History of the Wichita State University’s Herbarium

G. James Culhane
Wichita State University, gculhane@cox.net

Recommended citation

This paper is posted in Shocker Open Access Repository
http://soar.wichita.edu/dspace/handle/10057/3408
History of the Wichita State University’s Herbarium

G. James Culhane
Wichita State University
Department of Biological Sciences
Wichita State University
Wichita, KS

Abstract

The WSU Herbarium contains over 4,500 electronically data based specimens (as of spring 2009), including both plants and lichens, and contributes to biological infrastructure of the state by making specimen-level information accessible. Specimens in the collection provide data to address drivers of ecological and biodiversity change as well as changes in climate, land use, and invasive species.

The beginnings of the modern Wichita State herbarium start with the arrival of Dr. Art Youngman to the University in 1965. When he began teaching, the existing herbarium specimens were housed in open cabinets in one of the teaching classrooms. Using class budgets, he acquired herbarium cabinets for the storage of specimens. With the construction of Hubbard Hall in the late 1970’s, Dr. Youngman’s lab and classroom facilities had ample room for a herbarium. This is where the first of the organization of the herbarium began with specimen records on 5 x 8 index cards and a rough list of the specimens in the collection. Some attempts were made during the 1980’s to move this information to a computerized format, but were never completed.

After this time the herbarium was mostly neglected until the summer of 2007. Undergraduate students James Culhane and Michele Spenser undertook an independent study with Dr. Youngman, which included organizing the herbarium and moving all specimens to their new location. It quickly became apparent that there was much to be done. James Culhane, and undergraduate students he oversaw, spent the next 6 semesters entering the specimens into an Excel spreadsheet, mounting and identifying stored specimens, and updating nomenclature.

This work was the foundation for the digitalization project being led by Drs. Mary Liz Jameson and Leland Russell.

Introduction

The WSU Herbarium contains over 4,500 electronically data based specimens (as of spring 2009), including plants and lichens, and contributes to biological infrastructure of the state by making specimen-level information accessible. Specimens provide data to address drivers of ecological and biodiversity change as well as changes in climate, land use, and invasive species.

The specimens date back as far as 1895 and include samples collected from many areas of the country: Massachusetts, Colorado, New Mexico, and Arizona, but most are from within the state of Kansas. The collection is made up almost entirely of specimens
collected by Wichita State University (WSU) students and faculty (= Fairmount College and University of Wichita). One of the largest contributors with 555 specimens in the collection is Dr. Art Youngman, a botanist who worked in the department of Biology from 1965 to 2007 and who also oversaw the collection during most of that time.

Many of the specimens come from research projects conducted by faculty members for their own research or for outside agencies. An example is the 513 voucher specimens that are tied to two different projects for the Environmental Protection Agency (EPA). These voucher specimens include the lichens and mosses. There are also voucher specimens for the WSU field stations: 209 for the two former sites at Cheney Reservoir and 610 for the current field station at the Ninnescah Experimental Tract (NET).

Most specimens collected by students are from the late 1920’s and early 1930’s, shortly after Dr. Hazel Branch became the department chair, and from 1980 to present, after Dr. Youngman began teaching a class in plant taxonomy.

**History of the Wichita State Herbarium**

The modern Wichita State Herbarium began with the arrival of Dr. Art Youngman in 1965, when the existing herbarium specimens were housed in the open cabinets of a classroom. Dr. Youngman acquired herbarium cabinets for the storage of specimens. Further improvement was done in the 1970’s when the construction of Hubbard Hall was completed. Dr. Youngman’s lab and classroom facilities finally had ample room for a herbarium. The organization of the herbarium was specimens along with their records on five-by-eight index cards.

Due to his pending retirement, Dr. Youngman moved to a smaller lab in 2005 and did not have room to house the herbarium, so in June 2007, he decided that the herbarium needed to be reorganized and updated. A storage space on the third floor of Hubbard Hall was chosen as the new herbarium space with just enough room for six of the nine existing herbarium cabinets, a plant dryer, a desk, and a built-in shelving unit for reference material.

Machale Spencer and James Culhane assisted in gathering back-logged plant specimens that needed to be cataloged and moved into the new herbarium. All samples were frozen as part of the quarantine procedure before being relocated. Then, Spencer
and Culhane organized the new herbarium space and devised the means to address nomenclature changes within the last 20 years. A massive number of specimens that needed to be mounted and/or identified were found during the move. Specimens that were unnumbered, unmounted, or unidentified were placed in cabinets for later evaluation. The work of updating, organizing, and cataloging the herbarium continued into fall 2007.

Culhane continued working in the herbarium during the fall 2007 semester at Dr. Youngman’s request. Department secretary Maria Martino acquired a computer for the herbarium to allow for digital conversion of data at a later date. Dr. Youngman established that the first priority of organizing should be to mount and identify all specimens from the Wichita State Field Station at the NET. The largest percentage of the material from NET was part of work done by a Watkins Summer Research Fellow from Wichita South High, Lyle Jones. During the summer of 1993 and 1994, Jones collected over 700 specimens that were still wrapped in newspaper, and 366 were in condition to be mounted and identified. Culhane sorted, mounted, and did the first identification of the samples. Dr. Youngman verified the identifications. About 30 specimens that could not be verified by Dr. Youngman were sent to Dr. Freeman of the University of Kansas for verification. Organizing Jones’ work took the entire fall 2007 semester. Jones’ research examined the grassland plant communities at NET by evaluating the number of plant species that decreased in abundance, increased in abundance, or invaded under grazing pressure. He has since used the Field Station as a site to take his AP Science class at Wichita South High for field work.

During the spring of 2008, Culhane sorted, mounted, and identified specimens collected by Dr. Don Distler at NET from 1986 through 1992. When Dr. Distler’s collections were completed, all of the specimens from the NET were given collection numbers, and the data from the specimens were entered into a spreadsheet, separate from the main collection, as these specimens were to be transferred to the NET Field Research Building at its completion. This data included the collection number, family to which the species belongs, scientific name, common name, locality of collection (by county and state), altitude, collector’s name, identifier’s name, and date of collection. The spreadsheet was the first step in digitizing all of the data from the herbarium. The
collection data from NET was used to update the plant species list for NET, available on the WSU Biology department website. Also the computer monitor was replaced with a second-hand flat screen; again the details were handled by Maria Martino. Dr. Youngman continued to sort through older specimens that he had collected, turning them over to Culhane for mounting and labeling. Culhane worked with Dr. Leland Russell to enlist more assistance during summer 2008 to begin the data entry process for specimens collected in Kansas, as this made up about seventy-five percent of the collection.

Three undergraduates were chosen to assist during summer 2008: Bailey Cooper, Shirley Soderman, and James Crisler, with Culhane overseeing their work. He dealt with any nomenclature issues. The assistants were required to work twelve hours a week for eight weeks (288 total man-hours). By the end of the seventh week, all of the main collection had been entered into the spreadsheet and most nomenclature issues had been resolved. The assistants began to work on specimens collected from outside of Kansas. It was also established that the computer in the Herbarium needed to have internet access to be able to check for nomenclature changes that could not be verified by Flora of the Great Plains (2nd Edition. R.L. McGregor, Coordinator. University Press of Kansas: Lawrence, Kansas, 1990). Once again Maria Martino came to the rescue, placing a request with Computer Services for internet access.

Questions arose about some of the collection during data entry. Some older specimens had been collected by former faculty member Dr. Hazel Branch, whose specimens dated from 1908, but she did not join the faculty of Fairmount College until 1922. She was a student at the University of Kansas at the time she gathered the samples in our collection. This and the time of the collection meant that her specimens came from in and around Lawrence, Kansas.

We also had specimens collected by Dwight Isely in 1911, who was a noted entomologist at the University of Arkansas. Culhane was able to establish that Isely had attended Fairmount College (WSU) where he received is Bachelor of Science Degree. He received is MS and PhD from the University of Kansas. The dates that he attended University of Kansas matched the specimen dates. This information was not included on the original labeling of the specimens. Thus, it was decided that part of the data entry process should include research on the collectors as well.
As a note, the University of Arkansas was interested in acquiring work done by Dr. Isely, until they found out that it was plant specimens. They decided that we would be better suited to look after such valuable material.

After communication with Dr. Craig Freeman, the curator of the University of Kansas Herbarium, it was decided that the Flora of the Great Plains should be used as a guide to nomenclature. Classes using the herbarium will most likely use Flora of the Great Plains as a text, and that this would allow students to grasp how the herbarium was arranged. The herbarium was arranged alphabetically by family, genus, and, where necessary, species.

During fall 2008, Shirley Soderman continued to assist Culhane. Specimens from outside of Kansas were cataloged, and it was decided that specimens collected outside of Kansas would be integrated into the Kansas collection, making just one collection instead of several smaller ones. After all existing specimens had been entered and the collection numbers verified, new specimens could be entered without fear of duplicating collection numbers. The existing collection, which included specimens from inside and outside of Kansas, had previously totaled 2,827 specimens. With new entries, this number grew to over 4,500 specimens, and with additional specimens waiting to be entered. Furthermore, there have been about 200 lichen and moss samples added to the spreadsheets.

All of the old genus covers were replaced with new covers, but the budget did not allow for acid-free covers. Acid-free covers cost about $1.25 each and as we needed to replace over 500 covers; at the time, this was twice our annual budget. Acid-free covers have now been acquired. The new genus covers were marked with printed labels, and are much easier to read than the old handwritten covers. Also labels on cabinet doors were replaced to reflect the location of each family and, where necessary, genus.

On October 30, 2008, Dr. Freeman (University of Kansas) was in Wichita and, at my invitation, viewed the Herbarium and discussed the progress and future direction of our Herbarium. Drs. Youngman, Russell, Mary Liz Jameson, and James Culhane participated in the discussion. Dr. Freeman’s assessment of the Herbarium was very positive, and he offered to assist us in the future. Some of Dr. Freeman’s recommendations have already been put in place, such as the establishment of a disaster
plan and the posting of emergency contact numbers on the door. Other changes are being addressed in the scope of our present resources.

Two undergraduates registered for academic credit for herbarium management in spring 2009: Carin Sampson and Justin Trotter. It was hoped that one of these students will be suitable to take over for Culhane, but that did not occur. Culhane graduated in July 2009, but is currently holding the Herbarium manager position until a replacement can be found. Dr. Youngman continues to sort through older collections, although the amount of specimens that he needs to look at has decreased greatly.

During this transition we have established the following:

1. Specimen Arrangement

The collection is organized alphabetically first by family, then by genus, and lastly by species as described by Flora of the Great Plains McGregor Coord.; specimens not found in this resource are organized as described by www.plants.usda.gov.

2. Quarantine Procedures

Any materials that have been exposed to unmonitored conditions such as presses and other items used in the field must be quarantined before being added to the Herbarium. Specimens must be placed in a freezer, at -80° F, for forty-eight hours before they are brought into the herbarium.

3. Emergency Plan

Procedures for what to do in case of fire or flood and contact numbers for herbarium staff have been posted, as well as a plan to protect the data held in the herbarium computer.

4. Record Keeping

The first step to modernizing the collection data was to put it into an Excel spreadsheet to allow for instant cross-referencing and data sorting. A huge move from the
five-by-eight index cards and hand written species list and a monumental time saver for data retrieval.

5. Loans

Currently only herbarium equipment and books are available for loans. Without staff to monitor specimen loans, we are waiting on establishing a system for loan of specimens.


This manual is meant to be the first step in creating a Standard Operating Procedures (SOP) for the herbarium. The herbarium is in essence a library of plants, collected from sites, for research or as student assignments. Only a small percentage of the specimens were collected for other reasons. This should be kept in mind when creating the SOP for the herbarium.

7. Future Plans

Some of the projects in the works include digitizing photos of the collection, preparing collection records for incorporation into Shocker Open Access Repository (SOAR), repairing damage and improper labeling of the collection, cataloging the last of the remaining unidentified specimens, continuing research on past collectors, and completing SOP for the herbarium.

Currently the digitization of photos of specimen in the collection is underway, and the project is being handled by Drs. Russell and Jameson. This data is to be tied to the collection records that will be available through SOAR, the University’s institutional repository.

A number of the older specimens are in need of some repair. This mainly includes reattaching the specimens to their mounting paper or adding labeling to include new data not included on the original label. Much of these data are currently hand written on the specimen or in the collection records.
There are currently four cubbies of material yet to be sorted for inclusion into the collection. This is being handled by Dr. Youngman and Culhane and should be done in the near future.

Research on past collectors should be continued, as this is often a key to the origins of specimens within the collection when data is not included in the label.

Acknowledgements

I thank Dr. Art Youngman, Dr. Leland Russell and Dr. Mary Liz Jameson for their assistance in the preparation of this report and Dr. Freeman (University of Kansas) and Dr. Ferguson (Kansas State University) for their input to this work.

Contacts

Please feel free to contact me with any questions, or need of assistance. I can be reached at 316-260-3284 or via email at gculhane@cox.net.