# MS-GIST Projects Summer 2023 Tuesday, August 08

\* 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

Date/Time	Presentation Title	Student Name
08/08/23 09:30 - 09:55 AM	Assessing Habitat Value in Sonora for the Leopardus pardalis	Savanna Searles
08/08/23 10:30 - 10:55 AM	Spectral Assessment of Vegetational Recovery Following the Owyhee Mountains' 2015 Soda Fire	Jay Albertson
08/08/23 11:00 - 11:25 AM	<u>Visualizing Historic Housing Discrimination:</u> <u>Mapping Exclusionary Covenants in Tucson,</u> <u>Arizona</u>	Liz Wilshin
08/08/23 12:30 - 12:55 PM	<u>Geographic Analysis of Heat-Related Deaths in</u> <u>Maricopa County, Arizona</u>	Troy Snyder

### Assessing Habitat Value in Sonora for the Leopardus pardalis

Savanna Searles ssearles@arizona.edu

08/08/23, 09:30 - 09:55 AM

#### Abstract:

The ocelot can be found from northern Argentina to southern United States, with a small known population in southern Texas and a possible population in southern Arizona. They are protected both in the United States and in Mexico as an endangered species. Northeast Sonora deserves more research as an important extent of the current ocelot range, and one of the last linkages for ocelots in the United States. Identifying appropriate territory in Sonora exposes reasonable corridors for movement north into Arizona, where a small number of sightings and historical presence of ocelots are confirmed. This project examines habitat suitability using satellite derived data on canopy cover, vegetative land cover, as well as utilizing proximity to lakes, and distance from roads as raster inputs to a weighted rank suitability model. Testing multiple models reinforces the suitability of high scoring areas that are shared between scenarios. A review of the result showcases the need for additional research on habitat fragmentation, movement or dispersal, and cross-border studies of the ocelot.

**Keywords:** weighted suitability analysis, conservation, habitat suitability, endangered species, leopardus pardalis

## Spectral Assessment of Vegetational Recovery Following the Owyhee Mountains' 2015 Soda Fire

Jay Albertson jayalbertson@arizona.edu

08/08/23, 10:30 - 10:55 AM

#### Abstract:

Between August 10 and August 23, 2015, the Soda Fire burned 279,144 acres of the sagebrush steppe ecosystem in Idaho's Owyhee and Oregon's Malheur counties, southwest of Idaho's capital, Boise. This project attempts to examine, visualize, and explain the impacts of this fire on the sagebrush steppe, while demonstrating the need for boots-on-the-ground perspective to give context to spectral analysis like the Landsat 8 data used in this study. The dNBR analysis shows a largely net-neutral or positive change in vegetation in comparison to pre-fire values with a mean value of -0.02. Future NDVI analyses will demonstrate the overall health of vegetation, which will then be compared against a 3-year average of NDVI values. This final analysis will demonstrate the spectral change in vegetation quality post-fire, from 2015 to July 2020.

**Keywords:** Normalized Burn Ratio, Normalized Differenced Vegetation Index, Differenced Normalized Burn Ratio, Sagebrush, Sagebrush Steppe, Wildfire, Landsat 8

## Visualizing Historic Housing Discrimination: Mapping Exclusionary Covenants in Tucson, Arizona

Liz Wilshin ewilshin@arizona.edu

08/08/23, 11:00 - 11:25 AM

#### Abstract:

This study looks at historic housing discrimination based on race and ethnicity in Tucson, Arizona. By studying 2020 U.S. Census data spatially joined with historic Covenants, Conditions, and Restrictions (CCRs) obtained from the Pima County Recorder's Office, the research explores the social and spatial implications of discriminatory practices. Through data collection and preparation combined with spatial analysis techniques, a web app was developed visualizing the impact of CCRs on housing patterns. The web app showcases subdivision polygons, demographic information from the Census, and allows users to explore the connections between CCRs and contemporary housing trends. While any findings from the spatial analyses are preliminary and require further verification due to ongoing data validation and verification, the web app serves as a proof of concept for the broader research initiative, "Mapping Racist Covenants." The study contributes to a deeper understanding of the lasting effects of discriminatory practices and provides valuable insights into the complex relationships between race, housing, and urban development.

**Keywords:** discrimination, exclusion, housing, housing policy, segregation, race, equity, development, historic, mapping, demographics

## Geographic Analysis of Heat-Related Deaths in Maricopa County, Arizona

Troy Snyder troytsnyder@arizona.edu

08/08/23, 12:30 - 12:55 PM

#### Abstract:

Heat-related deaths are on the rise in Maricopa County, Arizona. Land use, climate change, and human development are contributing to increases in extreme heat, adversely impacting local populations. Though many factors affect heat-related deaths each year and not all of these are measurable, this study looks at the impacts of urban development and local temperature trends as two key players. The relationship between these factors and historic heat-related death data is explored, revealing areas where improvements can be made to better protect citizens from patterns of harsh summer heat. This study uses geographic analysis tools including supervised classification, inverse distance weighted (IDW) methods, choropleth mapping, and visual analysis to identify correlations in weather and environmental data with heat-related deaths. Results show that strategically identified areas can implement heat-reducing measures such as living walls, green roofs, and cooling centers to improve the quality of life for residents.

Keywords: Heat, development, climate, safety, community