

# MS-GIST Projects Spring 2023

## Monday, April 24

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*\* There will be 5 minute breaks between each back-to-back presentation to facilitate transitions in Zoom.*

*\*\* Zoom links are available on request. Please contact Andrew Grogan - [atgrogan@arizona.edu](mailto:atgrogan@arizona.edu)*

Date/Time	Presentation Title	Student Name
04/24/23 01:30 - 01:55 PM	<a href="#"><u>BEST PRACTICES FOR THE NORTHWEST LOUISIANA COUNCIL OF GOVERNMENTS TO SHARE DATA, MAPS, AND IDEAS WITH THE PUBLIC UTILIZING ARCGIS HUB</u></a>	Kevin Reeves
04/24/23 02:30 - 02:55 PM	<a href="#"><u>Determining the Impact of Human Infrastructure on the Mexican Wolf in Arizona and New Mexico</u></a>	Brandon Whitney
04/24/23 07:00 - 07:25 PM	<a href="#"><u>Automated Groundwater Contamination Analysis: A Geoprocessing Tool for Visualizing AshTracker Data</u></a>	Carmen Wyatt

# **BEST PRACTICES FOR THE NORTHWEST LOUISIANA COUNCIL OF GOVERNMENTS TO SHARE DATA, MAPS, AND IDEAS WITH THE PUBLIC UTILIZING ARCGIS HUB**

Kevin Reeves  
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04/24/23, 01:30 - 01:55 PM

## **Abstract:**

The Northwest Louisiana Council of Governments (NLCOG) strives to provide its member government agencies with the most accurate and current GIS data within our regional GIS (ReGIS). One concern is that the data has never been available to the public without a data request. NLCOG has envisioned better public access to GIS data for some time now. For this project, I created the ArcGIS Hub site, Northwest Louisiana GeoHub as the public outreach GIS arm of NLCOG. From this site, the public can view and download GIS data, including feature classes, web maps, and maps in PDF format. The Northwest Louisiana GeoHub also provides information about the Northwest Louisiana Council of Governments, as well as general GIS knowledge. Links to the member government agencies are on the site as well. The hope is that this site creates a connection between local government and the citizens of Northwest Louisiana. It is also my hope that this site brings awareness to our area of the capabilities of GIS and its potential. I envision this site growing to include more citizen participation to better our communities as well as more GIS data becoming available from the Northwest Louisiana Council of Governments' metropolitan planning area.

**Keywords:** NLCOG, Hub, GeoHub, government, public access

# **Determining the Impact of Human Infrastructure on the Mexican Wolf in Arizona and New Mexico**

Brandon Whitney  
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04/24/23, 02:30 - 02:55 PM

## **Abstract:**

The Mexican wolf (*Canis lupus baileyi*) is the smallest and southernmost subspecies of gray wolf in North America. Over the last 150 years, this subspecies was nearly driven to extinction through conflict with the livestock industry in its former range. Several studies have been conducted to determine suitable habitats for the reintroduction of the subspecies in Mexico and the US. Because conflict with humans caused the wolf's plight, in this Master's project, I tested the impact that giving increased importance to human population density and road density has on suitability models within the Mexican Wolf Experimental Population Area (MWEPA) in Arizona and New Mexico. To complete this task, I found or calculated data for land cover type, population density, and road density in 1km pixels across the study area and scaled the values between -1 and 1. I then used elevation, slope, terrain roughness, and various temperature and precipitation variables in training a presence-only prediction model to account for climatic suitability, which I then scaled from -1 to 1. I then took a series of weighted averages, increasing the weight of population density and road density. Compared with the results of the unweighted model, which produced 31,573 km<sup>2</sup> of highly suitable habitat, models with increased weight on population and road density produced 43,493 km<sup>2</sup> of highly suitable habitat. This discrepancy probably arose from the large tracts of unpopulated land across the study area. I found that the unweighted model most closely resembles previous research on Mexican wolf suitability in the region.

**Keywords:** Mexican Wolf, Arizona, New Mexico, Habitat Suitability, Geographic

# **Automated Groundwater Contamination Analysis: A Geoprocessing Tool for Visualizing AshTracker Data**

Carmen Wyatt  
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04/24/23, 07:00 - 07:25 PM

## **Abstract:**

The United States Environmental Protection Agency requires groundwater monitoring of over 200 coal ash disposal sites, relying on data collected from tens of thousands of well samples. Being able to convert that data into insightful analysis is crucial to making informed decisions regarding the magnitude of contamination and focus on planning for site improvement. Environmental scientists are key to maintaining such sites and need analysis tools to support their research. The geoprocessing tool created here provides a complete output of isoconcentration maps, providing visualizations of each contaminant required to be monitored by the EPA at coal ash sites. The analysis is completed using open source Ashtracker data and ArcGIS Pro. Python scripting is used to automate the analysis, which not only allows geologists to visualize the subsurface damage, but also eliminates human error introduced by the manual entry of data, as well as provides a uniform output across all site evaluations. In addition to automating the process through python scripting, creating an ArcGIS geoprocessing tool rather than a standalone script makes the analysis user-friendly for a complete team of environmental professionals. By implementing the groundwater contamination analysis tool, these teams have a better understanding of what lies beneath the surface and can take action to improve such a vital resource.

**Keywords:** Workflow Automation, Groundwater Analysis, Python Scripting, Map Series, Coal Ash