

SPNHC 2015

Small Collections Symposium

Why Small Collections: What is Unique, Valuable and Important

Anna Monfils

CMC Herbarium

Central Michigan University

Gil Nelson

iDigBio/FSU Herbarium

Florida State University



“Small Collection”

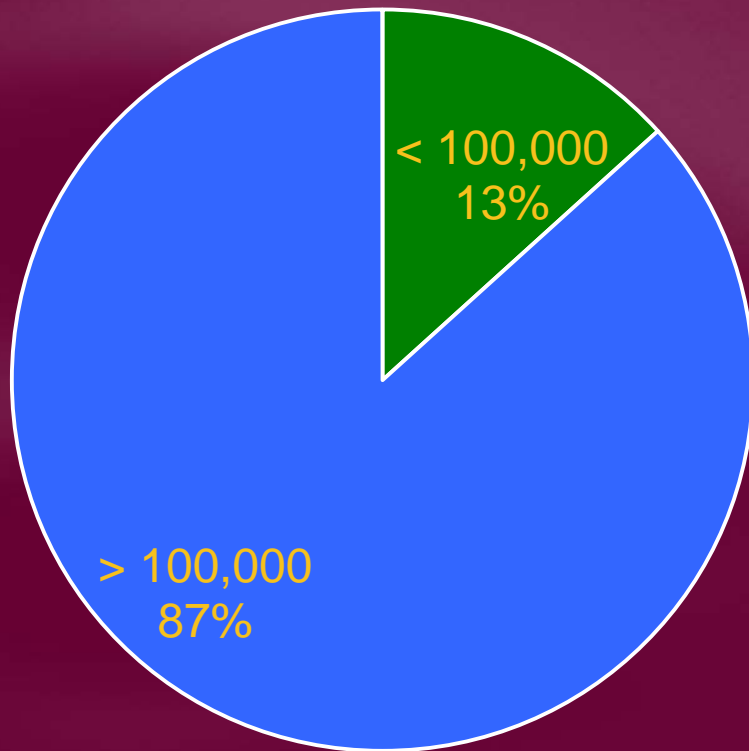
- $\leq 100,000$ specimens (though varies by collection type)
- Regional in scope (typically)
- Ecological, taxonomic and geographic bias
- Often not included in inventory or monographic studies

“If you feel small, you are one of us!”

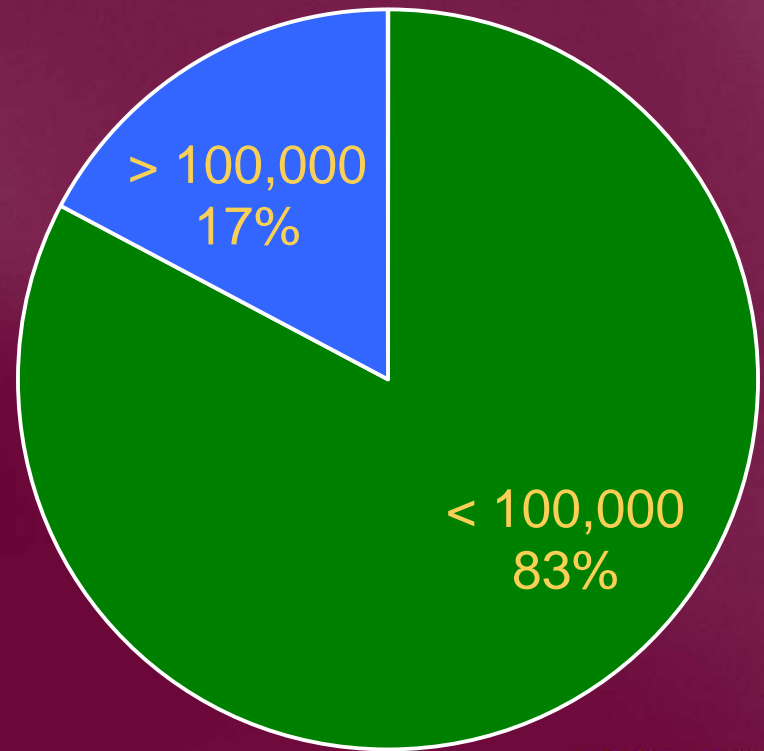
-Gil Nelson

Specimen and Collection Percentages by Herbarium Size Class*

Percent of Specimens



Percent of Collections



* 2014 entries in *Index Herbariorum* (Barbara Thiers)

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 - Not linked to reappointment, tenure or promotion
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- Job security
- We can finish!

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- Curators in large and small institutions may not see the quantitative and qualitative value of smaller collections for research, education and outreach.

Value of Small Collections to Scientific/Collections Community

- Unduplicated specimens
- Intense regional sampling
- Unrepresented temporal sampling
- Focused sampling of community composition
- Best source of data for biological hotspots (Biological Field/Research Stations)
- “Hidden source” of specimens representing curator’s expertise

Have the potential to significantly expand out knowledge of landscape-level Biogeography

The Contribution of Small Collections: A Case Study from Fuireneae (Cyperaceae)

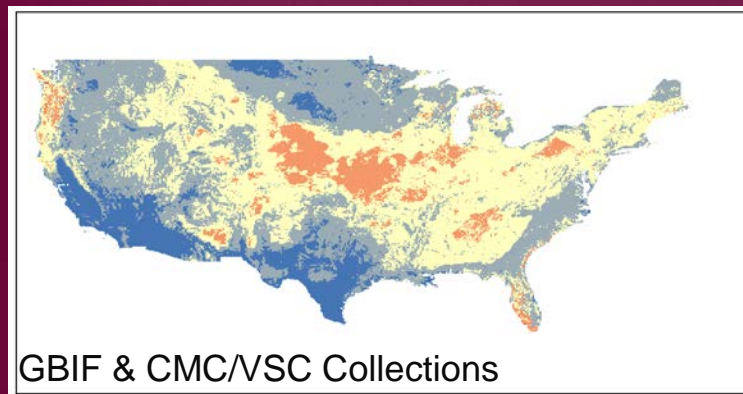
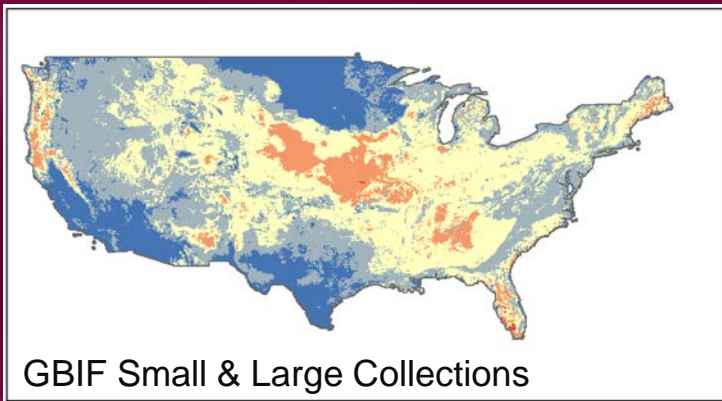
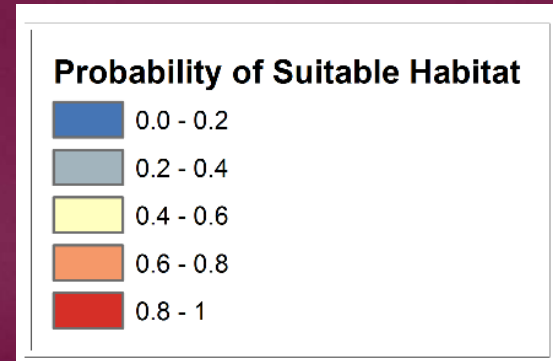
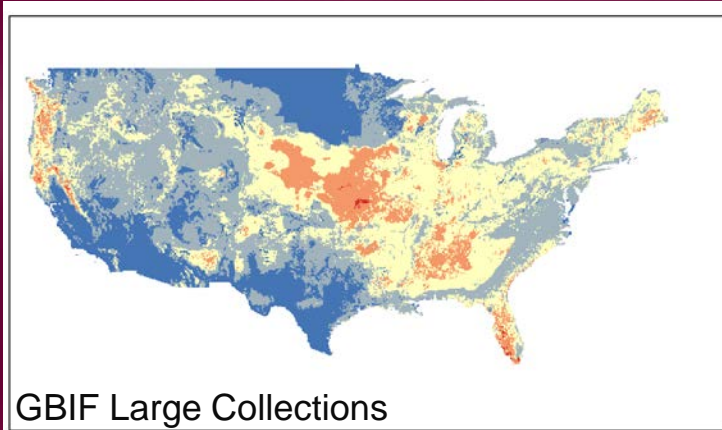


Heather E. Dame ^{1,2*}, Benjamin W. Heumann ^{1,3}, J. Richard Carter ⁴, Jessica M. Bartek ⁴, Anna K. Monfils ^{1,2}

- (1) Central Michigan University, Institute for Great Lakes Research, Mount Pleasant, MI
- (2) Central Michigan University, Department of Biology, Mount Pleasant, MI
- (3) Central Michigan University, Department of Geography, Center for Geographic Information Science, Mount Pleasant, MI
- (1) Department of Biology, Valdosta State University, Valdosta, GA

MaxEnt maps displaying the probability of suitable habitat

Schoenoplectus tabernaemontani



Small collections are strong contributors to models of species distribution and niche models.

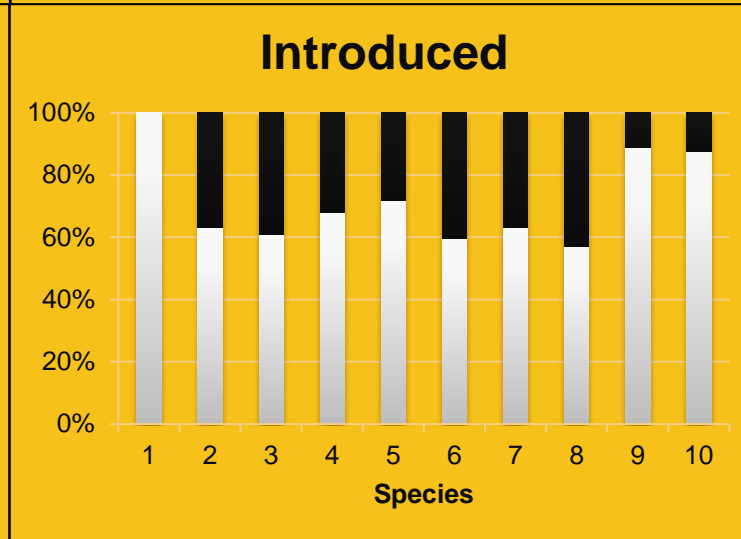
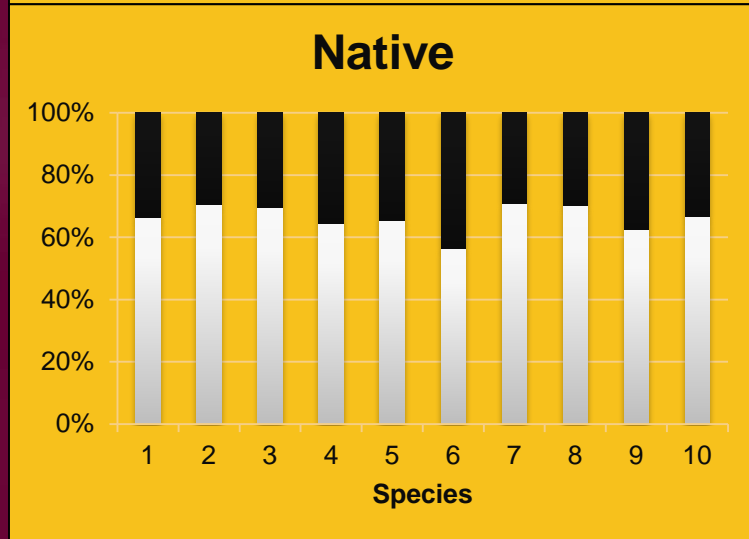
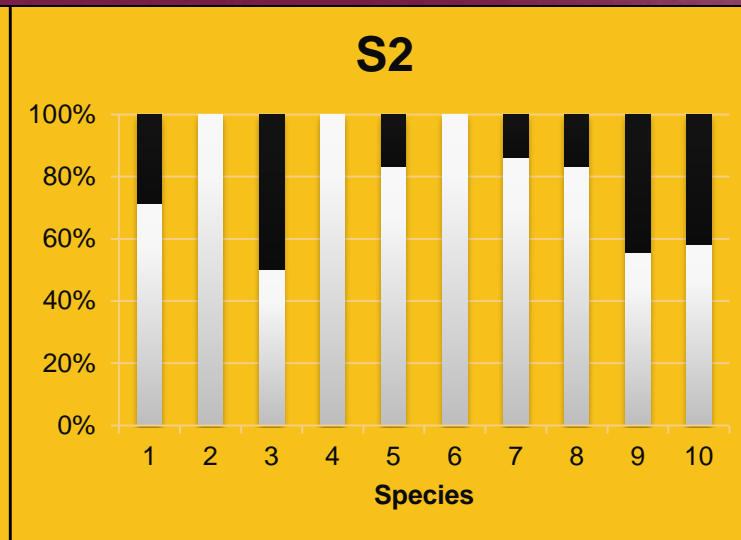
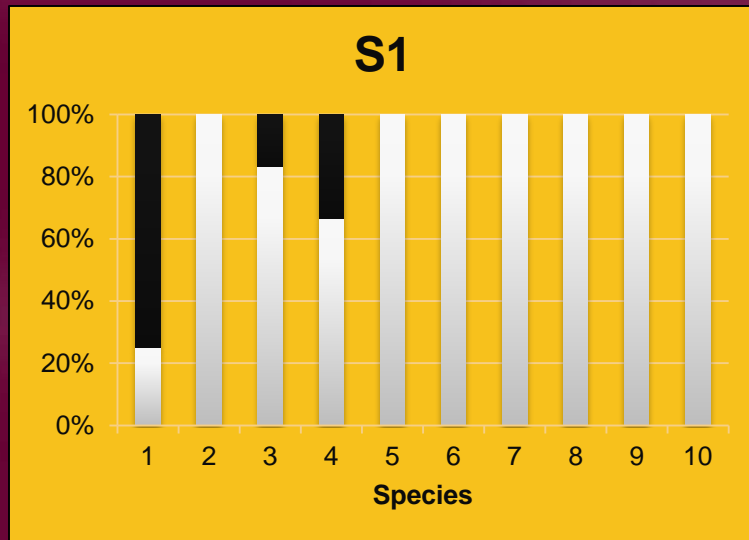
- Models inclusive of small collections data resulted in statistically significant increases in occurrence predictions
- Models inclusive of small collections data resulted in a 23% major change (10-50%) in geographic predictions

The role of small natural history collections in contributing to understanding species' distributions

Travis D. Marsico¹, Jeremy J. Caron², Richard Carter³, Emily Gillespie⁴, Erica Krimmel⁵, Ross McCauley⁶, Ashley B. Morris⁷, Gil Nelson⁸, and Anna K. Monfils²

¹Arkansas State University; ²Central Michigan University; ³Valdosta State University; ⁴Marshall University; ⁵Chicago Academy of Sciences; ⁶Fort Lewis College; ⁷Middle Tennessee State University; ⁸Florida State University

Michigan: Percentage Contribution to Locality Occurrence by Species



Large Collections
 Small Collections

Value of Small Collections in Education

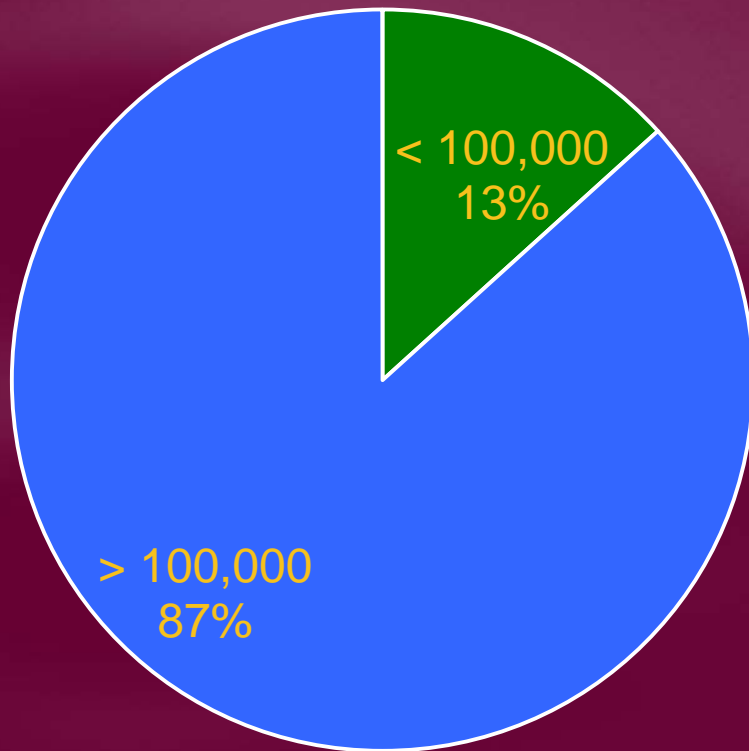
- More undergraduate students educated at institutions with small vs. large collections*



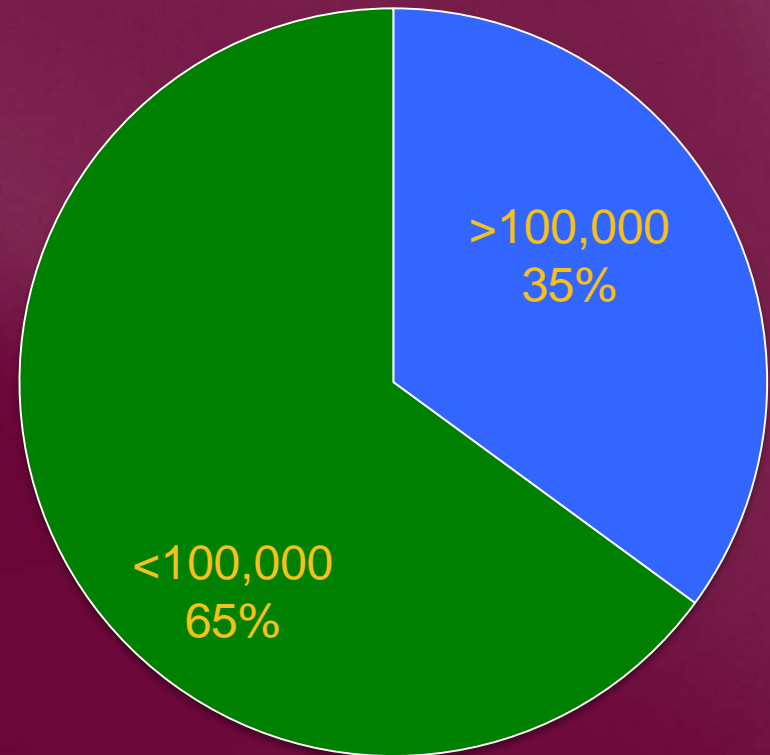
* 2014 entries in *Index Herbariorum* (Barbara Thiers)

Percentages of Students at Institutions by Herbarium Size Class*

Percent of Specimens



Percent of Students



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Value of Small Collections in Education

- More undergraduate students educated at institutions with small vs. large collections*
- Students working in collections are: §
 - Expressing increased understanding of the nature of science
 - Indicating collections based experience is influencing their undergraduate experience, course/major selection, and graduate school plans

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§ 2013 survey, “*Undergraduate Learning Outcomes in Natural History Collections.*”

Curator Survey

- 167 Curator responses
 - 85% university or college affiliated
 - 50% from “small collections” (<100,000)
 - 97% incorporate undergraduates
 - >3000 UGs over 5 year period
 - 87% database
 - 72% conduct research
 - 62% field collect

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Curator Survey

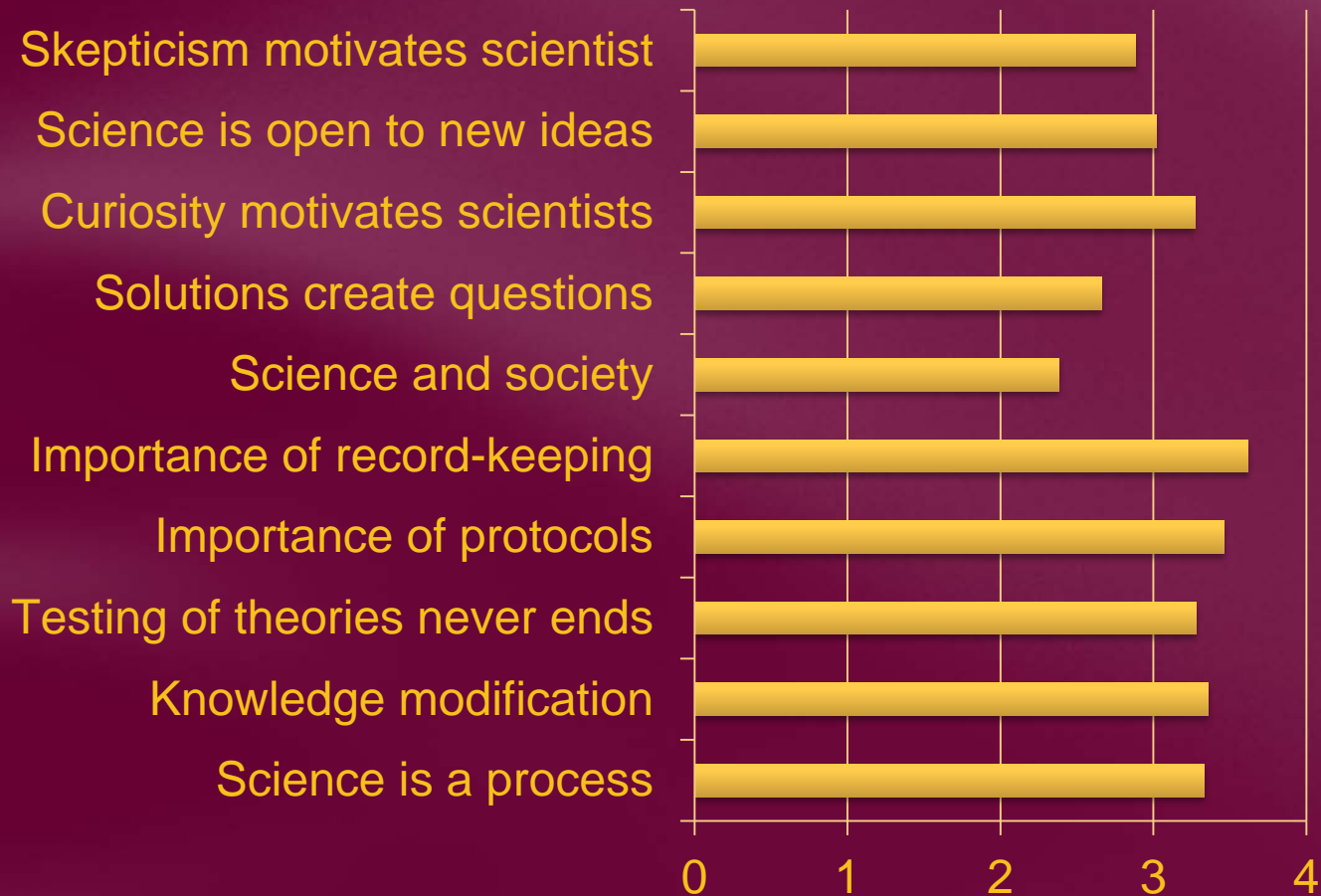
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Student Survey

- 258 Responses (76% “Biology” Majors)
 - 68/165 Indicated this influenced their course selection or choice of major
 - 64/138 indicate collections experience influenced post-graduate plans
 - 47% Intend to pursue graduate work in life, earth or physical science immediately after graduation

Results on Nature of Science



None = 0; Very Little = 1; Some = 2; A Lot = 3; Very Much = 4

Value of Small Collections in Education

- More undergraduate students educated at institutions with small vs. large collections*
- Students working in collections are: §
 - Expressing increased understanding of the nature of science
 - Indicating collections based experience is influencing their undergraduate experience, course/major selection, and graduate school plans
- Collections are a valuable resource that can be used by educators to authentically engage students in inquiry-based learning⌘#

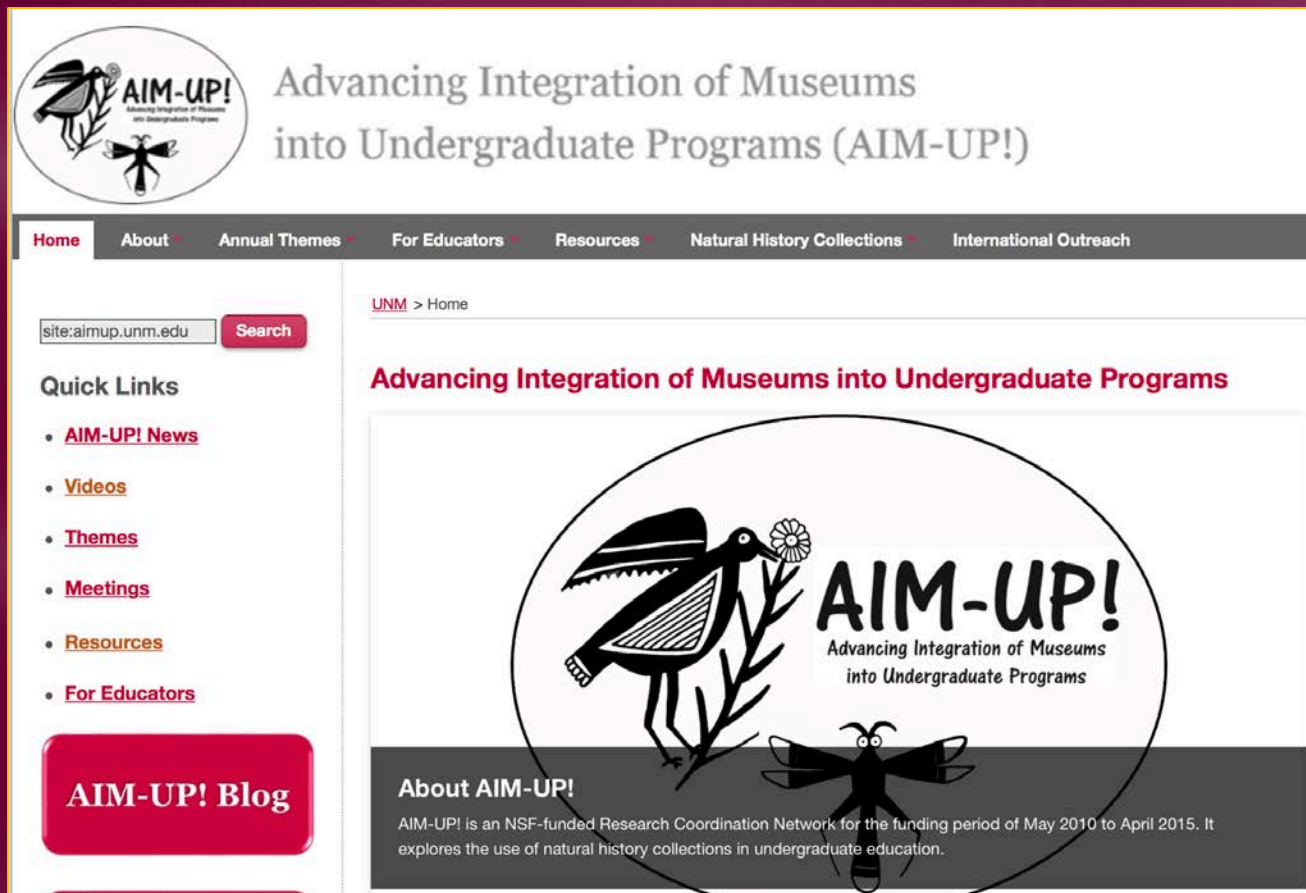
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⌘ Brewer & Smith, 2011, *Vision and Change: A Call to Action*

Advancing Integration of Museums into Undergraduate Programs – AIM-UP

AIM-UP (aimup.unm.edu)



The screenshot shows the homepage of the AIM-UP website. At the top left is the AIM-UP logo, which features a stylized bird and a fly. To the right of the logo is the text "Advancing Integration of Museums into Undergraduate Programs (AIM-UP!)". Below this is a navigation bar with links for Home, About, Annual Themes, For Educators, Resources, Natural History Collections, and International Outreach. On the left side, there is a search bar with the text "site:aimup.unm.edu" and a "Search" button. Below the search bar is a "Quick Links" section with a list of links: AIM-UP! News, Videos, Themes, Meetings, Resources, and For Educators. At the bottom of this section is a red button labeled "AIM-UP! Blog". The main content area on the right has a breadcrumb trail "UNM > Home" and a red heading "Advancing Integration of Museums into Undergraduate Programs". Below this heading is a large circular graphic containing the AIM-UP logo and the text "AIM-UP! Advancing Integration of Museums into Undergraduate Programs". At the bottom of this graphic is a dark grey box with the heading "About AIM-UP!" and a paragraph of text: "AIM-UP! is an NSF-funded Research Coordination Network for the funding period of May 2010 to April 2015. It explores the use of natural history collections in undergraduate education."

Value of Small Collections to the Institution

- Enhanced outreach capabilities and volunteer involvement

Outreach

OSAC

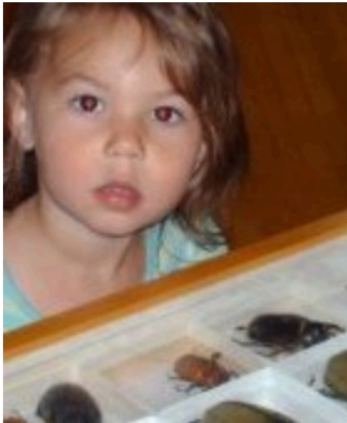
OREGON STATE ARTHROPOD COLLECTION



[Home](#) » [News from the Collection](#)

McMinville Public Library Outreach

Submitted by Curator on Wed, 2008-06-25 11:22.



What do you get when you mix 75 energetic kids and an assortment of cool arthropods -- you get: McMinville Public Library's summer reading program, which focussed on insects this year. OSAC travelled up to participate in the event and brought with it a number of showy specimens to give kids some real life props to illustrate the many books they might find on the shelves of the library. [Find out more](#)

[Curator's blog](#) [Login](#) to post comments

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- Increased institutional visibility

Institutional Visibility

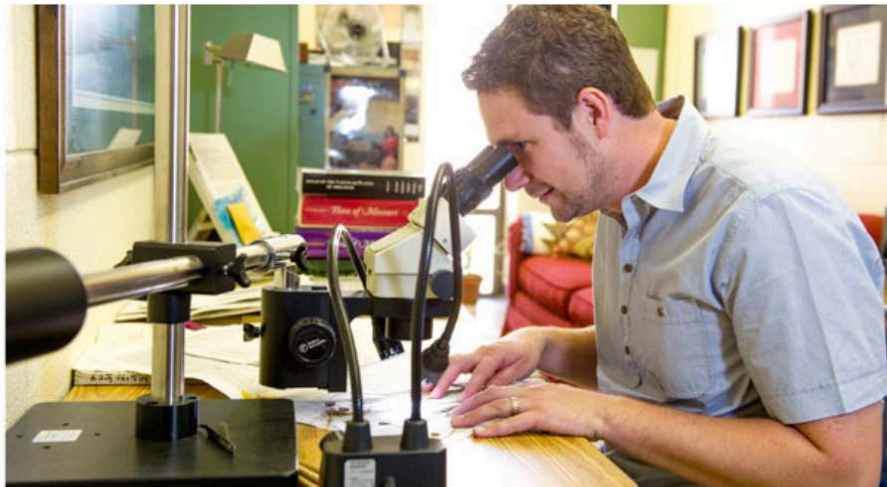
Arkansas State University News Highlights New TCN

Source:

<http://www.astate.edu/news/arkansas-plant-collections-to-be-digitized-with-support-from-national-science-foundation>

Release Date: Tuesday, October 7, 2014

Contact: news@astate.edu



Dr. Travis D. Marsico, by Andrew Ferguson/A-State Marketing and Communications.

Value of Small Collections to the Institution

- Enhanced outreach capabilities and volunteer involvement
- Increased institutional visibility
- Enables archiving and data management within home institution (increase fundability in organismal disciplines)

NSF Data Management Plan

- Plans for data management and sharing of the products of research. Proposals must include a supplementary document of no more than two pages labeled "Data Management Plan". This supplement should describe how the proposal will conform to NSF policy on the dissemination and sharing of research results (see [AAG Chapter VI.D.4](#)), and may include:
 1. the types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project;
 2. the standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies);
 3. policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;
 4. policies and provisions for re-use, re-distribution, and the production of derivatives; and
 5. plans for archiving data, samples, and other research products, and for preservation of access to them.

Value of Small Collections to the Institution

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- Enables archiving and data management within home institution (increase fundability in organismal disciplines)
- Enhanced relationship with state and federal agencies (NatureServe, DNR, DEQ)

Partnerships with State and Federal Agencies



Robert W. Freckmann Herbarium

University of Wisconsin - Stevens Point

[Vascular Plants](#)

[Plants of Wisconsin](#)

[Home](#)

[New Search](#)



Wisconsin's Potentially New Invasive Plants

The Wisconsin Department of Natural Resources and the Wisconsin State Herbarium have announced a new initiative.

Wisconsin Invasive Plants Reporting and Prevention Project

Prevent the spread of plants known to be newly invasive in Wisconsin or in nearby states.

Identify these population and **control or destroy** them before they can spread.

We hope the information presented here will assist in this effort.

Invasive Plants of the Future



Invasive Plants Targeted

[Upland](#)

[Aquatic / Wetland](#)

[You Can Help](#)

[Collecting & Reporting Guidelines](#) (new window)

[Invasive Plant Report Form](#) (pdf -Adobe® Reader®) (new window)

From the Small Collection Perspective: Why is it important for small collections to digitize?

- Expand accessibility
- Expose data – increase accuracy
- Enhance impact of data in holdings
- Ensure inclusion in larger research initiatives
- Increase connectivity between researchers
- Increase fundability



“Great things are done by a
series of small things brought
together”

Vincent Van Gogh

<http://scnet.acis.ufl.edu>



Small Collections Network

Serving, Supporting, Connecting Small Natural History Collections

Quick Links

[Blogs and News](#)

[Listserv](#)

[Webinar Series](#)

[NANSH Webinars and Meetings](#)

[Webinar Recordings](#)

Introduction to SCNet's Webinar Series

SCNet and iDigBio are pleased to announce a series of webinars centered on supporting small collections and establishing SCNet as a collaborative resource for small collections and the professionals who manage them. Each webinar in this series will be held 3:00-4:00 p.m. EST on the dates shown below. Meetings are virtual and accessible online at <https://idigbio.adobeconnect.com/scnet>. No special software outside of an internet browser is required to access the virtual meeting room.

[Read more](#)

Follow SCNet on Twitter

Tweets

[Follow](#)



Save Plants
@NTBG

29 Apr

#Hawaiian bog #plants:
Racomitrium lanuginosum
moss (foreground), Drosera
anglica (middle), Melicopes
(back, left)

To join SCNet listserv go to <http://scnet.acis.ufl.edu/tags/listserv>

Goals of SCNet

- Empower small collections by:
 - Reaching out and incorporating them into the collections community,
 - Making digitization doable for small collections,
 - Mobilizing and incorporating the “dark data” held in small collections into major data repositories (GBIF, iDigBio, BISON, etc.) and available to science,
 - Encouraging large collections to assist with ensuring the sustainability of small collections,
 - Providing formal and informal networks that provide forums for and training in small collections issues,
 - Resurrecting or otherwise saving orphaned collections from being lost to science.

SPNHC 2015
Small Collections Symposium

*The Contribution of Small
Natural History Collections in
the 21st Century*

- I. Small collections - the key to educating future generations of scientists
- II. Digitization practices and challenges in small collections and museums
- III. Reaching out to small collections