL EVENT
7:15 p.m. | Grandma’s Sports Garden
425 S Lake Ave, Duluth, MN 55802

Later in the evening be sure to join us in welcoming NSGIC to our Thursday night social at Grandma’s Sports Garden. There will be a wide variety of local beverages on hand along with hors d’oeuvres, games, raffle prizes, and more to benefit the MN GIS/LIS Education Fund.

K-12 TEACHER EVENT

Back by popular demand:

The MN GIS/LIS Consortium Planning Committee and the Minnesota Department of Education will sponsor a full-day of hands-on GIS instruction for K-12 teachers. This will happen the same day as the conference workshops on Wednesday, October 3. Teachers will get a great day of instruction, free lunch with YOU and other GIS professionals attending workshops and six hours of continuing education credits (CEUs). If you are interested in K-12 geo-mentoring, there will be an opportunity for you to help. Contact Scott Freburg or any GIS/LIS Board member for more information.
PRE-CONFERENCE WORKSHOPS

Workshop check-in begins at 8:00 am Wednesday morning where refreshments will be provided. Lunch will be provided at noon. All data and materials for the workshops will be provided by the instructors.

All hands-on workshops will be Bring Your Own Laptop and some hands-on workshops are Bring Your Own Mobile Device. If you would like to attend one of these workshops, you will need to have a laptop that you can bring to the workshop. Instructors will reach out to registered participants prior to the workshop if there are any additional materials or software requirements necessary.

AM WORKSHOPS

WK001: Introduction to Collector for ArcGIS

Presenters: Chris Pouliot & Mike Tronrud, MN.IT @ DNR
Audience: Beginner
Prerequisite Skills and Requirements: Working knowledge of ArcMap.
Format: Hands-On
Hardware Required: Laptop & a Mobile Device. Laptop - Windows Mobile Device - Android, iOS, Windows 10
Software Required: ArcMap & Mobile Applications (Explorer, Collector, Survey123, etc.) It is expected that the user will bring: • A laptop with Arcmap 10.2+ installed • A mobile device (Android, iOS, or Windows 10) with ArcGIS Collector installed.

Description: Curious about how to configure an ArcGIS Collector app? This course will walk you through the necessary steps, from beginning to end. In 3 hours, you will learn how to take a paper data entry form and turn it into a user-friendly mobile data collection app using ArcGIS Online, a File Geodatabase, and a smart phone or tablet. We will spend time discussing, developing and testing our end product: a Collector for ArcGIS application. Familiarity with geodatabase design and global positioning systems would be beneficial but not required. In addition to the noted hardware requirements for this class, please bring a mobile phone or tablet if possible (cellular connectivity is not required).

WK002: Esri Mobile Hands-On Workshop

Presenter: Mitchell Winiecki, Esri
Audience: Intermediate
Prerequisite Skills and Requirements: Experience with Esri desktop.
Format: Esri Mobile Hands-On Workshop
Hardware Required: Laptop & a Mobile Device
Software Required: ArcMap, ArcGIS Online Organizational Account, Survey123, Mobile Applications (Explorer, Collector, Survey123, etc.)

Description: This workshop will focus on several Mobile Solutions that Esri offers, including Collector, Survey123, Workforce and Operations Dashboard. In addition to hands-on activities, there will be an extensive discussion of field mobility capabilities and workflows. What you learn in this workshop will go a long way toward immediately improving your field operations. Attendees are encouraged to bring their own device (i.e. laptops, notebooks, tablets, phones, iPads) to be able to develop a completed Workforce application. The integration with Navigator will also be discussed.

WK003: Story Maps 101

Presenters: John Nerge, City of Brooklyn Park
Audience: Beginner
Prerequisite Skills and Requirements: Some ArcGIS Online experience wouldn’t hurt, but it’s not required
Format: Hands-On
Hardware Required: Laptop
Software Required: ArcGIS Online public or organizational (level 2) account

Description: In this workshop, we’ll cover the basics of what story maps are and how you can use them to tell powerful stories with your data. We’ll talk about the different story map templates, how to pick the right one for your situation, and what kinds of supporting information you’ll need to make one. Along with covering the concepts, you’ll actually start building some story maps during the workshop! Whether you’re brand new to story maps or are looking to take your storytelling skills to the next level, this workshop is for you.

WK004: UAS and GIS: Enabling Drone Technology for the Geospatial Professional

Presenters: Mel Philbrook, Frontier Precision
Audience: Beginner
Prerequisite Skills and Requirements: None
Format: Lecture & Hands-On
Hardware Required: Laptop, most PC’s/Macs will be able to use this software.
Software Required: ESRI Drone2Map, Pix4D

Description: The emerging technology of Unmanned Aircraft Systems (UAS) is enabling GIS professionals to acquire high quality aerial data of project sites in a timely fashion. The availability of lower cost drones, high-quality lightweight cameras, specialized sensors, and more user-friendly software is making it easier to deploy the technology and take advantage of the benefits. Attend this workshop and learn more about the UAS industry, using different types of drones for work, corresponding FAA regulations, and software such as Esri Drone2Map and Pix4D Mapper for creating 2D and 3D data in a GIS environment. See firsthand what the data deliverables may consist of and how the data are used in mapping applications.
**WK005: Exploring the New Utility Network using ArcGIS Pro**

**Presenters:** Kim Sundeen, Lake Superior Consulting  
**Audience:** Intermediate  
**Prerequisite Skills and Requirements:** Some knowledge of ArcGIS Pro  
**Format:** Lecture & Hands-On  
**Hardware Required:** Laptop  
**Software Required:** ArcGIS Pro 2.1

**Description:** The new Esri Utility Network Management extension to ArcGIS Enterprise is the next generation and replacement for the existing geometric network technology. In this workshop, we'll overview the basics of using ArcGIS Pro and what the Utility Network is all about for electric, gas, and water networks. Digging in a little deeper, you’ll learn about how the geometric network and tools are replaced in Pro and in the Utility Network tools. The first part of the workshop is lecture-style focused on understanding the architecture setup required for implementing the Utility Network, understanding the topology rules, asset groups, asset types, subnetworks, and using ArcGIS Pro to navigate the Utility Network. The last half is a hands-on section for you to test out the Utility Network, tracing, and tools of your choosing (electric, natural gas, or water) in a virtual environment. We’ll practice tracing, cleaning up “dirty” areas, and running geoprocessing tools.

**WK006: Expand your Python GIS capabilities**

**Presenters:** Zeb Thomas, MN Department of Natural Resources  
**Audience:** Intermediate  
**Prerequisite Skills and Requirements:** Some Python scripting experience  
**Format:** Hands-On  
**Hardware Required:** Laptop: Laptop with Windows 7+  
**Software Required:** ArcMap, Python & GDAL. Instructions to install GDAL and Python bindings will be sent out to registered students 1 week before the workshop.

**Description:** This workshop is designed for GIS professionals with some Python experience who want to expand their capabilities and improve their scripting efficiency. It will introduce a number of strategies for solving GIS problems using Python, with accompanying exercises and numerous scripting examples. Topics covered will include common mistakes, opportunities for efficiency improvements, organizing your scripts for code reuse, and introductions to useful Python modules. Such modules include arcpy, ArcGIS toolbox tools, psycopg2, and GDAL/OGR.

**WK007: Introduction to Remote Sensing in a QGIS Environment**

**Presenters:** Valquiria Quirino, Minnesota State University Moorhead  
**Audience:** Beginner  
**Prerequisite Skills and Requirements:** None  
**Format:** Hands-On  
**Hardware Required:** Laptop  
**Software Required:** QGIS Version 2.18 (most stable). If you plan on using your laptop, please make sure that you install QGIS prior to the workshop. The software is available at https://www.qgis.org/en/site/forusers/download.html. In the workshop we will use the QGIS version for Windows.

**Description:** This hands-on workshop will introduce participants to basic remote sensing functionalities available in the software QGIS. Topics that will be covered include: image composite and subset, contrast enhancement, vegetation indices, atmospheric correction, and image classification.

**WK008: Parcel Fabric 101 - An Introduction to the Parcel Fabric**

**Presenters:** Frank Conkling, Panda Consulting  
**Audience:** Beginner  
**Prerequisite Skills and Requirements:** Familiarity with Parcel Mapping.  
**Format:** Lecture  
**Hardware Required:** Laptop  
**Software Required:** ArcGIS for Desktop 10.4 or above & Windows

**Description:** This three-hour workshop will let attendees learn about the fundamentals of the data model and experience the editing procedures behind ESRI’s ArcGIS Parcel Editing Solution (aka the Parcel Fabric) prior to actually making the commitment to convert their data. Panda Consulting will provide a sample data set of a county that has already been converted and will review the new tools and procedures for performing consolidations (combines), splits, adjustments and inputting a subdivision (time permitting).

**WK009: Leaflet: Make a Web Map in a Snap**

**Presenters:** Kitty Hurley & Jessica Schuler, Minnesota IT Services @ Department of Natural Resources  
**Audience:** Beginner  
**Prerequisite Skills and Requirements:** None  
**Format:** Lecture & Hands-On  
**Hardware Required:** Laptop  
**Software Required:** This workshop will use the Atom text editor (https://atom.io), but any text editor can be installed on the attendees computer prior to arriving on-site (e.g. Notepad++, Sublime, Visual Studio Code, etc.). No previous experience is needed with text editors prior to attending the workshop.

**Description:** This workshop is perfect for a beginner who would like to get into web mapping. We will start from scratch including: why programming is so powerful, what we can do with a few lines of code, and key resources available to us. Next, we will dive into the Leaflet and Esri Leaflet JavaScript libraries to understand the basics of web mapping technologies, how they work, and how we can add in the bells and whistles to make an interactive map. While course content focuses on open source libraries, basic programming concepts and terms will be presented which apply to all languages and libraries. You will leave the workshop with the tools to get started, and some web map starting points to bring back home, and/or the office.
WK010: Intermediate Collector for ArcGIS Concepts

Presenters: Chris Pouliot & Mike Tronrud, MN.IT @ DNR
Audience: Intermediate
Prerequisite Skills and Requirements: Working knowledge of ArcMap and the ability to create a basic Collector app.
Format: Hands-On
Hardware Required: Laptop & a Mobile Device
Software Required: Android, iOS, Windows 10. It is expected that the user will bring: • A laptop with ArcMap 10.2+ installed
• A mobile device (Android, iOS, or Windows 10) with ArcGIS Collector installed.

Description: Building on foundational Collector for ArcGIS concepts, this course will teach students custom configuration techniques such as Collector database best practices, ArcGIS Online tips and tricks, and service, app, and custom basemap optimization techniques. Familiarity with subjects covered in Introduction to Collector for ArcGIS course or equivalent knowledge is suggested. In addition to the noted hardware requirements for this class, please bring a mobile phone or tablet if possible (cellular connectivity is not required).

WK011: An Introduction to QGIS 3

Presenters: David Bitner, Boundless Spatial
Audience: Intermediate
Prerequisite Skills and Requirements: Basic understanding of GIS terminology. Previous use of any desktop GIS system.
Format: Hands-On
Hardware Required: MAC, Windows, or Linux Laptop
Software Required: QGIS 3

Description: This workshop will give a hands-on demonstration of basic data management, data editing, and map creation using QGIS 3.

WK012: Introduction to ArcGIS Online and more

Presenter: Sharvari Sangle, SRF Consulting Group
Audience: Beginner
Prerequisite Skills and Requirements: Acquaintance with internet browser
Format: Lecture & Hands-On
Hardware Required: Laptop
Software Required: ArcGIS Online Organizational Account, Survey123. Any OS that supports web browser like chrome, Firefox, Internet explorer, Edge etc.

Description: Understanding basic concepts of ArcGIS online, leveraging online applications like web templates, Web app builder, Survey 123 etc. and understanding business needs. https://www.arcgis.com/home/createaccount.html ArcGIS Public Account? An ArcGIS Public Account is a personal account with limited usage and capabilities and is meant for non-commercial use only.

WK013: ArcGIS Server: Administration and Advanced Topics

Presenter: Justin Hansen, WSB & Associates
Audience: Advanced
Prerequisite Skills and Requirements: Basic experience with ArcGIS Server.

Format: Lecture
Hardware Required: No hardware needed.
Software Required: No software needed.

Description: This workshop serves as an advanced look into ArcGIS Server from both the IT and GIS management perspective. Existing users of ArcGIS Server will find the most benefit from this course as topics will range from installation recommendations, system architecture guidelines, security best practices, load testing and more. In addition, we will discuss how ArcGIS Server fits within Esri’s evolving Enterprise GIS platform and how you can best integrate it with your GIS portal: ArcGIS Online or Portal for ArcGIS. We will also discuss what’s new at ArcGIS Server 10.6 and its impact on your organization. This course will benefit both IT professionals and GIS Managers seeking to understand how to best manage their ArcGIS Server deployment and related resources. While this workshop is targeted at advanced users with ArcGIS Server experience, it will provide a solid introduction to core ArcGIS Server concepts.

WK014: Full Stack Application Development

Presenter: Caleb Mackey, Bolton & Menk
Audience: Advanced
Prerequisite Skills and Requirements: Some knowledge of Python and JavaScript
Format: Hands-on
Hardware Required: Laptop - Windows, Mac, or Linux machine
Software Required: Programming IDE, Node.js

Description: Integrating data from different business systems can be challenging, especially when it needs to be to be made available across an entire organization. This session will focus on creating custom web services with Python and consuming them in a modern Single Page Application (SPA). On the back end, we will learn how to create an API to interact with databases, run server-side processes, as well as integrating token based security that is validated against Active Directory. We will then build an application using Vue.js, a modern lightweight JavaScript framework to work with the web services. Finally, we will learn how to distribute the application code into a production build using webpack. Attendees should have some prior knowledge of RESTful services, Python, and JavaScript.

WK015: Web AppBuilder for ArcGIS: Knowing Your Options

Presenters: Chad Nunemacher & Paul Hedlund, Houston Engineering
Audience: Intermediate
Format: Lecture & Hands-On
In this session you will become familiar with the components that make up the Web AppBuilder (WAB) framework. App creation using the integrated ArcGIS Online version of the WebAppBuilder as well as the installation, configuration, and deployment the developer’s version will be explained and demonstrated. We will also show how to incorporate shared widgets into the Web AppBuilder development software. Last but not least, we will provide instructions and guidance in creating a custom widget for use in the WAB development software.

WK016: Cartographic Skillsets in ArcGIS Pro

Presenter: Rebecca Barney, University of Minnesota
Audience: Beginner
Prerequisite Skills and Requirements: Basic introduction and familiarization to ArcGIS Pro
Format: Hands-On
Hardware Required: Laptop
Software Required: ArcGIS Pro 2.1

Description: The transition to ArcGIS Pro has a lot of new changes for previous cartographic workflows. In this workshop we will go over some of the more bigger changes and improvements ArcPro has to offer and provide tips and useful advice in topics such as labeling, data display and layout design. Bring your questions!

WK017: Parcel Editing with ArcGIS Pro (Non-Parcel Fabric)

Presenter: Frank Conkling, Panda Consulting
Audience: Beginner
Prerequisite Skills and Requirements: Familiarity with Parcel Editing
Format: Lecture & Hands-On
Hardware Required: Windows Laptop
Software Required: ArcGIS for Desktop and ArcGIS Pro 2.1 or higher

Description: This three-hour workshop will review the current tools available with ArcGIS Pro and examine whether one can actually create and maintain parcels using the ArcGIS Pro toolboxes. Panda Consulting shall provide a sample data set of a county that has already been converted and will review the new tools and procedures for performing consolidations (combines), splits, adjustments and inputting a subdivision (time permitting).
SESSIONS

THURSDAY 10:30 AM - NOON

Session 1: Project Management
• Deadlines Suck: Tips for Managing Projects for Positive Outcomes and (Almost) On-Time Delivery — Cory Richter, City of Blaine
• Introduction to ArcGIS Monitor — Lucas Scharenbroich, Pro-West & Associates, Inc.

Session 2: Updates from the Statewide Geospatial Advisory Council Committees
• Outreach Committee Efforts: Free and Open Data, Which Cities Have It? — Kari Geurts, MnDNR; Len Kne, University of Minnesota
• 3D Geomatics Committee Update and Topiic Discussion for the GIS/LIS Community — Focusing on A Guided Approach to Minnesota’s Next LiDAR Collect. — Sean Vaughn, MNIT@DNR; Gerry Svjerven, Minnesota Power (60 minutes)

Session 3: Cadastral
• Building on the Parcel Fabric: Growth and Success at the City of Moorhead — Brad Anderson, City of Moorhead, MN
• Building the Perfect Parcel Data Layer — Frank Conkling, Panda Consulting
• GIS for Property Assessment Professionals: Using ArcGIS pro and the R-ArcGIS bridge for analyzing fair and equitable valuations — Daniel Fasteen, Dakota County Assessors Office

Session 4: Field Data Collection
• Enabling the Mobile Workforce through Esri Field Technologies — Jessica Fendos, Ramsey County
• Using Collector and High-Accuracy GNSS to Improve GPS Workflows — Tamir Maddio, City of Eagan
• High Accuracy Data Collection with Smartphones & Tablets — Jacob Wittenberg, Frontier Precision, Inc.

Session 5 Teaching & Learning
• GIS Story Maps in Art-led, Place-based, Experiential, Environmental Education — Jonee Brigham, Full Spring Studio
• Key Concepts for Teaching and Learning Web Mapping — Carl Sack, Fond du Lac Tribal and Community College
• Integrating UAS and Geospatial Curriculum — Benjamin Richason III, Dept. of Geography & Planning, St. Cloud State University

Session 6: Architecture/Infrastructure
• Getting Started with ArcGIS Pro — Mitchell Winiecki, ESRI
• ArcGIS Enterprise Overview and Deployment Options — Mitchell Winiecki, ESRI

Session 7: Undergrad Student Competition: Part 1

THURSDAY 1:30 - 3:00 PM

Session 8: Lightning
• Using meaningful assessment to improve GIS academic programs — Laure Charleux, University of Minnesota Duluth
• Introducing UAS in GIS undergraduate curriculum: A Journey — Laure Charleux, University of Minnesota Duluth
• Taking your enterprise GIS public with ArcGIS Open Data Hub! — Amanda Huber, Three Rivers Park District
• Let’s not keep GIS a secret — Len Kne, University of Minnesota
• Finally! The new roads layer from MnDOT is available to use — Jesse Pearson, MnDOT
• Mosquitoes, People, Virus — Putting Together a Risk Reduction Strategy for Jamestown Canyon Illness — Nancy Read, Metro Mosquito Control District

Session 9: Story Maps
• Which Esri™ Story Map Application Template Is Most Effective in Increasing the Public’s Awareness and Knowledge of the Windom Park Historic Residential District in Winona, Minnesota? — Hannah Hutchins, Olmsted County Planning Dept.
• Story Map Application Design: Historic Pottery Industry of Red Wing & Goodhue County — Leanne Knott, Goodhue County

Session 10: Forestry
• Moving Forest Management to the Cloud — Jesse Adams, North Point Geographic Solutions
• Using Lidar-Multispectral Data Fusion and Object-Based Image Analysis for Enhancing Forest Inventories — Benjamin Allen, University of Minnesota, Twin Cities
• Drone Multispectral Applications — Katie Gilmore, PAAP Drones

Session 11: Methods & Tools
• Discovering “Insightful” Patterns within Your Data Using Business Intelligence tools and GIS — Daniel Fasteen, Dakota County, MN
• How Machine Learning is Changing the World — Sean Maday, Google
• The Benefits of 3D GIS and Immersive Technology! — Jacob Wittenberg, Frontier Precision, Inc.

Session 12: Collaboration
• GIS as an Organizational Change Agent — Adam Gardner, City of Saint Paul
• Sharing Resources for Multi-agency Infrastructure Projects — Andrew King-Scribbins, Hennepin County
• The Process of Partnership: Inter-Jurisdictional Collaboration to Produce Standardized Datasets — Geoff Maas, Metropolitan Council
Session 13: Asset & Work Management
• Asset Management is like a Chopped Mystery Basket — Cory Richter, City of Blaine
• Implementation of Asset Management and Inventory Management with GIS — Jon Schwichtenberg, GRAEF

Session 14: Undergrad Student Competition: Part 2

Session 15: Graduate Student Competition

THURSDAY 3:30 - 5:00 PM

Session 16: PLSS Panel
• PLSS Panel Potpourri — Preston Dowell, St. Louis County

Session 17: Drones & Imagery
• Getting the most from your Lidar data — Arthur Crawford, Esri
• Inferring Drone Photographic Image Location Based Upon Drones XYZ Value — Thomas Sayward, Moore Engineering, Inc.

Session 18: Data/Metadata
• Open Source Metadata Tool for the Minnesota Geographic Metadata Guidelines — Kris Johnson, Natural Resources Research Institute
• Minnesota DNR LandView for QGIS — Craig Perreault

Session 19: Open Source & Web Mapping
• Navigating your spatial data with COMPASS (aka GeoMoose) — Bob Basques, City of Saint Paul, Public Works
• Managing Your Geospatial Data for the Long Term, or I Wish They Taught this Stuff in College — Bob Basques, City of Saint Paul, Public Works
• From Inception to Implementation: Online Mapping at the Department of Revenue — Sally Wakefield, MN Department of Revenue

Session 20: Survey123
• Customizing Survey 123 for Data Integrity and Integration — Jesse Adams, North Point Geographic Solutions
• Create your own survey in minutes with Survey123 — Corey Campbell, Pro-West & Associates, Inc.
• Using Survey123 for Work Management and Streamlining Workflows — Leah Sperduto, City of Eagan

Session 21: Hydrology
• Change, Watershed Health, and a Map — Kitty Hurley, Minnesota Department of Natural Resources
• Supporting Buffer Compliance with GIS Solutions at Grant County, MN — Jennifer Ward, Pro-West & Associates, Inc.

Session 22: Mapping Phenology
• Multi-Temporal 3D Surface Vegetation Canopy Mapping for Minnesota — Jennifer Corcoran, MN DNR; Keith Pelletier, UMN RSGAL; Jim Klasen, Shared Geo; Paul Morin, UMN PGC; Brian Huberty, FWS

Session 23: Finding a Job in GIS
• Panel — Mike Koutnik, Esri; Jason Menard, Lake Superior Consulting; Molly Shoberg, St. Louis County

Session 24: Esri Apps
• Winter is coming: How the City of Norwood Young America uses Collector for ArcGIS and Operations Dashboard for ArcGIS to better monitor and manage snow plowing — Allison Kampbell, Carver County
• Form-based data collection with Survey123 — Matt Robinson, Esri
• ArcGIS Arcade - What exactly is it and why should I implement it in my web maps? — Craig Prisland, Carver County

FRIDAY 8:30 - 10:00 AM

Session 25: GIS Leadership
• So You Think You’re a Boss: Field Lessons of an Enthusiastic Nerd — Cory Richter, City of Blaine
• Effective GIS Leadership for the Reluctant Leader — Kendis Scharenbroich, Pro-West & Associates, Inc.

Session 26: Map Accessibility Research Discussion
• Cartographic Map Accessibility — Christopher Morgan, Minnesota Department of Transportation
• Static Map Accessibility — Brad Neuhauser, Minnesota Secretary of State
• Interactive Map Accessibility — Kitty Hurley, Minnesota IT Services, Department of Natural Resources; Jake Stark, Minnesota IT Services, Department of Education

Session 27: LiDAR
• PAAP Drones Product Demonstration — Katie Gilmore, PAAP Drones
• Data Fusion for High Accuracy Geo-Spatial Projects — Sonja Ellefson, GPI Geospatial
• Extracting Tree Diameter and Height Measurements from Terrestrial Lidar — Patrick Landisch, University of Minnesota

Session 28: Natural Resources
• A High Resolution Historic Vegetation Model for Minnesota — Elizabeth Hobbs, Minnesota Department of Transportation
• Using Minnesota’s New and Improved Wetland Inventory for Geospatial Analysis — Steve Kloiber, MNIT@DNR
• Presenting the Natural Resource Atlas for Northeastern Minnesota — Kristi Nixon, Natural Resources Research Institute
Session 29: Project Management 2
- An Advanced Precision Spatial Solution for City Planning, Digital Mapping, GIS, and Sustainable Growth — Richard Harrison, Neighborhood Innovations, LLC
- Cost Map: Bringing Construction Cost Estimating to ArcGIS — Tyler Prahl, GISinc

Session 30: Utilities
- Development of a City-Wide ArcGIS-Based Water Quality Model to Estimate the Effectiveness of the Best Management Practices (BMPs) in Removing Pollutant Loads from Stormwater Runoff — Tim Anderson, Barr Engineering Company
- Modernizing GNSS Workflows at St. Paul Regional Water Services — Renee Huset
- Enhancing 811 Ticket Locating with GIS — Jacob Monson, Western Area Water Supply Authority

Session 31: Crowdsourcing
- Lightning Overview of the Best Geospatial Open Source (QGIS-Live Software) — Bob Basques, City of Saint Paul, Public works
- “Alexa, do my GIS work!” — ArcGIS Online and Computing in the Cloud — Ethan Borgen, North Point Geographic Solutions
- Using ArcGIS Online to Support Citizen Science — Kyle Wikstrom, Pro-West & Associates, Inc.

FRIDAY 10:30 AM - NOON

Session 32: Community Map Panel
- Best Practices for Contributing to the Community Maps Program — Arthur Crawford, Esri
- 3D Analyst, From Rasters to Terrains — John Wirries, KLI

Session 33: Remote Sensing
- DroneOps: What to Expect (and Watch For) When Introducing Drone Data to Organizations — Michelle Carroll, SC Recon
- An Inexpensive Alternative to Assessing Crop Health in Minnesota using Object-Based Image Classification and a Visible Vegetation Index — Valquiria Quirino

Session 34: Mobile GIS
- Have Your Raspberry Pi (RPi3) and Eat It Too! — Bob Basques, City of Saint Paul, Public works
- Leveraging High Accuracy GPS for Asset Management — David Malm, Bolton & Menk, Inc.
- Mobile Successes and Challenges at the DNR — Chris Pouliot, MN DNR

Session 35: Grab Bag
- Leave the GIS, Take the Usability: Designing Web Map Apps Your Users Can't Refuse — John Nerge, City of Brooklyn Park
- What Would You Say You Do Here? A Crime Analysis & Intelligence Team Takes Shape — Cory Richter, City of Blain
- Story Map of North Dakota Beer, A Heady History — Allan Schafer, KLI

Session 36: Transportation
- Navigating UMD: The Challenges and Solution when Creating Building Maps — Zachary Vavra
- Calculating Pedestrian Accessibility Using QGIS and OpenStreetMaps Data — Ricky Holzer, MnDOT
- Using the Trimble MX7 for Asset Data Collection and Management — Agata Miszczyk, MnDOT

Session 37: Emergency Management & Response
- Readdressing Your Cities for NG 911 — Caitlin Christenson, Stevens County
- Introduction to the U.S. National Grid — Randy Knippel, Dakota County Office of GIS
- Three Billion Points Underwater — Paul Wickman, RESPEC
GENERAL INFO

Location
Duluth Entertainment Convention Center
350 Harbor Drive
Duluth, MN 55802
(218) 722-5573

Meals
Conference registration includes lunch and refreshment breaks on Thursday and Friday and the vendor reception on Thursday evening. Pre-Conference Workshop registration, including half-day workshops, includes lunch and refreshment breaks on Wednesday. All conference and workshop attendees are invited to evening networking events on Tuesday, Wednesday, and Thursday.

Materials
Conference attendees will receive a copy of the conference proceedings, which will include abstracts for all presentations. Workshop attendees will receive workshop materials for each workshop attended. The information contained in this program should be considered preliminary and as such, could be subject to change in the final proceedings.

DIRECTIONS

From the Twin Cities or Southern MN
- Follow I-35 North to Duluth.
- Take Lake Avenue exit (#256B).
- At stoplights, turn right onto Harbor Drive.

From the Iron Range
- Follow Hwy 53 to Duluth.
- Continue straight past the Miller Hill Mall and through many stoplights until you can see the lake.
- Turn right onto Mesaba Avenue.
- Get into the left lane, and turn left at first stoplight.
- Immediately turn right onto Lake Avenue.
- Follow Lake Avenue to the bottom of the hill and over I-35.
- Turn right onto South Lake Avenue.
- After first set of stoplights, turn left onto Harbor Drive.

From the North Shore
- Follow Hwy 61 South to Duluth.
- Take I-35 South exit (left at stoplights by Holiday gas station).
- Take Lake Avenue exit (#256B).
- At stoplights, turn left.
- Immediately get into right lane.
- Turn right onto South Lake Avenue.
- After first set of stoplights, turn left onto Harbor Drive.

From the Airport
- Follow road to stop sign.
- Take right onto Haines Road.
- At second set of stoplights (1.5 miles), take left onto Hwy 53/194.
- Go straight, through many stoplights until you see the lake.
- Turn right onto Mesaba Avenue.
- Get into the left lane and turn left at first stoplight.
- Immediately turn right onto Lake Avenue.
- Follow Lake Avenue to the bottom of the hill and over I-35.

LODGING

ACCOMMODATIONS

For all hotels, please reference the Minnesota GIS/LIS Consortium Room Rate. For more information please contact Sarah Ewald at sarahe@mngislis.org

Holiday Inn & Suites: Duluth Downtown
200 West First Street | Duluth, MN 55802
Reservations: 218-722-1202
Rates: $94/night
Cut-off date: Sept. 2, 2018

Canal Park Lodge
250 Canal Park Drive | Duluth, MN 55802
Reservations: 218-279-6000
Rates: $109/night
Cut-off date: Sept. 2, 2018

The Inn on Lake Superior
350 Canal Park Drive | Duluth, MN 55802
Reservations: 218-726-1111
Rates: $135-185/night
Cut-off date: Sept. 2, 2018
Please fill out the registration form completely.

Name: ____________________________________________________________
Organization: _______________________________________________________________________________________
E-mail: _____________________________________________________________________________________________
Address: _____________________________________________________________________________________________
City: __________________ State: __________________ Zip: __________________________
Special diet needs: __________________________________________________________________________________

Attendance Options

Evening Events
I will attend the Tuesday evening event:  ☐ Yes  ☐ No
I will attend the Wednesday evening event:  ☐ Yes  ☐ No
I will attend the Thursday evening event:  ☐ Yes  ☐ No

Fun Walk/Run
I plan to participate in the Fun Run on October 6 at 6:15 a.m.:  ☐ Yes  ☐ No
Fun Run T-Shirt Size:  S  M  L  XL  XXL  ☐ Men’s  ☐ Women’s

Esri Hands-On Learning Lab
I am interested in attending the Esri Hands-On Learning Lab (during sessions):  ☐ Yes  ☐ No

<table>
<thead>
<tr>
<th>October 3, 2018</th>
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<tbody>
<tr>
<td><strong>AM Workshops</strong> (choose one) ($135/$170 after 9/7/18)</td>
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<tr>
<td>☐ WK0001 Introduction to Collector for ArcGIS</td>
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<td>☐ WK0002 Esri Mobile Hands-On Workshop</td>
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<td>☐ WK0003 Story Maps 101</td>
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<td>☐ WK0004 UAS and GIS: Enabling Drone Tech. for the Geospatial Professional</td>
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<td>☐ WK0005 Exploring the New Utility Network using ArcGIS Pro</td>
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<td>☐ WK0006 Expand your Python GIS capabilities</td>
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<tr>
<td>☐ WK0007 Introduction to Remote Sensing in a QGIS Environment</td>
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<tr>
<td>☐ WK0008 Parcel Fabric 101 - An Introduction to the Parcel Fabric</td>
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<td><strong>PM Workshops</strong> (choose one) ($135/$170 after 9/7/18)</td>
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<tr>
<td>☐ WK0009 Leaflet: Make a Web Map in a Snap</td>
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<td>☐ WK0010 Intermediate Collector for ArcGIS Concepts</td>
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<td>☐ WK0011 An Introduction to QGIS 3</td>
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<tr>
<td>☐ WK0012 Introduction to ArcGIS Online and more</td>
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<tr>
<td>☐ WK0013 ArcGIS Server: Administration and Advanced Topics</td>
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<td>☐ WK0014 Full Stack Application Development</td>
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<td>☐ WK0015 Web AppBuilder for ArcGIS: Knowing Your Options</td>
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<td>☐ WK0016 Cartographic Skillsets in ArcGIS Pro</td>
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<tr>
<td>☐ WK0017 Parcel Editing with ArcGIS Pro (Non-Parcel Fabric)</td>
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</tbody>
</table>

Payments/Fees

☐ Annual Conference ($275 | $310 after 9/7/18 | $330 onsite) $ _______________
☐ Presenter Rate ($230 | $310 after 9/7/18 | $330 onsite) $ _______________
*To register for workshop(s), please select the workshop you wish to attend above. Fee varies.
☐ Annual Conference - Student ($45) $ _______________
☐ Pre-conference Workshops only (Prices are above) $ _______________

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Full refunds (less $40 administrative charge) will be issued with a written cancellation notice received by September 24, 2018.
Please submit your cancellation notice online at www.mngislis.org/page/2018_cancellation. Notifications received after September 24, 2018 will NOT receive a refund, nor will no-shows at the conference.

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