

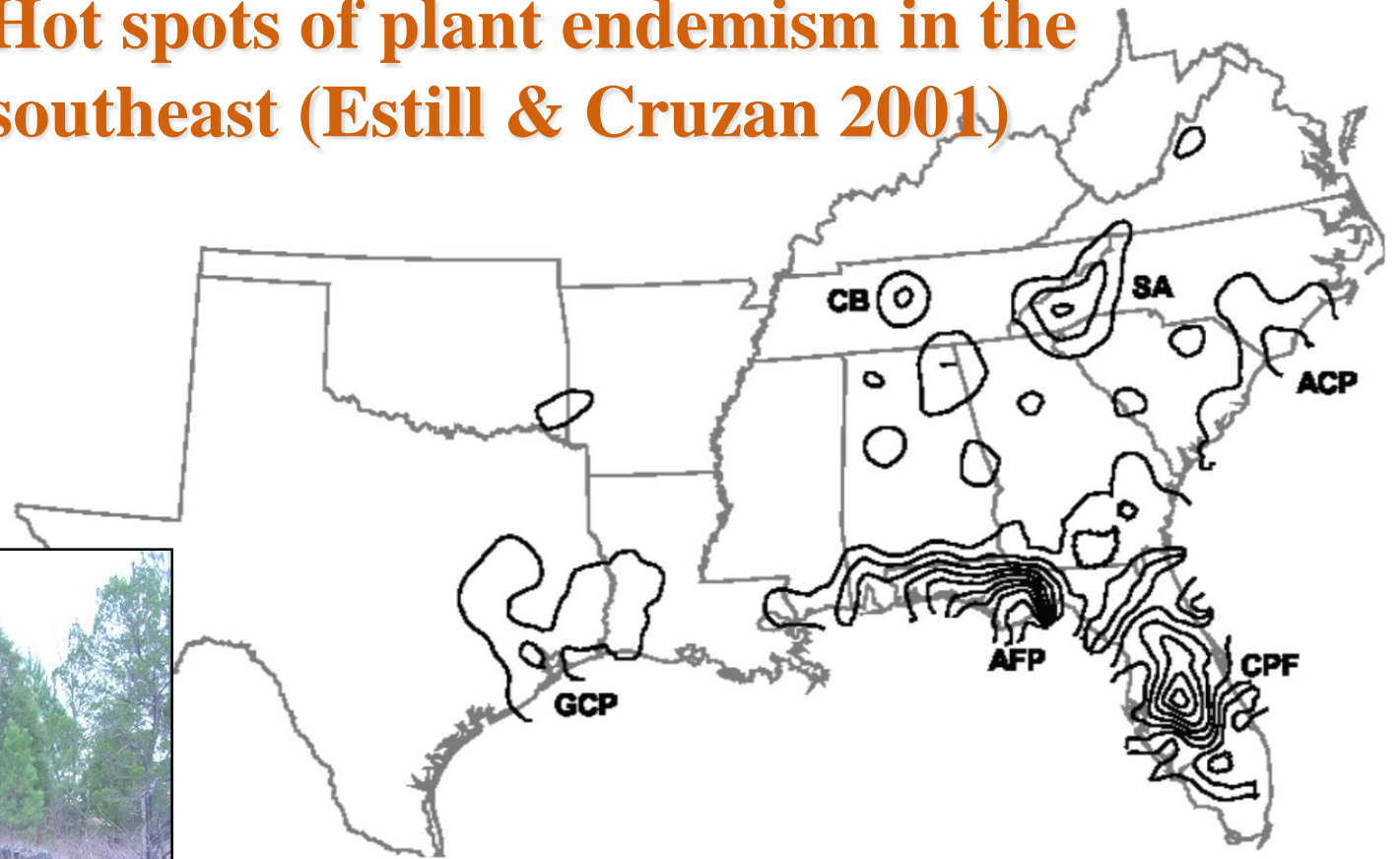
The Key to the Cabinets: Building and Sustaining a Research Database for a Global Biodiversity Hotspot

A new NSF-Advancing Digitization in Biological Collections (ADBC) collaborative project in the southeast

Zack Murrell, Appalachian State University. Dept. of Biology, 27 Oct. 2014



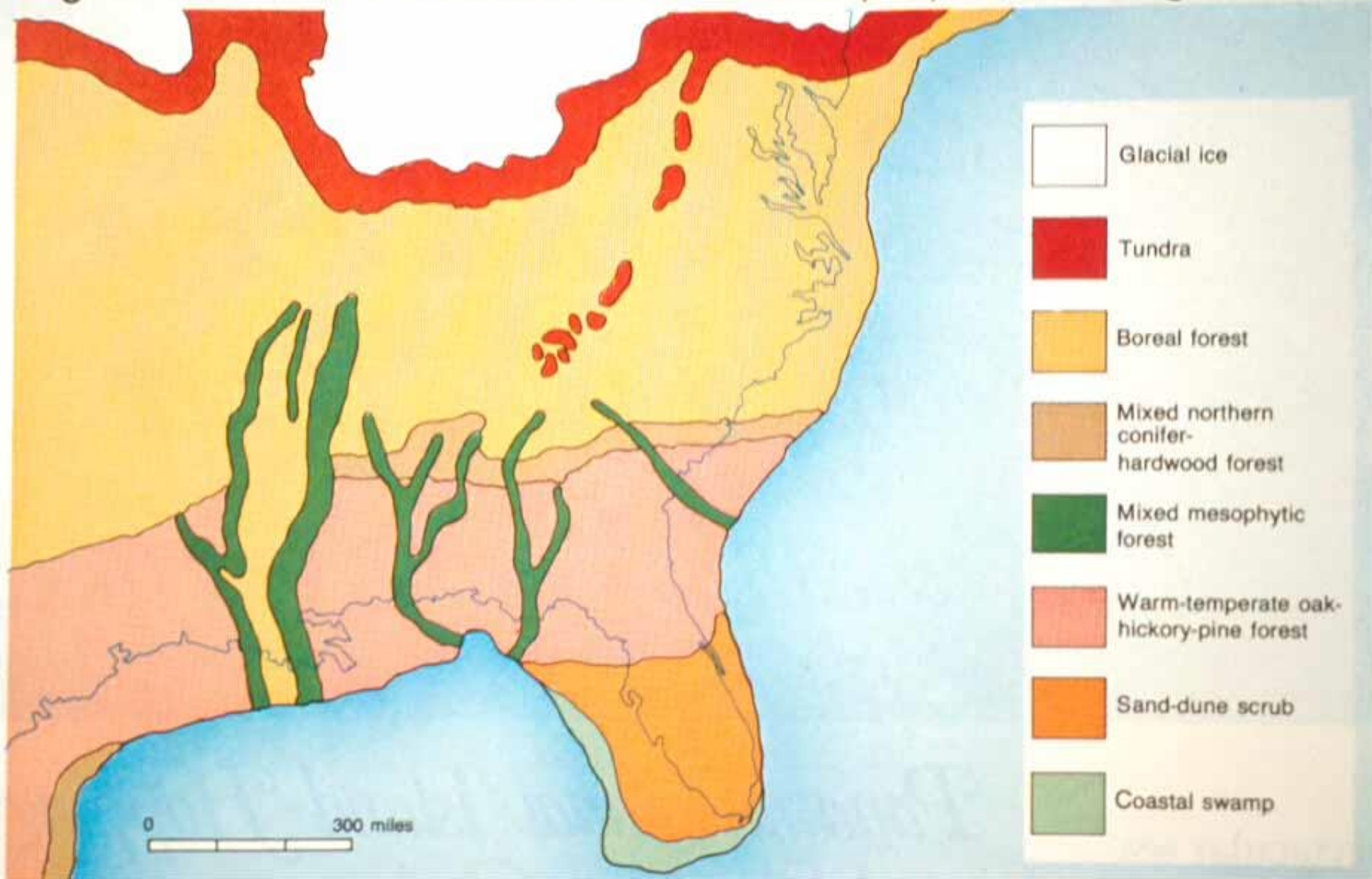
Hot spots of plant endemism in the southeast (Estill & Cruzan 2001)



New Communities discovered recently (Allison and Stevens 2001)

Compare past biogeography with present distributions to extrapolate about the future

Vegetation Patterns in Eastern North America, 18,000 Years Ago



2020 Vision: Implementing a community approach to getting herbarium collections databased and online.

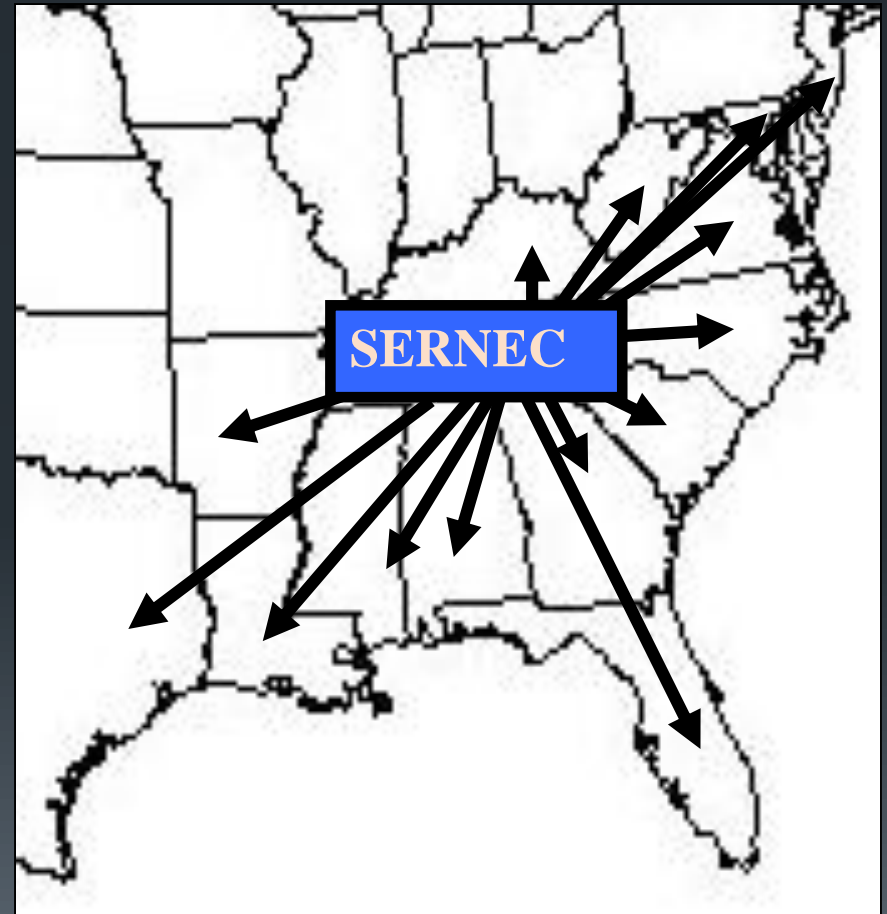
- In 2004, an NSF-supported workshop to gather 25 curators from the U.S. at Michigan State to discuss the future of herbarium collections
- A decision was made to write a proposal for an NSF RCN.



SERNEC

Southeast Regional Network of Expertise and Collections

- 2005 NSF Research Coordination Network (RCN) awarded to build the 'human infrastructure' to begin the '2020 Vision effort'
- 5-year project
- 150 herbaria participated
- Used existing infrastructure of the Association of Southeastern Biologists

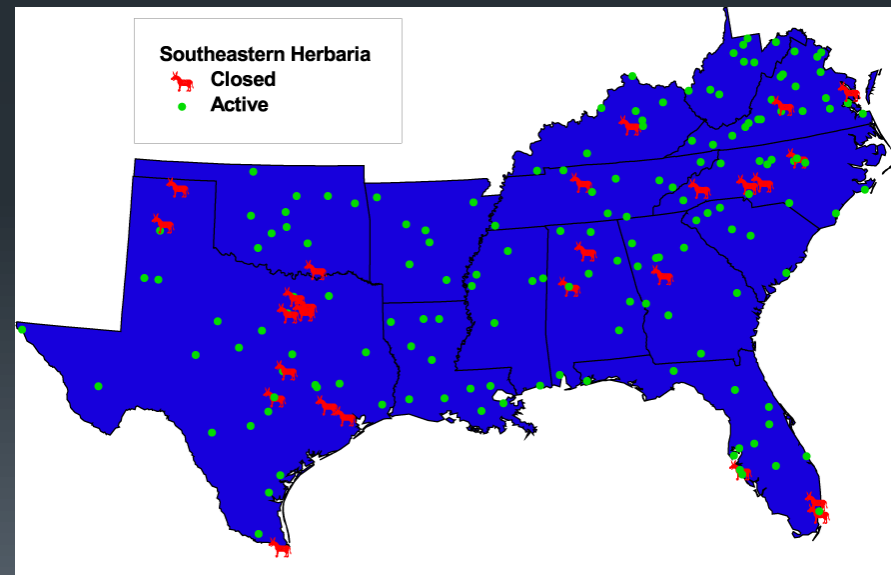


SERNEC Business plan

- Use state or sub-region level groups to seek funding for digitization.
- Expedite information exchange among state consortia for ideas on education and outreach.
- Develop distributed network of IT support that could be shared by the total network.

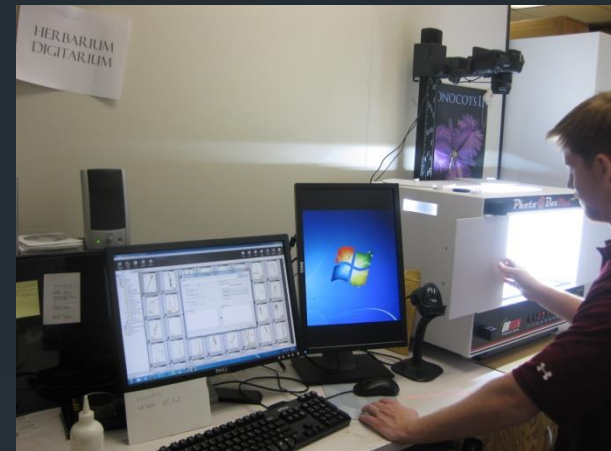
State of Herbaria in the Southeast USA

- Collections vary in size from 3,000 to 750,000 specimens.
- Curators are taxonomists, ecologists, paleobotanists, population biologists.
- Some institutions with significant budgets, IT support and curatorial staff.
- Some institutions are single person operations without budgets or IT support.
- ESTIMATED 15 MILLION SPECIMENS FROM THE SOUTHEAST.



Data derived from Index Herbariorum
(<http://www.nybg.org/bsci/ih/ih.html>) .

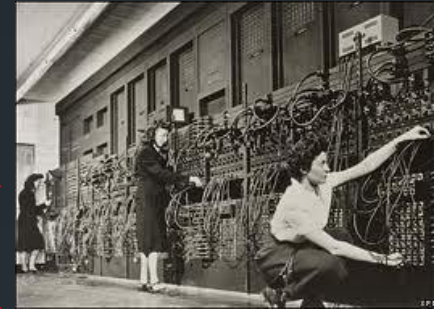
Data Management Workflow



Specimen Image Capture
"Herbarium Digitarum"



4,700,000 SPECIMENS
100+ INSTITUTIONS
12 STATES



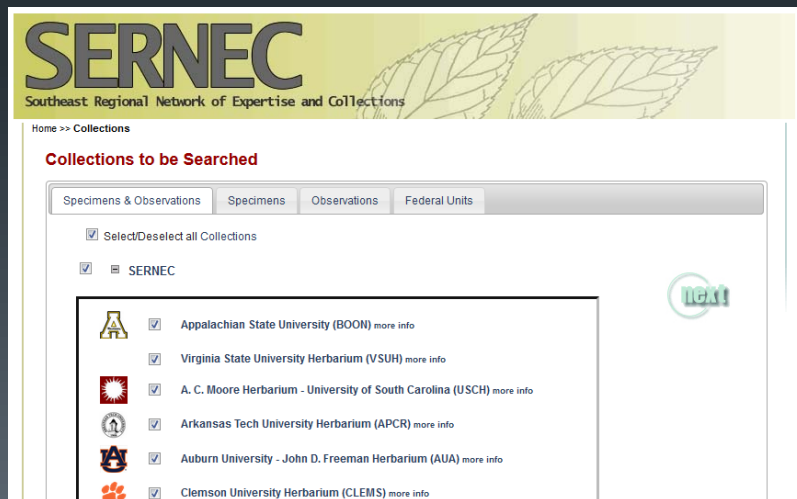
Archival Storage

Web Derivatives



Citizen Scientists

Metadata to Portal



Repatriation of Metadata to Local Institution
Symbiota and Specify

GEOLocate
Batch Georeferenced Data to Portal



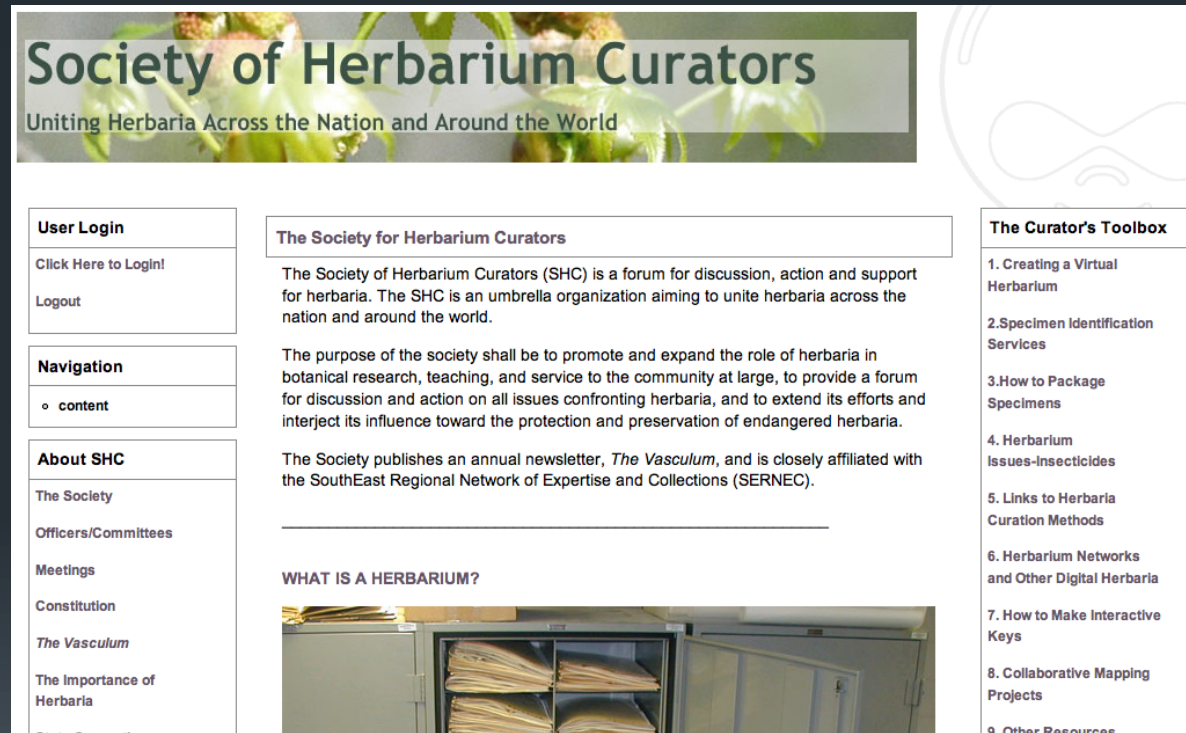
Using the Society of Herbarium Curators for governance structure

State consortia

Regional Chapter

Decision-making
Consensus building
Conflict resolution

Utilize existing organization's
constitution structure



The screenshot shows the homepage of the Society of Herbarium Curators. At the top, there is a banner with the text "Society of Herbarium Curators" and "Uniting Herbaria Across the Nation and Around the World" over a background image of green leaves. Below the banner, the page is divided into several sections:

- User Login:** Includes links for "Click Here to Login!" and "Logout".
- Navigation:** Includes a link for "content".
- About SHC:** Lists various topics such as "The Society", "Officers/Committees", "Meetings", "Constitution", "The Vasculum", "The Importance of Herbaria", and "State Consortia".
- The Society for Herbarium Curators:** Contains a paragraph describing the society as a forum for discussion, action, and support for herbaria, and another paragraph stating its purpose to promote and expand the role of herbaria in botanical research, teaching, and service to the community.
- The Curator's Toolbox:** Lists nine items: "1. Creating a Virtual Herbarium", "2. Specimen Identification Services", "3. How to Package Specimens", "4. Herbarium Issues-Insecticides", "5. Links to Herbaria Curation Methods", "6. Herbarium Networks and Other Digital Herbaria", "7. How to Make Interactive Keys", "8. Collaborative Mapping Projects", and "9. Other Resources".
- WHAT IS A HERBARIUM?:** Includes a photograph of a herbarium cabinet filled with specimen sheets.

<http://www.societyofherbariumcurators.org/>

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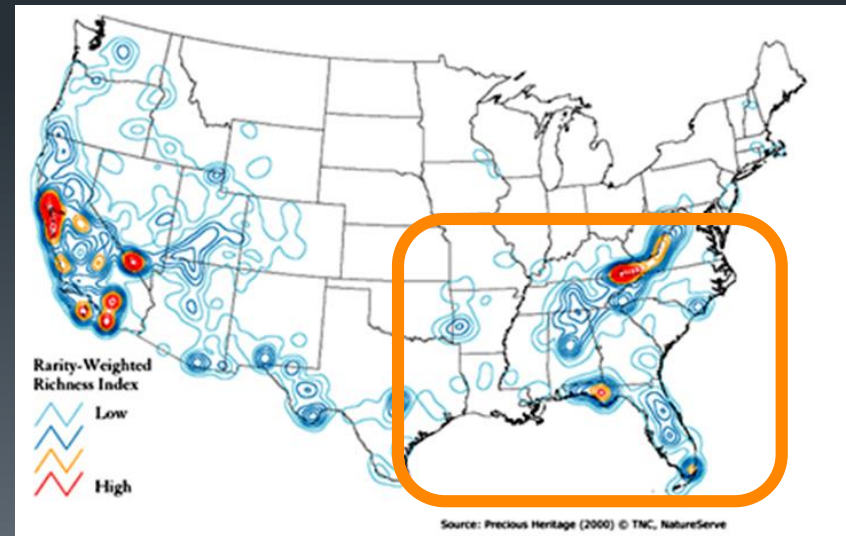
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What are the project goals?

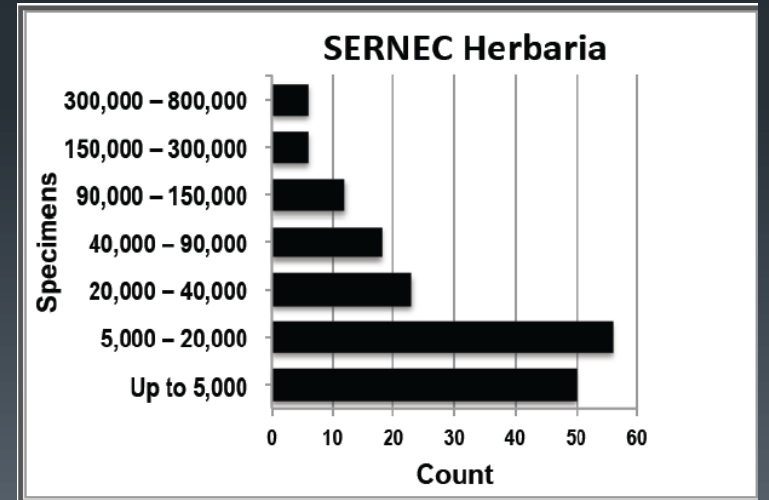
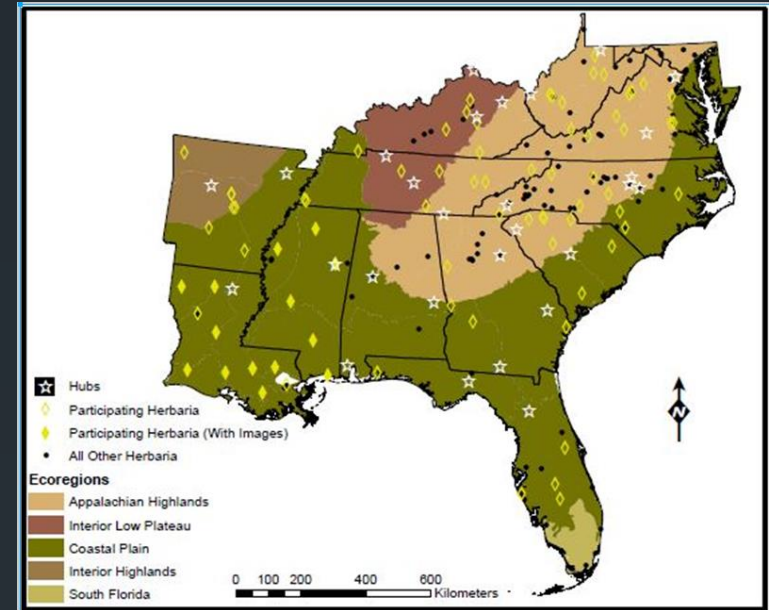
Use our robust human infrastructure

- 1) improve protocols at every stage of specimen digitization.
- 2) interface with citizen scientists to develop a strong collaborative community that will sustain high transcription and georeferencing rates through a multi-year effort.



Who is involved?

- 105 herbaria
- IT (Symbiota, GEOLocate, SPECIFY, iPLANT-TACC)
- Citizen scientists
 - Notes From Nature
 - Adler Museum
- Education
- iDigBio
- ...



How will the project work?

- Two main issues:
 1. Data
 2. People

Cat Herding

The challenges and rewards of managing online
scientific communities

Ariki Millikan - Corie Lok - Ijad Madisch



Photography Workflow

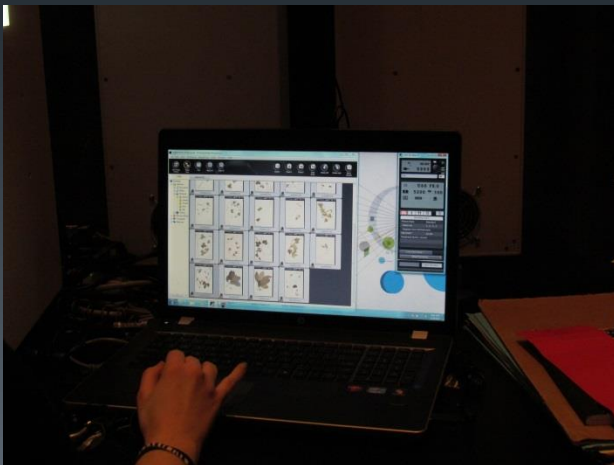
1. Apply a barcode



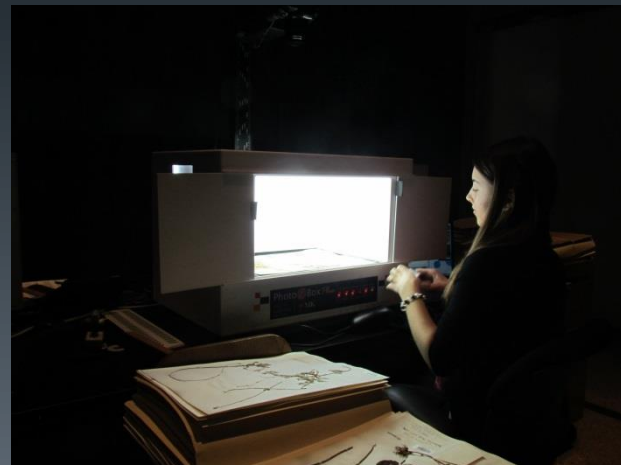
2. Scan the barcode



4. Save archival and web images



3. Photograph the specimen





Ethics of Citizen Science

- Collaborators - not users
- Contribute to real research
- Don't waste people's time

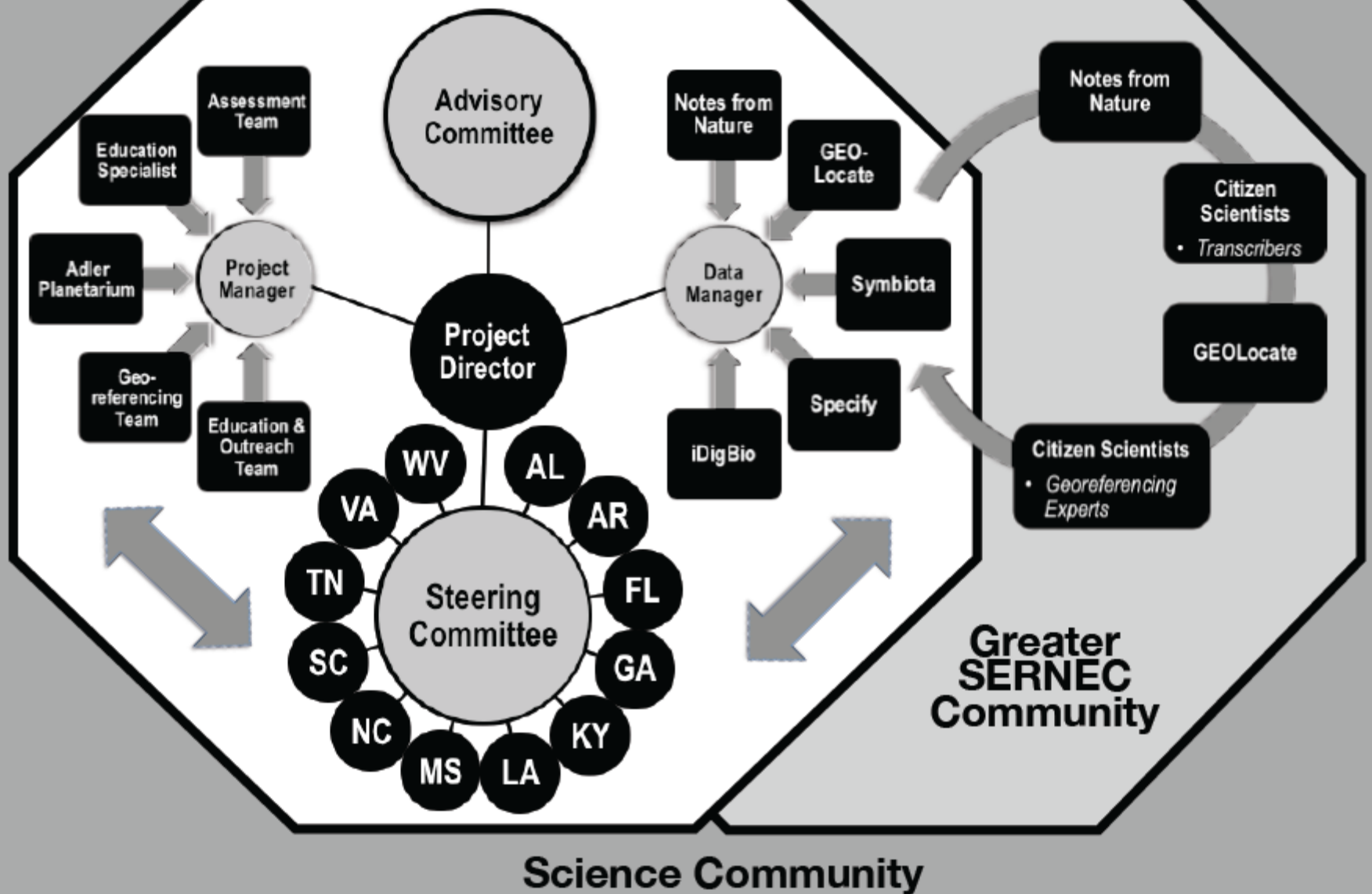
Arfon Smith (2013) Zooniverse/Adler Museum

Lessons learned

(Arfon Smith, Zooniverse/Adler)

- Authenticity matters (it is not a game)
- Community matters (community must look after self)
- Context matters
- Researchers matter – they must be engaged in with the citizen scientists

SERNEC ADBC-TCN



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