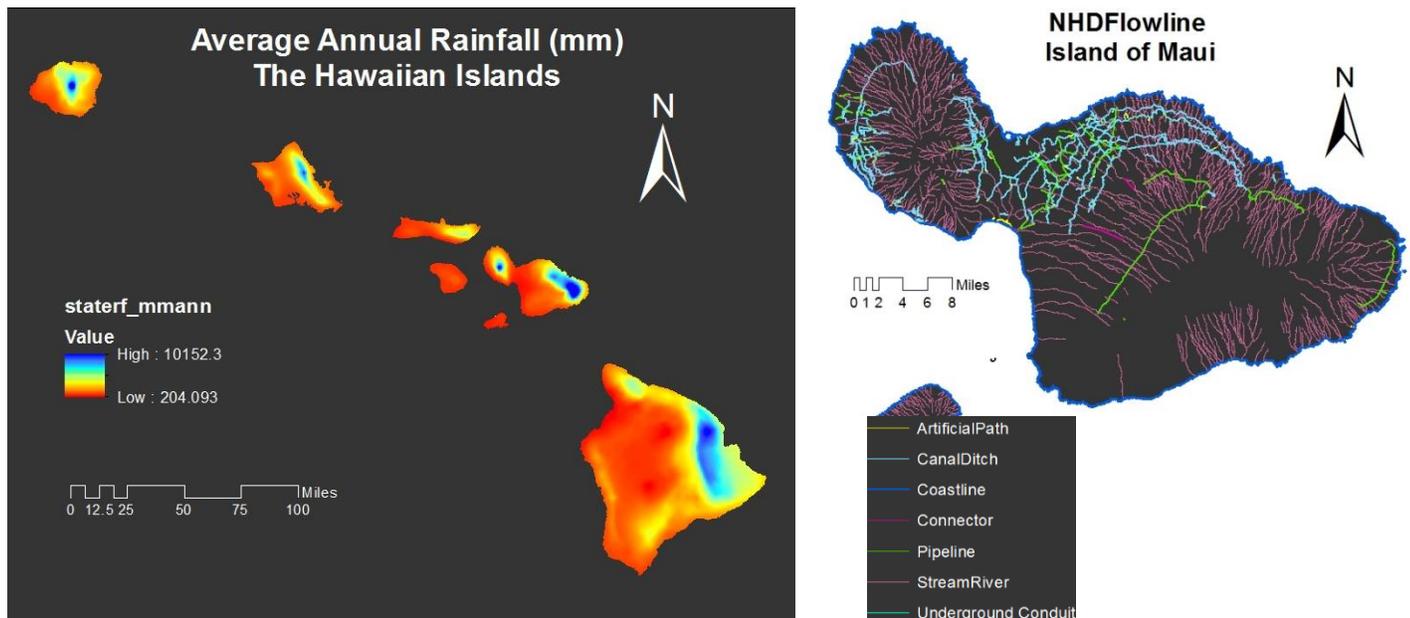# Freshwater and Energy Resources on the Hawaiian Islands

Project Update: After an initial round of data collection from Hawaii's Office of Planning online GIS program and the University of Hawai'i at Manoa's Rainfall Atlas of Hawaii, I have successfully added basic Hawaiian geospatial information including county and statewide boundaries, census blocks, roads, sewers and cables as layers into ArcMap. I have also added water information including shapefiles of streams, watersheds, aquifers, and water quality (chemistry) gages in addition to Hawaii's National Hydrography Dataset into ArcMap. I have started interpreting the information in each layer and have created a few maps with general water and resource information. There is a wealth of readily available information on hydrography, geography and infrastructure, but I will need to do more in-depth searches for energy resource information and time-series data.

However, I'm at a crossroads with my project and am considering narrowing the scope. I can do this by limiting my geospatial scope to just one or two islands, or one or two counties. There is a strong case for comparing Hawaii and Oahu because their county and island boundaries uniquely match (see Challenges below). I could also narrow the scope of my project by limiting, simplifying or completely eradicating the energy part of the analysis. I could change my topic to just Freshwater Resource Management, or I could change the energy analysis from looking at potential energy resources to existing energy infrastructure and power generation, changing the project to Hawaii and Oahu's Existing Energy and Freshwater Resources. In my data collection considerations below I have included both freshwater and energy data for the time being.

Data Collection (*desired data*)
a) **General Hawaii Geography**: County, island and statewide boundaries, elevation contours, *digital elevation grid*
b) **Hydrography:** Streams networks, Watersheds, Aquifers, NHD for Hawaii, *soils*
c) **Time-Series Water Data**
   - Freshwater Availability: Rainfall, *stream flow, soil moisture, water quality*
   - Freshwater Consumption: *Groundwater pumping, surface water withdrawals*
d) ~~**Domestic Energy Resources:** PV, CSP, wind, geothermal, hydrokinetic~~
e) **Existing Energy Infrastructure:** *Electrical grid network, power plants*
f) **Time-Series Energy Data:** *Power production, electricity consumption*

Challenges:

Zipped files cannot be displayed in ArcMap
This was a minor hiccup stepping from collecting data to adding data to ArcMap wherein I realized I had to unzip each downloaded file and extract all information from each file to a centralized folder in order for ArcMap to recognize the data and display the available information under the connected folder in ArcCatalog.

County v. Island boundaries
My original thought for the project was to find island-specific energy and water resource data to enable comparisons between island for available freshwater and potential energy resources. However, most available data is not island-specific but county-specific. This complicates things because the state of Hawaii consists of eight islands but only five counties. In the case of both Maui and Kauai Counties, county information can span more than one island. On the other hand, two counties (Maui and Kalawao Counties) share space on the island of Molokai. I am now considering comparing only Hawai'i and Oahu since the county and island boundaries are the same.
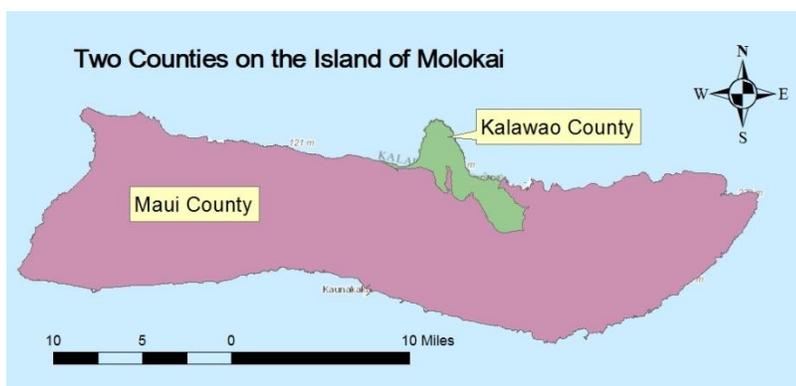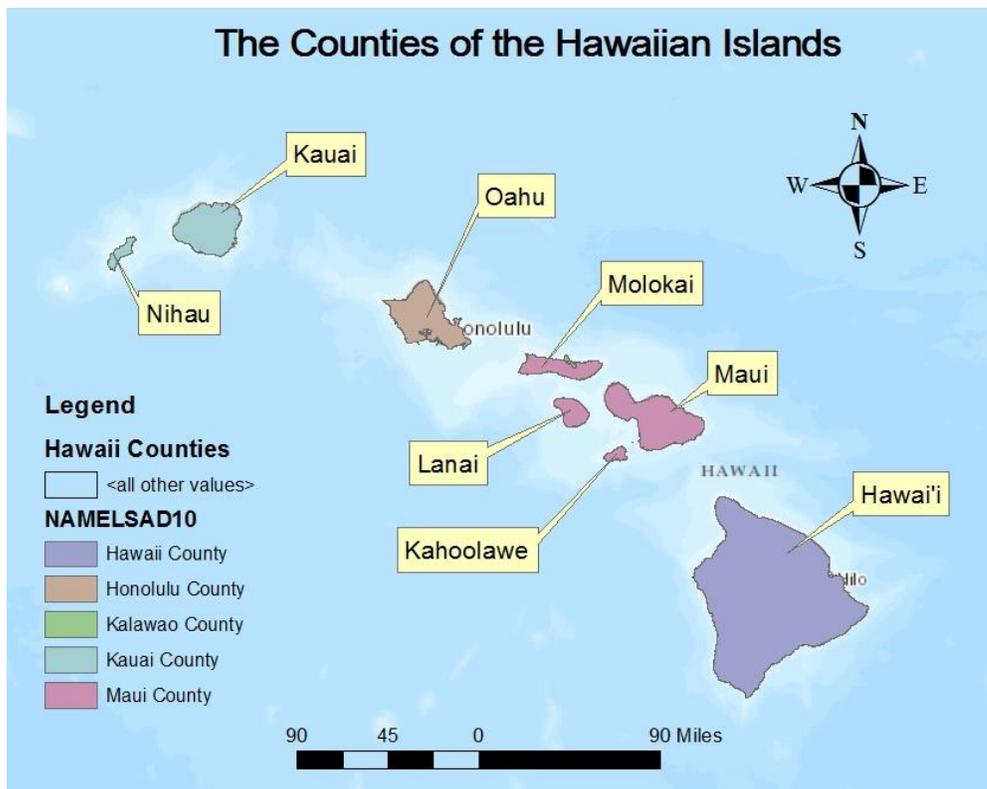
Island	County
Nihau	Kauai
Kauai	Kauai
Oahu	Honolulu
Molokai	Maui, Kalawao
Lanai	Maui
Maui	Maui
Kahoolawe	Maui
Hawaii	Hawaii