



NORTH
Dakota

**GEOSPATIAL
SUMMIT**

North Dakota Geospatial Summit

October 14-15, 2026

Bismarck Event Center

Hello!

Hello and welcome to the 2026 North Dakota Geospatial Summit!

We're glad you're here! Whether you're a seasoned expert, new to the field, or simply discovering how geospatial tools can support your work, the Geospatial Summit is designed with you in mind.

At its heart, this event highlights how a spatial perspective helps us understand and solve real-world challenges. Today's technology brings together many different fields, and the geospatial community plays an essential role in that collaboration. While GIS remains a core tool, our shared perspective goes beyond software—it's the recognition that many of the issues we face have a spatial component that must be understood to create meaningful solutions.

We encourage you to take full advantage of the opportunities here to learn, exchange ideas, and—most importantly—connect with others. No single person has all the answers, and that's what makes this community so strong, dynamic, and engaging.

Thank you for joining us this year. We hope you have a rewarding Geospatial Summit experience!

Sincerely,

2026 ND Geospatial Summit Planning Committee

- Kaitlyn Bakken, Co-chair, ND Association of Counties
- Bob Nutsch, Co-chair, ND Information Technology
- Jerame Novak, ND Department of Transportation
- Carol Wickenheiser, AE2S
- Danielle Moe, Frontier Precision
- Patricia Young, UND Conference Services

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2026 North Dakota Geospatial Summit: Schedule of Events*

October 14-15, 2026

Bismarck Event Center



Last updated: October 2, 2026

	Breakout sessions
	All participant session
	Break

Wednesday, October 14 th			
8:00 – 4:30	Registration & Check In (Upper Lobby)		
9:00	Welcome and Opening Remarks (Prairie Rose 104/105)		
9:05 – 10:00	Keynote: “Seeing Beyond the Dirt: What Lies Ahead for the FM Diversion” – Justin Fisher (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. Technology	A2. Coordination	A3. Mapping & Data
	BEYOND AUTOMATION: BUILDING NEW GEOSPATIAL CAPABILITIES WITH GEOAI	NORTH DAKOTA GEOSPATIAL SERVICES UPDATE	FIELD MAPS CULVERT COLLECTION
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. Land Use	B2. Coordination	B3. Mapping & Data
	AN HONEST LOOK AT UAS FOR WEED CONTROL IN AGRICULTURE	THE NORTH DAKOTA PARCEL PROGRAM	REELS, ROUTES, AND RESULTS: A GIS APPROACH TO INVENTORY MANAGEMENT
2:00 – 2:30	Premier Sponsor Presentations (Prairie Rose 104/105)		
	Break with Exhibitors (Upper Lobby)		
	Concurrent Sessions (C)		
	Prairie Rose 102	Prairie Rose 103	Prairie Rose 104
3:00 – 4:30	C1. Analysis & Reporting	C2. Coordination	C3. Mapping & Data

	INTEGRATED GEOSPATIAL FRAMEWORK FOR MODELING FIRST-RESPONDER COVERAGE IN SOUTH DAKOTA (60min)	CONNECTING OPERATIONS, COLLABORATION, AND COMMUNITY OUTCOMES (60min)	MAP THE MESSAGE: TELLING YOUR STORY THROUGH GIS (60min)
	POPULATION CHANGE PATTERNS IN THE UNITED STATES, 2000-2020	MCKENZIE COUNTY AUDITOR PARTNERS WITH GIS STAFF TO DEVELOP ELECTION SUPPORT RESOURCES	MORE THAN A PRETTY PICTURE: EFFECTIVE CARTOGRAPHIC DESIGN FOR SCIENTIFIC COMMUNICATION
4:30 – 5:30	Ice Cream Social & Networking (Upper Lobby)		
5:30	Dinner (On Your Own)		
Thursday, October 15			
8:00 – 10:00	Registration & Check In (Upper Lobby)		
8:25	Opening Remarks (Prairie Rose 104/105)		
8:30 - 9:30	Keynote: “Journey of a GIS Manager” – Eric Abrams (Prairie Rose 104/105)		
9:30 – 10:00	Last Break with Exhibitors (Upper Lobby)		
10:00 – 11:30	Concurrent Sessions (D)		
	Prairie Rose 102	Prairie Rose 103	Prairie Rose 104
	D1. Technology	D2. Current Events Impacts	D3. Environment
	BEYOND THE STATIC MAP: AUGMENTING MULTIDISCIPLINARY RESEARCH WITH ARCGIS ONLINE	NAVIGATING ACCESSIBILITY REQUIREMENTS IN A GIS WEB APP: ND ROADS CASE STUDY	GIS FOR NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE
	USING GIS TO DETERMINE STREAM POWER INDEX OF EROSION POTENTIAL: FOREST RIVER WATERSHED, NORTH DAKOTA	A MAP TO ACCESSIBLE MAPPING (60min)	THE DIGITAL JOURNEY OF LAND ACQUISITION FOR THE FM AREA DIVERSION PROJECT
	USING HARMONIZED LANDSAT AND SENTINELI2 IMAGERY TO MONITOR HARMFUL ALGAL BLOOMS IN NORTH DAKOTA LAKES		FROM IMAGERY TO ACTION: EXPANDING NORTH DAKOTA’S LAND MANAGEMENT CAPACITY WITH REMOTE MONITORING TOOLS
11:30 – 12:00	Summit Wrap-Up (Prairie Rose 104/105)		

Before We Begin ... Thank You Sponsors!

The Planning Committee would like to extend its gratitude to all sponsors of the 2026 North Dakota Geospatial Summit. An event like this is crucial to the proliferation of the geospatial community in North Dakota and the surrounding areas, and it is simply impossible without their support!

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

Thank You!

Premier Sponsors

- Frontier Precision, Inc.
- Fugro

Partner Sponsors

- Advanced Engineering and Environmental Service (AE2S)
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- Pro-West & Associates, Inc.
- U.S. Geological Survey
- University of North Dakota, Department of Geography-GISc.

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- Western Area Water Supply Authority
- Upstream Tech

General Sessions

KEYNOTE #1 Wednesday October 14, 9:05 – 10 am, Prairie Rose 104/105



Presenter: Justin Fisher – Director of Lands and Compliance, Metro Flood Diversion Authority

Justin Fisher, of West Fargo, North Dakota, joined the Metro Flood Diversion Authority as its Director of Lands and Compliance in June 2025. Prior to this role, Justin worked for multiple federal agencies, to include the USDA's Natural Resources Conservation Service, U.S. Army Corps of Engineers and, most recently, the U.S. Department of Energy. Throughout these different roles, Justin has gained an extensive background in land management, real estate, and environmental compliance.

Abstract: Seeing Beyond the Dirt: What Lies Ahead for the FM Diversion

The goal of reliable flood protection is at the center of the FM Area Diversion project. Years of planning, budgeting and permitting allowed this project to move from concept to construction. However, as the machinery moves offsite a new effort of work begins as we focus on operations, maintenance and environmental monitoring. This critical transition requires effective and efficient approaches that lend to GIS-centric efforts to visualize, track and analyze current and future efforts. These efforts involve tracking fish passage through aqueducts and associated features, levee and dam safety inspections, river geomorphology, forest and wetland mitigation, and native grass plantings across the 22-mile southern embankment.

KEYNOTE #2 Thursday October 15, 8:30 – 9:30 am, Prairie Rose 104/105



Presenter: Eric Abrams – Strategic Geospatial Advisor, GFT

Eric Abrams brings 36 years of GIS and professional experience as Iowa DOT's Geographic Information Officer and, most recently, as a GIS and transportation subject matter expert at GFT. Eric draws on experience with technologies from Esri, FME, Vertigis, Oracle, and more, along with a deep understanding of government organizations and business processes, to help customers advance their GIS ecosystem and data integration by assessing an organization's GIS maturity, technology, and culture. Eric brings a unique perspective to GIS, data management, organizational culture, and how to get things done in the fast-paced, ever-changing GIS environment. As a side note, Eric and his wife run 4 retail stores with 65 employees, and Eric was elected to city council just to keep life busy.

Abstract: Eric Abrams invites you on a fun and lighthearted journey through his 36 years of personal GIS experiences. From Iowa DOT GIO to consultant and entrepreneur, his story highlights trials, tribulations, and lessons learned that shape his view of today's and tomorrow's GIS landscape. In this lively, interactive session, Eric shares memorable experiences—and maybe some advice—about navigating budgets, government, technology, data, and organizational structures in pursuit of enterprise GIS utopia.

Premier Sponsor Presentations, Wednesday October 14, 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, **Frontier Precision** and **Fugro**. At this Premier Sponsorship level, organizations have the option to present information on their geospatial services and products. Both **Frontier Precision** as well as **Fugro** have chosen to provide us with a brief presentation.

Ice Cream Social and Networking, Wednesday October 14, 4:30 – 5:30 pm, Upper Lobby, Event Center

After a day of presentations and information, by now your brain is probably getting overloaded with all of the content! Here's your chance to cool it down, but don't get a brain freeze! We plan to offer ice cream with toppings, and root beer floats, along with non-dairy and sugar-free options.

Summit Wrap-Up, Thursday October 15, 11:30 am – noon, Prairie Rose 105

The co-chairs will use this opportunity to wrap things up, including providing time to hear suggestions for improving the Geospatial Summit and providing more value to attendees and sponsors. And best of all, we plan to have the drawing for sponsor door prizes!

Concurrent Sessions A

A1. Technology

Title: Beyond Automation: Building New Geospatial Capabilities with GeoAI

Author: Phillip Julian

Organization: ESRI

Abstract: GeoAI is changing more than workflows. It's expanding what organizations can discover, understand, and accomplish with geographic information. From accelerating analysis and extracting insight from imagery to enabling natural language interaction with spatial data, GeoAI is opening new possibilities for GIS professionals and decisionmakers alike.

A2. Coordination

Title: North Dakota Geospatial Services Update

Author: Mark Steele

Organization: North Dakota Department of Water Resources

Abstract: This presentation will provide attendees with an update on the North Dakota Department of Water Resources' geospatial activities and services over the past two years (since the last Summit). Participants will learn about key developments, enhancements, and changes to the Aerial Image Service, LiDAR Service, Survey Service, and Data Download Services. The session will highlight recent efforts to improve access to authoritative geospatial data, expand available resources, and enhance the tools and services used by agencies, professionals, and the public. Attendees will leave with a clearer understanding of current capabilities, recent updates, and what these changes mean for accessing and using North Dakota's geospatial data resources.

A3. Mapping & Data

Title: *Field Maps Culvert Collection*

Author: Ryan Miles

Organization: Williams County, North Dakota

Abstract: The Williams County Highway department has been using out-of-date culvert data for the last several years. The data was collected originally by a consultant, was very expensive and had no way of being updated. They requested a newer way of collecting culverts that can be tracked and updated using GIS technology. The GIS department used ESRI's Portal and Field Maps to create a form for culvert data collection. ESRI's Arcade language was used to simplify collection on the form. A Dashboard was also built for the Highway Department Director to verify the accuracy of the data collection and to know which culverts need to be maintained. Using ArcGIS PRO, a report of all culverts collected was created as well.

Concurrent Sessions B

B1. Land Use

Title: An Honest Look at UAS for Weed Control in Agriculture

Authors: David Vinson, Arjun Upadhyay, and Kyle Bloomquist

Organizations: Grand Farms, NDSU, and iSight Drone Services

Abstract: Weed control is one of the biggest costs in agricultural crop production, and resistant weed species like Palmer amaranth and Waterhemp keep making it even harder. UAS technology is now being tested as a possible tool for finding and treating these weeds, but whether it actually earns a place in a working weed-management program is still an open question.

Title: Integrating Surface Water Dynamics, Active Fire Monitoring, and Rangeland Change Detection to Assess Climate-Driven Ecosystem Shifts in North Dakota Using Machine Learning

Authors: Mbongowo Mbuh, Rahman Sakib, and Gregory Vandeberg

Organization: University of North Dakota

Abstract: North Dakota's prairie sits at the meeting point of three coupled subsystems (pothole surface water, grassland fire, and rangeland vegetation) whose interaction, rather than any single trend, governs how the landscape responds to a changing climate. Studying the three in isolation, or overlaying finished maps, cannot tell whether water loss, fire, and vegetation decline merely share ground or share a sequence. We developed the Coupled Surface-water–Fire–Vegetation (CSFV) framework, a sequence-aware integration implemented in Google Earth Engine, and applied it across North Dakota for 2000–2024. Each subsystem is mapped from the sensor best suited to it, reduced to aligned annual per-pixel series, and combined into a data-calibrated Ecosystem Instability Index that encodes lagged cross-subsystem coupling and critical-slowness early-warning signals. A Random Forest then attributes each pixel's instability to a water-, fire-, vegetation-, compound-, or land-use-conversion cause. At the scale of the state the record is benign: open water showed no significant trend, vegetation greened ($\text{NDVI} + 0.0031 \text{ yr}^{-1}$), and active-fire counts declined (-79 yr^{-1}) even as fire stayed coupled to drought ($r = -0.42$ with SPEI). Beneath that aggregate, a per-pixel classification (0.935 overall accuracy, $\kappa = 0.913$) showed change dominated by land-use conversion and vegetation recovery, while the cross-subsystem coupling, near-zero statewide because fire reaches under a tenth of the rangeland, recovered to a leading predictor within the fire-exposed subset, where water loss leads fire and fire leads the failure to regreen. The resulting instability concentrates in a fire-coupled western band, spatially distinct from the eastern agricultural frontier.

B2. Coordination

Title: The North Dakota Parcel Program

Authors: Bob Nutsch

Organization: North Dakota Information Technology

Abstract: The Statewide Parcel Dataset is the North Dakota GIS Hub's most popular resource. This session offers value whether you're just getting started or already using this dataset. Attending this session will provide background on how the dataset came to be, why it's important for North Dakota, and provide a behind the scenes look at how it functions. You'll also learn about the partners involved in maintaining it and the best ways to access the data. This presentation is tailored for a general audience of geospatial technology users.

Title: The National Map: New Look and New Data

Authors: Elaine Guidero

Organization: U.S Geological Survey

Abstract: The United States Geological Survey's National Geospatial Program (NGP) provides foundational digital geospatial datasets, maps, and services representing the topography, natural landscape, and manmade environment of the U.S., free and publicly available through The National Map (TNM). Partnerships with state, county, Tribal, and other Federal agencies enable the acquisition of high-resolution elevation data through the 3D Elevation Program (3DEP), and the derivation of high-accuracy hydrography from that elevation data through the 3D Hydrography Program (3DHP). 3DEP and 3DHP data are published to TNM. This year, the North Dakota Department of Water Resources, the Natural Resources Conservation Service, and NGP partnered on a project to develop elevation-derived hydrography in two watersheds in north-central North Dakota. This data will be transformed into 3DHP and published on TNM within the next few years. NGP has recently updated the topoBuilder application, which lets users make custom maps, with new map styles and a new user interface. Updates on other TNM products and progress on current 3DEP and 3DHP projects will also be shared.

B3. Mapping & Data

Title: Reels, Routes, and Results: A GIS Approach to Inventory Management

Author: Alex Lange

Organization: Pro-West and Associates

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: Imagery as Infrastructure: Activating the Insights Layer in Local and State Government

Author: Porter Sartor

Organization: EagleView Technologies

Abstract: High-resolution aerial imagery has become foundational infrastructure for local government. As more jurisdictions upgrade to 1-inch resolution, the opportunity shifts from acquisition to activation. This session examines how local governments are converting detailed imagery into automated GIS datasets that support compliance, revenue recovery, infrastructure planning, and emergency response. Through real-world examples, we'll demonstrate how agencies are using automated extraction of impervious surfaces, sidewalks, building footprints, and land cover to modernize their base maps and reduce operational backlog. Learn how to move

beyond pixels and leverage imagery as a growth engine for smarter, faster, and more defensible decision-making.

Concurrent Sessions C

C1. Analysis & Reporting

Title: Integrated Geospatial Framework for Modeling First-Responder Coverage in South Dakota

Author: Jeremiah Maxfield

Organization: State of South Dakota

Abstract: South Dakota has implemented a statewide geospatial analytics framework that fuses authoritative state and federal datasets to model real-world first-responder coverage using a standardized 15-minute network-based drive-time analysis. The platform incorporates EMS incident data within an interactive dashboard environment that supports temporal, spatial, and categorical filtering of call records. A proximity-based “Near Me” tool enables rapid identification and ranking of responder agencies by querying validated operational datasets and returning location and contact attributes. In addition, the system generates exportable, boundary-driven analytical reports based on federal geographic units—such as municipal, county, legislative, and school district polygons—providing consistency for cross-jurisdictional planning and interoperability.

Title: Population Change Patterns in the United States, 2000-2020

Author: Daniel Lureen

Organization: University of North Dakota

Abstract: Throughout U.S. history, population change patterns have varied significantly across different decades. This study examines county-level population change in all 50 states from 2000 to 2020. The first aim of this research is to map population change patterns from 2000 to 2020 and identify statistically significant hot and cold spots of county-level population change nationwide. This study uses Global Moran’s I to determine spatial autocorrelation for population change across US counties, while Anselin Local Moran’s I is used to identify local clusters and spatial outliers. The Getis-Ord Gi* hot spot analysis is further used to identify statistically significant hot and cold spots. This first part of the analysis identifies county-to-county population change patterns from 2000 to 2020.

The second aim of this research study is to identify factors associated with this population change and analyze them to determine which are most significant. These factors will include different economic, climatic, presidential election voting patterns, and cost-of-living factors. An Ordinary Least Squares (OLS) regression will provide a baseline assessment of the relationship between these factors and population change patterns. A Spatial Error Model (SEM) and Spatial Lag Model (SLM) will then be conducted to account for spatial dependence where appropriate. This study is expected to identify significant patterns of county-level population change from 2000 to 2020 and determine the role of economic, climatic, political, and cost-of-living factors in this change.

C2. Coordination

Title: Connecting Operations, Collaboration, and Community Outcomes

Authors: Phillip Julian

Organizations: ESRI

Abstract: The most effective organizations connect operational work, stakeholder collaboration, and public engagement into a single, coordinated approach. When information flows seamlessly across teams and communities, organizations can improve transparency, strengthen trust, and make better decisions.

Title: McKenzie County Auditor Partners with GIS Staff to Develop Election Support Resources

Authors: Bonnie Foster

Organizations: McKenzie County, North Dakota

Abstract: McKenzie County Auditor partners with GIS staff to develop election support resources. Began by identifying issues previously involved with maintaining master street files and registered voter database records. Recognized that other county department workflows were utilizing current data in the County's enterprise GIS system. Realized the potential impact using GIS technology could have on data access and simplifying election processes.

C3. Mapping & Data

Title: Map the Message: Telling Your Story Through GIS

Author: Jerame Novak, and Stephanie Weiland

Organization: North Dakota Department of Transportation

Abstract: Much like a picture is worth a thousand words, a dataset can make a thousand pictures. Join Stephanie and Jerame from the NDDOT as they show you how to turn your data into a masterpiece that will effectively tell your story. Using the magic of GIS, we will show you how to expertly weave a data-driven narrative that will inform and engage your audience.

Title: More than a Pretty Picture: Effective Cartographic Design for Scientific Communication

Author: Hayden Yates, Kripa Thapa, and Zahra Finnigan

Organization: University of North Dakota

Abstract: Maps are essential tools for communicating scientific information, yet cartographic design is frequently overlooked during the scientific process. Even when a map presents accurate data, poor design choices can impede the final delivery and interpretation of results by diminishing, obscuring, or misrepresenting meaningful patterns and relationships. In contrast, strong cartographic design can transform complex spatial data into clear and actionable insights that support interpretation and facilitate decision-making. Drawing directly on real-world examples from the Energy & Environmental Research Center, this presentation will demonstrate how seemingly minor design choices determine whether specific maps effectively convey their intended message or purpose. Focusing primarily on North Dakota's energy landscape and carbon capture, utilization, and storage development, with supplementary examples from across the United States, we will compare less-effective maps with proposed revisions to illustrate how particular design choices shape audience perception and interpretation of spatial patterns and relationships. Through these comparisons, we will examine how symbology, color, labeling, hierarchy, and composition can either reinforce or undermine a map's intended message. Ultimately, cartographic design is more than aesthetics; it is a critical component of scientific communication. By designing maps with clarity and purpose, researchers and organizations can strategically convey scientific narratives and equip both internal and external stakeholders with accessible and actionable decision-making tools.

Concurrent Sessions D

D1. Technology

Title: Beyond the Static Map: Augmenting Multidisciplinary Research with ArcGIS Online

Author: Kripa Thapa

Organization: University of North Dakota

Abstract: Research involves different specialties, datasets, and analytical needs. With ArcGIS Online (AGOL), GIS can move beyond communicating results to also support data exploration and decision-making throughout the research process. The Energy & Environmental Research Center (EERC) is a multidisciplinary research organization where geospatial information supports diverse projects. GIS no longer simply communicates the EERC's final answers; it is becoming part of how its researchers arrive there. Previously, GIS at EERC centered on desktop analysis and static maps, but now it is expanding how researchers interact with spatial information. AGOL allows researchers to collaboratively validate data via web maps and applications that integrate disparate datasets into interactive environments, display data attributes and spatial relationships, perform proximity and buffer analyses, and iterate interim maps as research evolves. This expansion is not without challenges. The EERC has had to address new governance concerns around content management, user roles, credits, data reliability amid personnel and responsibility changes and overlapping projects, and reviewing, retiring, and archiving outdated resources. This presentation will explore how the EERC is using AGOL's capabilities to augment traditional static GIS products to improve research. The discussion will highlight how this secure internal web GIS environment can help multidisciplinary teams augment conventional GIS to investigate, understand, and visualize their data, supporting faster decisions and more informed, trusted research.

Title: Using GIS to Determine Stream Power Index of Erosion Potential: Forest River Watershed, North Dakota

Author: Sheena Ofori, and Gregory Vandeberg

Organization: University of North Dakota

Abstract: The Forest River watershed is an approximately 936 square miles agricultural tributary of the Red River of the North in eastern North Dakota. The watershed transitions from moderately sloping glaciated plain in the west, with a low relief former Lake Agassiz plain of the Red River Valley in the east, providing useful setting for examine the relationship among terrain, surface runoff and potential erosion. The study also looked at changes in historic flow regimes for the Forest River. Using an approximately 9m resolution digital elevation model (DEM), GIS-based terrain analyses were conducted in ArcGIS Pro, including slope, D8 flow direction, flow accumulation, higher order drainage pathways, and Stream Power Index (SPI). SPI is a terrain-based index that combines contributing flow accumulation and slope to represent the potential erosive power of concentrated surface runoff. Percentile-based classification produced 85th, 90th and 95th percentile SPI thresholds of 2.898, 3.624 and 4.865 respectively. Locations at or above the 95th percentile were considered to be the highest erosion potential areas. Approximately 68.2% of these areas occurred in Walsh County, followed by Grand Forks County (23.1%), Nelson County (8.4%), and Cavalier County (0.3%). The results were compared to previous SPI research conducted by Thalacker (2014) in the Forest River system. This difference could be due to the resolution of the DEM, the area of the watersheds and the preprocessing methods. The study illustrates the use of GIS-based terrain analysis to determine priority areas for field verification, monitoring erosion and planning conservation in the agricultural watershed.

Title: Using Harmonized Landsat and Sentinel2 Imagery to Monitor Harmful Algal Blooms in North Dakota Lakes

Author: Zachary Ahrenstorff

Organization: University of North Dakota

Abstract: Harmful algal blooms (HABs) are an increasing concern for freshwater systems and require monitoring approaches capable of capturing changes across both space and time. This research evaluates the use of Harmonized Landsat and Sentinel-2 (HLS) satellite imagery to monitor algal conditions in four North Dakota water bodies: Devils Lake, Stump Lake, Larimore Dam, and Homme Dam. In-situ water samples are collected during the open-water season and analyzed for chlorophyll-a and phycocyanin, which serve as indicators of algal and cyanobacterial abundance. These field measurements are paired with satellite imagery acquired near sampling dates to examine relationships between measured water-quality conditions and satellite-derived spectral information. Google Earth Engine is used to acquire, process, and analyze HLS imagery and develop a repeatable workflow for monitoring water quality. Spectral indices and reflectance information will be compared with field measurements to evaluate their ability to identify elevated algal concentrations and potential bloom areas. GIS and time-series analyses will further be used to examine the spatial distribution, development, and persistence of algal conditions. This research aims to demonstrate how satellite remote sensing can complement traditional field sampling and improve monitoring of harmful algal blooms in North Dakota lakes.

D2. Current Events Impacts

Title: Navigating Accessibility Requirements in a GIS Web App: ND Roads Case Study

Author: Brian Fischer, and Brandon Backman

Organization: Houston Engineering

Abstract: ND Roads is one of the flagship GIS web applications in the State of North Dakota that communicates road conditions to the public. The web application was developed prior to the recent Department of Justice ruling that requires all government agencies to ensure web applications are compliant with the WCAG 2.1 standard. This presentation will provide an overview of the process used to assess and remediate the NDRoads web application to conform to the standard. Specifically focusing on the GIS features within the web application. We will share some lessons learned along the way and critical decision points.

Title: A Map to Accessible Mapping

Author: Ann Fritz, Stephanie Weiand, and Jerame Novak

Organization: North Dakota Department of Environmental Quality, and Department of Transportation

Abstract: The Americans with Disability Act or ADA, was signed into law in 1990 by President George Bush. In 1996, the U.S. Department of Justice interpreted that the ADA includes websites and mobile devices. Despite that ruling, digital accessibility compliance had been lagging or non-existent -until recently. In 2024 the DOJ issued a final rule and timeline for states and local governments to bring their digital presence into compliance. The compliance date for state governments has now been pushed back to April 26, 2027 (or April 26, 2028, for public entities with total population less than 50,000 or special district governments). What is digital accessibility, what does it mean for a GIS professional and the web maps they create for their organization? This special panel will provide three perspectives on why accessibility matters and the importance of digital accessibility specific to geospatial information. The first perspective is from a former state agency GIS Coordinator who is now external civil rights program manager responsible for compliance and investigating complaints of discrimination; North Dakota Department of Transportation's journey to implementing digital accessibility in their digital geospatial products; and finally a geospatial professional in Minnesota working closely with their state's Office of Accessibility will share how coordination and cooperation have led to increased adaption of accessibility standards and expectations for state and local governments.

D3. Environment

Title: GIS For National Environmental Policy Act (NEPA) Compliance

Authors: Dan Lissick

Organizations: AE2S

Abstract: GIS mapping tool created to comply with the Federal National Environmental Policy Act (NEPA) permitting requirements for a 150-mile rural water project that crossed 50 miles of the Little Missouri National Grassland. The GIS tool allows for real time collaboration with all project stakeholders and streamlined the navigation of waterline design and installation through cultural resource areas and sensitive wildlife habitats.

Title: The Digital Journey of Land Acquisition for the FM Area Diversion Project

Authors: Carol Wickenheiser

Organizations: AE2S

Abstract: Every infrastructure project requires some type of property right. Property acquisition generates volumes of spatial and tabular data, documents, drawings, and exhibits. Property information is often managed as a short-term project deliverable rather than a long-term organizational asset. This presentation takes us on a journey through the lifecycle of parcel data, from project location decisions, to initial rights of entry, through property acquisition processes and finally migration to an archivable yet living dataset which can be referenced for future maintenance and project operation.

Attendees will learn how GIS is used as the foundation for integrating ownership records, appraisal data, acquisitions and property rights into a single authoritative source of information. The GIS data needs to be accessible to multiple levels of participants in the project's day-to-day operations, and maintenance will continue in one form or another for generations. The project's long lifespan introduces complex challenges that are best addressed through the broad range of solutions GIS provides.

Title: From Imagery to Action: Expanding North Dakota's Land Management Capacity with Remote Monitoring Tools

Authors: Miles Van Blarcum

Organizations: Upstream Tech

Abstract: North Dakota agencies manage large, dispersed land portfolios, infrastructure, and natural resources while working within short field seasons and limited staff capacity. This session will show how North Dakota Game and Fish (NDGF) is using Lens (a remote monitoring platform) alongside existing GIS resources to make land monitoring more targeted, scaleable, and actionable. In addition to sharing more about NDGF's use of change detection tools to support the Private Lands Open to Sportsmen (PLOTS) program, Upstream Tech will cover other ways that agencies are using aerial imagery and change detection to help prioritize inspections, evaluate land-use changes and grazing, understand forest trends, monitor Wildlife Management Areas, and more. The session will also discuss recent breakthroughs in AI that have proven useful for monitoring vast landscapes and uncovering insights about land management practices. Topics include compatibility with QGIS; usage of AI for change detection and insight collection; combining public and commercial imagery; and using automated alerts, notes, and reports to direct limited staff capacity toward the highest-priority sites. Attendees will leave with a practical framework for extending existing GIS investments into an operational remote-monitoring workflow that improves statewide oversight while keeping field expertise central.

The End

Thank you for attending,
we hope to see you in
2028!