



## TNGIC Middle Tennessee Fall Regional Forum

### Detailed Agenda

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| 8:30 – 9:00 am   | <b>Registration Opens</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| 9:00 – 9:20 am   | <b>TNGIC Welcome</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                  | <i>Natalie Robbins &amp; Paul Dudley – TNGIC Board Members</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| 9:20 – 9:50 am   | <b>A Suitable Hydrology Model for Dalea foliosa on the Duck River State Natural Area</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                  | <i>David Pineros - Tennessee Division of Natural Areas (TDEC)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                  | Dalea foliosa is a federally endangered plant in Tennessee and is restricted to cedar glades of the Central Basin. This habitat is characterized by rocky shallow soils with streams that dry in the summer, many rare plants have adapted to these xeric conditions and thus is considered a hot-spot for biodiversity in the state. In our monitoring work, we observed D. foliosa is linked to the wetter and deeper soil sections of this habitat. Here we use DEM and occurrence data to model suitable hydrology areas inside the Duck River Complex Natural Area to guide future surveys and management for D. foliosa. |
| <b>BREAK</b>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 10:00 – 10:30 am | <b>Assessing Ecosystem Biodiversity and Carbon Cycling on the Isle of Raasay, Scotland through Community Driven and Field-Based Approaches</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                  | <i>Samantha Allen, Joshua Loiacono, and Anthony Lamantia – Tennessee Technological University</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                  | Join us as we walk through our approaches to a place-based research project aimed at understanding how human activities—past and present—shape carbon cycling on the Isle of Raasay, one of Scotland’s designated Carbon Neutral Islands. We’ll showcase our field approaches and also highlight how we integrated remote sensing, drone surveys, and a mobile GPS unit, with GIS techniques to build landscape models and assess biodiversity to inform future conservation and land management decisions.                                                                                                                    |
|                  | Our collaboration with Pacific Northwest National Laboratory helps deepen this work, especially in analyzing carbon cycling in sensitive aquatic systems. Throughout the session, we’ll demonstrate how we have been using Survey 123, ArcGIS StoryMaps and an ArcGIS Hub Site to bring science, community insight, and conservation together into one interactive platform—offering practical ideas that participants can apply to their own research, teaching, or outreach projects.                                                                                                                                        |
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| 10:30 – 11:00 am | <b>Mergin Maps: An Open-Source Platform based on QGIS for Data Collection and Collaboration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                  | <i>Vitor Vieira - Lutra Consulting</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Mergin Maps simplifies field data collection, offering an open-source platform built on the power and familiarity of QGIS. Capture, share, and publish your geospatial data seamlessly with intuitive mobile apps and robust web tools.                                                                                                                                                                                                                                                                                                                                                                                        |
|                  | Mergin Maps (MM) has the following components: <ul style="list-style-type: none"> <li>• Desktop: QGIS to set up and design your field survey</li> <li>• QGIS MM plugin: to upload/download your data to/from your cloud service (Mergin Maps server)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                |



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|                     | <ul style="list-style-type: none"> <li>• Mergin Maps mobile: an app based on QGIS with synchronisation tool allowing you to open your QGIS project and edit/capture data in the field</li> <li>• Mergin Maps server: a service allowing you to store and synchronise the data between QGIS and mobile app.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 11:00 – 11:30 am    | <b>Crop Yield Assessment Using Low-Cost Spatial Technologies</b><br><i>Abdul Momin - Tennessee Tech University</i><br><p>Precision agriculture (PA) offers opportunities for site-specific management, yet adoption is limited by the high cost of commercial technologies. Real-time kinematic (RTK) GPS, a cornerstone of PA, is often too expensive for many producers. This study investigated the use of low-cost RTK GPS receivers and open-source GIS software (QGIS) to develop crop yield maps in sugarcane and corn fields. During harvesting, a harvester and tractor were equipped with low-cost GPS units to capture machine positioning data, while harvested weights were recorded. Yield maps were generated by correlating crop weights with fill event distances, dividing by distance and row width to estimate yield in ton/hectare. QGIS was used to analyze and map spatial variability in yield. Results show that low-cost spatial technologies can provide meaningful yield information while reducing financial barriers, highlighting their potential to democratize precision agriculture and support data-driven decision-making.</p> |
| 11:30 am – 12:00 pm | <b>Tennessee's Elevation and Hydrography Program - Updates and the future</b><br><i>Paul Dudley and Suzanne White – State of Tennessee STS-GIS Services</i><br><p>Paul and Suzanne will dive into how the state is participating in the USGS 3D National Topography Model (3DNTM) programs. Paul will give a brief overview of the 3D NTM, and give updates on the 3D Elevation Program's future and funding efforts. Suzanne will discuss the 3D Hydrography Program (3DHP) updates, project status, and future project areas.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>LUNCH</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1:00 – 1:25 pm      | <b>From Broadway to Game Day: How Nashville is using GIS in Special Events Planning</b><br><i>Veronica Carter and Matthew Menendez – Fairpointe Planning / Nashville Department of Transportation and Multimodal Infrastructure (NDOT)</i><br><p>Nashville is a city that never sleeps, regularly hosting a variety of special events. From the exciting atmosphere of a Titans game at Nissan Stadium to the daily activities on Broadway, and the numerous concerts at the venues in the downtown core, Nashville offers something for everyone. So how does the city prepare for the thousands of visitors, staff, and residents that attend these events?</p> <p>This presentation will give insight on how NDOT is working with other Metro departments to use GIS to prepare and plan for special events. NDOT has implemented several ESRI tools to help organize and provide information to event stakeholders. From a special events dashboard to the starts of a permitting solution, GIS is helping Nashville coordinate road closures, permitted events, and expected attendance.</p>                                                                  |
| 1:25 – 1:50 pm      | <b>Causing Trouble with OpenStreetMap and FOSS4G Tools</b><br><i>Randal Hale - NRGS</i><br><p>Nobody does GIS enough. So what if you wanted to do it in your spare time and stir up some trouble. A good way to do this is OpenStreetMap and a host of other FOSS4G software. OSM is a "wiki map" of the world. Technically it's a Database of about anything you want to map. I'll walk you through a couple of random projects I do in my spare time and will encourage you to contribute to the database.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |



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| 1:50 – 2:15 pm | <b>Accessible mapping and Tennessee Property Boundary services</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                | <i>Matt Lane and Kari Sadley – State of Tennessee STS-GIS Services</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                | Kari will give a background and update on the ADA regulations for Accessibility and how GIS professionals can make their web maps more accessible. Matt will discuss the new Tennessee property boundary services and how they can be accessed and used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2:15 – 2:40 pm | <b>Assessment of Sinkhole Flooding Conditions in Murfreesboro, TN Using Dove Satellite Imaging, Hydrograph and Precipitation Data, ArcGIS, and LiDAR Elevation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                | <i>Grace Sandidge – Middle Tennessee State University</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                | Flooding conditions were compared for both 2021 vs 2024 storm events along Steelson Way. Hydrographs, cloud free Dove satellite images, LiDAR, and delineated topographic depressions of these storm events show a change from a wetter time with lots of sinkhole flooding in 2021 to a drier time with less sinkhole flooding in 2024. This change in flooding patterns might be from a low vs high water table between 2021 and 2024 based on the data and images gathered before and after both storm events. Another possibility is overall effective stormwater management based on the addition of retention basins that have been installed south of Steelson Way since 2024, which were not present during 2021. These basins appear to help redirect stormwater. Further investigation must be conducted to help determine the exact cause currently experienced along Steelson Way and whether this may be due to a lower water table, effective stormwater management, or an entirely different reason not considered. |
| 2:40 – 3:00 pm | <b>Closing Remarks and Door Prizes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### 2025 TNGIC Middle Tennessee Business Partners

