

### Thursday, February 20

## GIS Project Management

A project is a project is a project, right? Well, yes and no. This class will cover the basics of project management from a GIS project delivery perspective, focusing on the ways in which industry standard project delivery methodologies and practices can (and should) be utilized for GIS projects. We will also cover the unique requirements of GIS and related technologies that merit special consideration when initiating, planning, executing, and monitoring GIS projects.

Cost: \$95 non-members; \$75 GISCO members

### Friday, February 21

## GIS Colorado Quarterly Meetup

### Virtual Meetup

The sessions will be recorded, but no live stream will be available.

8am to 9am	<b>Coffee and Networking</b> donated by Einstein's Bagels Join us for coffee and networking starting at 8am; presentations at 9am.
9 am to 9:30 am	Welcome and Announcements (30min)
9:30 am to 10:30 am	<b>The National Spatial Reference System: the Common Foundation of Surveying and GIS</b> <i>Brian Shaw, Rocky Mountain Regional Advisor (CO, MT, WY)</i> <i>NOAA's National Geodetic Survey (NGS)</i>
10:45 am to 11:45 am	<b>Update on the 2022 Colorado State Plane Coordinate System</b> <i>John Hunter, PLS, Manager of Survey, Denver Water</i>
12:00 pm to 1:00 pm	<b>Lunch</b> sponsored by <b>HDR, Inc</b> and <b>Merrick &amp; Company</b>



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1:15 pm to 2:15 pm

**Future of GIS: Student Innovations Panel**

- Relationships between the ratio of disturbance to the stability of plant communities in a semi-arid ecosystem - Jenna Tansill, Western Colorado University, M.S. of Ecology
- Going from Zero to GIS Hero - Gina Girgente, University of Denver, M.S. Geographic Information Science
- Quantifying the risk of pesticide drift from golf courses - Meredith Boos, Regis University,

2:30 pm to 3:30 pm

**GIS Govey Panel**

- Jenny Wallace - Program Manager (GIS) - DRCOG
- Joseph Stone - GIS Manager - Denver Water
- Doug Genzer - TS GIS Manager - City and County of Denver

3:30 pm to 3:45 pm

**Break**

3:45 pm to 4:15 pm

**Exploring ArcGIS Instant Apps and ArcGIS Experience Builder Express Mode: A Guide to Modernizing Your Apps**

Hannah Larsen

4:15 pm to 4:45 pm

**Mapping History for the Ghost Town Club of Colorado**

Nathan Doty

4:45 pm to 5:00 pm

**Closing Remarks & Wrap-Up**

**Mappy Hour!**

5:30 pm onwards

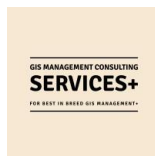
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Questions?

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## Program Abstracts and Descriptions

### **The National Spatial Reference System: the Common Foundation of Surveying and GIS**

*Brian Shaw*

NOAA's National Geodetic Survey (NGS) defines, maintains, and provides access to the National Spatial Reference System (NSRS), which is a common foundation for geospatial data that serves as the basis for civilian surveying and mapping in the United States. Changes in technology and a better understanding of the dynamic earth have made it necessary to improve the NSRS to be of better use for modern applications. Currently, NGS is in the process of modernizing the NSRS, updating the existing horizontal datums with a suite of geometric reference frames and the vertical datums with a gravimetrically-derived geopotential datum. Part of the modernization process involves updating NGS products and services to support users of the Modernized NSRS. Such updates include coordinate conversions and transformations, geodetic control, GNSS data processing, the Continuous Operating Reference Station (CORS) network, aerial imagery, and the many tools and datasets that make the NSRS possible. An entirely new State Plane Coordinate System is also being developed.

For both the existing and future NSRS, the goal of NGS is the same: to best meet the diverse positioning needs of the entire U.S. geospatial community that includes surveyors and GIS professionals. Learn how NGS is striving towards this goal during this session.

### **Update on the 2022 Colorado State Plane Coordinate System**

*John Hunter*

The National Geodetic Survey (NGS) is set to release the 2022 State Plane Coordinate System, replacing the long-standing system based on NAD83. This presentation will explore the development, which adopts the North American Terrestrial Reference Frame of 2022 (NATRF2022) as its foundation. The updated system introduces 36 six-zone grid planes that are carefully tailored to the local topography. This topography-centric design significantly mitigates the linear distortion issues inherent in the older, ellipsoid-based approach of the NAD83 design.

Given Colorado's dramatic elevation ranges, the enhanced precision of these zone-specific projections will dramatically improve mapping accuracy and geospatial analyses across the state. The session will detail the technical advancements, the rationale behind the shift from a NAD83-based model to NATRF2022, and the anticipated benefits for geospatial professionals, surveyors, engineers and the overall geospatial community.

### **Relationships between the ratio of disturbance to the stability of plant communities in a semi-arid ecosystem**

*Jenna Tansill*

With the "Visualizing shifts in Vegetation Structure in Response to Traditional Cattle Grazing within Critical GUSG Habitat with R-based Manipulation of HLS Imagery" project, the objective is to utilize it as a template to generate additional, relevant vegetation indices like NDVI through a script based system like RStudio. And, to then combine those resulting layers with other resources that I've created like a Supervised Classification of Vegetation Percent Cover, those that I've been given like a Wet Meadow Map, or those that are public like the Rangeland Analysis Platform (RAP) to ultimately create a model that accurately illustrates the mosaic landscape. It would be utilized as a tool to identify sampling areas with potential for



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disturbance that coincide with obligate species habitat. The title presented above is a working title for my thesis which will be heavily focused on understanding how plant communities in semiarid ecosystems respond to varying degrees of disturbance from herbivorous ungulates like cattle, elk, and deer. As stated in the poster that was submitted, the existing monitoring methods established by land management agencies lack the capabilities to capture the spatial and temporal variation. So, by adding remote sensing and other GIS techniques it may assist with that tedious process. The study will take place on permitted USFS allotments throughout the Gunnison Basin within Gunnison County Colorado that overlap with critical Gunnison Sage-Grouse (GUSG) habitat. Currently, I'm planning to use that conglomerate of a model to identify areas with sampling potential to then head out into the field to establish paired utilization cages (one that will be put in before cattle grazing so it won't be grazed and another that will be put in after cattle grazing so it doesn't continue to be grazed), along with identifying and measuring the vegetation in those plots. There's potential that I will be able to get UAV imagery of select sampling areas in some pastures to better illustrate their usefulness when determining productivity on the ground. At the end of the grazing field season, I will return to collect above-below ground biomass samples as well as a potential small soil core so that they can be processed in a laboratory setting. By collecting biomass samples, I'm hoping to see how plants allocate their energy to their root to shoot structure in response to disturbance from herbivory. By collecting a small soil core or utilizing Web Soil Survey (WSS), I'm hoping to apply it in my thesis work as a covariable, along with precipitation data from PRISM climate data, to better understand what other factors could influence plant response and how they can further alter a ecosystem when in conjunction with varying levels of grazing disturbance. I feel I should receive this award because I'm truly passionate about this project. I started out as an undergrad research technician during the '23 field season for this project. Through that experience, I was inspired to continue my education by taking on this project as a graduate student and I've committed to do all that I can for the next three years. I'm passionate about understanding plants, providing a sustainable balance between habitat and ecosystem services, and trying to assist land management agencies in developing a better approach to adaptive management. There isn't a project I'd rather be spending time on.

## Going from Zero to GIS Hero

*Gina Girgente*

GIS is a broad and sometimes overwhelming field for students and new professionals. As I began my undergraduate career, I did not know what GIS was. After changing my major to geography at the end of my freshman year, I quickly became stressed by the many pathways I could travel on while using geography and GIS. Through the help of college classes, internships, academic research, and open-source GIS materials, GIScience became more than my field of study—it became a hobby. This presentation will cover my personal journey through GIS, highlighting the various GIS communities, the "invisible" opportunities available for GIS in academics, the free learning materials I used to become a more competitive professional, and what to do when you get in a GIS rut.

## Quantifying the risk of pesticide drift from golf courses

*Meredith Boos*

The adverse health effects of agricultural pesticide exposure—from insecticides, fungicides, and herbicides—are well understood. A common exposure pathway is pesticide drift with residues traveling as far as 0.375 miles from the site of application. Pesticides aerosolize when sprayed, leach into groundwater, and can adhere to clothing or skin as dislodgeable foliar residues. While some state policies, such as those in California, have implemented buffers to reduce exposure risk (e.g., prohibiting agricultural fumigants within 0.25 miles of a school), the risks related to urban pesticide use remain underexplored. Golf courses, often located in urban areas, use pesticides to maintain the quality and aesthetic of



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turfgrass, resulting in pesticide use rates that are four- to eight-fold more intense compared to conventional agriculture. This potential exposure warrants concern since urban golf courses are situated in residential communities. This geospatial project aimed to quantify the risk of low-dose pesticide exposure via drift to residential communities surrounding golf courses in the Denver metropolitan area. We modeled agricultural buffer zones at 0.25 miles and 0.375 miles from the site of application—assuming center of fairway application—across 71 golf courses. A comparison of population density within these zones revealed a 38% increase in the broader buffer (0.375), affecting almost half a million people. This project provides critical insights into the risks of pesticide exposure around golf courses. The findings can guide future regulations and public health initiatives, ultimately fostering safer residential environments.

## Exploring ArcGIS Instant Apps and ArcGIS Experience Builder Express Mode: A Guide to Modernizing Your Apps

*Hannah Larsen*

Are you looking to transition your apps from ArcGIS Web AppBuilder to the next generation of configurable web mapping applications? Come learn about ArcGIS Instant Apps and the brand-new Express Mode in ArcGIS Experience Builder, and learn how to use them to rebuild your existing ArcGIS Web AppBuilder apps. This session will focus on tips and tricks for getting started with the new app builders, demos on rebuilding ArcGIS Web AppBuilder apps, and an overview of the widgets and tools available in each app builder.

## Mapping History for the Ghost Town Club of Colorado

*Nathan Doty*

Maintaining any small non-profit organization as a going concern is a challenge. 68 years old this year, the Ghost Town Club of Colorado faces multiple crises: an aging and declining membership, a shrinking budget, and a growing physical archive. Founded in an analog age, the Club must extensively digitize not only to attract the next generation of photographers and history enthusiasts, but to enable the long-term preservation of its own history and to facilitate the enjoyment, research, visitation, and preservation of historical sites at greater scale. The history and mystery of old and abandoned places fascinate thousands, and tourism to these sites contributes meaningfully to Colorado's rural economy. At the same time, oversharing, overtourism, trespassing, vandalism, and looting hasten the demise of our most vulnerable structures. Using low-cost software, the Club built an interactive research tool: a map of historical features and related information across Colorado which doubles as a high-level way to browse its new digital archive and plan field trips and donations. Significant challenges remain: The Club is working with outside experts to understand how to map these sensitive places responsibly, without releasing too much information to a general audience and inadvertently enabling overtourism ourselves. To help the Club identify more economically impactful preservation donation candidates, the Club will incorporate various county-level economic data into new map layers. To illustrate the rate of structure loss, the Club will record known dates of structure loss. And the Club is gathering feedback to carefully balance the map's depth and accessibility. Making history fun, not intimidating, allows us to reach more people with this vitally important Colorado history. This session will highlight the software we used, the map and archive's form and function, design and security considerations, and our roadmap, all within the context of the Club's budget and expertise constraints.

### Logistics

#### Meeting Location



Questions?

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City and County of Denver  
201 W Colfax Ave, Denver, CO 80202

**Cancellation policy:**

*100% refund 7 days before the scheduled event*

*0% refund less than 7 days before the scheduled event*

**No real-time streaming of events expected**

**Directions to Raices for Mappy Hour:**

