2022 TNGIC East Fall Forum

Friday October 28, 2022
Tusculum University Meen Science Center

Agenda at a Glance

Start Time*	End Time*	Room	Topic
8:30		Registration Opens	
9:00	9:30	Lecture Hall	Welcome
9:30	10:00	Lecture Hall	Keynote
10:00	10:30	Lecture Hall	State Update
10:30	10:45	*Break*	
10:45	11:45	001,005	Presentations
11:45	12:00	*Break*	
12:00	1:00	Lunch	
1:00	1:45	Vendor and Map Gallery	
1:45	2:00	*Break*	
2:00	3:00	001,005	Presentations
3:00	3:15	*Break*	
3:15	4:00	005	Presentations
4:00	4:30	Lecture Hall	Closing

* All times Eastern

Thank you to our sponsors who make this event possible

Thank you to Tusculum University for Hosting

TU | COLLEGE OF
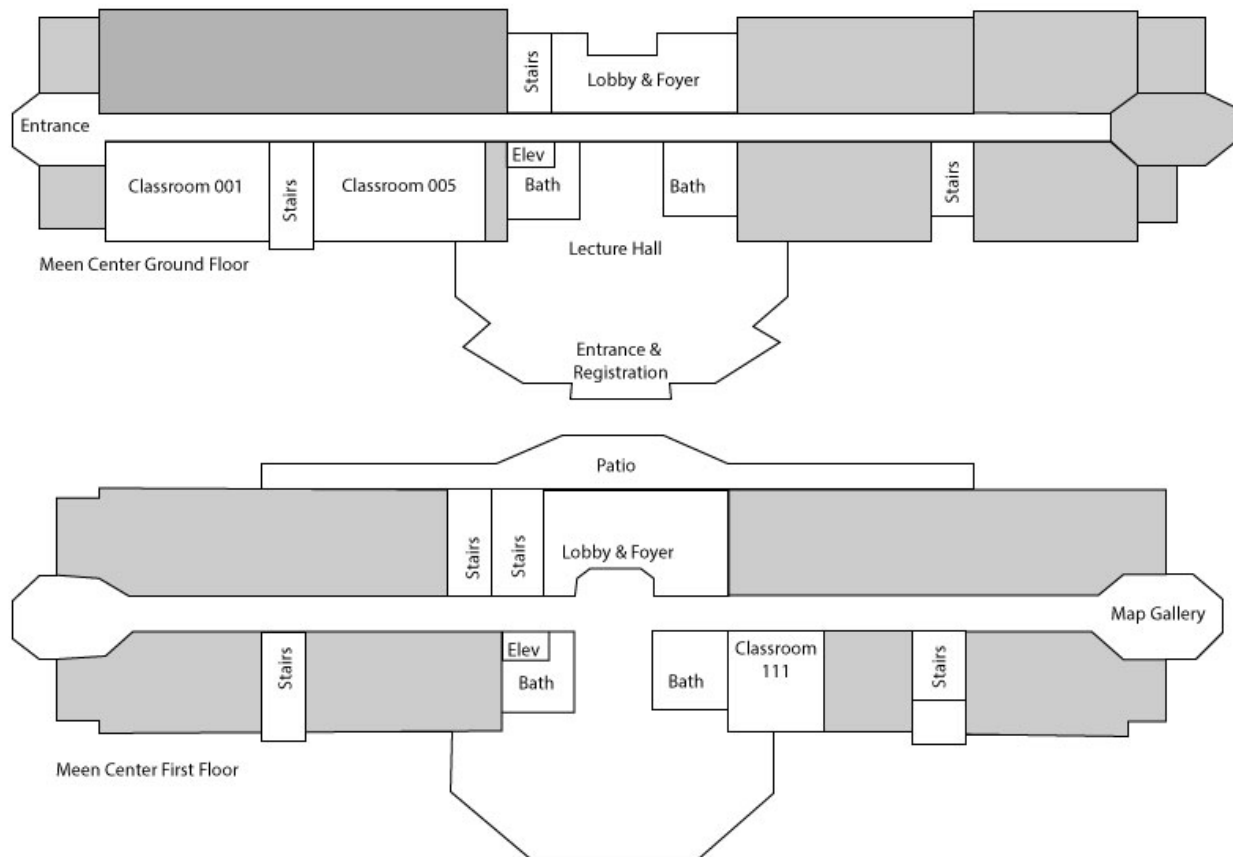SCIENCE, TECHNOLOGY & MATH

WiFi Instructions

Network: TU-students
Password: pioneers

Facility Map

Please discard your name tag and lanyard in the boxes when you leave so we can reuse them next year

Keynote

We are honored to have Charlie Mix, GIS Director of the IGT Lab at University of Tennessee Chattanooga as our keynote speaker. Charlie oversees GIS project development and management, spatial data analysis, modeling, cartography, GIS application development, partnership coordination, and GIS software, hardware, and data management for UTC's campus and partners. Charlie has led several successful projects utilizing GIS and cartography for conservation, outdoor recreation planning, public health, and community prosperity. His cartographic work has received international recognition through awards and publications.

The Interdisciplinary Geospatial Technology Lab (IGTLab) provides the University of Tennessee at Chattanooga and the greater Chattanooga metropolitan region with leadership, expertise, and a platform for the successful integration of geospatial technologies and spatial thinking into academic instruction and problem solving.
Since 1995, the University of Tennessee at Chattanooga's IGTLab has provided UTC the Chattanooga region and beyond expertise and support in spatial thinking, GIS data collection and management, spatial analysis, cartography and GIS application development. IGTLab staff provide consultation and project management services to UTC and the larger community. The IGTLab also connects UTC faculty and students with community partnerships that provide students unique real-world GIS learning opportunities through internships, applied research and sponsored projects; and its partners with GIS and cartography support.

Presenters and Descriptions

Student Presenters

Tracy Homer |. University of Tennessee Knoxville
Never Trust an Anthill

Abstract: Paleontologists frequently rely on anthills to gather microfossils that ants have amassed in building their homes. However, erosion may have carried those fossils from their original deposit site into areas from a different geological era. In this project, I used ArcGIS's Hydrology toolset to calculate the watersheds of 29 anthills and answer the question of how far these microfossils may have traveled before being picked up and collected.

Jonathan Bell, Mayra A. Román-Rivera. |. University of Tennessee Knoxville
Changing Coastal Management Perspectives

Abstract: The nearshore is a transition zone between the land and continental shelf that is significantly influenced by waves during normal and extreme conditions. Nearshore zones are constantly changing, and their bathymetry varies both temporally and spatially. Some coasts are characterized by sand structures called sand bars, which are significant underwater reservoirs of sand.Transverse bars can often cause beach erosion, similar to the erosion observed in locations where hard engineered structures, such as jetties and groynes, are found. This project investigates the impact of transverse bars on erosion rates in nearshore zones. We compare those dynamics to beaches that contain hard-engineered structures. The goal of this work is a greater understanding of transverse bar impact on beach and dune erosion processes in order to provide more appropriate management of these areas.

Luke Lawley. |. University of Tennessee Knoxville
Utilizing LiDAR to Detect Abandoned Highwall Mines for Environmental Remediation

Abstract: For this project, we were asked by the Tennessee Department of Environment and Conservation to provide a dataset that could be used to accurately identify locations that were potential sites of abandoned highwall mines. The criteria of potential locations had two primary conditions: the first was that the slope of the landscape was between 60 and 90 degrees (as most slopes of this steepness are likely to be anthropogenic) and the second was that the area with this slope extends longer than 10 feet. Using LiDAR Data provided by the State of Tennessee LiDAR Initiative, we were able to create a model to identify the locations of potential highwall mines. The purpose of this presentation is to share our method with the GIST Community in the hopes similar procedures can be used for similar projects, as finding topographical features provides noteworthy benefit to a variety of industries.

Kingsley Fasesin. |. East Tennessee State University
Creating Blue Spots Model for Davidson County, Tennessee Using ArcGIS Model Builder

Abstract: Climate change and global warming results in natural hazards, including flash floods. Flash floods can create blue spots; areas where transport networks (roads, tunnels, bridges, passageways) and other

engineering structures within them are at flood risks. The impact of flooding within blue spots is either infrastructural or social, affecting lives and properties. Currently, more than 16.1 million properties in the U.S are vulnerable to flooding, and this is projected to increase by 3.2% within the next 30 years. The infrastructural damage cost to Mississippi, Missouri and Arkansas Rivers resulting from flood events in 2018 was about $20.3B. States' governments, stakeholders, and environmental experts make efforts to mitigate the impact of flooding in blue spots by funding interdisciplinary research that creates methods and models for flood prediction and impact assessments.

Annie Liu. |. University of Tennessee Knoxville
Using GIS to Alleviate Hunger in the Nonprofit Childcare Landscape

Abstract: The Child and Adult Care Food Program (CACFP) is a federally funded program that reimburses child care programs for serving nutritious meals and snacks to eligible children in their care. Child Care Aware of America, in partnership with Nemours Children's Health, has helped map out areas in partner states where CACFP participation could and should be expanded to. We used census tract data for food deserts and poverty levels in conjunction with a comprehensive database of all childcare programs in the state to track where CACFP programs would be the most impactful in serving communities. In addition to those variables, states were also given a "wild card" dataset of their choosing to maximize the impact of the StoryMap and dashboard deliverables. Attendees will learn about real applied GIS in a national nonprofit setting, as well as gain insight into state-level childcare landscapes across the US.

Annie Liu, Savannah Roth, Simon Jolly, Olivia Lamm. |. University of Tennessee Knoxville
The #EsriExperience as an Intern

Abstract: Participating in an internship is oftentimes one of the biggest goals for any college undergraduate. In the field of GIS and geography, an internship with Esri's summer internship program is a highly coveted prospect that has led over 3,000 students to apply to it this past year! In 2022, about 190 students from across the globe were selected, which included 4 interns selected from The University of Tennessee, Knoxville. This presentation will cover all 4 interns' experiences this summer, with an emphasis on sharing how they got their internships and what they discovered throughout the internship process. With this presentation, they hope to encourage more students to apply to the internship, especially those trying to figure out if they want to go work for Esri in the future!

Hannah Morris |. University of Tennessee Knoxville
Play and the Built Environment

Abstract: Play is crucial to supporting early childhood development, and playgrounds are an important vehicle for promoting high-quality play. Playgrounds and diverse play promote language development, imaginative thinking, cooperation, gross and fine motor skills, and more. Despite the importance of play, many children have disparate access to safe and high-quality playspaces; this project examines to what extent this is true in Knox County. This project begins by examining the distribution of race and

socioeconomic status and exploring how the quality and accessibility of playspaces differ based on these factors.

Presenters
Paul Dudley |. State of Tennessee STS-GIS Services
State of Tennessee - Data Program Updates and Initiatives

Abstract: This presentation by the state's Strategic Technology Solutions GIS Services (STS-GIS) group will cover updates to the state's data, lidar and imagery programs. Additionally, several new initiatives will be highlighted including 3D Hydrography, the Trails Recreation Environment and Community (TREC) Project, and the TN Vistas Project.

Alex Lennon. |. LJA Engineering
Improving Map Accessibility

Abstract: Maps are crucial visual aids for conveying information. Therefore, it is important for us to make sure they are easily readable for everyone. Typically, cartographers rely on color to distinguish between features; however, strictly using color for symbolism can make a map difficult to read for certain audiences, particularly those with color vision deficiency. Often, individuals with color vision deficiencies can have difficulty distinguishing between reds, greens, and blues. Using new tools in ArcGIS Pro 3.0 in addition to utilizing texture and shape, your maps can impact a broader audience.

Jeff Kirchberg. |. City of Maryville
To 3 or not to 3, that is the question: Things to consider before moving to ArcGIS Pro 3.0

Abstract: ArcGIS Pro 3.0 is out, but should you make the switch? Are you thinking about making the change, but don't know what will change when you do? This presentation will go over the major new features in 3.0, so you can decide if it's worth upgrading, and what things you should consider before clicking the upgrade button.

Andy Carroll | Skytec
Adding Change Detection and Remote Monitoring to your GIS

Abstract: The proliferation of commercial satellite imaging options, advancements in drone mapping, and development of machine learning and feature extraction resources is making monthly, weekly, or daily monitoring and change detection possible. Organizations and governments can leverage these advancements through their existing GIS infrastructure. Real efficiency gains and return on investments are being realized for natural resource management, construction project tracking, and permit compliance.

Andrew Joyner, William Tollefson |. Tennessee Climate Office / East Tennessee State University
The Tennessee Climate Office: A Very Spatial State Climate Office

Abstract: The Tennessee Climate Office (TCO) became the official state climate office in January 2021, but has been producing climate services since its formation in 2016. Most of these services are developed using GIS. In addition to monthly climate reports including GIS-derived maps and analysis;

each week the TCO releases a drought infographic that shows where conditions have improved/deteriorated compared to the previous week and what is expected in the week ahead. The TCO is producing a Site Suitability Assessment for the future Tennessee Mesonet - a system of research-grade weather stations for the state. This suitability model will utilize land cover, flood zones, topographic roughness, and other layers to derive top sites for every county. The TCO is also developing new climate risk assessments for the Tennessee State Hazard Mitigation Plan Update. These risk assessments will include the exploration of historical trends using the space-time cube analysis tools available in ArcGIS Pro.

Simon Jolly, Nick Karrick. |. Esri
Mapping Climate Resiliency in East Tennessee

Abstract: The purpose of this presentation will be to promote climate resiliency within East Tennessee. We will highlight a recent and ongoing natural resource conservation project spearheaded by Thrive Regional Partnership in the Chattanooga area. Charlie Mix of UTC contributed to the innovative GIS work produced by Thrive that's inspiring environmental action in the region. The presentation will also explore recent federal resources (developed in collaboration with Esri) enabling communities to develop their own resiliency plans/toolkits. Finally, we will underscore the value of the Living Atlas through highlighting several of the relevant public datasets that feed into the federal government's work. The conclusion of the presentation will also provide attendees with a QR code to a document of extensive local resources/funding opportunities/etc.

Randal Hale. |. North River Geographic Systems, Inc
QGIS and LIDAR

Abstract: QGIS started out as a data viewer back in 2006. With each release, more tools have been added which has turned a small open source GIS desktop into a Fully Functional Enterprise offering. During this presentation we will discuss how QGIS deals with LIDAR products from DEMs to Point Clouds and how the QGIS community will provide more functionality in new releases. We will look at data freely available (LAZ and IMGs) from the State of TN.

Monica Anderson, Justin Huntsman, Micah-John Beierle. |. TVA
GIS Contribution to the Floating Aquatic Vegetation Efforts

Abstract: In 2020 TVA GIS & Mapping was tasked with providing a Mobile solution in place of paper reporting for sampling of harvesting upstream floating aquatic vegetation data; Imagery Collection along affected area; & Reporting of collected information for situational awareness. This presentation outlines steps taken, mobile solutions provided, imagery collected, and lessons learned.

Presenter Agenda

Start Time	Room 001	Room 005
10:45	Improving Map Accessibility	The Tennessee Climate Office: A Very Spatial State Climate Office
Presenter	Alex Lennon	Andrew Joyner, William Tollefson
11:05	To 3 or not to 3, that is the question: Things to consider before moving to ArcGIS Pro 3.0	Mapping Climate Resiliency in East Tennessee
Presenter	Jeff Kirchberg	Simon Jolly, Nick Karrick
11:25	Adding Change Detection and Remote Monitoring to your GIS	Changing Coastal Management Perspectives^
Presenter	Andy Carroll	Jonathan Bell, Mayra A. Román-Rivera
11:45	*Break*	
12:00	Lunch	
1:00	Vendor and Map Gallery	
1:45	*Break*	
2:00	QGIS and LIDAR	Using GIS to Alleviate Hunger in the Nonprofit Childcare Landscape^
Presenter	Randal Hale	Annie Liu
2:20	Utilizing LiDAR to Detect Abandoned Highwall Mines for Environmental Remediation^	The #EsriExperience as an Intern^
Presenter	Luke Lawley	Annie Liu, Savannah Roth, Simon Jolly, Olivia Lamm
2:40	Creating Blue Spots Model for Davidson County, Tennessee Using ArcGIS Model Builder^	Play and the Built Environment^
Presenter	Kingsley Fasesin	Hannah Morris
3:00	*Break*	
3:15		Never Trust an Anthill^
Presenter		Tracy Homer
3:35		GIS Contribution to the Floating Aquatic Vegetation Efforts
Presenter		Monica Anderson, Justin Huntsman, Micah-John Beierle
4:00	Closing | Lecture Hall | ^ indicates a student presentation	