TNGIC Middle Tennessee Fall Regional Forum

Detailed Agenda

8:30-9:00 am- Registration Opens

9:00-9:20 am- **TNGIC Welcome**
Natalie Robbins & Paul Dudley, TNGIC Board Members

9:20-9:40 am- **USGS and the 3D National Topography Model in Tennessee**
Paul Dudley & Suzanne White, STS GIS
This presentation will cover the State's coordination and participation in the USGS 3D National Topography Model (3DNTM). The 3DNTM is a national initiative that integrates the 3D Elevation Program (3DEP) and the 3D Hydrography Program (3DHP). Paul Dudley will introduce the 3DNTM as well as touch on efforts with next generation 3DEP and lidar collections in Tennessee. Additionally, in year two of the five-year hydrography data production plan, Tennessee has made great strides with its participation in the 3DHP. Suzanne will discuss status updates, project submissions, and the future of the 3D Hydrography Program

9:40-10:00 am- **Pedestrian Level of Traffic Stress**
Will Rogers, Tennessee Department of Transportation
TDOT's Level of Traffic Stress (LTS) model was updated to align with UT Knoxville's research on pedestrian fatalities and other models from the US. This tool helps to select safety project locations and allows for scenario planning.

10:00-10:20 am- **TNGIS.org Updates**
Paul Dudley, STS GIS
TNGIS.org is Tennessee's GIS Data Clearinghouse with links and applications for authoritative geospatial data. The TNGIC Web and Data Committee re-launched the TNGIC.org data clearinghouse in 2023. This presentation will be a brief overview of the resources available there, and a call to action to the community to keep it updated.

10:20-10:40 am- **Break**

10:40-11:00 am- **Using GIS to Inform Remedial Design in TDEC's TN Clean Program**

Callie Hilgenhurst, TDEC- Division of Remediation

State Superfund sites across TN are complex, with layers of historical contamination in soil, soil vapor, groundwater, surface water, and sediment. TDEC's Division of Remediation is leading the TN Clean program to address 20 State Superfund sites with legacy contamination. The sites on the TN Clean list were former industrial facilities such as dry cleaners, metals smelters, automobile recyclers, assembly plants, and more that were polluted by industry. They are complicated by a variety of contaminant types in many matrices. Utilizing GIS to assess historical contamination hotspots, waste masses of landfills, watershed analysis, and more, decision makers can make informed decisions about the state of contamination and the best strategies to remediate the sites.

11:00-11:20 am- **Exploring the Battle of Nashville Further: Continued Research in Sevier Park**

Dr. Adam Fracchia, Metro Nashville Historical Commission

Over the last two years, the Sunnyside Mansion in Sevier Park has undergone extensive renovations. Built in 1852, this historic house in south Nashville is the current office of the Metro Historical Commission which seeks to protect and preserve the historic and archaeological resources of Metro Nashville/Davidson County. Recent renovations and archaeological work at Sunnyside have documented extensive damage to the property during the Battle of Nashville and material evidence of the battle. This paper details the efforts to analyze this information to better understand the events of December 15th, 1864.

11:20-11:40 am- **Leveraging Deep Learning for Weed Canopy Mapping in Precision Agriculture**

Dr. Judith Oppong, Tennessee State University

Deep learning models provide actionable insights based on vast amounts of data. This data-driven approach enables more precise and strategic decision-making, which is crucial for modern agricultural practice. The aim of this study was to investigate different pixel-based deep learning classification algorithms for mapping weed canopy cover in winter wheat production using drone data. The research evaluated three neural network architectures: U-Net, DeepLabV3 (DLV3), and Pyramid Scene Parsing Network (PSPNet), for their effectiveness in weed detection, classification and mapping. Results indicated that the U-Net architecture outperformed PSPNet, and DLV3 classification algorithms.

11:40-12:00 pm- **Vendor Spotlights**

12:00-1:00 pm - **Lunch, catered by Publix** (vegetarian options available)

1:00-1:20 pm - **TNMap Application and Project Updates**
Matt Lane, Kinley Winchester, Kari Sadle, STS-GIS
Matt, Kinley, and Kari plan to demonstrate and explore new applications featuring exciting initiatives including the Property Viewer update, new dashboards, and the TREC project, which highlights recreation in Tennessee.

1:20-1:40 pm- **Using Dove satellite images and GIS to document success in stormwater management at Stones River National Battlefield, Tennessee**
Mark Abolins & Jonah Harris, Middle TN State University, Josh Upham, City of Murfreesboro, TN Water Resources
During 2001-2021, the proportion of low, medium, and high intensity developed land increased from ~23 to 73% within an ~1,369 acre area south and east of Stones River National Battlefield, TN, according to the National Land Cover Dataset. Nonetheless, comparison of 2020-2021 Dove satellite images with a map of 2001-2002 flooding indicates that the same parts of the Battlefield flooded in 2020-2021 with the exception of a ~0.9 acre flooded sinkhole which accounted for <3% of the flooded area. The relatively small change in flooding indicates the effectiveness of stormwater infrastructure, including ~27.99 acres of detention basins and ~28.12 acres of stormwater control measures. Nearly half of sites developed since 2008 either infiltrate all or part of the first 1.2 inches of rain or treat 80% of the first 1.2 inches of rain. Most sites slowly release a 1-year storm (3.1 inches) over 24 hours, and some sites are designed to discharge at predevelopment levels through a 100-year storm.

1:40-2:00 pm- **Break**

2:00 -2:20 pm- **Woolpert and Rutherford County Working Together to Support the Community**
Eric Cole, Woolpert & Mike Curtis, Rutherford County OIT/GIS
Woolpert has had the pleasure of working with the Rutherford County GIS team to provide a sustainable base mapping program for all county agencies. By collecting annual orthoimagery, the county is able to leverage this investment to keep up with the tremendous population growth throughout the region by mapping changes in planimetric features for the entire country every two years. This supports the county's 911 and all public safety departments,

public works, planning, property assessment, and another twenty plus departments. This also supports similar agencies in the municipalities of Murfreesboro, Smyrna, and LaVergne.

2:20-2:40 pm- **Surveying the Cemetery**

Natalie Robbins & Stacy Curry-Johnson, Vanderbilt University

This presentation will cover several cemetery survey projects that VISR has conducted using ground penetrating radar. These surveys aim to better classify the cemeteries and attempt to identify unmarked burials along with other subsurface features. We will also touch on the technologies used to geolocate surface features of interest (including marked burials and potential burial markers) using both open source and Esri technologies.

2:40-3:00 pm- Closing Remarks and Door Prizes

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