GUIDE TO USING ECOTRENDS

EcoTrends (http://www.ecotrends.info/) currently has >20,000 datasets (original data was provided by 50 research programs across the US) to browse, explore, download, and visualize. These datasets fall into 4 main themes: biogeochemistry, climate and physical variability, human population and economy, biotic structure (there is also a fifth theme, disturbance, but it is not very functional right now - most of the driver information is linked to the climate theme and most of the response data is linked to the biotic structure theme, and we do not currently have a way to link the datasets appropriately). All of the data has been aggregated into annual and/or monthly time steps for simpler comparison and visualization. Metadata about the derived data that is provided on EcoTrends, as well as metadata documents describing the original datasets, are made available so that the website users can better understand the research program and decide which datasets are comperable to one another.

Below are some ideas about which datasets might be best to utilize under the 4 NEON Grand Challenges themes:

Biogeochemistry (Facilitator: Maifan Silitonga)

Biogeochemistry datasets basically fall into three categories:

1. Concentration of ions or nutrients in precipitation (in milligrams per liter) [**keyword**: **deposition**; note that this will change to 'precipitation concentration' after the next reload of the website]
2. Deposition of ions or nutrients from deposition (in kilograms per hectare) [**keyword**: **deposition**]
3. Surface water (surfaces of streams, lakes or oceans) concentration of ions or nutrients (in milligrams per liter) [**keyword**: **surface water**]

We have a large amount of data in each of the above catagories for **calcium**, **chloride**, **nitrogen** (from **nitrate** and from **ammonium**) and **sulfer** from **sulfate**. Other less common measures are of dissolved organic carbon (DOC), alkalinity, phophorus, etc. and I would not suggest using these for the workshop.

Climate Change (Facilitator: Safwat Shakir)

The climate and physical variability portion of EcoTrends is very comprehensive. For the purposes of this workshop, you may be interested in using only data that are most available and widely used: **precipitation**, **air temperature**, **palmer drought severity index (PDSI)**, **ice duration** (usually the number of days that lakes are covered by ice), and **sea level** (for a comparison between coastal sites). There is one phenology (**bud burst**) dataset from Bonanza Creek LTER (Alaska) that might be interesting to look at.

Biodiversity (Facilitator: Mary McKenna)

The biotic data are often the most complex and most difficult to interpret. Where the source datasets contained data for many species, we created summary datasets (e.g., net primary productivity by all species at a site), and individual species datasets (e.g., net primary productivity by a single species). For this workshop, it would likely be best to only use the summary datasets, unless you know of a specific species that is found at several sites and is of broad interest (for example, an invasive plant or animal).

The most comprehensive datasets are **plant cover**, **plant density**, **aboveground net primary production**, **plant biomass**, **animal abundance**, **animal species richness**, and **plant species richness.**

One of the most compelling and accessible group of datasets are those related to 3 penguin species and sea ice at Palmer station.

Ecohydrology (Facilitator: Alex Acholonu)

Our store of ecohydrology data is currently limited, but there are a few resources. First, check the **precipitation** and **streamflow** data, which is standardized between sites as a rate of liters per second (which is not necessarily the best for sites that have episodic flow, rather than continuous - I am looking into providing both total volume of water per month or year in addition to rate). You may be interested in the **surface water** biogeochemistry datasets (see above). Soil moisture has presented a challenge to EcoTrends - much of the data that is available was collected using incomperable methods, or the probes were not calibrated correctly, so we have yet to include any soil moisture data. However, there are **soil temperature** data available.

All of these themes can be related to Human population and Economy data. All of the county-level datasets contained under this theme were obtained from the US Census Bureau. Each LTER site identified counties that are most relevant to their sites in terms of population pressure, development/land use, and water quality. Of most interest to this group will probably be **human population** (i.e., total population for the county), **urban population**, **human population density**, and **percent urban population**. Some groups have also been interested in land use patterns, such as **number of farms** and **total farmland acres**.

How to discover and use datasets on the EcoTrends website

First, login with the username and password assigned to you (you can change your password after you log in for the first time). There are several ways to search for these datasets. The most precise way to search for these datasets on the EcoTrends website is to use the **Search Datasets** function. Use either the EcoTrends Sites OR the Spatial Criteria to select the sites or region of interest. In the Sites list, you can select several sites using the shift or control button while clicking on the site names. In the Spatial Criteria section, you can click on the magnifying glass, then click on the map to create a rectangular bounding box, or you can type in bounding

coordinates. If you leave both of these blank, your results will contain data from all sites where the data are available.

Next, select a single or multiple variables of interest (again, you can use the control or shift buttons while clicking to select more than one variable) Note that if you want a summarized biotic dataset (e.g. plant cover), select the variable that doesn't include a species or genus name (e.g., NOT plant cover of Acacia angustissima (prairie acacia)). For biogeochemistry data, note that the variable names start with the element (e.g., calcium) and end with the catagory (e.g., wet deposition).

I would suggest that you skip choosing specific Investigators - your search will narrow too far. Choose your Time Step of interest (monthly, yearly, or both), and skip the Temporal Criteria. Click on the Search button.

For more information on how to use the browse features and the Data Store, click on **Browse Datasets**. (https://www.ecotrends.info/searchDescription.jsp)