TNGIC MBSP 2024

TNGIC 2023 Annual Conference

Montgomery Bell State Park Lodge

1000 Hotel Avenue

Burns, TN 37029

April 9-11, 2024

Keynote Speakers

Presentations

Social

Golf

Training

Map Gallery

Door Prizes

Please visit the TNGIC website for more information:

https://www.tngic.org/

Keynote Speakers

Wednesday | April 10, 2024
Dr. Budhu Bhaduri

ORNL Director of Geospatial Science and Human Security Division

Dr. Budhendra "Budhu' Bhaduri is the director of the Geospatial Science and Human Security Division and a Corporate Research Fellow at Oak Ridge National Laboratory (ORNL). In that capacity he is responsible for an interdisciplinary research portfolio focused on human dynamics, geographic data science, remote sensing, scalable geocomputation, and special communications and autonomous systems. Previously he led the Geographic Information Science & Technology research group in Computational Science and Engineering Division. Additionally, between 2014-2019, he founded and led ORNL's Urban Dynamics Institute, a cross-disciplinary initiative across the laboratory that fostered a data driven understanding of complex urban systems. Over his career, he has catalyzed the integration of geographical sciences in the laboratory's as well as the Department of Energy's mission. His professional interests and experience cover novel implementation of geospatial science and technology for a wide variety of programs supporting energy, environment, and national security missions across the Department of Energy, the Department of Defense, and the Department of Homeland Security. Dr. Bhaduri's research has had global impact and has benefited the U.S. federal missions, international organizations, and private foundations.

Thursday | April 11, 2024
Dr. Nik Smilovsky

Bad Elf Geospatial Solutions Director

Dr. Smilovsky is the Geospatial Solutions Director for Bad Elf, a GNSS technologies company. Dr S is a faculty member at Arizona State University teaching various GIS and design classes. He is a certified Geographic Information Systems Professional, a certified Arborist, and a Part 107 certified UAV pilot. As a geospatial evangelist, custom geospatial solutions provider, and geographic researcher. Dr. S is widely versed in all things geodetic. He is a proud Geoholic!

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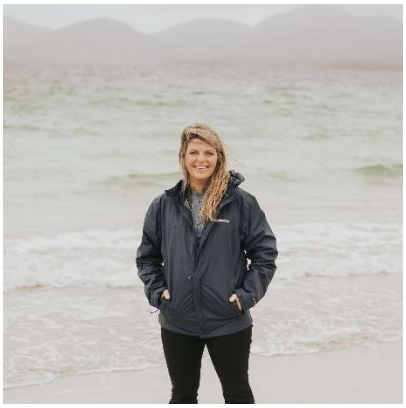
Board Nominations

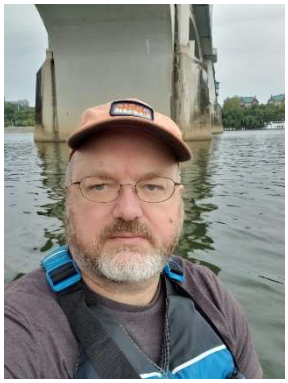
Samantha Allen



Samantha Allen is faculty at Tennessee Tech University in the School of Environmental Studies. She has been attending TNGIC for seven years, first as a student and now as a faculty member. She teaches spatial analysis and remote sensing courses, and much of her research is focused on finding innovative ways to use remote sensing and environmental variable data to make more informed watershed management decisions. In serving on the board, Samantha hopes to contribute back to the organization of TNGIC, which has been an invaluable resource for networking and personal development over the years.

Randy Hale

Randal Hale is the owner operator of North River Geographic Systems, Inc in Chattanooga TN. He's been in the Geospatial Industry for far too long. He also hates talking in the third person. I'm currently on the board for a few organizations around the US (Georgia Geospatial, OSGEO US, and whatever QGIS US currently looks like). In my spare time I tend to go canoeing, possibly map something in OpenStreetMap, or go for increasingly long walks. We should go canoeing sometime.

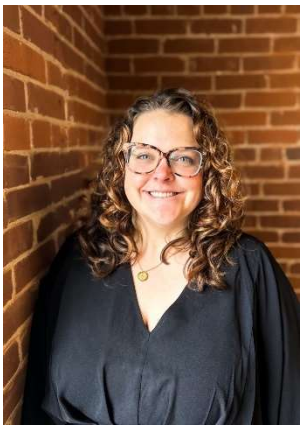


Danielle McClanahan

Danielle is a project manager and GIS team lead at Stantec in the Nashville office. She supports their FEMA Risk MAP program as a project manager, GIS lead, quality advocate, and FEMA tools lead. Her favorite part of her job is going to various parts of the country to meet with communities to discuss flood risk data. When she is not working, she spends her time gardening, reading, and trying to convince her husband to let her keep the stray animals she finds.

Sarah Sweat

Sarah Sweat has over 10 years of experience working in Environmental Sciences, Hydrology, Freshwater Ecology, and Public Works utilizing GIS. Previously, she worked for the Tennessee Aquarium as a GIS Analyst for 8 years where she focused on spatial analyses of freshwater turtles, salamanders, fishes, and crayfishes. She also previously served as Treasurer for the Southeastern Fishes Council and as a member Advisory Board for the Georgia Environmental Protection Division's Georgia Adopt-A-Stream Program. She graduated in 2012 with her B.S in Environmental Sciences and in 2014 with her M.S. in Biology from Georgia College & State University. She received her GISP certification in 2022. Currently, Sarah is a GIS Professional at LJA Engineering in Chattanooga, TN where she focuses on data management and application building for the Public Works sector. Sarah also currently organizes meet ups for the Chattanooga GIS User Group quarterly and enjoys making new connections in the GIS community. She also helped organize the Eastern Fall Forum in 2023 in Chattanooga, TN. Outside of work Sarah likes to craft and spend time with her family exploring Chattanooga.



Conference Map Gallery

TNGIC hosts an annual Map Gallery Competition for the GIS Community to share their work. It is just another great way to see what TNGIC Members are working on. Share your work below!

What to Expect: Physical maps are to be checked in at the conference registration table. Authors may be available in the map gallery at a time designated in the conference agenda to answer questions about their map (attendance during judging is optional). Award recipients will be announced during lunch of the second day of the conference and be posted on the TNGIC website.

We have **five** categories we will be judging for Map Gallery Awards:

1. Best Cartographic Design: Awarded to the map that artistically employs the elements of cartography without compromising use and functionality.

2. Best Analysis: Awarded to the map that is best designed to display the results of spatial data analysis and presents the information in an unbiased way, allowing the viewer to extract their own conclusions, utilizing the map as a tool.

3. Best Student Map: Awarded to the best overall student map or research poster. Submitted maps may be cartographic or analytically focused.

4. Best Online Map or App: Awarded to the best Online Map or App (such as a dashboard or story map). Map entries will be judged before the conference. All web maps or apps must be made public (not password protected). Maps will be accessible for conference goers via hyperlinks in the conference app, as well as in the map gallery.

5. Viewer's Choice: Award chosen by the attendees for the best overall **physical map** in the map gallery. Maps entered the day of the conference are eligible for viewer's choice.

TNGIC MBSP 2024

Conference Training

GRASS GIS 101 – Dr. Vero Andreo and Caitlin Haedrich

Date / Location: **April 9, 2024 / Ballroom**
Timeslot: **8:30 AM - 12:00 PM CT**

This session will cover basic concepts such as projects, computational region, masks using the graphical interface, and tasks within Jupyter notebooks. By the end of the workshop, participants will have hands on experience with setting up and organizing GRASS GIS projects and data, processing multi-band remote sensing imagery, computing vegetation indices, unsupervised image classification, and automating processes with the GRASS Command Line and Python APIs. Participants should bring their own laptops with the latest GRASS GIS version and workshop data downloaded.

- Download GRASS GIS here: https://grass.osgeo.org/download/
- Download sample data here: https://grass.osgeo.org/sampledata/north_carolina/nc_spm_08_grass7.zip

Cloud Computing with Google Earth Engine and Geemap – Dr. Qiusheng Wu

Date / Location: **April 9, 2024 / Ballroom**
Timeslot: **1:00 PM - 5:00 PM CT**

This workshop provides and introduction to cloud-based geospatial analysis using the Earth Engine Python API. Attendees will learn the basics of Earth Engine data types and how to visualize, analyze, and export data in a Jupyter environment with Geemap. Through practical examples and hands-on exercises, attendees will enhance their learning experience. Familiarity with Earth Engine JavaScript API is not required but will be helpful. Attendees can use Google Colab to follow this workshop without downloading anything on their computer. Attendees must bring their own laptop and register for an Earth Engine account: https://code.earthengine.google.com/register

ArcGIS Experience Builder & Arcade Across the ArcGIS Platform – Mike Sweeney

Date / Location: **April 9, 2024 / Ballroom**
Timeslot: **1:00 PM - 5:00 PM CT**

ArcGIS Experience Builder empowers you to quickly transform your data to interactive, mobile optimized web apps and web pages. It provides a new level of configuration with flexible design, mobile optimization, smart widgets, and integration. Learn the building blocks of Experience Builder including pages, windows, widgets, data sources, layouts, and themes, as well as how they work together, then adapt the content on different screen sizes, integrate with ArcGIS Survey123 and ArcGIS Dashboards apps to streamline processes, and interact with your 2D and 3D data for immersive experience.

This session will cover the ArcGIS Arcade expression language. Learn how to use Arcade for simple functions like configuring popups, labeling and symbology for ArcGIS Pro, ArcGIS Online and ArcGIS field apps. In addition, learn about advanced capabilities of Arcade for data engineering, analysis and use in ArcGIS Dashboards and APIs. This course is intended for all ArcGIS users, and we will establish a foundation in Arcade before moving onto more advanced use cases of Arcade.

Using QGIS with LIDAR Data – Randal Hale, NRGS

Date / Location: **April 9, 2024 / Ballroom**
Timeslot: **1:00 PM - 5:00 PM CT**

This class is aimed at people that would like to view and manipulate LIDAR data in QGIS. Class participants will take elevation data (tifs) and LIDAR data (LAS/LAZ) files and view/symbolize those in 2D and 3D. Participants will take LAS data and filter, extract, and create data with QGIS.

Agenda

Wednesday, April 10, 2024

7:30 AM – 9:00 AM	Breakfast
8:00 AM – 9:00 AM	New Member Breakfast (Boardroom)
8:00 AM – 12:00 PM	Registration
8:00 AM – 5:00	Business Partner Hall (Ballroom A)
8:00 AM – 5:00 PM	Map Gallery
9:00 AM – 9:30 AM	Opening Session (Ballroom B/C)
9:30 AM – 10:30 AM	Keynote Dr. Bhaduri (Ballroom B/C)
10:30 AM – 11:00 AM	Break (Ballroom A)
11:00 AM – 11:30 AM	TN and the 3D Hydrography Program (Ballroom B/C)
11:30 AM – 12:00 PM	Business Partner Lightening Rounds (Ballroom B/C)
12:00 PM – 1:30 PM	Lunch (Ballroom B/C)
1:30 PM – 3:00 PM	Presentations (Ballrooms B, C, Private Dining Room)
3:00 PM – 3:30 PM	Break (Ballroom A)
3:30 PM – 5:00 PM	Presentations (Ballrooms B, C, Private Dining Room)
6:00 PM – 9:30 PM	Dinner and Social (Lake Acorn Pavilion)

Thursday, April 11, 2024

7:30 AM – 8:30 AM	Breakfast
7:30 AM – 8:30 AM	New Member Breakfast (Boardroom)
8:00 AM – 12:00 AM	Registration
8:00 AM – 3:30 PM	Business Partner Hall (Ballroom A)
8:00 AM – 3:30 PM	Map Gallery
8:30 AM – 9:00 AM	Opening Session (Ballroom B/C)
9:00 AM – 10:00 AM	Keynote Dr. Smilovsky (Ballroom B/C)
10:00 AM – 10:30 AM	Break (Ballroom A)
10:30 AM – 11:30 AM	TNGIC Business Meeting (Ballroom B/C)
11:30 AM – 12:00 PM	Business Partner Lightening Rounds (Ballroom B/C)
12:00 PM – 1:30 PM	Lunch (Ballroom B/C)
1:30 PM – 3:00 PM	Presentations (Ballrooms B, C, Private Dining Room)
3:00 PM – 3:30 PM	Break (Ballroom A)
3:30 PM – 4:00 PM	Closing Ceremony (Ballroom B/C)

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Presentation Schedule

Wednesday, April 10, 2024
1:30 – 3:00 PM

Private Dining: FOSS	Room B: AGOL	Room C: Public Works
10 Tasks to Consider Using QGIS (And a Few To Not) - Natalie Robbins	Experience Builder: Advice, Hints, and Recommendations for App Success - Andrew Pericak	Innovative Uses of Technology to Facilitate Smoke Testing Data Collection - Matthew Snyder & Jeramy Davis
Interactive Visualization of Geospatial Data with Leafmap – Dr. Qiusheng Wu	Utilizing ArcGIS StoryMaps for Public Science Communication -Callie Hilgenhurst	Mapping Lead Replacement in Shelby County, TN - Michelle Patton
Using Open-Source Apps for GPS Field Data Collection – Dr. Nik Smilovsky	Tennessee Geographic Alliance: Updated Tennessee State Atlas - Emma Blanks, Anna LaFollette, Bradford Shipley	Trash Talk: How the City of Spring Hill automated Bulk Item Pick-up! - Helen Orlet
QGIS and LIDAR – Randy Hale	Day in the Life of a GIS Analyst: TDOT ITS and Fiber Data Management Dashboard – Caitlyn Mills	
Creating Maps as Physical Art – Tracy Homer		

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Wednesday, April 10, 2024
3:30 – 5:00 PM

Private Dining: Research	Room B: Planning	Room C: Solutions
Using Spatial Analysis to Determine Arboretum Accessibility: A Tennessee Case Study - Dr. Jillian Gorrell	TN TREC Project: Mapping Statewide Recreation - Paul Dudley & Kari Williams	Moving Forward with ESRI's Data Management Solutions - Kevin Bingham
Urban Development using Ground Penetrating Radar Applications - Heather White & Dr. Eileen Ernenwein	Assessing ADA Compliance of Pedestrian Infrastructure - Joe Martin	The Future of GIS with High Resolution Aerial Imagery - Savannah Heckman
Tracking Tornado Alley: How is it Changing and Why? - Preston Ford	Application of Geodesign Principles in Tullahoma Land Use Planning - Michael Cullen	Tennessee Statewide Ortho Imagery and Elevation Data Program - Rob Edie
	Building an Enterprise Solution to meet Nashville's Complex Data Security Needs - Jennifer Higgs	Enabling your Data! - Kenneth Bryant

Wednesday, April 10, 2024
3:30 – 5:00 PM
Board Room: Special Session

GNSS Trail Blazing: The Montgomery Bell State Park Trail Mapping Project, Dr. Nik Smilvosky. Please sign up in advance, this session will take place outside.

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Thursday, April 11, 2024
1:30 – 3:00 PM

Private Dining: Education	Room B: Workflows	Room C: TNView Contest
Update on K-12 Geography Education - Kurt Butefish	Working with What you Got: Leveraging Standard ArcGIS Online Functionality to Replace Expensive Software Solutions - Austin Averill	Exploring land cover change in the Chattanooga tri-state region using the NLCD, NAIP imagery, and deep learning – Mimi White
Mapping with meaning: Significance beyond georeferencing - Dr. Mayra Roman-Rivera & Dr. Derek Alderman	Audit Seasoning: Auditing Enterprise GIS Environments - Cory Gens	Spatiotemporal Fish Assemblage Patterns Associated with Fluctuating Flow in a Cumberland River Watershed in Tennessee – Mark Rine
Customizing Vector Tile Basemaps: Beginner to Advanced - Matt Lane	From Field to Attribute Table: Best Practices for Data Acquisition - Alex Lennon & Mark Crow	Temporal Dynamics of Land Use and Cover in Knox County, Tennessee: A Geospatial Analysis Using NLCD and Geemap - Mahnaz Meem
	Working in Harmony: GIS in Music City - Danielle Greer	Skyward Sentries: Detecting Unmarked Burials with Drones and Geophysics – Noah Hall

Presentation Details

10 Tasks to Consider Using QGIS (And a few to not)

Presenter: Natalie Robbins, Vanderbilt Institute for Spatial Research

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Private Dining Room

Presentation Abstract: Many times, in GIS, we become comfortable performing workflows in only one software system, even if it may be advantageous to perform that task in another software platform. In this talk, I propose the adaptation of a multi-software approach and recommend a few workflows I have found are easier or produce better results in QGIS. In many of the projects I work on at Vanderbilt, at least part of the project is conducted in QGIS. QGIS can be used to create publication-quality maps, provides flexibility in processing algorithms, and I argue, has a better layout interface. One of the best parts of QGIS is its extensionality using plugins--I will cover a few plugins that I rely on for research projects, including Quick OpenStreetMap, and MMQGIS for geocoding. Hopefully, this presentation inspires you to try out QGIS and even adapt it into a few of your workflows.

Presenter Bio: Natalie Robbins is a spatial researcher at Vanderbilt University, where she engages with researchers on geospatial, remote sensing, and geophysical consultation projects. A native of Chandler, AZ, Natalie has a B.S. in Environmental Science from the University of Arizona and a Professional Science Master's (PSM) in Environmental Informatics from Tennessee Tech. Natalie has been at Vanderbilt for going on five years, during which time she has become interested in, and an advocate for open source geospatial tools. She is currently working on learning PostgreSQL/POSTGIS, so please reach out and chat with her with any advice/training recommendations. Natalie is a current TNGIC board member and member of the PSM Industry Advisory Board at TN Tech. When she isn't wrangling geospatial data, Natalie enjoys visiting our wonderful TN State Parks with her dog Lucy, reading, and estate saleing.

Interactive Visualization of Geospatial Data with Leafmap

Presenter: Dr. Qiusheng Wu, University of Tennessee Knoxville

Title: Interactive Visualization of Geospatial Data with Leafmap

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Private Dining Room

Presentation Abstract: Geospatial data visualization is essential for understanding and analyzing geographic information. While numerous Python packages exist for visualizing geospatial data, few offer interactive capabilities within the Jupyter environment. This poses a challenge, particularly for novice users with limited coding skills. However, Leafmap, an open-source Python package, addresses this issue by enabling interactive mapping and geospatial analysis with minimal coding in Jupyter notebooks. In this presentation, we will showcase the powerful interactive functionalities of Leafmap for visualizing geospatial data. Attendees will learn how Leafmap simplifies the process of loading and displaying various file formats, including local vector and raster datasets, LiDAR data, COG, and STAC. By the end of this presentation, attendees will have a comprehensive understanding of the capabilities of Leafmap and will be empowered to leverage interactive mapping and geospatial analysis with ease.

Presenter Bio: Dr. Qiusheng Wu is an Associate Professor in the Department of Geography & Sustainability at the University of Tennessee, Knoxville. In addition, he holds positions as an Amazon Visiting Academic and a Senior Research Fellow at the United Nations University. Specializing in geospatial data science and open-source software development, Dr. Wu is particularly focused on leveraging big geospatial data and cloud computing to study environmental changes, with an emphasis on surface water and wetland inundation dynamics. He is the creator of several open-source packages designed for advanced geospatial analysis and visualization, including geemap, leafmap, and segment-geospatial. For a closer look at his open-source contributions, please visit his GitHub repositories at https://github.com/opengeos.

Using Open-sources Apps for GPS Field Data Collection

Presenter: Dr. Nik Smilovsky, Bad Elf

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Private Dining Room

Presentation Abstract: During this presentation (part of open-source session), we'll explore integrating external GPS antennas with open-source GIS apps for enhanced field data collection. We'll emphasize the significance of GPS accuracy, demonstrate connecting external antennas to apps like QGIS, and showcase improved data precision.

Presenter Bio: For nearly two decades, Dr. Smilovsky has dedicated himself to advancing the geospatial professions both professionally and academically. With experience spanning various private consulting firms, he has been instrumental in collecting, analyzing, and visually presenting geographic data. Simultaneously, as an academic, his focus on research has significantly contributed to the educational knowledge landscape. Dr. Smilovsky's life passion revolves around geography, evident in his roles as an energetic public speaker, dedicated teacher, and influential thought leader. He finds joy in sharing successes with others and witnessing their growth. His specific interests within the geospatial domain include the geography of behavior, sustainable and resilient geodesign, pedagogy in geographic science (particularly in online education), and a holistic exploration of geospatial technologies.

QGIS and LIDAR

Presenter: Randy Hale, NRGS

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Private Dining Room

Presentation Abstract: How does QGIS and LIDAR work together? There has been a lot of work over the last 2 years to make QGIS into a platform that can incorporate LIDAR into your analysis work. This talk will walk through how you can use QGIS to view and manipulate LIDAR data. We will use PDAL Wrench to work with some data and create a DEM. We will use the normal viewing capabilities OF QGIS to view LIDAR and create an Elevation Profile. After this talk you will all get a free lifetime copy of QGIS to use for fun and profit.

Presenter Bio: Owner and operator of North River Geographic Systems, Inc. Randal Hale has been in the geospatial industry for way too long. I generally work with Free and Open Source Software for Geoinformatics (QGIS, PostGIS, Geoserver, GRASS). NRGS is a business supporter of QGIS and a business partner with Mergin Maps. One will hopefully find him either sifting through data or sitting in a canoe - hopefully a canoe.

Creating Maps as Physical Art

Presenter: Tracy Homer, UTK Alumni

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Private Dining Room

Presentation Abstract: Tracy will show several different art maps she has made, and go through the different software tools used to make them. She will discuss what datasets and formats work for each type of map and how you can make your own artistic maps using freely licensed software.

Presenter Bio: Tracy Homer is a proponent and enthusiast of Open Source Software, especially in mapping. By day she works for the Software Freedom Conservancy, a software advocacy organization; and by night administrates Knox Makers, a local community makerspace. In her spare time she makes artistic maps using FOSS and whatever materials she finds interesting at the time.

Experience Builder: Advice, Hints, and Recommendations for App Success

Presenter: Andrew Pericak, TDOT

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Room B

Presentation Abstract: I will share tips, tricks, and lessons learned that I have picked up while migrating web apps from Esri's Web AppBuilder (WAB) to the new Experience Builder (EB). I am not an Esri employee nor an EB expert, but I imagine those statements are true for you too—so I will discuss the things I think you need to know as you start working with EB. Experience Builder is the replacement for the tried-and-true but sadly soon-to-retire Web AppBuilder. While we all have through at least 2025 to switch our web apps to EB, if you're anything like me, EB's learning curve has presented a bit of a challenge. But through work in translating existing WAB apps to EB, I have already found a set of concepts, best practices, and unwritten rules that can smooth that curve and—dare I say it—make creating apps in EB exciting and fun. I am eager to share what I have learned with you and to hear your own wisdom for finding Experience Builder success.

Presenter Bio: Andrew Pericak (he/him/his) is a geographer, policy analyst, spatial analyst, and cartographer currently based in Nashville, Tennessee. He specializes in analyzing and assessing environmental policies through a geospatial lens. Andrew works as a GIS Analyst for the Tennessee Department of Transportation, where he serves as an internal GIS consultant and expert for the agency's location technology users statewide. He holds a Master of Environmental Management degree and Certificate in Geospatial Analysis from Duke University's Nicholas School of the Environment. In his free time, Andrew speedruns the daily New York Times Crossword; plays French horn, piano, and guitar for an audience of his cats; fortnightly bakes buttermilk biscuits; and variously nerds out about electric vehicles, Star Wars, local weather, and music theory.

Utilizing ArcGIS StoryMaps for Public Science Communication

Presenter: Callie Hilgenhurst, TDEC Division of Remediation

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Room B

Presentation Abstract: The TN Clean program directs over $60 million towards the remediation of 21 industrially contaminated sites across Tennessee. To promote government transparency, DOR uses ArcGIS StoryMaps to communicate site histories and current remedial use of funding to the public.

Presenter Bio: A native of Brentwood, TN, Callie has been working for the Division of Remediation since August, after graduating from Vanderbilt University in May of 2023. At Vanderbilt, she completed an undergraduate thesis on microplastics in Mammoth Cave National Park. She now utilizes her expertise in contaminants and karst at the DOR, where she uses ArcGIS StoryMaps to convey stories of industrial contamination of sites in the TN Clean program to the general public. The 21 sites in the TN Clean program receive state funding to be completely rehabilitated to productive use, despite complex industrial histories. Though Callie specializes in microplastic pollution, her position at the DOR provides valuable experience in other types of contamination, including chlorinated solvents, metals, VOCs, PAHs, PCBs, and radionuclides.

Tennessee Geographic Alliance - Updated Tennessee State Atlas

Presenter: Emma Blanks, Anna LaFollette, & Bradford Shipley, University of Tennessee, Knoxville

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Room B

Presentation Abstract: As a collaboration between the Tennessee Geographic Alliance and The University of Tennessee's "GIS in the Community" class, our group worked to recreate and digitize a state atlas to be used as a K-12 geographic education teaching aid. Additionally, our presentation will explore best practices for developing applications from scratch using the ESRI Experience Builder platform.

Presenter Bio: Emma, Anna, and Bradford are all current students at the University of Tennessee, Knoxville.

Day in the Life of a GIS Analyst: TDOT ITS and Fiber Data Management & Dashboard Edition

Presenter: Caitlyn Mills, Stantec

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Room B

Presentation Abstract: In this presentation, I'll talk about the GIS aspects of the ITS and Fiber Deployment Plan project I'm currently working on for TDOT. I'll cover the life cycle of a consulting project through the GIS Analyst lens, talk about the data that was available as a starting point vs. the end goal and what the data processing looked like, and showcase the GIS viewer and dashboard we created for TDOT as part of this project.

Presenter Bio: Caitlyn serves in Stantec's environmental services group and is part of Stantec's FEMA team. She supports Risk MAP projects and brings GIS expertise into water resources, planning, and transportation. Caitlyn is versed in ArcGIS Online and enjoys creating web viewers to share geospatial data with people outside the GIS world.

Innovative Uses of Technology to Facilitate Smoke Testing Data Collection

Presenter: Matthew Snyder & Jeramy Davis, City of Chattanooga

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Room C

Presentation Abstract: This project spotlights the collaboration between GIS And the Wastewater Department to use UAV imagery to test wastewater lines. The Wastewater Department is responsible for the operation and maintenance of the surrounding metropolitan area for a population of 400,000. Wastewater and DPW-WQ enforcement tea members routinely smoke test lines to detect leaks, but decided to take an innovative approach to capacity issues they were experiencing. In addition to recording the positive smoke defects from the ground, they partnered with GIS to use a UAV to gain a bird's eye view and use thermal and color 4K imaging. This innovative approach was useful to identify problem areas more quickly, with greater accuracy. DPW-WQ, WW Engineering, and GIS are pleased with the success of this technique and plan to use colored smoke for future searches to make images more visible.

Presenter Bio: Matthew Snyder is the Engineering Manager for the City of Chattanooga Wastewater Dept and has overseen CMOM activities for the past two years as Chattanooga reached the halfway point of its Consent Decree www.ClearChattanooga.com. He started his wastewater career at KUB in 2009 during Knoxville's CD. Jeramy Davis seasoned GIS Analyst and Unmanned Aerial Vehicles (UAV) expert with over 5 years of comprehensive experience in geographic data acquisition, design, and cutting-edge technology integration. Currently based in Chattanooga, Tennessee, Jeramy serves as a Geographic Information Systems Analyst/UAV Specialist for the City of Chattanooga, where He's played a pivotal role in maintaining, updating, and creating datasets for the Wastewater and Public Works Departments. Additionally, He is responsible for spearheading the development of the City's UAV program, becoming the first Part 107 FAA-certified operator.

Mapping Lead Replacement in Shelby County, TN

Presenter: Michelle Patton, Memphis Light, Gas, and Water

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Room C

Presentation Abstract: Memphis Light, Gas & Water (MLGW) is working towards reaching compliance with the Environmental Protection Agency's (EPA) Revised Lead and Copper Rule (LCRR). This ongoing project focuses on completing MLGW's lead inventory on both the MLGW service side and the customer property side for each customer in Shelby County, TN by October 16th, 2024. This talk covers the hurdles of integration between Geographic Information Systems (GIS) and Customer Information Systems (CIS), importing historical data, using building and water main data to determine the customer side, and inspections.

Presenter Bio: Michelle Patton (Field), GISP serves as a Geographic Information Systems (GIS) Developer for Memphis Light, Gas & Water (MLGW) on the GIS Administration team. In this role, she has integrated geospatial tools and location intelligence for MLGW's internal and external stakeholders. Michelle previously served as the President of the Memphis Area Geographic Information Council's (MAGIC) Board of Directors and teaches remote sensing at the University of Denver. She received her Master of Science in Earth Sciences at the University of Memphis in 2019 and is FAA Part 107 certified.

Trash Talk: How the City of Spring Hill automated Bulk Item Pick-up!

Presenter: Helen Orlet, OHM Advisors

Date and Time: Wednesday, April 10, 1:30-3:00 PM

Room: Room C

Presentation Abstract: The City of Spring Hill provides bulk item pick-up to all residents once per week. Pick-up crews struggled to keep up with demand as the population within the city continued to surge. They needed a solution that would increase efficiency and reduce complaints from citizens. OHM Advisors' GIS staff leveraged multiple Esri tools including ArcGIS Navigator, ArcGIS Notebooks, ArcGIS Solutions, and ArcGIS Tracker to develop a custom workflow. Since its launch in 2022, this workflow has saved city staff countless hours and reduced time spent on pick-ups from over a week to an average of only 2 days per cycle!

Presenter Bio: Based in Nashville, Helen is GIS Manager for OHM Advisors' regional offices in Tennessee and Kentucky. She provides GIS technical expertise to specific projects and disciplines surrounding data management, asset management planning, web application development, and training. Helen received her B.S. degrees from the University of Tulsa and master's degrees from Indiana University. Throughout her career, she has had a passion for leveraging geospatial technology to enhance decision-making processes and contribute to the success of diverse projects.

GNSS Trail Blazing - The Montgomery Bell State Park Trail Mapping Project

Presenter: Dr. Nik Smilovsky, Bad Elf

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Board Room

Presentation Abstract: Embark on a 90-minute GNSS trail mapping adventure at Montgomery Bell State Park! Equipped with advanced GPS devices and Esri Field Maps, participants will learn best practices and data collection techniques while contributing to park management. During this session, participants will not only immerse themselves in the park's natural beauty but also gain invaluable insights into GPS best practices and Esri Field Maps configuration. From mastering satellite reception to refining data collection techniques, attendees will leave equipped with essential skills for efficient trail mapping. By harnessing the power of modern technology and software, participants will actively contribute to building a comprehensive GIS dataset for the park. Yet, it's not just about learning – it's about enjoying the great outdoors! Whether you're a GIS professional or a nature lover eager to contribute, this experience promises adventure and education in equal measure.

Please bring adequate footwear, water, and your cell phone. Everything else is provided! Max of 20-25 people. People need to have cell phones with Esri Field Maps downloaded.

Presenter Bio: For nearly two decades, Dr. Smilovsky has dedicated himself to advancing the geospatial professions both professionally and academically. With experience spanning various private consulting firms, he has been instrumental in collecting, analyzing, and visually presenting geographic data. Simultaneously, as an academic, his focus on research has significantly contributed to the educational knowledge landscape. Dr. Smilovsky's life passion revolves around geography, evident in his roles as an energetic public speaker, dedicated teacher, and influential thought leader. He finds joy in sharing successes with others and witnessing their growth.

Using Spatial Analysis to Determine Arboretum Accessibility: A Tennessee Case Study

Presenter: Dr. Jillian Gorrell, University of Tennessee at Knoxville, Walters State Community College

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Private Dining

Presentation Abstract: The Tennessee Urban Forestry Council (hereafter TUFC) manages an arboretum certification program for organizations and individuals in Tennessee. TUFC's vision for the arboretum program is to increase accessibility to arboreta, ensuring there is a TUFC certified arboretum within a 30-minute drive of every Tennessee community. ArcGIS Pro was used to determine accessibility and conduct generalized linear regression analysis. More than one third of Tennessee communities need arboretum accessibility assistance through outreach and promotion of arboretum establishment near these areas. As accessibility to arboreta increases, communities are more densely populated, are more racially diverse, have higher income, and have lower percentage of forested land cover.

Presenter Bio: Dr. Jillian Gorrell is a Natural Resources graduate from the University of Tennessee at Knoxville (UTK). Two of the three manuscripts from her dissertation used GIS to expand the body of knowledge for urban forestry. One study, which she will be presenting this year, used GIS to identify the accessibility of the Tennessee Urban Forestry Council's (TUFC) certified arboretum network for Tennessee communities. The other GIS study, which was presented last year, identified urban heat islands (UHI) in Tennessee and created a UHI prediction model using land cover, evapotranspiration levels, and socioeconomic variables. She used ArcGIS Pro for the analysis of both projects. Most recently, Dr. Gorrell worked with The Morton Arboretum as a Postdoctoral Geospatial Data Scientist on a NOAA funded grant project to create a drought prediction model for the greater Chicago area, using satellite imagery and meteorological variables in R Studio.

Urban Development using Ground Penetrating Radar Applications

Presenter: Heather White, ETSU

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Private Dining

Presentation Abstract: This presentation will discuss the applications of ground-penetrating radar (GPR) for urban development, from detecting unknown buried utilities to locating unknown graves at historical sites. This study focuses on Carter Mansion and ETSU, using an SIR 4000 to detect any underground anomalies without disturbing the land. We will discuss a brief history of both sites, the survey methods, post-processing data, and results, and discuss the pros and cons of using GPR in these environmental settings for a mid-size city.

Presenter Bio: Heather is originally from Dandridge, TN, but moved to Johnson City, TN when she started her Master's Degree at ETSU. During that time, she earned her current position at Washington County 911 as their GIS Coordinator. While this great opportunity arose, she still intends to finish her Master's Degree before the year ends. Dr. Eileen G. Ernenwein has been a professor at ETSU for over 12 years. Dr. Ernenwein's research focuses on near-surface geophysics, archaeological geophysics, and GIS for locating buried archaeological and geological features and understanding human spatial behavior. She has extensive experience with ground-penetrating radar, electromagnetic induction, magnetometry, and electrical resistance.

Tracking Tornado Alley: How is it changing and why?

Presenter: Preston Ford, MTSU

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Private Dining

Presentation Abstract: Tornado Alley is one of America's most infamous weather phenomena. Did you know it is changing shape and location, and that Tennessee is becoming a new hot bed of tornado activity? This presentation seeks to uncover how Tornado Alley is changing. It also tries to identify potential reasons why, using 70 years of climate and tornado data across Tennessee and Oklahoma for comparison.

Presenter Bio: Freshly graduated from MTSU in December 2023, Preston has continued to find passion in geography and geospatial analysis since early childhood. Experience with StoryMaps and ArcGIS Online in Tennessee's first high school GIS course reignited this interest. Love for the field was found again at the University of Oklahoma, working with ArcGIS Pro's suite of tools. He transferred back in-state to MTSU, pursuing a Bachelor's in Geospatial Analysis. Preston is currently an intern for Zada Law and the Tennessee Historical Commission, with sights set on an eventual Master's in GIS to supplement plans of a life-long career in the industry.

TN TREC Project - Mapping Statewide Recreation

Presenter: Paul Dudley & Kari Williams, State of TN STS-GIS Services

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Room B

Presentation Abstract: The TN TREC (Trails, Recreation, Environment and Community) Project is an effort to inventory all of the parks, recreation areas, greenways and trails in the state. Spearheaded by the Department of Health and engineered by the Department of Finance and Administration, Strategic Technology Solutions GIS Services (STS-GIS), the solution was built using ESRI's ArcGIS Online suite of tools to include Hub, Experience Builder, and Survey123. The presentation will outline the history of the TN TREC Project, give an overview of the technical solution(s), and touch on the future of the project.

Presenter Bio: Paul Dudley is a Location Intelligence Analyst with the State of Tennessee STS-GIS Services group helping support various data programs. His primary focuses are imagery, LiDAR, and special projects. He is the President of the TN Geographic Information Council (TNGIC) and is always looking for ways to help Tennesseans use GIS technology. He is a graduate of University of TN Knoxville's Geography Department and has experience in the private and public sectors. Kari Williams is a Geospatial Analyst with the State of Tennessee STS-GIS Services group and holds a Master's degree in Geoscience from Middle Tennessee State University. In her role, Kari supports the imagery, lidar, and TREC projects and is always committed to advancing the state's geospatial capabilities and contributing to the success of STS-GIS division.

Assessing ADA Compliance of Pedestrian Infrastructure

Presenter: Joe Martin, LDA Engineering

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Room B

Presentation Abstract: A full network assessment of pedestrian facilities within the Right-of-Way was recommended to assess ADA compliance within the ADA Transition Plan Update. This recommendation resulted in a goal of 500 miles of sidewalk and associated features to be audited by end-of-year 2023. LDA accomplished this for our client by using applications, GPS equipment, and data schema to efficiently collect, process, and deliver ADA assessment data.

Presenter Bio: Joe is the GIS Manager at LDA Engineering. He has 10 years of experience working in the telecom, engineering, and energy industries. His passion lies in leveraging spatial data to provide value and support decision making for cities and municipalities.

Application of Geodesign Principles in Tullahoma Land Use Planning

Presenter: Michael Cullen, Penn State University

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Room B

Presentation Abstract: Study of sustainable Development Goals and Geodesign principles to be applied to long term land use policy. Systems Thinking approach to long term micropolitan land use and zoning decision and impact modeling.

Presenter Bio: Michael Cullen, Penn State graduate student, Geodesign Framework Sustainable Development Goals and Land Use Study of Tullahoma, TN, Project Manager at AEDC

Building an Enterprise Solution to meet Nashville's Complex Data Security Needs

Presenter: Jennifer Higgs, Nashville Information Technology Services

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Room B

Presentation Abstract: Nashville is large and growing city with over 60 department and 10,000 employees. The GIS staff embarked on designing and building an enterprise system that would meet the complex security needs of all Metro employees. This was accomplished by implementing 5 ArcGIS Enterprise portals. This presentation will discuss all aspects that went from design to roll out.

Presenter Bio: I am the Enterprise GIS Manager for Nashville's Information Technology Services. I have managing our Enterprise GIS for the past 27 years. I have a Master's Degree in Geography and have my GISP.

Moving Forward with ESRI's Data Management Solutions

Presenter: Kevin Bingham, True North Geographic Technologies

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Room C

Presentation Abstract: Several of True North's clients have decided to implement one or more of the Esri Data Management solutions. Two of these clients are in West Tennessee. One of these organizations began their GIS journey with the data management solution and the other organization is migrating their existing GIS data into the data management solution. Join us as we explore the challenges faced by each of these organizations and discuss how they are utilizing their GIS as a system of record, a system of insight, and a system of engagement.

Presenter Bio: Kevin has worked with local government as both an employee and as a consultant for 23 years, managing projects and providing spatial information services for utilities, public safety, planning, engineering, and code enforcement. Kevin has a wide range of experience from data collection to system administration and has worked to integrate GIS with organizational workflows and business systems. Kevin lives in Lakeland with his wife, Anna, and their three boys.

The Future of GIS with High-Resolution Aerial Imagery

Presenter: Savannah Heckman, EagleView

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Room C

Presentation Abstract: Accuracy, efficiency, and safety are the key to successful data collection and analysis. EagleView's "1" inch imagery has proven to be a huge asset to many entities and save time out in the field. We will be covering use cases across departments for "1" inch imagery, and also providing some exciting updates on our new and upcoming products including 3Dmesh and ML data.

Presenter Bio: Savannah has been working for EagleView just over a year now. She is certified in GIS and has a degree in Environmental Science from the University of Western Kentucky and resides in Louisville, KY.

Tennessee Statewide Ortho Imagery and Elevation Data Program

Presenter: Rob Edie, Hexagon Geosystems

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Room C

Presentation Abstract: The HxGN Content Program, Hexagon's aerial data program, offers the largest library of aerial imagery and elevation data across the United States, Europe and parts of Canada. This presentation provides highlights of the Content Program and focuses on the State of Tennessee program and some of the applications of the data.

Presenter Bio: Rob Eadie joined the Hexagon Content Program in April 2021 as Partner Manager. Rob has spent his entire career in the geospatial industry working in the areas of aerial/satellite photogrammetry, satellite remote sensing, airborne LIDAR and IFSAR mapping, with a variety of roles in production, marketing, technical sales, and project management environments.

Enabling your Data!

Presenter: Kenneth Bryant, 1Spatial Inc.

Date and Time: Wednesday, April 10, 3:30-5:00 PM

Room: Room C

Presentation Abstract: This presentation will explore how automated business rules can enhance Data Governance in public sector organizations at various levels. 1Spatial's automated COTS products help these organizations validate data, streamline workflows, and integrate data into their systems. These products have been implemented in various contexts, including data supply chains for Spatial Data Infrastructures for entities like Google, DOTs, utilities, the US Census Bureau, and the State of Michigan. They've also been used in several NG9-1-1 implementations. These organizations are enabling their partners to understand data requirements and empowering them to rectify issues by pinpointing potential non-conformances in the data and indicating which rule might have been violated. Once the data achieves a mutually agreed-upon quality threshold, it is integrated with various other data sources into seamless, organization-wide enterprise databases. To encapsulate, reliable data and practical timely benefits.

Presenter Bio: Kenneth Bryant brings a wealth of knowledge to his role as Senior Account Executive for Utilities & Enterprise at 1Spatial, backed by over two decades of leadership in technical and project management. His tenure as a U.S. AirForce Veteran has endowed him with a diverse skill set across multiple sectors. Kenneth's illustrious career includes key positions such as Senior Technical Director at Rolta India Limited, where he played a pivotal role in the development of digital mapping, GIS, and Oracle services across the U.S., Middle East, and Europe. His tenure at Imtech Traffic & Infra UK was marked by the delivery of cutting-edge highway technologies and a commitment to high-quality service. In his role at Avineon Europe, he led business development efforts in infrastructure and telecommunications. With his deep expertise in GIS, project management, and IT services, Kenneth is ideally suited to share insights on 1Spatial's 1Integrate and 1DataGateway products at the TNGIC conference.

Update on K-12 Geography Education

Presenter: Kurt Butefish, Tennessee Geographic Alliance

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Private Dining Room

Presentation Abstract: There have been changes in the K-12 Geography curriculum and within the Tennessee Geographic Alliance organization since the presenter last updated the membership of TNGIC. Kurt Butefish will provide an update on how and where Geography appears in the new K-12 curriculum standards and discuss recent changes in leadership of the Tennessee Geographic Alliance and its activities. Please attend this session if you are interested in Geography education in Tennessee and how it might impact the future of your organization.

Presenter Bio: Kurt Butefish is the retired Executive Director of the Tennessee Geographic Alliance which is the primary organization that represents the discipline of Geography across the state at the K-12 level. The TGA has been in operation as a non-profit for 38 years and works with professional organizations, all levels of educators and education administration, state legislators, and other decision makers to advance geographic literacy in Tennessee. Kurt served two terms on the TNGIC Board and has been active with the Education Committee since joining the organization.

Customizing Vector Tile Basemaps: Beginner to Advanced

Presenter: Matt Lane, State of TN STS GIS

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Private Dining Room

Presentation Abstract: This presentation will cover a range of topics related to Vector Tile basemaps, including changing map element styles, adding custom data sources, hosting your own style files, and manipulating the basemap directly in your application with javascript.

Presenter Bio: Matt Lane is a Location Intelligence Analyst for the State of Tennessee, where he has worked for 19 years. During his tenure he has developed applications and data processing workflows for agencies while building and maintaining the GIS infrastructure.

Mapping with meaning: Significance beyond georeferencing

Presenter: Dr. Mayra Roman-Rivera & Dr. Derek Alderman, University of Tennessee

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Private Dining Room

Presentation Abstract: In the realm of Geographic Information Systems and Technology (GIST), the act of mapping transcends mere cartography; it embodies a profound connection to community engagement and social restoration. This presentation delves into the multifaceted role of GIST professionals, showcasing how they serve as catalysts for building communities, allocating resources, and revitalizing spaces. Beyond data analysis and visualization, these initiatives serve as a testament to the power of collaborative knowledge exchange. By leveraging technology to amplify marginalized voices and commemorate erased histories, GIST professionals champion social equity and collective memory preservation. This presentation underscores the transformative potential of mapping with meaning, where every data point signifies not just spatial coordinates, but a narrative of resilience, community, and justice.

Presenter Bio: Mayra is a Lecturer at the Department of Geography and Sustainability at UTK. She is a coastal geomorphologist with a background in GIST. Derek Alderman is a Professor at the Department of Geography and Sustainability at UTK. His interests include cultural and historical geography with a specific focus on landscapes of public memory, race, heritage tourism, and social/spatial justice.

Working With What You Got: Leveraging Standard ArcGIS Online Functionality to Replace Expensive Software Solutions

Presenter: Austin Averill, North West Utility District

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Room B

Presentation Abstract: This case study highlights the methods and implementation of a database driven web application designed within the framework of ArcGIS Online developed to limit overhead costs associated with state required monitoring and reporting. The web application was developed using basic elements in ArcGIS Online's Experience Builder and with extended functionality made possible with the use of Python. The resulting application has provided our organization with an indispensable utility in managing our cross-connection control program without incurring the additional expense of a separate software package. The experienced success highlights the broad range of functionality that can be achieved by leveraging software that a GIS oriented organization is already likely paying for.

Presenter Bio: Austin is a graduate of the University of Tennessee at Chattanooga, holding a degree in Environmental Science. He is currently serving as the GIS Coordinator at North West Utility District, managing a small ArcGIS Online and several hosted services for the district. Austin is currently working on developing custom solutions within Esri's ArcGIS Online that substitute the need for the purchase of additional third-party software packages to satisfy management and reporting requirements set by the state.

Audit Season: Auditing Enterprise GIS Environments

Presenter: Cory Gens, Metropolitan Government of Nashville and Davidson County

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Room B

Presentation Abstract: Auditing your enterprise GIS environment can be taxing however the return on your investment is well worth the time. In this presentation I will cover how we use python, webhooks, and ArcGIS Monitor to maintain and monitor our enterprise GIS environments.

Presenter Bio: Corey Gens is a Solution Engineer on the GIS & Data Analytics team at Metro Nashville. He has over 10 years of experience using GIS including a Masters Degree in GIS Technology from Florida State University. Throughout the past 10 years he has attained multiple professional certifications including ArcGIS API for Python, Esri Enterprise Administration, Enterprise Geodata Management, and ArcGIS Online Administration. In his free time Corey enjoys hiking, watching football, and spending time with his family.

Working in Harmony: GIS in Music City

Presenter: Danielle Greer, Metro Nashville ITS-GIS

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Room B

Presentation Abstract: An overview of several cross-departmental collaborations using combinations of Esri's Survey123, Dashboards, and ArcPro. Will include descriptions and screenshots of how we requested interaction from the public with items in AGOL; created and used items behind our firewall in the Enterprise Portal; how we set up the incoming data for QA/QC and used the results.

Presenter Bio: Danielle Greer is a GIS Analyst with Metro Nashville ITS Department's GIS & Data Analytics Team. She works with Survey123, Field Maps, Dashboards and other Esri tools and apps, as well as spatial editing tasks and map creation for both internal and external use. She also assists with cross-departmental collaboration. She is an alumna of MTSU (Class of 2020).

From Field to Attribute Table - Best Practices for Data Acquisition

Presenter: Alex Lennon & Mark Crow, LJA Engineering

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Room B

Presentation Abstract: Often overlooked and under appreciated, data acquisition is a key aspect of GIS; therefore, it is important that data collection methods are efficient, accurate, and verifiable. While every GIS project has its own specific needs, we plan to share some "best practices" that can: improve workflow efficiency, having your approach match your needs, making sure your accuracy is verifiable, having pre-prepared field maps on hand, and a well-refined workflow. Utilizing these best practices will improve both the quality of your data and productivity of data collection.

Presenter Bio: Alex is a GIS Technician and Field Crew Leader at LJA Engineering. He graduated from the University of TN in Chattanooga in 2021 with a BS in Environmental Science. Alex worked previously for the Interdisciplinary Geospatial Technology Lab at UTC analyzing data and building dashboards to showcase the digital divide in the Chattanooga area which were used to help underserved/underprivileged students obtain internet access. At LJA, he has helped build organizational GIS standards, lead efforts to improve static and digital map accessibility, prepared client facing and internal dashboards and lead field crew efforts; performing a variety of tasks and becoming proficient using high-accuracy GNSS equipment. Mark Crow has over 20 years of professional land surveying and GIS experience. He is a is the group leader for all GIS and CAD work for LJA in Tennessee and leads efforts to develop and maintain standards for the presentation of GIS maps, format of spatial data, and web content.

Exploring land cover change in the Chattanooga tri-state region using the NLCD, NAIP imagery, and deep learning

Presenter: Mimi White, University of Tennessee Chattanooga

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Room C

Presentation Abstract: As population increases in the Chattanooga tri-state region, the loss of forest and agricultural land to development is an ever-present concern. In this study, remotely sensed data was analyzed with GIS tools to quantify past land cover change in the region. First, National Land Cover Database (NLCD) data was processed with the Change Detection Wizard. Next, the resulting output was a HUC-12 map using graduated colors to express greatest percent loss in forest and agricultural land cover. Lastly, an optimized hotspot analysis detected areas with significant clusters of change. The results captured with this workflow now serve as inspiration for an ongoing regional study using deep learning algorithms to classify NAIP imagery. This information will be useful in future change detection analysis and may potentially inform tree-planting suitability studies in ongoing efforts to reduce urban heat island severity in Chattanooga, Tennessee.

Presenter Bio: Mimi White of the University of Tennessee at Chattanooga is expecting to graduate this spring with a Bachelor of Science in Environmental Science, concentrating in the Geographic and Cartographic Sciences. She is excited to begin working on her Master's in Environmental Science under Dr. Thomas Wilson next fall and would like to focus on habitat suitability models for her thesis. She works as a GIS Analyst-in-training in the University's Interdisciplinary Geospatial Technology Lab. Her future career goals include being published in an academic journal and getting her drone pilot's license.

Spatiotemporal Fish Assemblage Patterns Associated with Fluctuating Flow in a Cumberland River Watershed in Tennessee

Presenter: Mark Rine, American Fisheries Society & The Wildlife Society

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Room C

Presentation Abstract: Streams and rivers that naturally experience flow intermittency account for over half of all streams in the United States. Due to the dynamic attributes of intermittent fluvial systems (IFS), they harbor distinct and diverse assemblages of fishes. However, relatively few studies have investigated which environmental and spatial predictor variables influence IFS fish assemblages in temperate regions of the Southeastern United States. Using the Roaring River watershed, a Cumberland River tributary system with dynamic spatiotemporal variability in flow intermittency, our objective was to evaluate the influence of spatial and environmental variables on fish assemblages in perennial and intermittent sites and to examine variation in the extent of this influence over time. We will use canonical correspondence analysis to analyze the effect of spatial and environmental variables on fish assemblage structure.

Presenter Bio: My research examines variation in stream fish communities in response to spatiotemporal occurrences of flow intermittency. To study the effects of flow intermittency on stream fish, I sampled three sub-watersheds with disparate flow regimes and, using multivariate analyses, will identify what predictor variables may explain the observed variation of the fish assemblages.

Temporal Dynamics of Land Use and Cover in Knox County, Tennessee: A Geospatial Analysis Using NLCD and Geemap

Presenter: Mahnaz Meem, University of Tennessee

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Room C

Presentation Abstract: This study conducts a comprehensive analysis of land use and land cover (LULC) changes in Knox County, Tennessee, over a twenty-year period from 2001 to 2021, using data from the National Land Cover Database (NLCD). Employing geemap, a Python package that facilitates interactive geospatial analysis and visualization through integration with Google Earth Engine, the research explores the spatial and temporal patterns of land cover transformation in the region. The study leverages the NLCD's high-resolution, consistent, and reliable datasets to trace the evolution of land use within Knox County, emphasizing the nuanced shifts across diverse landscapes. Through a suite of advanced visualization techniques, including timelapse mapping and comparative land cover analyses, the research offers a interactive portrayal of LULC changes, enhancing the understanding of their ecological, urban, and policy-related implications. The inclusion of watershed data adds depth to the analysis, linking land cover dynamics with hydrological features and processes. This research contributes to the field of environmental planning and management by providing a detailed, geospatially-informed overview of LULC changes, thereby informing future policy decisions, conservation strategies, and urban development planning in Knox County and similar regions. The application of geemap and Google Earth Engine exemplifies the potential of cutting-edge geospatial tools in enriching LULC research and underscores the importance of accessible, high-quality land cover data in environmental studies.

Presenter Bio: Mahnaz S. Meem is a dedicated PhD student in Geography and Sustainability at the University of Tennessee, Knoxville, with a rich academic background in Landscape Ecology and Nature Conservation from the University of Greifswald, Germany. Her research spans across continents, focusing on disaster management, nature conservation, and the innovative use of GIS and remote sensing technologies. Mahnaz has a proven track record in community engagement through organizing environmental events and a passion for data analytics, evidenced by her completion of a Data Analytics Bootcamp in Germany. Her work embodies a commitment to environmental sustainability and a deep-seated passion for exploring and understanding the complexities of our planet.

Skyward Sentries: Detecting Unmarked Burials With Drones and Geophysics

Presenter: Noah Hall, ETSU

Date and Time: Thursday, April 11, 1:30-3:00 PM

Room: Room C

Presentation Abstract: The Sinking Spring Cemetery in Abingdon, VA was founded in 1773 by the Sinking Spring Presbyterian Church. Since its founding, the cemetery has been divided into two separate sections; the “colored” cemetery and the “white” cemetery. The traditionally white cemetery is 9 acres and has easy access from the road, walled in family plots, walking paths, and many stones for individual burials. The other cemetery is only 2 acres with very few stones and access to it is more difficult. The purpose of this study is to utilize non-invasive survey methods such as geophysics and drone remote sensing to analyze the “colored” cemetery in hopes of revealing how many unmarked burials there are. Ground Penetrating Radar (GPR) will be the main geophysical tool used for this study. GPR sends radio waves into the ground and can record the way those waves reflect and refract on anything different than the surrounding soils. For drone surveying, 3 different sensors were used; Light Detection and Ranging (LiDAR), thermal, and multispectral. LiDAR can detect the slightest changes in elevation using dense laser scans. Thermal sensing can sometimes detect the heat signatures of buried objects and disturbed soils. Lastly, multispectral is most useful for analyzing infrared bands of light; the sensor measures two infrared bands. Different bands can also be combined to reveal different patterns. Small feasibility studies were conducted for the GPR and drone surveying. GPR has proven to be effective, and the drone results are extremely successful so far.

Presenter Bio: I am a first-year master's student at ETSU. I graduated with my bachelors in Geology from the University of Wisconsin - Eau Claire. I've been doing geophysical research since my undergrad and got actively involved in using GPR for detecting unmarked burials. My thesis work follows a similar theme of using GPR (and other methods) for this purpose. I will be looking at a cemetery that has historically been referred to as the "colored" cemetery in Abingdon, VA. Alongside the geophysics, I plan to conduct a drone survey.

Sponsor Information

Bad Elf line of GNSS receivers empower GIS and survey professionals to collect high-accuracy field data using any phone, tablet, or laptop. Our products work with any location-based app running on iOS, Android, and Windows. All **Bad Elf**'s Bluetooth receivers have an integrated LCD screen and intuitive user interface to provide status information and perform standalone data collection when needed. Our flagship **Bad Elf** Flex GNSS receiver is the first survey-grade receiver to support a flexible "pay only for the accuracy you need" daily token model that minimizes up-front costs and eliminates monthly subscriptions. Now your entire team can collect high-accuracy data when needed while staying within your budget. When the iPad debuted over a decade ago, **Bad Elf** was one of the first GPS accessory manufacturers to provide rock-solid GPS reception for moving-map aviation apps used by private, commercial, and military pilots. Over the years we started working with more GIS and survey customers. Their feedback and requirements have driven our team to build the most powerful GNSS receivers that are also affordable, accurate, and intuitive.

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TNGIC MBSP 2024

The Department of Geosciences at East Tennessee State University offers a Master of Science in Geospatial Analysis and a 100%-online Graduate Certificate in GIS with in-person options. Our Bachelor of Science in Geosciences has concentrations in Geospatial Science, Geography and Sustainability, Paleontology, and Geology and Environment. We are proud to be the headquarters of the Tennessee Climate Office and the world-class Gray Fossil Site and Museum. Geospatial science and technology is our bedrock! Stop by our booth to find out how our programs could help you take the next step in your GIS career!

G-Squared is an employee-owned GIS consulting firm. We use GIS and data analytics to do the number crunching, analysis, and problem solving that provides our clients with the best possible data-driven tools and information. Whether you're implementing GIS from scratch or expanding existing capacity, we can help you use GIS technology to better serve your community and your internal departments.

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Fugro is the world's leading Geo-data specialist, collecting and analyzing comprehensive information about the Earth and the structures built upon it. Through integrated data mapping, modeling, and monitoring, we unlock insights from Geo-data to help our clients design, build and operate their assets in a safe, sustainable, and efficient manner. Working around the globe, we employ approximately 10,000 employees in over 60 countries. By deploying our fleet of specialized assets and cutting-edge digital solutions we provide a vital contribution to building a safe and livable world.

G-Squared is a photogrammetric engineering firm staffed and tooled for massive and efficient aerial survey production. In short, we make maps. For over 25 years we have provided design scale mapping products that meet all state and federal guidelines for geospatial accuracy. We are a quality over quantity company, so our short list of services is by design. We do a few things and focus on doing them right. All our products are made in America at our facility in Fayetteville, Tennessee to ensure that level of quality.

The **HxGN** Content Program, **Hexagon's** aerial data program, offers an expansive library of high-resolution aerial imagery, elevation data, 3D models and analytics across North America and Europe. The aerial data is orthorectified, accurate and available at multiple resolutions. Flexible flight plans allow data collection during optimal conditions, which helps minimize clouds, shadows and other artefacts that negatively impact or obscure the data. The high quality and exceptional consistency over large areas makes the **HxGN** Content Program ideal for understanding the real world and addressing today's most challenging problems.

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HP, Inc. creates technology that makes life better for everyone, everywhere. Through our portfolio of printers, PCs, mobile devices, solutions, and services, we engineer experiences that amaze. More information about HP Inc. is available at http://www.hp.com.

Driven to create a more interconnected, livable world, **KCI Technologies, Inc.**'s team of technologists and consultants apply knowledge, determination, skill and innovation for the resilience, growth and success of our clients and communities.

Our staff of professionals provide a broad spectrum of technical services including business advisory, data & analytics, solutions engineering, and asset management and land management consulting and solutions. Supporting clients across all industries, we drive innovation each day, optimize operations, and incubate new ideas for a better tomorrow.

Kucera International Inc. Kucera International Inc. is a leading provider of aerial imaging and lidar surveying, remote sensing, photogrammetric imaging and mapping, land use/cover mapping, geospatial data conversion, GIS support, and related geomatic services for government, professional, commercial/industrial, and educational/research applications . **Kucera** has been in continuous operation for over 70 years and currently has a staff of over 60 geomatics professionals working from **Kucera**'s headquarters and hangar facilities in Willoughby, Ohio and satellite offices in Columbus, Ohio, Pittsburgh, Pennsylvania, and Tampa, Florida **Kucera**'s staff has an average individual experience level or over 15 years and includes multiple licensed/certified photogrammetrists, surveyors, engineers, pilots, aircraft mechanics, and project management and GIS professionals. For aerial acquisition **Kucera** owns and operates a fleet of seven multi and single port, multi and single engine manned aircraft outfitted with latest generation digital aerial camera, aerial lidar, and multispectral sensor systems. **Kucera** has full in-house ground surveying capability with multiple survey grade GPS/GNSS receivers and surveyors licensed in 25 States, including Tennessee. For geospatial data production and services **Kucera** has over 50 servers and workstations dedicated to aerial data georeferencing, aerial ortho and oblique imagery processing, application, and hosting, lidar processing, terrain and feature modeling, stereo compilation and digitizing, volumetrics, automated feature extraction/mapping, change detection, and CAD and GIS conversion and support. **Kucera** annually completes hundreds of individual projects throughout the US and abroad covering sites ranging in size from a few acres to tens of thousands of square miles. **Kucera** is an active corporate member of ASPRS, MAPPS , and numerous other national, state, and local geomatics professional organizations.

Kucera has provided aerial mapping and GIS services to numerous government entities in Tennessee at the Federal, State, Regional, and local level. Previous customers include TVA, TN River Basin Authority, TN DEC, Metro Nashville-Davidson County Planning Dept., Rutherford and Wilson Counties, and the Cities of Brentwood and Franklin.

LaBella Associates, founded in 1978, is a versatile consulting firm that provides a comprehensive suite of services, including GIS, Civil Engineering, Environmental, and Land Surveying. Our Data Intelligence Group, consisting of 11 skilled professionals, specializes in GIS system architecture, database development, application programming, and geospatial analysis. We work closely with clients, tailoring customized applications and workflows to enhance efficiency and add value to their businesses. At **LaBella**, our commitment to client satisfaction is unwavering, driven by teamwork, respect, and trust.

LJA, is an employee-owned, full-service, comprehensive multi-disciplinary consulting firm. With offices across the nation, we offer one-source, one-stop reliability for all of our clients, when and where they need us. We are organized around eight comprehensive sectors and can seamlessly build successful project teams with civil, structural, and electrical engineers, plus hydrologists, planners, landscape architects, construction managers, GIS designers, and surveyors. Our resources are leveraged across the firm to deliver expertise-driven teams, increase responsiveness to your specific needs, and individualize project solutions. https://www.lja.com/

Established in the fall of 2003, **MAGIC** provides an educational forum for interested parties to get together and share their GIS knowledge and experiences at our monthly meetings and to broaden their exposure at the Annual GIS Conference every November. Headquartered in Shelby County, TN, **MAGIC** attracts members from the entire Mid-south region including west Tennessee, north Mississippi and east Arkansas; roughly a one hundred mile radius around Memphis (Although membership is open to anyone from anywhere). **MAGIC** represents a community of GIS professionals, students, and end-users who, through our knowledge and work, provide the maps, analysis, data, and applications to make much of this possible. Our mission is to promote the profession and education of GIS in the Memphis Area, provide training opportunities and award GIS student scholarships, coordinate GIS advocacy, and generally promote appreciation and participation of GIS to all interested parties - all are goals of **MAGIC**.

Nearmap provides easy, instant access to high resolution aerial imagery, city-scale 3D content, AI data sets, and geospatial tools. Using its own patented camera systems and processing software, **Nearmap** captures wide-scale urban areas in the United States and Canada, several times each year, making current content instantly available in the cloud via web app or API integration. Every day, **Nearmap** helps thousands of users conduct virtual site visits for deep, data-driven insights—enabling informed decisions, streamlined operations and better financial performance.

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That's why at **Stantec**, we always design with community in mind. We care about the communities we serve—because they're our communities too. This allows us to assess what's needed and connect our expertise, to appreciate nuances and envision what's never been considered, to bring together diverse perspectives so we can collaborate toward a shared success. We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

The **Tennessee Geographic Alliance** (TGA) (tngeographicalliance.org) is a not-for-profit that partners with professional associations, academic professors, K-12 teachers, educators, education policymakers, and other external stakeholders to advance geographic literacy. These are the centers from which spring local, state, and national activities aimed at establishing and improving geography in K-12 schools. The role of the **TGA** is to build the capacity, the systems and the structures needed to affect systemic improvement in the geographic literacy of K-12 students across their respective areas and to help create a supportive state policy climate where this increased and improved geography instruction can occur throughout the K-12 system.

Tennessee Tech University and the School of Environmental Studies offers the Professional Science Master's Degree in Environmental Informatics, equipping students with skills in Spatial Analysis, GIS, as well as statistics and leadership skills. Undergraduate and graduate students alike are using GIS in their research and class projects. **Tennessee Tech University and the School of Environmental Studies** is proud to support the TNGIC organization and the ways it serves our faculty and students!

The **Tennessee Spatial Data Center (TNSDC)** is a collaborative initiative involving the State of Tennessee, The University of Tennessee, and the U.S. Census Bureau. Our mission is to empower Tennessee's data users by providing accessible and understandable data related to the state's population, demographics, and economy. As experts in data dissemination, we work closely with a statewide network of 18 affiliate agencies, ensuring that data reaches citizens, businesses, and government agencies. Through the State Data Center Program, we efficiently provide access to U.S. Census data, offer training, and address state and local government data needs. Additionally, as part of the Federal State Cooperative for Population Estimates (FSCPE), we collaborate on annual population estimates. The **TNSDC** plays a vital role in making Tennessee's data landscape informative and impactful. For more information, visit the **Tennessee Spatial Data Center** website at https://tnsdc.utk.edu.

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Transit and Level Clinic is the Southeast's leader in Geospatial Solutions from manufacturers such as Leica Geosystems, Spectra Precision, Geomax, Carlson Software and CHC Navigation with a strong focus on service, repairs and training. Seven convenient locations throughout NC, SC, GA, TN, VA, AL, MS, and MO.

True North Geographic Technologies is an award-winning GIS services firm in Murfreesboro, Tennessee, serving federal, state and local governments, utilities, and private sector organizations. **True North** is focused on creating solutions that help our customers leverage the Esri platform to meet their current and future business needs. **True North** delivers successful projects by utilizing our highly skilled staff and over 100 years of collective technical experience with the Esri platform. We excel in working with local GIS staff to maximize the existing hardware, software, and financial resources that are available while providing guidance and strategies to grow the local GIS programs through budget and new technology planning. We also provide the skills and expertise to integrate other enterprise data systems with GIS.

Geographers study people and our environments across the globe and throughout time. Geographers bring together global and local perspectives to address today's challenges. Our faculty study everything from climate change over the past ten thousand years, to poverty and urban development, to how the internet is changing how we understand the places where we live. This big picture view of the world makes geography and sustainability degrees highly marketable: our graduates are helping with security management of the Boston Marathon, mapping global population for disaster readiness, and working as data scientists at the largest technology companies in the world. The **UTK Department of Geography and Sustainability** offers BA degrees in Geography and in Sustainability, BS in GIST, and an MS and PhD in Geography. Our students work alongside faculty, study abroad, and develop marketable skills while helping community organizations and working in local governments, the private sector, and Oak Ridge National Laboratory. Details at https://geography.utk.edu/

For over 30 years, **Vexcel** has been the industry leader in the photogrammetric and remote sensing space, building market-leading UltraCam sensors, and providing a comprehensive library of cloud-based geospatial data. The **Vexcel** Data Program is the largest aerial imagery program in the world, collecting high-resolution imagery and geospatial data in 30+ countries. Its dedicated fleet of fixed-wing aircraft capture imagery in the U.S., UK, Canada, Australia, New Zealand, Japan, and across Western Europe. **Vexcel's** unique technology stack results in consistency across its aerial collection programs. Its comprehensive aerial data library helps customers streamline remote assessment, innovate common workflows, and enhance decision-making with confidence. More at: **vexceldata.com**

Woolpert is the premier geospatial firm in the U.S. with an unmatched reputation for performance, quality, and service. We offer an integrated suite of geospatial services including photogrammetry, remote sensing, mobile mapping, digital and oblique aerial imagery, aerial and ground-based lidar, UAS, surveying, payload integration and testing, and GIS consulting/application development.