

# Utilizing Geographic Information Systems to Enable Information Sharing Across NEON Domains



Sharon Williams, University of Montana Western

## Background

- The National Ecological Observatory Network (NEON) is a continental-scale ecological observation facility sponsored by the National Science Foundation to gather and synthesize data on the impacts of climate change, land use change and invasive species on natural resources and biodiversity. The mission of NEON is to enable understanding and forecasting by providing infrastructure and consistent methodologies to support research and education in these areas.
- A necessary component for supporting that infrastructure is enabling information dissemination and collaboration between NEON staff across all (twenty) NEON-identified continent-wide eco-climatic domains. The purpose of this project was to utilize geographical information systems (GIS) to allow NEON staff and field technicians to share logistical sampling information.

## Scale and Symbology

Sampling site types and locations are symbolized when viewing at large scale. These symbols vanish when viewing at a smaller scale to avoid crowding and disorder.

## Interactive Features

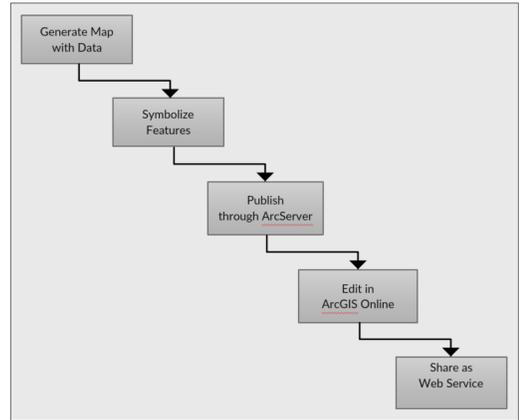
When a viewer clicks on any symbol within a map, a popup is displayed which includes information about the feature, as well as relative links and photos.

## Site-Specific Information

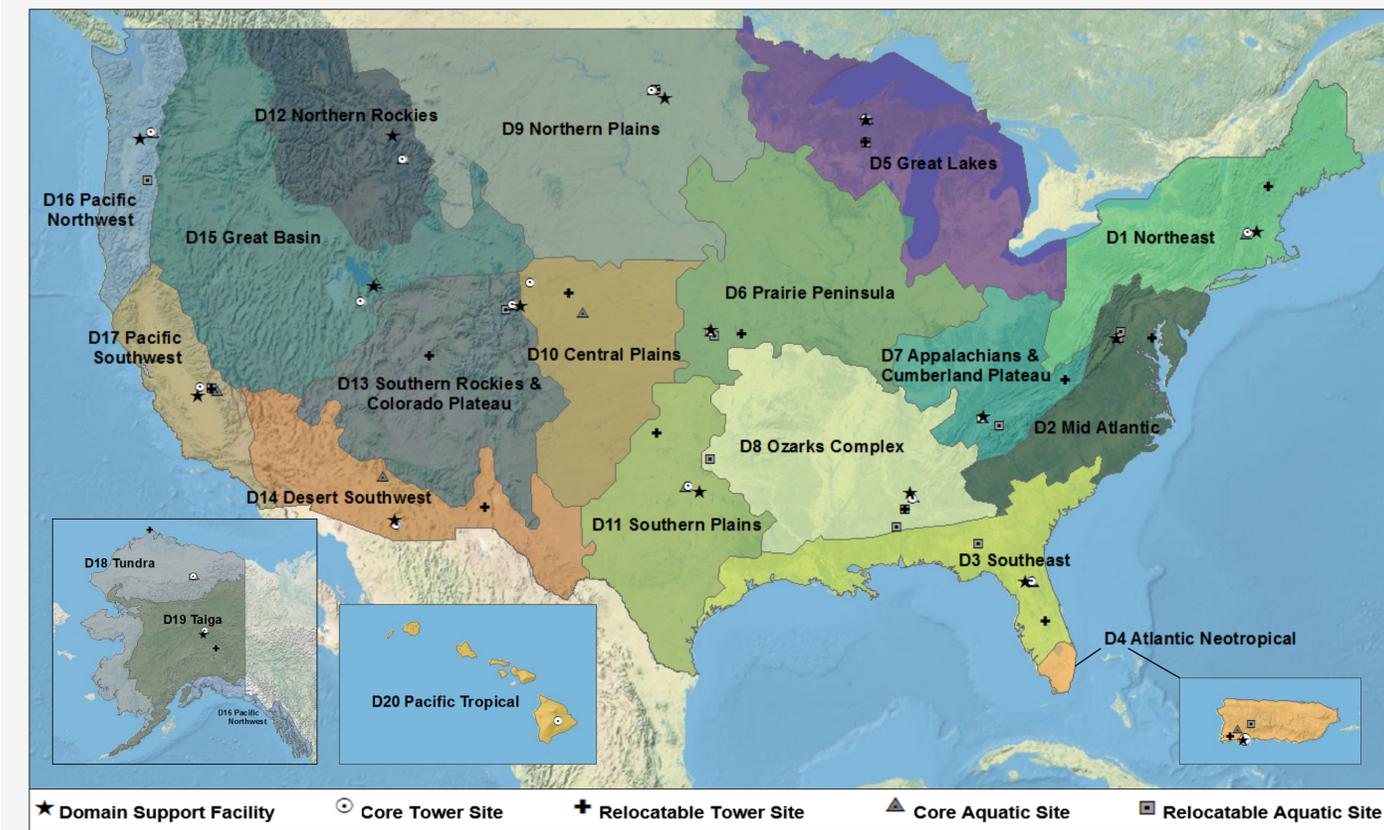
When necessary, features such as roads, gates, and road blocks were drawn onto maps by site managers (left) and either digitized directly onto the web map or downloaded as a shapefile and added to the web map (right). This editing capability within ArcMap allowed for specialized site-specific information to be included in each domain map.

## Methods

- Creation of domain maps consisted of first isolating a domain and populating the map with relative site and sampling location information. This data was obtained from NEON files, site managers, and/or publically-available NEON web material.
- Features within each map were then generated by determining the most appropriate symbology to accurately represent the data.
- Once the initial design was completed in ArcDesktop, each map was then published through NEON's ArcServer and edited in ArcGIS Online. Popups were generated that included site-specific information, links, and pictures.
- Once completed, the maps were shared as an accessible web map service for real-time visualization through a NEON Enterprise GIS.



## Interactive NEON Domain Maps



## Final Product: Standardized, interactive web maps, catalogued by location

- Creating domain maps using GIS produced standardized visual representations of NEON data collection.
- Through the use of dynamic web maps, NEON staff and field technicians are able to locate sampling sites across all domains.
- Interactive labels, popups, and symbology illustrate information regarding sample type, land cover type, property owner, and other relevant information for each location.
- These maps, shared through a NEON Enterprise GIS, allow for simultaneous and instantaneous updating capability and prevent potential operating inefficiencies such as copied data and outdated information.
- Standardization of maps and information also allow for user-friendly access. This platform could eventually enable the public and researchers to access, analyze, and visualize data about NEON sites.