Alexis O'Callahan Mapping Portfolio

UNIVERSITY OF ARKANSAS

Conservation and Cartography Samples

Google Drive Link to Manuscripts

SPRING 2026

Selection of Maps & Figures

1	Choropleth of Diversity (RStudio)
2	Land Cover + Sampling (ArcGIS)
3+4	Disturbance + Biodiversity (ArcGIS)
5	Wildfires (Google Earth Engine)
6	Cartographic Art (Padlet)

Project #1

Publication Folder

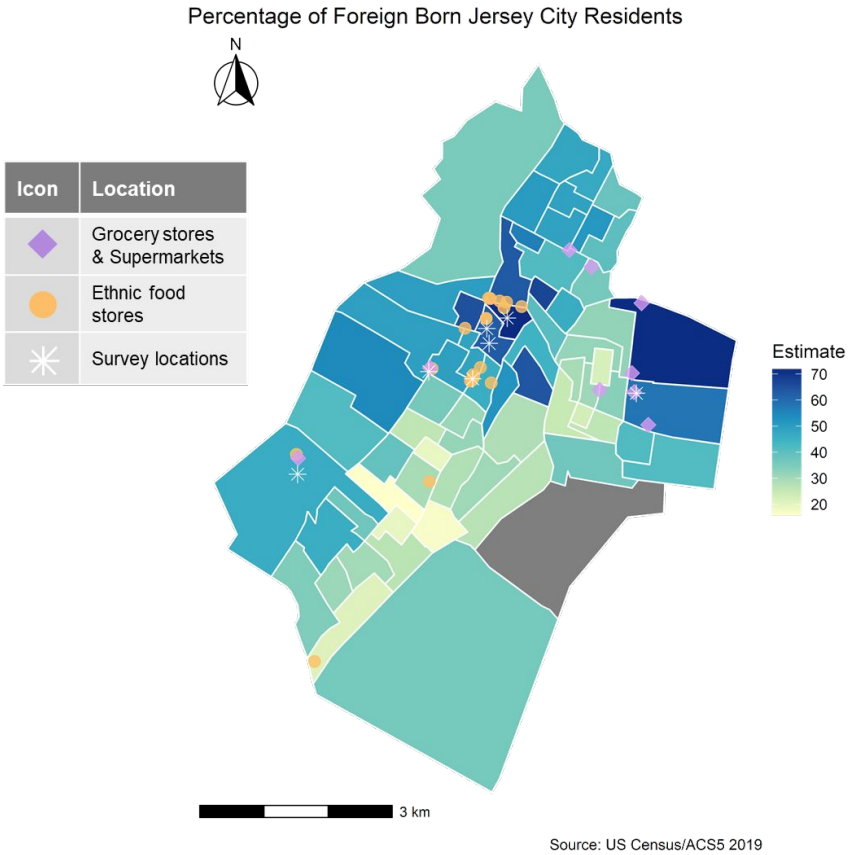


Figure 3. Choropleth map of the percentage of Jersey Cityans who were born outside of the U.S. and its territories. Nativity data was gathered from the ACS 5-year Census (2019) using the tidycensus (Walker 2020) R package. The white stars indicate the 7 survey locations the researchers utilized. The orange dots represent the explicitly mentioned food stores that were “ethnic”, determined by the mention of another culture or language in the store’s name, description, or front signage.

Project #2

Conference Poster Link

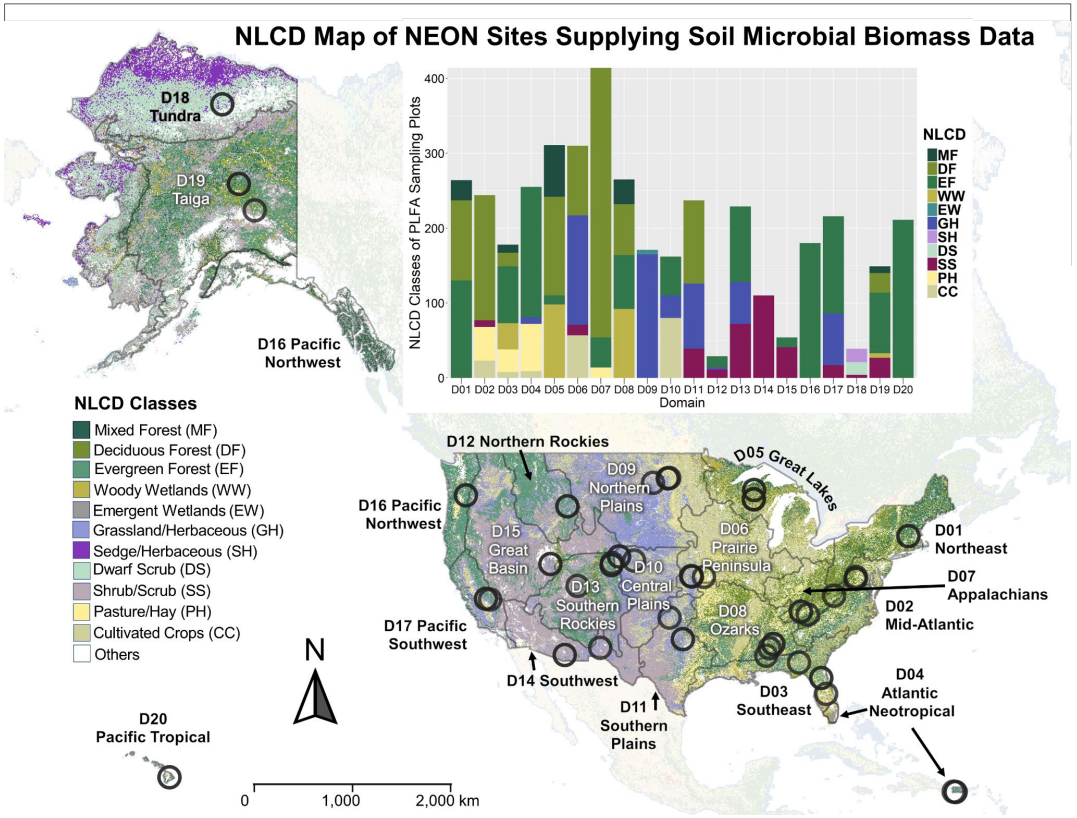


Figure 1. NLCD map of the 41 NEON sites studied, with sites shown as circles (with some overlapping) throughout the 20 ecoclimatic domains.

Project #3

Report Link

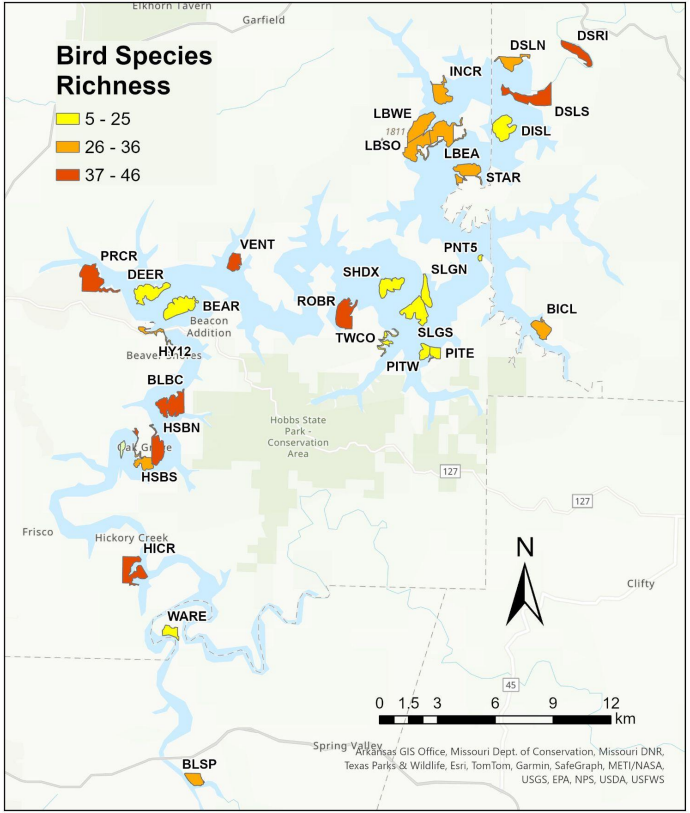


Figure 6. Avian species richness by site from the summer 2024 point count survey data. Note that species richness does not account for unequal effort between land-accessible (n = 3 surveys/site) and boat-accessible (n = 1 survey/site) sites.

Project #3

Report Link

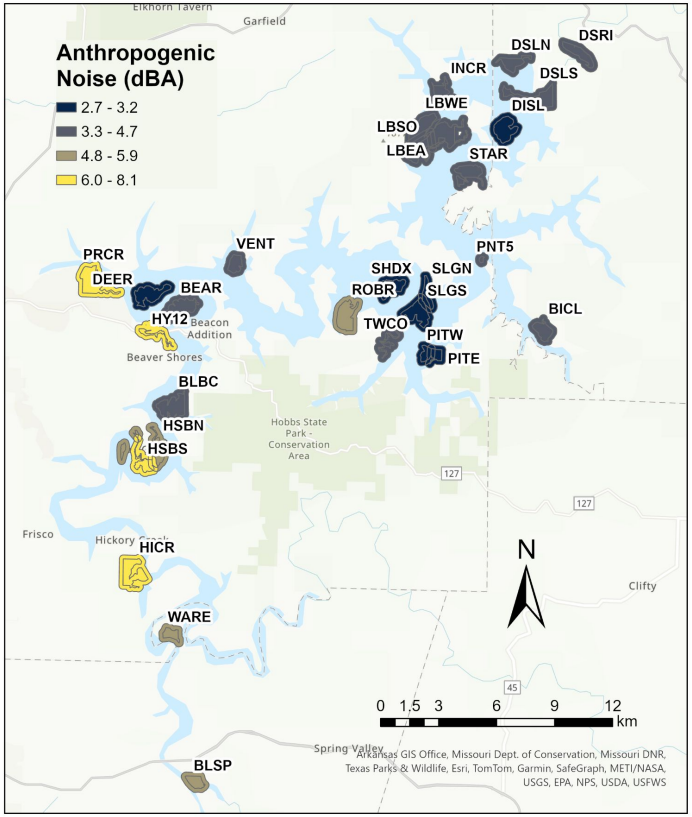


Figure 8. Anthropogenic noise (dBA) of the 29 study sites + 200 meter buffers.

Project #3

Report Link

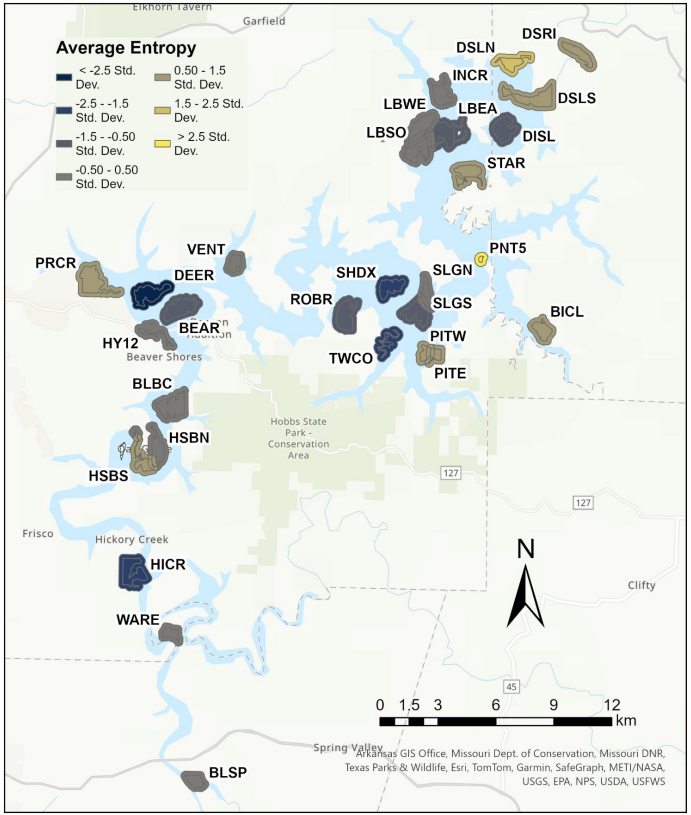


Figure 12. Average entropy of study sites, colored in terms of their standard deviation from the mean entropy value. Low entropy indicates homogenous landscapes, whereas higher entropy indicates more complex landscapes in terms of topography, geography, and land cover, as we used cloudless Sentinel 2-a data from peak greenness (2024) to calculate entropy.

Project #3

Report Link

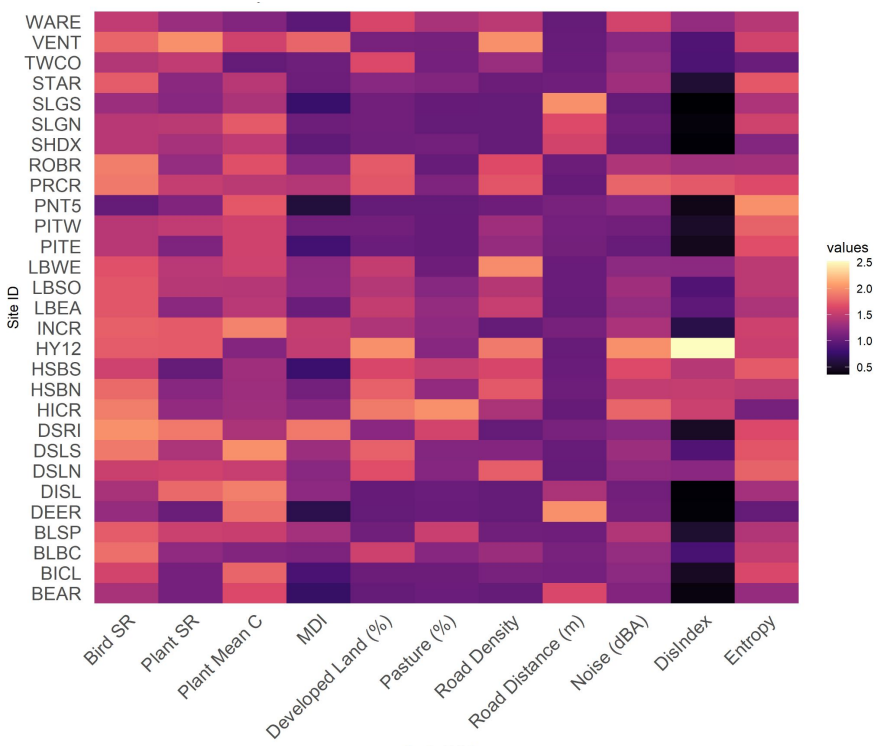
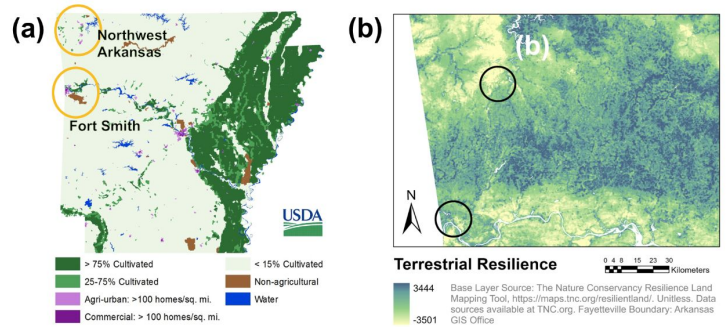


Figure 9. Heatmap of biodiversity and disturbance values for all 29 surveyed sites in the Beaver Lake Watershed. Values of each diversity and disturbance variable were scaled and normalized from 1-2, whereas multidiversity (MDI) is average scaled bird and plant richness and the combined disturbance index (DisIndex) is the average of scaled road density, anthropogenic noise, and proportion developed land cover.

Project #4

Proposal Link



Map credit: USDA Economic Research Service Food & Environmental Atlas

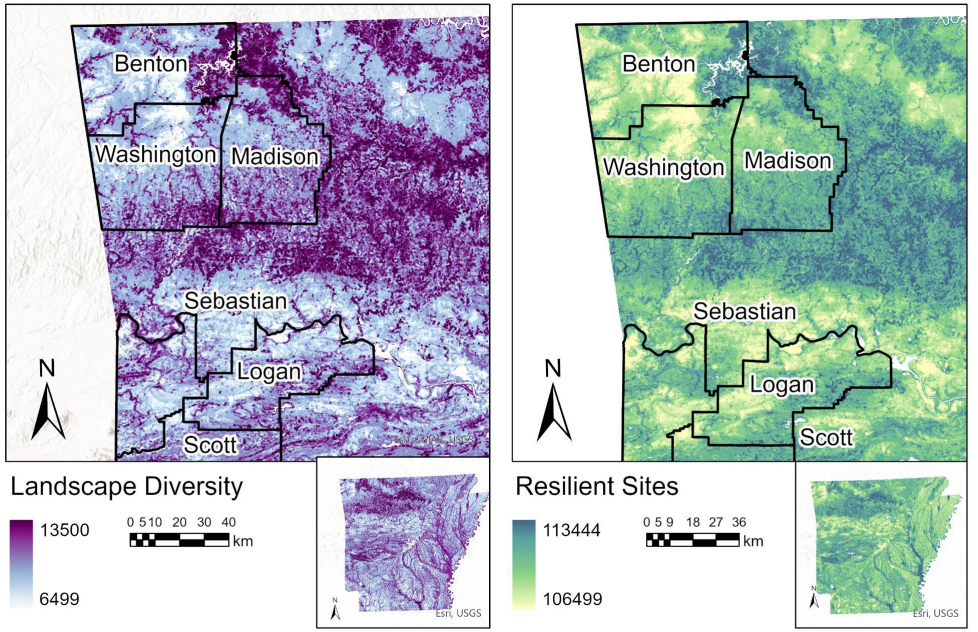
Candidacy Proposal Project Excerpt:

Analyzing patterns of socio-ecological resiliency in Arkansan agri-urban landscapes

Figure 1. Potential study area for a research project investigating the interactive patterns of human well-being, socio-ecological values, biodiversity, and resiliency in urbanizing landscapes. A) Northwest Arkansas (NW AR) and Fort Smith are two urban areas in Arkansas that differ in their surrounding land use and land cover. NW AR has a patchier configuration of low density cultivation and dense yet fragmented urban areas, whereas Fort Smith has larger patches of cultivated and non-agricultural lands. B) Terrestrial resilience in the regions do not correlate with land cover or land use maps; terrestrial resilience scores will highlight an additional dimension to socio-ecological resilience. C) Food access in peri-agricultural and urbanizing zones in Northwest Arkansas varies by county, but is not explained by landscape complexity or socioeconomic data alone. Considering food access and security is an additional tenet to socio-ecological resilience.

Project #4

Proposal Link

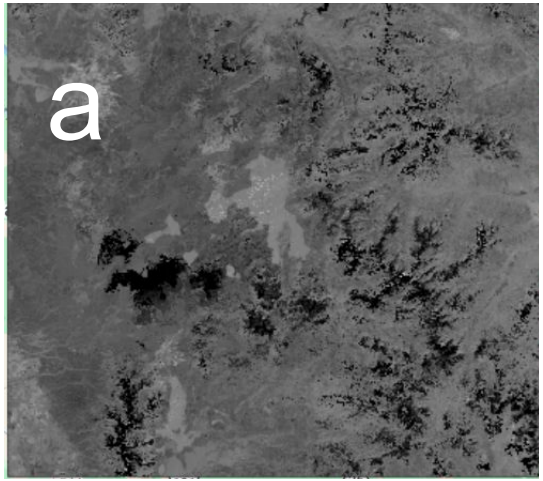


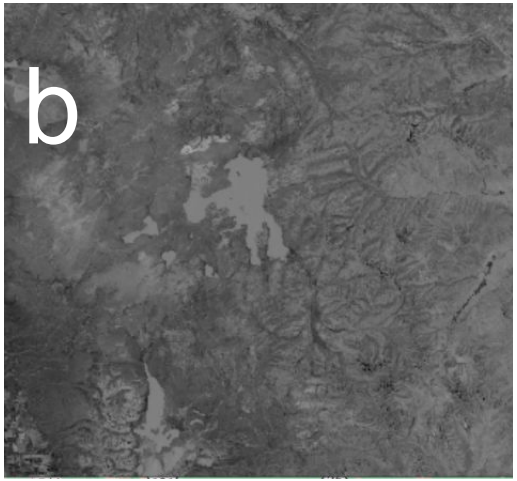
Base Layer Source: The Nature Conservancy Resilience Land Mapping Tool, https://maps.tnc.org/resilientland/. Unitless. Data sources available at TNC.org. Fayetteville Boundary: Arkansas GIS Office

Supplemental Figure 1. Potential counties to sample in Arkansas to assess the connection between ecological and socio-ecological resilience. Landscape diversity is the main explanatory variable predicting ecological resiliency, but in terms of socio-ecological resiliency, more complex landscapes may expose communities to more environmental hazards, explaining the need for our study.

Project #5

Write up





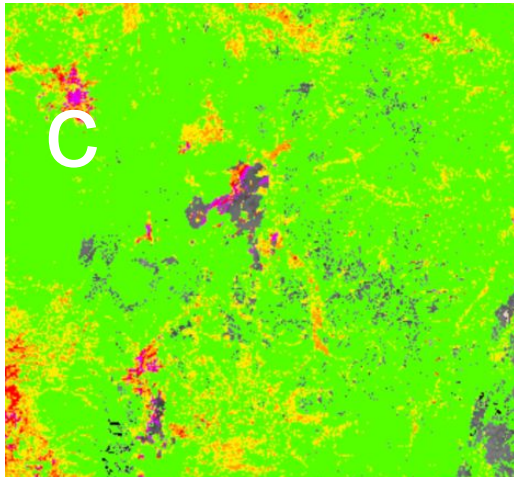


FIgure 1. To map and quantify areas that were burned badly after a fire, in Google Earth Engine, I used Sentinel-2 data to calculate the normalized NBR (dNBR) by subtracting the (A) post-fire NBR image from the (B) pre-fire NBR image. (C) Fire burn severity map of Yellowstone's 2016 fire. with red pixels indicated more severe burns per USGS fire burn severity palette (Wyoming, USA).

Project #6

Map Link

Multimedia interactive story map featuring all of the birding excursions I went on with two expert ornithologists whom I befriended during their post-docs in Arkansas.