



Presentation Abstracts

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BAS-ket Case: Lessons Learned in Municipal Mapping	North Carolina built an authoritative statewide municipal boundary dataset to support the Office of the Secretary of State, which became the foundation for a new Boundary Annexation Survey (BAS) agreement to support the U.S. Census Bureau. In 2026, North Carolina responded to the 2025 BAS on behalf of more than 500 municipalities for the first time. It was a crash course in what can go wrong (and how to respond without going crazy). The team experienced challenges across the process including the data issues we uncovered, the update plans we created (and revised), the communication and coordination with state and local governments required to support this project, and the experience builder application that we had to revise from scratch. The benefit of this pain is the improvements we made to be better prepared this year. Walk away with practical lessons for surviving the next BAS cycle and hear what we're doing differently in 2026.
Beginner to Expert Accessibility Resources - GICC Accessibility Workgroup	The Geographic Information Coordinating Council formed a workgroup of Local and State Government GIS staff to find resources, develop guidance, and conduct outreach to assist with the large task of updating online maps and applications to comply with the new accessibility rules. Join Faye Koenigsmark and Melanie Williams to hear about the newly published NC GIS Accessibility Resources and Guidance website. Find out what is still to come from this group and provide feedback on accessibility compliance issues you are looking to solve.
Beyond the Flight: Integrating UAS and GIS for Environmental Data Collection and Analysis	The North Carolina Department of Environmental Quality (DEQ) Drone Program has become a nationally recognized example of how uncrewed aircraft systems (UAS) and GIS can modernize environmental data collection and decision-making. This presentation will showcase how DEQ has integrated drones, ArcGIS, and advanced sensors, including RGB, thermal, multispectral, and LiDAR, to support a wide range of environmental initiatives across the state. Attendees will learn how drone-derived geospatial data is being used to improve habitat mapping, coastal resilience, infrastructure inspections, disaster response, water quality assessments, and regulatory operations while increasing efficiency, enhancing safety, and reducing costs. The session will also highlight lessons learned in building a collaborative, enterprise-scale drone program and explore future opportunities involving AI, bathymetric mapping, and next-generation geospatial technologies.
Deed Fraud, Estates, and You	4 hour workshop on Thursday afternoon that will contain two different one hour presentations followed by a two hour moderated panel discussion involving the prior presentors as the panel. Discussion will center around land record issues such as deed fraud, estates, ownership discrepancies, and other specific land related issues.
Fix It, Track It, Map It: Work Orders Done Right (and in-house)	The Town of Kernersville developed an in-house Work Order System using ArcGIS to manage citizen requests and operations. Supporting Stormwater, Solid Waste, and Streets, it integrates intake, tasking, field collection, and reporting. Features include dispatching, notifications, mobile tools, and real-time dashboards for compliance and operations. This presentation shares design, implementation, and lessons learned.
From As-Builts to Asset Management: Streamlining Stormwater GIS	GIS is critical for fast-growing communities trying to keep pace with new development while working with limited staff and budgets. By automating the transition from design files to geospatial data, Colliers Engineering & Design (CED) helped the Town of Wendell maintain accurate stormwater data with a sustainable workflow using ModelBuilder.
From Clipboard to Cloud: Implementing AGOL with Low-Tech Teams	This session shares communication strategies for implementing AGOL and cloud-based solutions with teams that have limited GIS experience and low technical fluency. It emphasizes the importance of clear, consistent guidelines for tools like Survey123 and Field Maps to improve efficiency and deliverable consistency. Real-world examples (including pavement surveys, emergency management data collection, and public involvement) illustrate this transition from outdated, disconnected workflows.
From Fragmented Data to Connected Networks: Statesville's Electric GIS Modernization	The City of Statesville modernized its electric utility GIS to support outage response, asset traceability, and long-term data integrity. This session tells the practical story of migrating fragmented CAD and GIS data into the Esri Utility Network, deploying ArcGIS Enterprise, integrating with an Outage Management System, and supporting field crews with mobile workflows. Attendees will learn lessons learned, common pitfalls, and best practices for utility GIS modernization.



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From the Ground Up: Building a Local Government Drone Program	Most local government drone programs begin in public safety departments, yet the value of drone technology extends far beyond emergency response. GIS-based drone programs are increasingly becoming powerful tools for supporting tax administration, environmental analysis, infrastructure and facilities management, and economic development. As a GIS-led drone program in North Carolina, Chatham County's program has worked to expand drone operations into a cross-departmental resource supporting a wide range of county initiatives. This presentation will share lessons learned from building the program from the ground up, including the challenges, learning curves, and practical decisions that shaped its development. Topics will include cost of entry, baseline equipment considerations, flight planning tips, data management practices, and post-processing software comparisons. We will also highlight real-world projects that have supported departments across county government, including economic development, tax administration, environmental monitoring, watershed protection, parks, elections, and facilities management. Attendees will gain practical insight into how local governments can develop and scale a GIS-led drone program that delivers value across departments.
Henderson County Integrates Survey123 to Streamline Current Planning Tasks	Henderson County is nestled in the Mountains of North Carolina. The county has seen significant growth in both residential and commercial development within the last twenty years. The planning department is responsible for processing Subdivisions, Map Amendments, Addressing requests. Each planner manages a wide range of daily tasks and responsibilities, which limits the amount of time available for individual project requests.
Hope Floats, So Does Data: The NC RAFT Application Overhaul	The NC RAFT application, standing for "Resilience Analysis Framework for Transportation", is a digital, cloud-based toolset developed by WSP and NCDOT Hydraulics to leverage the abundant flood risk data available in the state of NC and apply statewide coverage of said data to our state transportation network, thus facilitating the ability of NCDOT and emergency management officials to precisely identify, evaluate and act on areas of flood risk potential affecting our roads. This presentation will highlight the functionality of the brand-new next generation version (v3.0) of the RAFT application and also expand on the current benefits of the RAFT platform to stakeholders and preview some planned future enhancements to the platform over the coming years.
How to Understand and Incorporate Flood Resilient Strategies	We know the storms are coming. There are known areas that will be impacted and there are surprises that we never expected. Our goal is resiliency, to invest time and money ahead of the event allowing us to come back not just to where we were but better than we were in structure, human, and economic impacts. Our goals are to focus on planning that allows cities, towns, and counties to understand what is in harm's way, increase preparedness at the local level, understand cost and potential funding, provide information through stakeholders, and interested parties, and highlight potential paths to implementation for planned projects. This presentation will focus on these resiliency goals and give examples of how other entities are facing these issues as well as provide specific examples at the state, county, and city level of methods used for providing resiliency.
Identifying Historic Inequality: Mapping Racially Restrictive Deeds	Prior to the Fair Housing Act of 1968, demographic discrimination was common when selling or mortgaging property. This created systemic challenges to homeownership for people of color. Over the past six years, volunteers with Hacking into History (HiH) searched Durham County historic deeds & found over 2,000 examples of racially restrictive covenants. We partnered with HiH to map these historic parcels. Our goal is to create a publicly available dataset & partner with climate researchers.
Implementing Fee Collection into a County Address Management System	Mecklenburg County, North Carolina, is the largest county in the state and continues to experience rapid growth. The county is quickly approaching more than 700,000 active addresses, with an additional 20,000 to 25,000 new addresses added each year over the past four years. This sustained expansion places increasing operational demands on the County's Address Management System and the GIS team responsible for maintaining accurate, high quality address data. Mecklenburg County GIS operates under a hybrid funding model that blends general fund support with fee based revenue. As development activity intensified, GIS was tasked with identifying new and sustainable revenue opportunities to support Addressing Operations and reduce dependence on the general fund. This executive directive led to evaluating how a fee collection mechanism could be integrated directly into the address management workflow.
Mapping Firearm related deaths across North Carolina: Geospatial and Temporal analysis of public safety issues related to firearm mortality rates across North Carolina.	Firearm related deaths remain a persistent and unevenly distributed public health crisis in North Carolina and across the United States, with patterns differing between urban and rural areas. Environmental justice offers an important perspective for understanding how social and structural inequalities shape these patterns. This study examines the spatial distribution of firearm related deaths across North Carolina using Geographic Information Systems (GIS).
Modernizing and Improving Public Service Response Through ArcGIS-Driven Workflows	Local governments increasingly rely on efficient, standardized workflows to manage public complaints, issue reporting, and response tracking across multiple departments. This presentation highlights two operational workflows developed by Henderson County staff using the suite of capabilities provided by the modern ArcGIS ecosystem, to streamline information collection, improve response coordination, and generate actionable spatial insights.



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Modernizing Automated Flight Following for Wildfire Aviation	ICF partnered with the U.S. Forest Service to modernize Automated Flight Following (AFF), a mission-critical application that provides near real-time aircraft location to thousands of users in support of aviation safety and situational awareness during wildfire response. AFF helps dispatchers track firefighting aircraft and supports swift decision-making when conditions are changing rapidly.
Modernizing Community Safety Operations with ArcGIS Enterprise, Survey123, and Operational Dashboards	The City of Greensboro Community Safety Department has been modernizing a largely manual outreach and case-management process into a GIS-supported operational platform using Esri ArcGIS Enterprise, Survey123, Dashboards, and Experience Builder. This presentation will walk through the department's setup, implementation strategy, and lessons learned while building tools to support programs such as violence reduction, behavioral health response, peer support, outreach, and homeless engagement. Attendees will see how GIS is being used to support field data collection, internal operations, staff metrics, service tracking, and leadership reporting. The session will also cover practical hurdles encountered during implementation, including working with surveys that were not originally designed with geometry, building a process to add point locations after collection, managing related client-and-note records, improving dashboard performance, and planning for future public-facing data sharing. This session will focus on practical implementation strategies, decision points, hurdles, and future goals. Attendees will leave with repeatable patterns and ideas they can apply within their own local government or organizational workflows. Topics include: • Designing client-and-notes related data models in ArcGIS • Using Survey123 for complex operational data collection workflows • Building dashboards for staff activity, service tracking, and program performance • Adding geo-points to records from surveys that were not originally configured with geometry • Optimizing ArcGIS Enterprise views and filters for dashboard performance • Planning future Enterprise Portal to ArcGIS Online ETL workflows for public-facing transparency products • Lessons learned from implementing GIS tools in a real-world municipal community safety environment
Modernizing Geodatabase Management	The tools and techniques for using and analyzing geospatial data have evolved considerably over the last 30 years, but strategies for storing, structuring, and managing that data have not always evolved in parallel. As organizations modernize their GIS environments, they must rethink legacy geodatabase structures and the progression from traditional versioning and direct database access toward service-based access and branch versioned editing. This presentation will explore practical approaches for modernizing enterprise geodatabases to improve performance, simplify data management, and prepare for ArcGIS Enterprise 12.x. Attendees will learn considerations for restructuring data, transitioning to modern editing workflows, optimizing performance, and building a more scalable, maintainable, and future-ready enterprise GIS architecture.
NC DEQ Post Construction Stormwater Permitting Guidance Mapping Application	The purpose of this abstract is to describe an Experience Builder application for the North Carolina Department of Environmental Quality. DEQ requires a location-based method for applicants to understand if stormwater permits are required for post construction for any given location in the State. Stormwater post-construction permits are regulated by DEQ because new construction significantly increases the amount of coverage of impervious surfaces like pavement which can lead to large volumes of polluted stormwater runoff that can harm nearby waterways. DEQ is responsible for protecting water quality by overseeing regulations to manage this runoff after construction is completed. DEQ's requires an automated programming methodology to update the Experience with all applicable dynamic statewide data to facilitate change in geographic coverage or changes in agencies permitting authority's areas of jurisdiction. The premise of the application lies in a data coded method to satisfy all requirements as either yes or no. Through the application of Experience Builder's enhanced widgets and list boxes, the requirements can be delivered in a simple intuitive manner vs more subjective and confusing means such as popup dialogs.
NC Seamless Parcel Program -Transformed!	The North Carolina Seamless Parcels Enterprise System is a collaborative project which has succeeded in providing locally sourced County level parcel data for all 100 North Carolina Counties. While the original parcel transformer, created in 2014, streamlined the process for standardizing parcels across North Carolina, it had limitations, such as an inability to utilize REST services for county parcel updates. In June 2026 CGIA replaced the original Carbon Cloud transformer with an in-house transformer using FME software. This new transformer allows for multiple upload formats and allows for the creation of one-to-one, one-to-many, or many- to-many relationships between parcel geometry and attribution data. This presentation will dive into the details of how this new transformer was created using FME as well outline the parcel update process from county parcel upload to its availability on NC OneMap.
Parcel Fabric (ArcGIS Online's Version)	This session will provide an introduction to ArcGIS Online Parcel Fabric and demonstrate how organizations can create, edit, maintain, and share authoritative parcel information directly in ArcGIS Online. Attendees will learn how parcel fabrics support accurate land records management through parcel lineage, record-driven workflows, and topology-based editing. The presentation will highlight key capabilities, common use cases, and best practices for organizations looking to streamline parcel maintenance while increasing accessibility across departments.



Presentation Abstracts

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Plat Chat: How We Built Our Plat & DWG Solution	Our Plat Solution is a comprehensive tracking and reporting system that centralizes plat submittal data from recordation to mapping. The solution leverages ArcGIS Experience Builder and ArcGIS Dashboards to provide an intuitive editing interface for tracking submittal progress, plat details, and key workflow milestones. Integrated components include a Deed Log and an Annexations Dashboard. Custom coding and the Field Calculator enhance data automation and consistency across the platform. To complement this, our DWG Request Solution streamlines dwg requests with surveyors: an internal Survey123 form triggers a Power Automate flow that emails the surveyor a submission link, and a second flow notifies our team upon receipt. This presentation will walk through the architecture of both solutions, demonstrate key features, and share practical tips on application development, form design, and power automate.
Raleigh in Motion: Where AI Meets Urban Mobility	The City of Raleigh, in collaboration with NVIDIA, Esri, and Microsoft, developed Raleigh in Motion—a solution combining digital twins and computer vision to analyze vehicle turn movements and pedestrian activity at intersections. Using NVIDIA's VSS blueprint and GIS data, it delivers real-time insights, lane-level performance analysis, and incident detection to improve traffic operations and safety.
Roads and Commodities – Incorporating Utilities and Land Use in Regional Transportation Planning	The North Falls Lake Area Study was an innovative effort for data-driven analysis to plan for a community's future. Eight jurisdictions teamed together for an examination of future growth that integrated utility analysis, land use, and transportation planning into a single process. The study began with a detailed spatial analysis of environmental constraints, including water and sewer availability, land preservation priorities, and stormwater management challenges. These constraints informed a publicly supported land use scenario planning process, ensuring development patterns reflect both environmental realities and community values. From these scenarios, transportation improvements were derived, creating a prioritized transportation plan for a rural transitional area. This session will demonstrate how GIS can provide powerful planning support through a variety of spatial analyses.
Scalable Work Order Management Solutions	Many organizations struggle to modernize work order management while balancing budget constraints, staffing levels, and long-term growth. Small utilities and local governments often rely on spreadsheets, email, or paper processes, while larger agencies require enterprise asset management systems with deep integrations and reporting. This presentation explores a scalable, GIS-centric approach to work order management by demonstrating examples of three work order solutions designed for small, medium, and large organizations. Attendees will see how organizations can adopt tools, such as tasks, service requests, and work orders, that meet their current operational needs while providing a path to grow as workflows, staffing, and asset management requirements become more complex.
Scaling GIS for Elections: From County Workflows to Statewide Redistricting Support	As North Carolina jurisdictions prepare for future election cycles, many state and local governments are exploring how GIS can improve election operations, transparency, and voter confidence. This presentation highlights two scalable approaches to applying GIS for elections, demonstrating patterns and workflows that could be replicated by agencies across North Carolina. In Texas, San Patricio County partnered with Blue Raster to configure and extend Esri's Election Management Solution, using ArcGIS Survey123, Dashboards, Workforce, and Hub to improve election reporting, public transparency, and operational awareness through real time data collection and reporting tools. In Georgia, the Secretary of State Elections Division worked with Blue Raster and Esri to support statewide redistricting efforts by leveraging ArcGIS Pro, ArcGIS Hub, ArcGIS Enterprise, AWS cloud infrastructure, and ArcGIS StreetMap Premium to geocode nearly 8 million registered voters, automate voter assignment validation, and deliver dashboards and Hub sites supporting 159 counties. Together, these projects demonstrate how GIS can support elections at different scales and levels of complexity while creating sustainable workflows that improve accuracy, transparency, and operational readiness for election officials and the public alike.
Survey123 Insights for NC Orthoimagery Statewide Cycle 5	The NC 911 Board Orthoimagery Program is now in its fourth statewide acquisition cycle since launching in 2012. As we plan for the next iteration of the program, we deployed a Survey123 feedback form to gather input from GIS and imagery users across North Carolina. Our goal is to better understand current workflows, identify emerging technical needs, and evaluate opportunities to enhance the program's value to the state. This presentation will examine our experience with Survey123, summarize survey results collected to date, highlight key trends in imagery use and requirements, and discuss potential directions for Cycle 5 following the completion of Cycle 4.
The City of Greensboro does WHAT with Survey123?!? Hosted Feature Services, REST APIs, and AI as a Force Multiplier	Most organizations use Survey123 as a form to capture simple data. Greensboro uses it as a development platform. We built a custom web interface layered with business logic and validation guardrails. Underneath, AGOL Hosted Feature Services are the data backbone. REST APIs drive deep integration with our EAM, and Python handles the heavy processing under the hood. AI is the force multiplier that lets a lean GIS shop ship production code at scale. You'll leave knowing how to push Survey123 past the form.



Presentation Abstracts

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The Next Era of Survey123	This session introduces the next generation of ArcGIS Survey123 and what it means for modern data collection workflows. Attendees will explore the new platform, featuring improved performance, enhanced mapping, accessibility support, and a refreshed user experience. We'll discuss upcoming capabilities, backward compatibility considerations, and how participating in the beta helps shape the future of Survey123.
To Certify or not to Certify: Has our Industry Adopted Certification as a Requirement	There are numerous professional and technical certifications you can earn in the GIS field. However do these have value? Do employers require them? Do you get paid more for having one? I try to answer these questions as I present the results of a recently survey I completed along with looking at the results of similar previous ones.
Transforming Municipal Infrastructure Management with 3D, ArcGIS, and Cityworks	The City of Concord partnered with NV5 to implement a Scan-to-BIM-to-ArcGIS workflow, enhancing 3D asset management within Cityworks. The project includes LiDAR scanning of 12 water facilities, BIM model creation in Autodesk, and integration into a 3D GIS dataset using ArcGIS Pro. NV5 will develop a geodatabase, scene layer package, and a custom 3D widget for Cityworks Respond, enabling interactive, spatially accurate 3D asset management. This initiative streamlines asset lifecycle management and improves operational efficiency through integrated 3D data visualization and analysis.
Understanding ArcGIS Pro Projects	ArcGIS Pro makes use of project files in place of MXDs. For those that are old timers and that used ArcView GIS, this is not a new concept. ArcGIS Pro projects, aka APRX files, provide a powerful and flexible format to access, view, and share content when used properly. This presentation will help you gain a better understanding of what a project is and how to add content to one. We will also look at how you can import existing ArcMap files into to an ArcGIS Pro.
Using ArcGIS Pro and Open-Source GIS Software to Identify Potential Stream Restoration Sites Based on Erosion	Local jurisdictions in many states are faced with the challenge of finding suitable locations for restoration projects to meet their MS4 requirements. This talk will give an in-depth overview of a raster analysis approach McCormick Taylor used to identify potential stream restoration opportunities in Howard County, MD by identifying stream channel reaches that have shown the greatest amount of erosion between 2011 and 2025. The analysis used a combination of open-source software and ArcGIS Pro and primarily relies on a terrain openness metric which helps locate incised channels. This approach has strong potential for any local or state governments that need to find stream restoration opportunities, whether to meet MS4 requirements or mitigate for stream impacts.
Utilizing the Cloud for your GIS: Options and Considerations	GIS Managers are choosing to leverage the 'Cloud' as part of their implementation strategies for several reasons. For one, it amounts to fewer on-premises resources that must be maintained by their IT departments. Another reason is improved security, as a properly deployed cloud implementation can be more secure than an on-premises deployment. Additionally, cloud hosted GIS resources can be easier to use if designed and implemented properly.
Vibe Coding with Claude, ArcPy, and NCTech Street-Level Imagery	Everyone knows a picture is worth 1000 words, but how many GIS features might it contain? Come see what is possible when Steet-level imagery becomes a backdrop for your GIS. Plus, learn how coupling Claude with ArcPy makes it possible to use your data and your domain expertise to create entirely new experiences with data. It's time to get excited about GIS again!
Wood You Believe It: NC State's Data-Driven, Risk-Based Approach to Campus Forestry	Managing a thriving urban forest within a major university campus requires moving beyond reactive maintenance toward a standardized, data-driven approach to tree management. At NC State University, the management of thousands of campus trees historically faced significant hurdles, including fragmented datasets, non-standardized naming conventions, and overly complex data entry fields that hindered efficient field operations. This presentation outlines the collaborative effort between the Facilities Division's Urban Forester, Landscape Maintenance and Enterprise GIS teams to modernize the university's tree inventory into a proactive asset management tool.



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<u>Student Lightning Talk</u> Mapping Malaria: Spatial Patterns of Plasmodium Infection in Dschang, Cameroon	Malaria transmission is spatially heterogeneous and shaped by geographic and structural factors, even within relatively small areas. This study examines household-level malaria infection data collected from 2023–2025 in Dschang, Cameroon. We characterize the spatial distribution of infections across multiple Plasmodium species, examining variation over time and associations with household livestock ownership. Spatial autocorrelation, local cluster analysis, and spatial risk modeling were used to identify and visualize patterns of infection across species and time periods. This analysis highlights fine-scale heterogeneity in malaria infection and demonstrates how GIS and spatial statistical methods can contribute to understanding malaria transmission at the community level.
<u>Student Lightning Talk</u> Fine Scale Dynamics of Urban Forests and Their Role in Heat Mitigation	Urban forests are a major factor in creating pleasant and healthy environments in cities. They help cool temperatures during hot weather. It is essential to understand how urban forests are changing together with cities and how various tree structures might contribute to more efficient heat reduction. Understanding how the dynamics of tree height, shape, and distribution impact cooling can help cities develop more effective strategies to mitigate heat. Most of the studies conducted, however, are relatively short term and fine scale studies of long-term urban forest change and heat relationship are limited. Specifically, changes in the 3 D structure of trees, such as tree height and crown size, have been less well studied than changes in 2 D structure, including canopy cover. This study looks closely at the fine-scale (one meter or finer resolution) changing patterns of urban forests in Charlotte's various neighborhood types (e.g., urban vs. suburban, dense vs. sparse canopy areas). Significant tree features like height, crown area, and canopy cover are measured over the last 20 years, capitalizing on cutting edge remote sensing technologies, such as high-resolution LiDAR data and aerial imagery. The research also quantifies changes in tree growth, shrinkage, and fragmentation at the same scale. Understanding how various tree features, such as height, crown spread, and canopy density, contribute to lowering surface temperatures, particularly on extremely hot days, is another key goal of the study. The study also explores the impact of urbanization and built form on the potential for urban forests to reduce urban heat by integrating trees, buildings, roads, and land cover data with temperature measurements from the field and remote sensing. Using spatial statistical methods, associations between forest structure, urban form, and temperature are identified. The patterns and results reveal long term canopy changes across neighborhoods in Charlotte and the factors associated with forest change. The analysis also shows that highly urbanized neighborhoods are associated with higher temperatures, while higher tree canopy is associated with lower temperatures. The study reveals spatial patterns of urban cooling and offers information to enhance the cooling potential of urban forests for environmental managers, urban planners, and policymakers.