Making Good Use of SEINet

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Introduction
SEINet stands for Southwestern Environmental Information Network. It is a series of linked herbarium specimen databases and accompanying web software that helps one use those databases. SEINet was initially created to integrate databases within the Arizona State University, and has grown into a cooperative venture with over 100 institutions. SEINet now hosts millions of specimen records principally from the western states and northern Mexico, but also includes herbaria from all over the nation.

SEINet can be used to create checklists, query location data, identify unknown plants, and even play plant games. We explain below some of the things you can do with SEINet.

Making checklists:
There are two types of checklists one can generate from SEINet: static and dynamic. **Static checklists** are research checklists that have been compiled by scientists working on floristic projects. Typically these lists are for a specific geographic area such as a county or park. Static checklists allow specimens to be linked to the species names within the checklist and thus serve as vouchers. Specimen vouchers are proof that the species actually occurs in the given area. If there is any doubt, one can inspect these specimens for verification or annotate the identification when necessary.

To browse this set of checklists, go to SEINet [http://swbiodiversity.org/seinet/index.php]. Click on "Flora Projects" from the left menu, then select the region of interest, "Arizona Flora," "Colorado," "New Mexico," etc… A list of checklists will display –each one linked to a species list. Checklists have relevant information at the top of the page, and the option to customize the way they are displayed on the right. Field photos and other images as well as species description will display when you click on the species name.

Dynamic checklists are generated from the data housed in the SEINet portal and will display the specimens from any area you choose. For example, suppose you would like to have a checklist of plants from Tortilla Flat, Arizona: click on "Search Collections" and this will take you to a page where the collections are listed by their name and acronym. Choose individual collections or select them all. Click on "Next" and a new window appears entitled "Search Parameters". Type "Tortilla Flat" in the Locality field, "Arizona" in the State field, and "Maricopa" in the County field and click on "search" and the designated collections are queried for these parameters.

The initial display will show the specimen records retrieved from your search, ordered by the herbarium in which they were found. At the top, you can click on the **"Species List"** tab to convert the list of specimens into a list of taxa. There are options in the species list for customizing the way the species are displayed. Under the "Taxonomic Filter" drop down menu, "Raw data" will show names as they appear on the labels; the other options are based on other taxonomic options. You can convert your checklist to an illustrated one by checking "Display as Images" box and then click on "Rebuild Checklist." There is also a **"Maps"** tab for displaying records that are georeferenced. Click on "Maps" – then choose one of two options to generate maps, "Google Map" which does not require any downloads, and

"Google Earth" which requires the software on your computer. Click on any place mark to display the data from that individual record.

Dynamic checklists can also be generated from a **"point radius search."** From the "Search Criteria" page, scroll to the "Point-Radius Search" box. If you know the decimal degree point you are interested in, you can enter directly here. To select a point on a map, click on the little globe icon and a Google Map will open. Navigate to the spot you would like to search and then click. Select, "Submit Coordinates" and it will return to the "Search Criteria" page. You can refine your query by adjusting the radius of the search, or any of the other search parameters, for example, typing "Poaceae" in the Taxonomic Criteria field will limit your search to only the grasses that have been collected in your area of interest. In any of the fields, multiple criteria can be queried by separating the words with a semi colon, for example, "Maricopa County; Yavapai County"

Checklists based on currently held specimens might be useful for a class field trip, land managers, conservation efforts, a family outing or help in identify an unknown from a particular area.

Creating Your Own Checklist

Many people are utilizing SEINet to create their own personal checklists. You must have a profile on SEINet to do this and you must have permissions from an administrator. But that's easy, contact Liz Makings [eliabeth.makings@asu.edu] or any other SEINet administrator, and we will assign you permissions to create your own checklist. From the main page click on "New SEINet Account" and fill in the necessary information. The next time you open the main page, Log In then go to "My Profile" and click on the "Species Checklists" tab. Click on the little green "+" sign which will open up the page to create a checklist. Fill in the information and make sure you check "public" in the access box toward the bottom. Then click the "Create Checklist" box which will take you to a page to upload your taxa. If you have a spreadsheet, you can choose the option that says "Batch upload spreadsheet" in the yellow boxed area. The data must be in CSV format in one column with the scientific name. Make sure they are spelled correctly or they will not upload. You can also upload taxa individually from the yellow box which says "Add New Species to Checklist." If you don't want others to be able to view your checklist, select "Private" from the dropdown. Otherwise, let Liz or any other SEINet administrator know that you have a checklist you would like uploaded.

Query tricks and suggestions:

Sometimes localities have unique names (e.g., Tortilla Flat) but other names are used various times in a state (e.g., Sycamore Creek is found many times). Be sure to use county names, references to locality, or any other criteria that will **narrow the search**. For example, if you want to know the plants that have been collected from Schnebly Hill in Sedona, type in "Yavapai" in the County field, and "Schnebly Hill" in the locality field.

Two or more taxa: If you would like to search for two or more taxa at once and compare their distributions, type in the species names separated by a semicolon. For example, "Pinus edulis; Pinus cembroides." Be sure to click "Include Synonyms from Taxonomic Thesaurus" box so that synonyms will be found. Click on the "Maps" tab and each species will display with a different colored place mark.

Identifying unknowns:

From checklists: The process of plant identification is not always reliable from an image, but it can be a good start. For example, recently someone sent Les Landrum an image of *Petrophyton caespitosum*

from the North Rim of the Grand Canyon. He had never seen the plant before, but was able to guess its family, Rosaceae. After making a checklist of "Rosaceae" for the area, he was able to identify this very distinctive plant in a few minutes.

From the Interactive key: An alternate way to identify unknowns is using the character database in the **"Dynamic Key."** From the main page under "Dynamic Floras," click on "Dynamic Key" and a map of the Southwest will open. Navigate to the area where the plant came from and click to capture the coordinates. Setting the taxon filter will limit the return to species found within that taxonomic group. Click on "submit coordinates" and a species list will be generated from that point radius search. Symbiota has searched the specimen collections in increments of 6 miles until a checklist can be made that represents local species diversity. A list of relevant characters is displayed on the left and selecting characters will narrow the search. Click on individual taxa to browse the images and identify your species. Clicking on the little yellow key in any static or dynamic checklist will also bring up the "Dynamic Key" option.

Games:
Links to interactive games - Plant of the Day, Name Game, Flash Card Quiz, Supermarket Game, and Botanical Matching are found on the home page of SEINet. The Name Game and Flash Card Quiz can also be played for any checklist. After generating the checklist, click on "Games" next to the checklist title and only taxa from those checklists will be included in the game- a fun way for students to study, or quiz yourself on your botanical knowledge of an area.

Background and funding
SEINet was created by a National Science Foundation Grant (BDI 9983132) to Peter McCartney, Nancy Grimm, Charles Redman, Timothy Craig, and Corinna Gries at the Global Institute of Sustainability (GIOS) at Arizona State University in 1999. Subsequent databasing grants have expanded SEINet (e. g., BRC 0237418) and continue to do so (e.g., DBI 0847966) and other databases have joined SEINet without any special funding. An additional programming grant (BDI 0743827) has allowed for the enhancement of software [Symbiota, http://symbiota.org/tiki/tiki-index.php] associated with SEINet.