NORTH Dakota | GEOSPATIAL SUMMIT 2024

September 25-26

Bismarck Event Center

Hello!

Welcome to the 2024 North Dakota Geospatial Summit! We are excited to offer this event and hope that your experience will be a memorable one.

This Summit is important to you, whether you're an experienced professional in the field, just starting out or are finding geospatial functionality to be a useful tool in your industry. At the core of this event is the focus on how a geospatial understanding offers solutions to the problems around us. The technology of our time has offered fascinating integrations of vastly different fields of expertise and study to address complex issues, and the contributions of the geospatial community is no small factor in this integration. In fact, with these advancements, we are finding more and more that the geospatial community is not reducible to GIS. Indeed, GIS is the core, indispensable tool of the geospatial perspective, but the common element for people such as yourself who are at the Geospatial Summit is not so much a tool as much as it is the understanding that the complex issues facing us today have a spatial dimension that needs to be understood in order for a solution to be achieved.

To this end, we strongly encourage you to take advantage of this event's opportunities to learn ideas, share ideas, and – above all – network! These objectives are the reasons behind this Summit's organization because no one person has all the answers, insights, and skills – and thankfully so, because that would make our community and its contributions to the world utterly boring!

Thank you again for joining us this year. Look forward to an exciting Summit!

Sincerely,

2024 ND Geospatial Summit Planning Committee

- Kaitlyn Bakken, Co-chair, ND Association of Counties
- Bob Nutsch, Co-chair, ND Information Technology
- Carol Wickenheiser, AE2S
- Rory Porth, Mountrail County, ND
- Matt Syvertson, Richland County, ND
- Kate Ronning-Schimetz, ND Department of Environmental Quality
- Greg Vandeberg, University of North Dakota
- Patricia Young, UND Conference Services

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2024 North Dakota Geospatial Summit: Schedule of Events*
September 25-26, 2024
Bismarck Event Center

NORTH Dakota Be Legendary. | Geographic Information Systems INFORMATION TECHNOLOGY

Last updated: September 23, 2024

Breakout sessions
All participant session
Break

Wednesday, September 25, 2024			
8:00 – 9:00	Registration & Check In (Upper Lobby)		
9:00	Welcome and Opening Remarks (Prairie Rose 104/105)		
9:05 – 10:00	Keynote # 1: "A Brief History of Topographic Mapping" – Dr. Elaine Guidero (Prairie Rose 104/105)		
10:00 – 10:30	**Break with Exhibitors (Upper Lobby)**		
10:30 – 11:30	**Concurrent Sessions (A)**		
	Prairie Rose 102	Prairie Rose 103	Prairie Rose 104
	A1. Automation	**A2. Mapping & Data**	**A3. Coordination/Data**
	Digital Transformation in the Geospatial Technology World	Collecting, mapping, analyzing, and communicating field data	Environmental Justice: Using EJScreen in North Dakota - Practical Tips and Practice
	Use Cases for GIS Programming with ArcGIS Notebooks and ArcGIS Arcade		
11:30 – 1:00	**Lunch (Upper Lobby & Prairie Rose 101)**		
1:00 – 2:00	**Concurrent Sessions (B)**		
	Prairie Rose 102	Prairie Rose 103	Prairie Rose 104
	B1. Coordination/Careers	**B2. Analysis & Modeling**	**B3. Process/Solutions**
	Geospatial Employment – What it Takes	Monitoring Air Quality Using Modis and Calipso Data in Conjunction with Socioeconomic Data to Map Air Pollution in Hampton Roads Virginia	Modernizing Approach Permits at McKenzie County
		open	GIS Solutions to Complete Lead Service Line Inventory
2:00 – 2:30	Premier Sponsor Presentations (Prairie Rose 105)		
2:30 – 3:00	**Break with Exhibitors (Upper Lobby & Prairie Rose 101)**		
3:00 – 4:30	**Concurrent Sessions (C)**		
	Prairie Rose 102	Prairie Rose 103	Prairie Rose 104
	C1. Process/Solutions	**C2. Analysis & Modeling**	**C3. Application Development**
	Bring your Capital Improvement Planning alive with GIS	ND Dept of Water Resources Data Collections Update	ArcGIS Experience Builder: Tips & Tricks
		GIS Hotspot Analysis of Algal Blooms in Eastern North Dakota Lakes	Lesser-Known Features of the Survey123 Web Designer

	Integrating a Data Fabric Framework for Improved Data Accessibility and Integration	Deriving Hydrography from Lidar	Taking Control of Your ArcGIS Online Pop-Ups
4:30 – 5:30	Ice Cream Social & Networking (Upper Lobby)		
5:30	Dinner (On Your Own)		
Thursday, September 26			
8:00 – 8:25	Registration & Check In (Upper Lobby)		
8:25	Opening Remarks (Prairie Rose 104/105)		
8:30 - 9:30	Keynote #2: "Planting the Seeds to Ensure that GIS Has a Future" – Dr. Joseph Kerski (Prairie Rose 104/105)		
9:30 – 10:00	**Last Break with Exhibitors (Upper Lobby & Prairie Rose 101)**		
10:00 – 11:30	**Concurrent Sessions (D)**		
	Prairie Rose 102	Prairie Rose 103	Prairie Rose 104
	D1. Technology	**D2. Analysis & Modeling**	**D3. Mapping & Data\Coordination**
	Esri Web Apps Are for Everyone	Water balance and assessment of agricultural drought and crop yield in North Dakota, USA. from 2000-2023 using Landsat data	Evolution of GIS in South Dakota Government
	Collect, Maintain, Integrate: Indoor Mapping Workflows for Public Safety	Spatial and temporal assessment of meteorological drought using the Standardized Precipitation Index (SPI) and its effect on crop yield over the Corn Belt Region of the United States from 2000 to 2023	Tips & Tricks for Effective GIS Team Communication
	Traffic Analysis with Python and ArcGIS Online Dashboards	Using GIS Data in Mitigation Planning	A Century of Mapping: Using Story Maps to Celebrate History
11:30 – 12:00	Summit Wrap-Up (Prairie Rose 105)		

Before We Begin … Thank You Sponsors!

The Planning Committee would like to extend its gratitude to all sponsors of the 2024 North Dakota Geospatial Summit. An event like this is crucial to the proliferation of the geospatial community of North Dakota and the surrounding areas, and it is simply impossible without your support!

Sometime during the Summit, please take the time to visit and thank our sponsors listed below.

Thank You!

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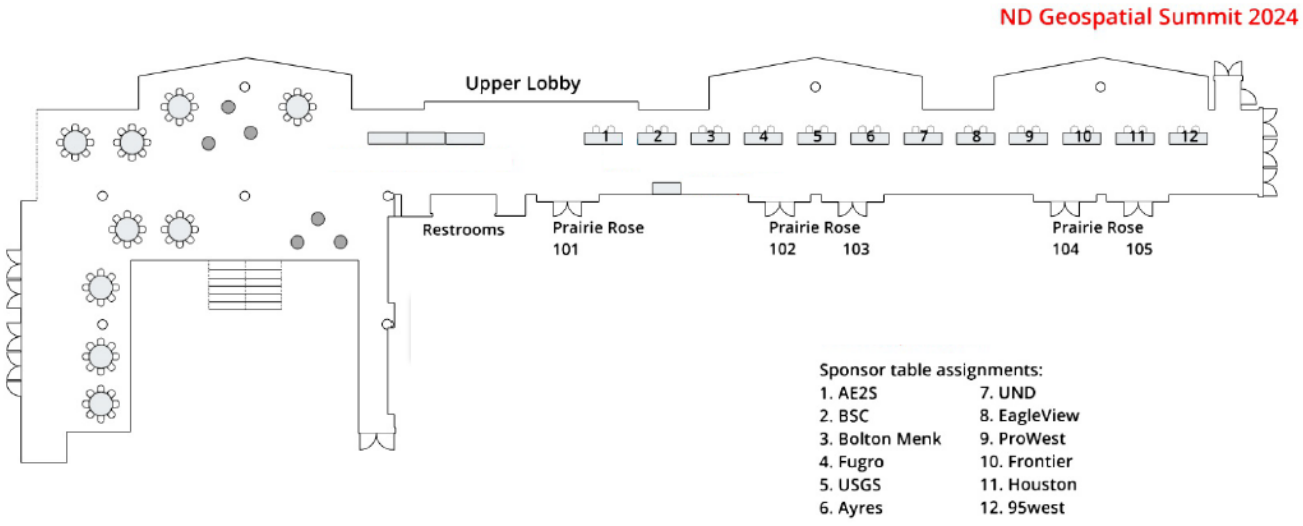

General Sessions

KEYNOTE #1 Wednesday September 25, 9:05 – 10 am, Prairie Rose 104/105

Presenter: Elaine Guidero, Ph.D. – National Map Liaison, US Geological Survey, Denver, CO.

Elaine Guidero is the USGS National Map Liaison for Idaho, Montana, North Dakota, and South Dakota, coordinating geospatial data activities for The National Map, 3D Elevation Program, and 3D Hydrography Program. Elaine has worked for the USGS since 2012, first as an applied researcher of multi-scale cartography in the National Geospatial Technical Operations Center, and then becoming a liaison with the National Geospatial Program in 2020. She has a Ph.D. and M.S. in Geography from Penn State.

Abstract: **A Brief History of Topographic Mapping**

The first USGS topographic maps in 1884 started as hand-engraved copper plates, and in the early 1900s, relief was hand-shaded. By the 1960s, maps were scribed on mylar sheets, labels were applied letter by letter, and technicians field-verified map features. Since 2009, maps are made using GIS software with remotely sensed data, produced on a predefined grid and updated every three years. The 2022 release of topoBuilder allows users to skip the three-year cycle and create custom topographic maps with the latest available data from The National Map centered anywhere in the U.S. and territories.

KEYNOTE #2 Thursday September 26, 8:30 – 9:30 am, Prairie Rose 104/105

Presenter: Joseph Kerski, Ph.D. – ESRI, Denver, CO.

Joseph Kerski is a geographer with a focus on the use of Geographic Information Systems (GIS) in education. He holds 3 degrees in geography and has served as geographer in 4 major sectors of society, including government, academia, private industry, and nonprofit organizations. In addition to authoring many chapters, articles, and podcasts on GIS, education, space, place, and related topics, he has visited 100s of schools and universities around the world and regularly conducts professional development for educators. His books include Interpreting Our World, Spatial Thinking in Environmental Contexts, Essentials of the Environment, Spatial Mathematics, Tribal GIS, International Perspectives on Teaching and Learning, the GIS Guide to Public Domain Data, and others. But as a lifelong learner, he feels as though he's just getting started and thus actively seeks mentors, partners, and collaborators.

Abstract: Planting the Seeds to Ensure that GIS Has A Future

Join Joseph Kerski in a lively session where we examine the rapid evolution of GIS workflows and tools, including those enabled by AI, investigate the technological and societal forces responsible for it, analyze

changes in schools, colleges, and universities with impacts on the GIS workforce, and discuss how you in the GIS professional community can chart your own pathway forward.

Premier Sponsor Presentations, Wednesday September 25, 2:00 – 2:30 pm, Prairie Rose 105

In recognition of our sponsors this time is allocated to those organizations who have sponsored the Geospatial Summit at the Premier Sponsorship level, **AE2S** and **Bismarck State College**. At this Premier Sponsorship level, organizations have the option to present information on their geospatial services and products. AE2S has chosen to provide us a brief presentation.

Presenter: Lucas Rengstorf, AE2S

Ice Cream Social and Networking, Wednesday September 25, 4:30 – 5:30 pm, Upper Lobby, Event Center

Join us for this ice cream social and networking event. Sign up for door prizes at the sponsor booths and try to identify the location of satellite images at each booth for a chance to win a prize as the best image analyst at the summit (no using image search engines please). In addition to visiting vendors, participants can congregate over jigsaw puzzles featuring Earth as Art satellite imagery. Let's have some fun being the map/tech-centered people that we are, all while visiting vendors, networking and socializing with other map-minded souls.

Summit Wrap-Up, Thursday September 26, 11:30 am – noon, Prairie Rose 105

Presenter: Bob Nutsch, North Dakota Information Technology

Are you wanting to stay at the Geospatial Summit for as long as possible? Are you wanting to provide feedback and direction for future Summits? If either or both of these apply, this brief session is for you. While it's still fresh in our minds, we'd like to hear directly from you what you liked and for the things you didn't like, we'd like to know what you believe would fix those. We would also like to brainstorm for a bit on what could be done to offer the Geospatial Summit on annual basis while balancing the logistics with the value to sponsors and attendees. And finally, we will wrap up the 2022 Geospatial Summit with the student presentation awards.

Concurrent Sessions A

A1. Automation

Title: Digital Transformation in the Geospatial Technology World
Author: Eric Abrams
Association: GeoDecisions
Abstract: Artificial intelligence (AI) is accelerating digital transformation at unprecedented speeds, poised to impact everything we do and help solve complex challenges. The Geospatial Technology industry is already adapting and seeing changes in project requirements creating a world of GeoAI. While this rapid transformation may seem unsettling, numerous opportunities exist to leverage technology for critical infrastructure. While appreciating AI's power, it's important to distinguish geospatial technology and AI individually and the growth of the GeoAI industry. GIS is a powerful tool that enables visualization, data analysis, designing data structures,

and providing decision-making frameworks. On the other hand, AI provides a platform for big data analysis and high-end computing processing that supports the fast deployment of AI models, reducing the time and effort required for manual feature extraction. Combining the two to form GeoAI enhances the accuracy, efficiency, and speed in the computation of various applications and geo-visualization. GeoAI as a digital transformation technology, along with Generative AI, Digital Twins, Big Data, IoT, Metaverse, Machine Learning, and Immersive Technologies like AR/VR, Automation & Robotics, Blockchain, Cloud, and SaaS, have revolutionized the way our industry operates. Together, these technologies enable robust digital ecosystems capable of driving efficiency, scalability, and innovation across sectors.

Title: Use Cases for GIS Programming with ArcGIS Notebooks and ArGIS Arcade
Author: Lucas Rengstorf
Association: AE2S
Abstract: GIS Scripts are useful to automate processes to save time and repeat processes with consistent results. This presentation will showcases how python programming has been used in ArcGIS Online Notebooks and ArcGIS Pro Python Notebooks along with uses of ArcGIS Arcade within ArcGIS Online Popups and ArcGIS Pro field calculations.

A2. Mapping & Data

Title: Collecting. Mapping, Analyzing and Communicating Field Data
Author: Joseph Kerski
Association: ESRI
Abstract: Discover how you can collect, map, analyze, and communicate the result of your field investigation using easily configurable tools including ArcGIS Survey123, ArcGIS Online, instant apps, dashboards, and storymaps in this hands-on, engaging workshop designed to give you confidence and skills that you can use right away.

A3. Coordination/Data

Title: *Using EJScreen in North Dakota - Practical Tips and Practice (Panel)*
Author: Ann Fritz, Patty Winn (NDDOT), Matthew Lee (US EPA, Virtual)
Association: ND Department of Environmental Quality, ND DOT, USEPA
Abstract: Did you know as a GIS data steward in North Dakota you may be providing data to national mapping tools? North Dakota DOT and DEQ both use EJScreen as a first-cut environmental and socioeconomic screening tool. EJScreen is the U.S. Environmental Protection Agency's environmental justice screening tool. It provides users with nationally consistent datasets and an approach for examining environmental and socio-economic factors. Environmental Justice is the fair treatment and meaningful involvement of all people, regardless of race, color, income, national origin, disability, or Tribal affiliation in the government decision making process and activities that have a potential to affect human health and the environment. This means that people are protected from adverse health and environmental affects and have equitable access to a healthy environment in which to live, play, work and grow. There are things that users in North Dakota, or any rural state, should be aware of when using EJScreen. This awareness does not diminish the usefulness of the tool, but rather enhances your ability to make the best use of the incredible amount of data presented in EJScreen. The EPA will provide an overview of EJScreen; the DEQ will demonstrate the tool for their unique processes; DOT will provide an example of how they applied the tool to transportation projects, and in general, things to be aware of when using "nationally consistent" modeled data within rural areas like North Dakota. Finally, the presenters will demonstrate how to add datasets that are on the ND GIS Hub into EJScreen.

Concurrent Sessions B

B1. Coordination/Careers

Title: Geospatial Employment – What it Takes (Panel)
Author: Bob Nutsch, Rod Bassler (NDDWR), Shelly Miller (NDIT), Brad Hoffarth (NDCTE), Carol Wickenheiser (AE2S), Joseph Kerski (ESRI), and Greg Vandeberg (UND)
Associations: ND Information Technology, ND Dept. Water Resources, ND Information Technology, NDCTE, AE2S, ESRI, University of North Dakota
Abstract: The geospatial industry has been rapidly changing and expanding, and will likely continue doing so. In this panel discussion which includes opportunities for questions from the audience, we'll hear the panelists from the geospatial industry, government, and education describe the hard and soft skills necessary to thrive now and into the future. If you are looking to move into some aspect of the geospatial industry, are looking for ideas on how to move upward in the industry, or are looking for ways to grow in your current role, this panel is for you. If you already in the geospatial industry and are looking to hire, you will likely come away with valuable insight.

B2. Analysis and Modeling

Title: Monitoring Air Quality Using Modia and Calipso Data in Conjunction with Socioeconomic Data to Map Air Pollution in Hampton Roads Virginia
Authors: Marilee Karinshak
Association: NASA
Abstract: Situated along Virginia's southeastern coast, the Hampton Roads region is a historic hub for coal storage and transportation. When inhaled, pollutants like coal dust can cause respiratory and cardiovascular issues, raising concerns among community members about the potential human health risks associated with coal dust and other particulate matter (PM) pollution. This project determined the feasibility of using NASA Earth observations—specifically Terra/Aqua MODIS and CALIPSO CALIOP—to measure air particulates, map their distribution across the region, and identify air quality trends over time.

B3. Process/Solutions

Title: Modernizing Approach Permits at McKenzie County
Authors:, Mike Nordquist, Bonnie Foster
Association: Pro-West and Associates, McKenzie County
Abstract: McKenzie County recognized the possibilities for streamlining its process for managing approach permits using GIS. Having relied on a paper-based process for many years, the County wanted to eliminate duplicate data entry, improve the way information was gathered, stored and tracked, and provide staff, contractors and the public with a more user-friendly experience. Join this session to see how the County transformed its workflow, using Survey123 forms and ArcGIS solutions to manage approach permit applications with greater ease, speed and accuracy than before.

Title: GIS Solutions to Complete Lead Service Line Inventory
Author: Ethan Tschosik, Dave Kirkpatrick
Association: Interstate Engineering Inc

Abstract: The U.S. Environmental Protection Agency (EPA) announced that the Lead and Copper Rule Revisions (LCRR) would go into effect with the intention to identify and replace all lead pipes in communities across the nation to reduce lead in drinking water. The North Dakota Department of Environmental Quality is administering the program. A GIS centric methodology was used throughout the entire project process.

Concurrent Sessions C

C1. Process/Solutions

Title: Bring your Capital Improvement Planning alive with GIS
Author: Lucas Rengstorf
Association: AE2S
Abstract: The CIP tool discussed in this presentation helps decision makers see asset inventory results summarized by pressure zones, size, or material within maps and graphs. Along with additional tabs to help determine areas to prioritize replacement with map and graphs showing remaining useful life, and risk results. The CIP tool is iterative and interactive, the Project Planning tab allows the user to test different project scenarios. The results of using the CIP tool allows key project stakeholders to determine areas to prioritize projects, GIS users to identify gaps in their data, and summarize asset inventories that meet state funding requirements.

Title: Integrating a Data Fabric Framework for Improved Data Accessibility and Integration
Author: Eric Abrams
Association: GeoDecisions
Abstract: Agencies in our industry are constantly collecting, storing, and Analyzing data from various sources. However, integrating this data between systems without resorting to custom code or ad hoc processes can be a significant challenge. Often, policies, procedures, and people can act as barriers to effective data integration and governance. This session will demonstrate the critical role that a data fabric framework plays in overcoming these challenges, bringing data and systems together through culture, GIS, data management, and business processes.

C2. Analysis & Modeling

Title: ND Dept of Water Resources Data Collections Update
Authors: Rod Bassler
Associations: ND Dept. of Water Resources
Abstract: The North Dakota Dept of Water Resources has always had a very robust data collection operation, but our data holdings have grown substantially in the years since the last Geospatial Conference and are literally growing by thousands of data points every day. This presentation will briefly review updates to the DWR's primary data collections in the areas of remotely sensed water, atmospheric and geologic data, survey data, LiDAR, aerial imagery, and map resources.

Title: GIS Hotspot Analysis of Algal Blooms in Eastern North Dakota Lakes
Authors: Gregory Vandeberg, Sae Young Lee
Associations: Department of Geography & GISc., University of North Dakota
Abstract: Harmful Algal Blooms (HABs) can degrade the water quality of lakes and streams. HABs can block sunlight, lower oxygen levels, and may produce toxins. Industrial and domestic waste and fertilizer runoff can enrich nutrients for algae and lead to HABs. Chlorophyll-a (Chl-a) is a significant indicator for tracking HABs and

has been monitored increasingly using remote sensing techniques. Chl-a water samples were collected and analyzed in summer and fall of 2023 from five lakes including Fordville Dam Recreation Area, Larimore Dam Recreation Area, Homme Dam Recreation Area, and South and North Golden Lakes. Six multi-band combination indexes of Sentinel-2 and Landsat 8 remote sensing satellite imagery were compared with in-situ Chl-a concentrations. Chl-a concentrations had a strong correlation with the Normalized Difference Chlorophyll Index (NDCI). Getis-Ord Gi* Hotspot analysis was used to identify trends and patterns of the NDCI values in the lake. Chlorophyll hotspots in South and North Golden lakes were mostly located in the shallow edges and migrated from north to south over time. Chlorophyll hotpots in the reservoirs migrated from the influent tributaries to the remaining parts of the lake over the sampling period.

Title: Deriving Hydrography from Lidar
Authors: Tyler Kaebisch
Associations: Ayres Associates
Abstract: There are many benefits updated hydrography can provide that are essential to a wide range of critical applications including natural resources, infrastructure management, agriculture, planning and water resource management. Elevation derived hydrography from lidar increases the accuracy of water features flowing across the landscape. Integrating culvert inventories and lidar DEMs, stream networks can be updated to represent true concentrated flow of water. Elevation derived hydrography can be used to update inventories of the state 24k Hydrography or the USGS National Hydrography Dataset (NHD). This presentation will review lidar derived watershed hydrography examples and potential for future opportunities will be explored.

C3. Application Development

Title: ArcGIS Experience Builder: Tips & Tricks
Author: Julian Phillip
Association: ESRI
Abstract: Whether you are new to ArcGIS Experience Builder or have you been building experiences for years, this session will touch on some of the tips and tricks to help you be more efficient in creating your web applications.

Title: Lesser-Known Features of the Survey123 Web Designer
Author: Phillip Julian
Association: ESRI
Abstract: Have you always defaulted to the ArcGIS Survey123 Connect designer because you didn't think the web designer could handle it? Now is the time to take a closer look at the ArcGIS Survey123 web designer interface to check out the new features added to make designing complex surveys even easier. While it doesn't do everything, it does a lot more than it used to. Come see what some of the features are to help you with your next ArcGIS Survey123 design.

Title: Taking Control of Your ArcGIS Online Pop-Ups
Author: Julian Phillip
Association: ESRI
Abstract: Pop-ups in a web map or web application provide essential context for the user to learn about the data they've clicked on. This session will cover the ins and outs of pop-ups in the ArcGIS Online map viewer along with some recently released capability updates.

Concurrent Sessions D

D1. Technology

Title: Esri Web Apps Are For Everyone
Author: Stephanie Weiand
Association: NDDOT
Abstract: In this session, we will utilize some of the ESRI Online web apps to do more with your maps. Developer experience is unnecessary to build great applications. We will also take a look at available resources to get you on a fast track to using these products.

Title: Collect, Maintain, Integrate: Indoor Mapping Workflows for Public Safety
Author: Matt Dandanville, Greg Brooks
Association: DATAMARK Technologies
Abstract: Join us to explore ways that indoor mapping can help improve public safety response. With Americans spending over 85% of their time indoors, getting indoor data into the right hands is vital. From collection of over 5 buildings a day to tools for first responders, we will look at tips and techniques to help decrease response times, improve situational awareness, and save lives. Giving call takers, dispatchers, fire, EMS, and police the ability to know where an incident is when someone says "Outside of room 101" can save time when seconds matter!

Title: Traffic Analysis with Python and ArcGIS Online Dashboards
Author: Tyler Johnson
Association: Bolton & Menk
Abstract: As part of NDDOT's Transportation Management Center and I-29 SMART Corridor project, Bolton and Menk GIS staff relied on Python and ArcGIS Online (AGOL) Dashboards to analyze numerous datasets and present those results. The goal of the project was to study the benefits of implementing a Statewide Transportation Management Center (TMC) and/or a SMART (Safety, Mobility, Automated, Realtime, Traffic management) Corridor. GIS staff led the effort to evaluate 5 years of historic data including crashes, weather, speed, and construction projects/511 events. By determining the impacts on traffic and the existing transportation network, Bolton and Menk were able to assess the needs and opportunities for a TMC and/or SMART corridor. The result was a collection of ten AGOL dashboards and dozens of PDF figures for internal QA/QC and external deliverables. This presentation will highlight the general Python methodology, GIS deliverables, as well as lessons learned.

D2. Analysis & Modeling

Title: Water Balance and Assessment of Agricultural Drought and Crop Yield in North Dakota, USA. From 2000-2023 Using Landsat Data
Author: Mbongowo Mbuh, Anai Caparo, Ossai Alu, Gregory Vandeberg, Bradley Rundquist
Association: Department of Geography & GISc, and Earth System Science and Policy, University of North Dakota
Abstract: Drought-associated water shortage is a complicated hazard, and extreme weather and climate events severely impact any society's agricultural, ecological, and socio-economic activities. This work aims to develop and evaluate a combined drought index for North Dakota using high-resolution data from Landsat to evaluate the Spatiotemporal distribution of drought events and intensities for a better understanding of agricultural

drought and water resource stress at a micro-scale from 2000 - 2023. In this study, we calculate the main components of the water balance and link them with information on vegetation growth and drought in North Dakota. We estimated monthly precipitation, evapotranspiration, water balance, and vegetable and drought Indices. The soil moisture index and the widely used vegetation condition index (VCI) for drought monitoring were analyzed to assess extreme drought events. In addition to VCI, we used meteorological indicators of land surface temperature (LST) to evaluate the temperature condition index (TCI) and vegetation health index (VHI) and assess the temporal trend of vegetation health and its impacts on drought events. Results were compared with remote-sensing-based drought indices, such as TCI and VHI. It was observed that the VCI and VHI, which combined vegetation and meteorological information and the Moisture stress index (MSI), had a stronger correlation with precipitation data than the NDVI-derived VCI. We also observed a significant decrease in monthly precipitation over major crops of the region during these intense drought years. Compared with drought indices, the long-term agricultural drought situation reveals a distinctly good agreement among all agricultural drought indices, as the TCI, MSI, VHI, and precipitation anomalies also decreased significantly.

Title: Spatial and Temporal Assessment of Meteorological Drought Using the Standardized Precipitation Index (SPI) and its Effect on Crop Yield Over the Corn Belt Region of the United States from 2000 to 2023

Author: Victor Araya
Association: Department of Geography & GISc., University of North Dakota

Abstract: Climate change and global warming have contributed to extreme weather events and patterns, including severe flooding, earthquakes, wildfires, and drought. Drought happens to be the deadliest catastrophic event around the world. Drought's impact on ecosystems and local communities has been increasing in many parts of the world, including the United States and, most importantly, the corn Belt, which also happens to be the country's food basket. Understanding drought prediction and mitigation can be investigated through drought indices. The Standardized Precipitation Index (SPI) is considered the most reliable in this study. It is used in this study to present the critical identifier in diagnosing extreme precipitation events during multiple periods. It is also comparable to various landscapes across a region and is simple to use concerning its calculation process. This study focuses on the Midwest Corn Belt Region of the United States between the climate record from 2000-2023. This study is designed to understand precipitation regimes and their impact on agricultural production in various landscapes across the corn belt region of the United States. Results for the study area showed drought affecting at least portions of the Corn Belt 2000, 2001, 2002, 2003, 2006, 2009, 2011, 2012, 2013, and 2018 with areas characterized as being mild, moderate, severe, or extremely dry. Our analysis shows that climate change has undoubtedly resulted in a temperature rise, exacerbating the frequency and severity of heat waves in many parts of the United States, including the Corn Belt.

Title: Using GIS Data in Mitigation Planning

Author: Hope Brighton, Katie Leitch
Association: North Dakota Department of Emergency Services – Division of Homeland Security

Abstract: Involving the whole community in mitigation planning isn’t a new concept, however, the North Dakota Department of Emergency Services – Division of Homeland Security Planning section is taking mitigation planning to the next step. Utilizing GIS based data tools to guide mitigation planning data collection and targeting outreach efforts has aided our planning to be more effective and inclusive. Collecting information while identifying underserved populations and opportunities for resiliency building allows emergency managers and plan developers to provide focused attention on communities that may need it the most. Integrating this GIS Data into other emergency management efforts such as recovery efforts and response planning allow for a better overall outcome allowing our communities to continue thriving and build resilience.

D3. Mapping & Data/Coordination

Title: Evolution of GIS in South Dakota Government
Authors: Mark Freund
Associations: State of South Dakota
Abstract: Throughout the last couple of decades geographic information systems (GIS) use has been expanding in the South Dakota government, however, there were some early pioneers who used GIS for land cover and soils mapping as early as the mid 1970's. In the past GIS technologies and those who use them were thought to only be mappers. However, we now recognize that GIS is much more than just desktop software and mapping, it has grown to a true GIS Enterprise infrastructure recognized as being a major integral system within state government that is touching every aspect of government. This progress is not without some spectacular false starts and roadblocks, as well as some major technological advancements. During this talk we'll walk through some of this history and then move forward to the latest enhancements for the current state-of-the-state GIS and our future vision.

Title: Tips & Tricks for Effective GIS Team Communication
Authors: Hope Records
Associations: AE2S
Abstract: This presentation focuses on the simple and efficient communication techniques that the AE2S GIS team uses to transfer assignments and workflows using programs like ArcGIS Pro and Microsoft Teams.

Title: A Century of Mapping: Using Story Maps to Celebrate History
Authors: Jerame Novak
Associations: North Dakota Department of Transportation
Abstract: 2024 marks the 100th anniversary of the North Dakota Highway Map. To celebrate, the North Dakota Department of Transportation (NDDOT) is publishing monthly blogs that illustrate the history and changes of the map. Join the NDDOT as they show you how ESRI story maps are used to guide readers down memory lane to learn more about the history of the State Highway Map.

The End