

Survival at a Small Regional University

Advancing Herbaria in the Age of Digitization

Symposium sponsored by Association of Southeastern Biologists, Southern Appalachian Botanical Society, and Southeastern Chapter of Society of Herbarium Curators

78th Annual Meeting of the Association of Southeastern Biologists

Montgomery, Alabama

30 March 2017

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History

- Valdosta State began as teacher's college, accepting its first class in 1913
- In 1993 designated regional university, becoming Valdosta State University
- VSU is predominately undergraduate
- Before 2001 herbarium housed in one small room with inadequate ventilation and space
- In January 2001 herbarium moved into new building providing
 - Greatly improved ventilation and air quality
 - More than double the space

The foundation of the VSU Herbarium

- As a teaching collection:
Dr. Beatrice I. Nevins joined the faculty in 1937, accumulating a teaching collection of about 1,000 specimens.
- As a research collection:
Dr. Wayne R. Faircloth joined the faculty in 1961 and by 1967 had increased the depth and stature of the herbarium sufficiently to be recognized in *Index Herbariorum*.



Dr. Beatrice I. Nevins

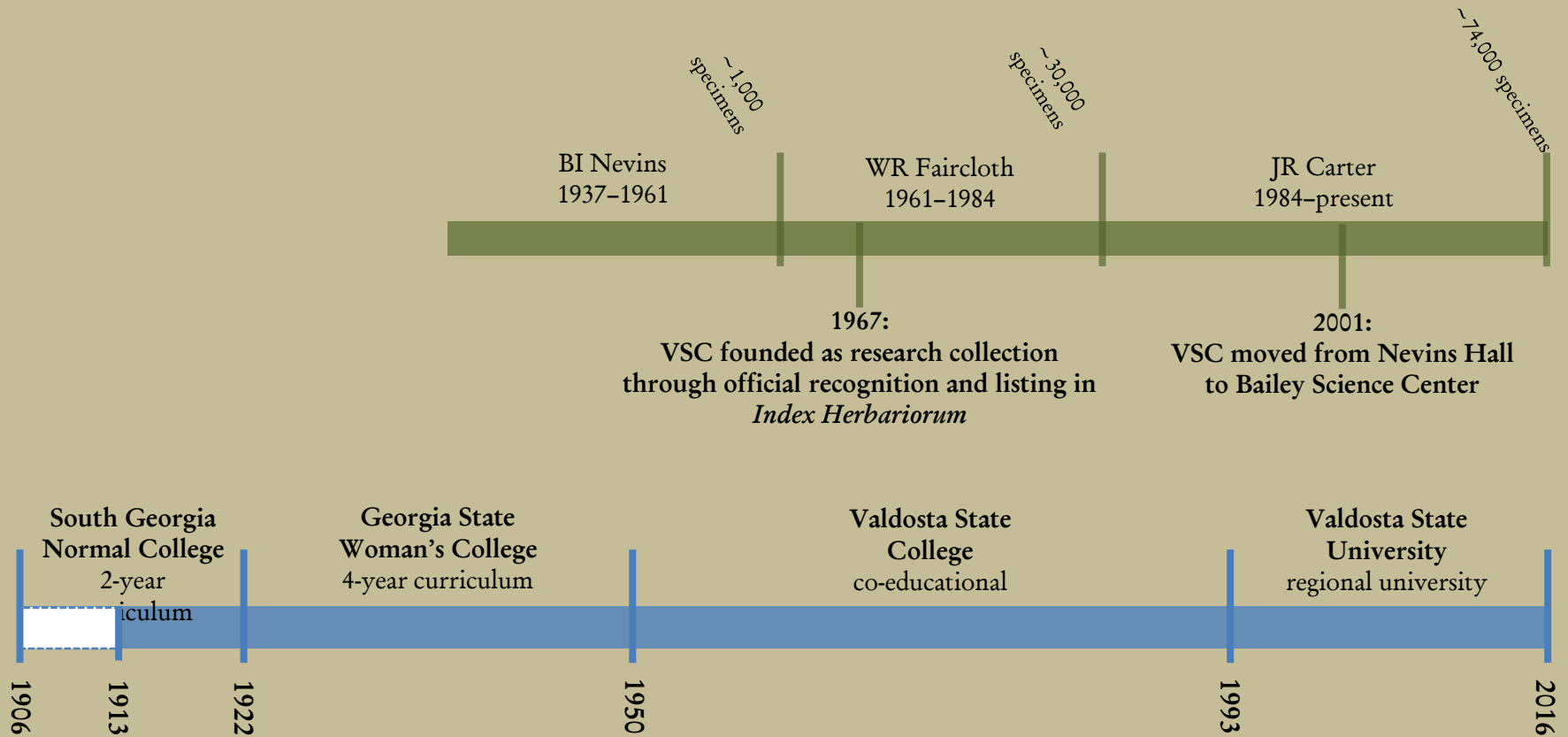


Dr. Wayne R. Faircloth (left)

Timeline:

Valdosta State University

Valdosta State University Herbarium [VSC]



The Herbarium

Valdosta State University (VSC)

Documenting biodiversity in the coastal plain region of Georgia



Mission Statement

The Valdosta State University Herbarium (VSC) provides a repository for the preservation of voucher specimens that document the flora of the Coastal Plain region of Georgia and specimens from a broader geographical area that might be useful in the study of the flora of this region and that enable specialized research on particular groups of plants carried out by faculty and students in residence at Valdosta State University and by taxonomic specialists at other institutions. VSC also provides specimens for use in teaching, and its staff responds to requests from the general public, natural resource managers, agricultural scientists, and others by providing information about plants and service determinations of unknown plants and, where appropriate, preserving vouchers relating to such.

Size & Scope of Collection

- Regional collection of >73,000 accessioned specimens
 - Number of accessioned specimens has increased more than two-fold since 1984
 - Particularly rich in plants of Georgia coastal plain
 - Extensive collections of graminoids, ferns, bryophytes
- Significant collectors
 - C. T. Bryson
 - R. Carter
 - W. R. Faircloth
 - R. K. Godfrey
 - R. Kral
 - R. K. Lampton
 - S. T. McDaniel

VSC Activity 2016

Backlog specimen records processed: **2,711***

Backlog specimen labels prepared: **6,465**

Specimen sheets accessioned: **2,058**

Exchange specimens sent out: **2,501**

Exchange specimens received: **455**

Loans sent out: **45** specimen sheets

Visitors: **158**

Service determinations: **23**

Data requests filled: **9**

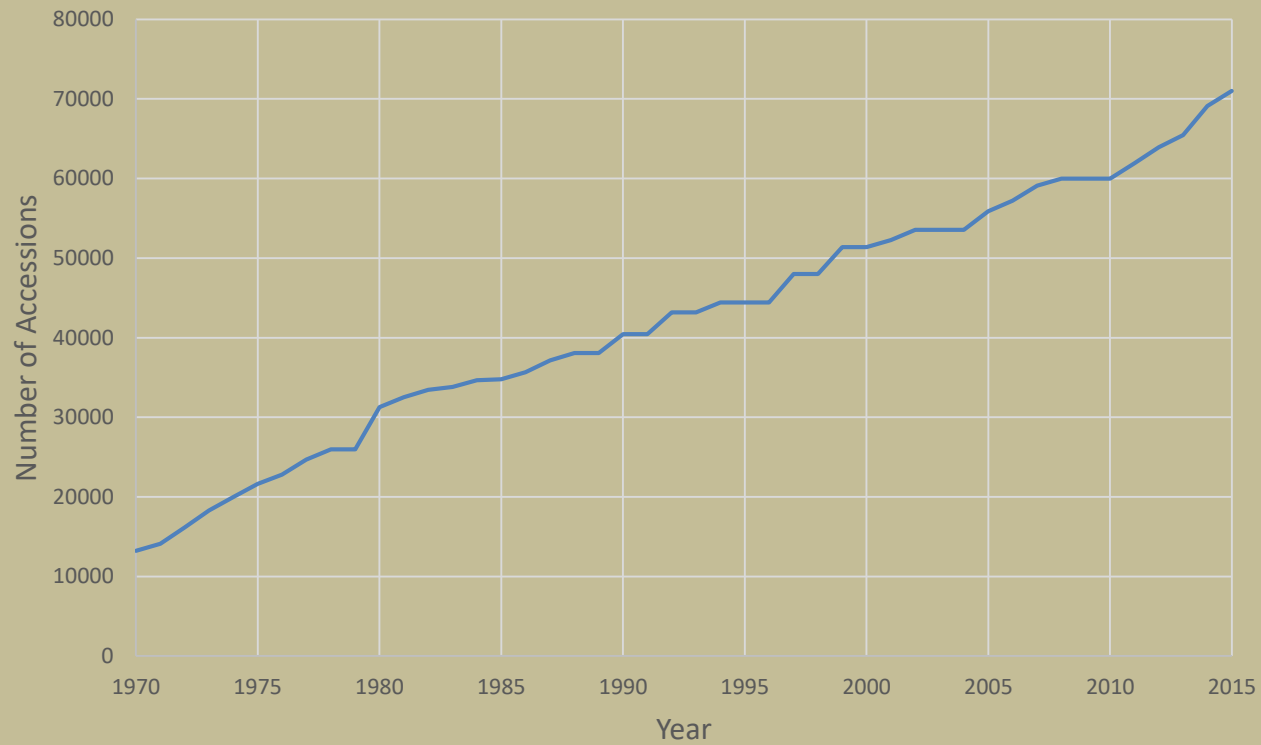
*All of these records have been georeferenced.

VSC Accessions as of 2/20/2017

73,229 specimens

- 69,146 vasculares
- 4,083 non-vasculares

Valdosta State University Herbarium [VSC] 1970–2015



Personnel

- One part-time curator/director
 - One-quarter release time
 - Release time, negotiated upon initial employment, has generally been honored
- Until 2011, only an occasional student assistant

Service – Plant Identification

Mostly for agricultural scientists at UGA Tifton and Griffin campuses

- ca. 60 per year average 2011-2014
- Managed through VSU Foundation, revenue for this service has accrued to support the herbarium
 - ca. \$1,500 per year, since 2001

Research projects compliment and support the herbarium

Grants and contracts secured by curator support field research, purchase of materials, and occasional employment of students

- Department of Defense (DoD)
- Georgia Botanical Society
- Georgia Department of Natural Resources (Georgia DNR)
- Louisiana Department of Wildlife & Fisheries
- Nature Conservancy
- US Department of Agriculture (USDA)
- US Fish & Wildlife Service (USFWS)
- University of Georgia Foundation
- US Army Medical Research Acquisition Activity (USAMRAA)
- Valdosta State University Faculty Research Fund

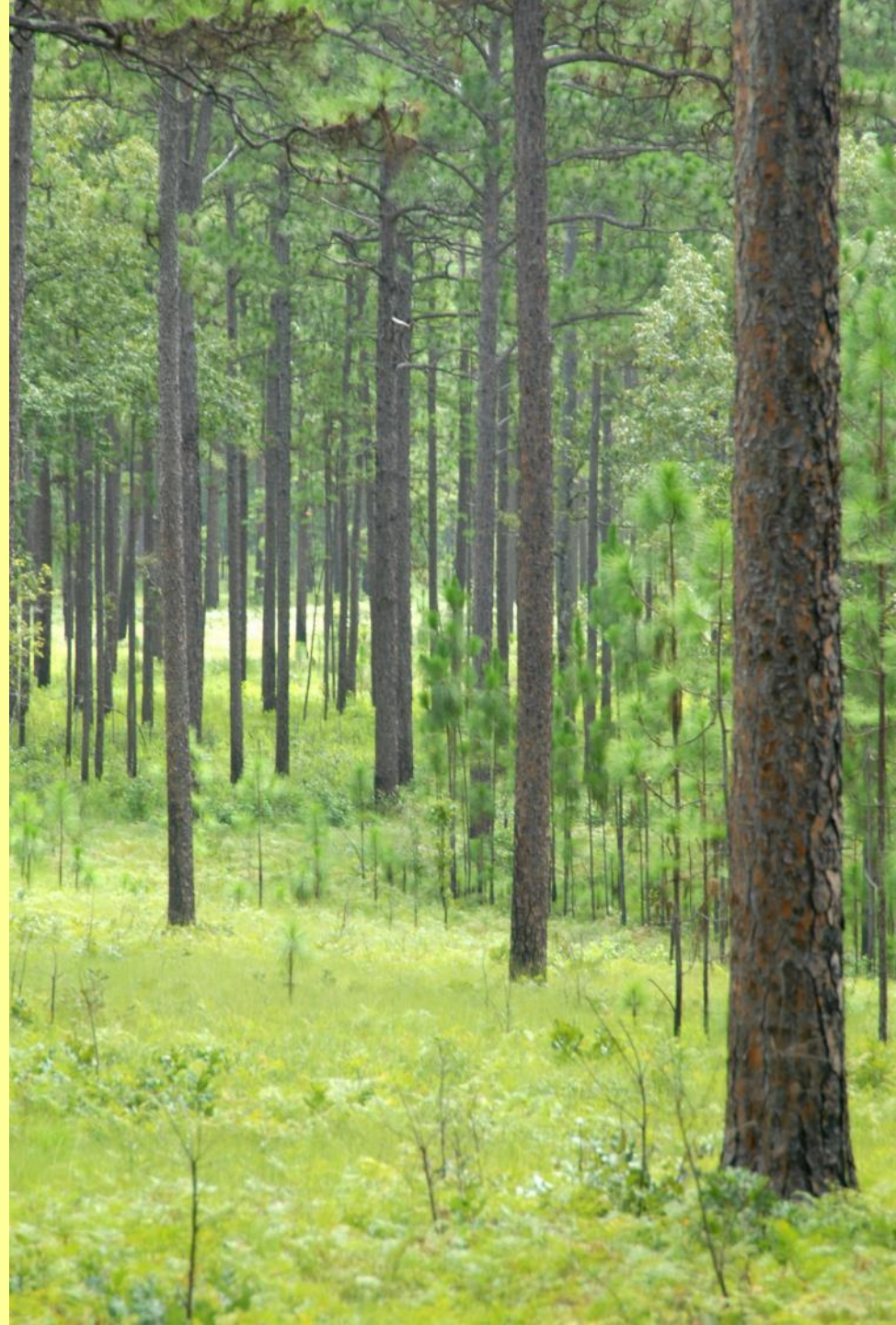
Floristic inventory of Broxton Rocks Nature Preserve, Coffee County, Georgia

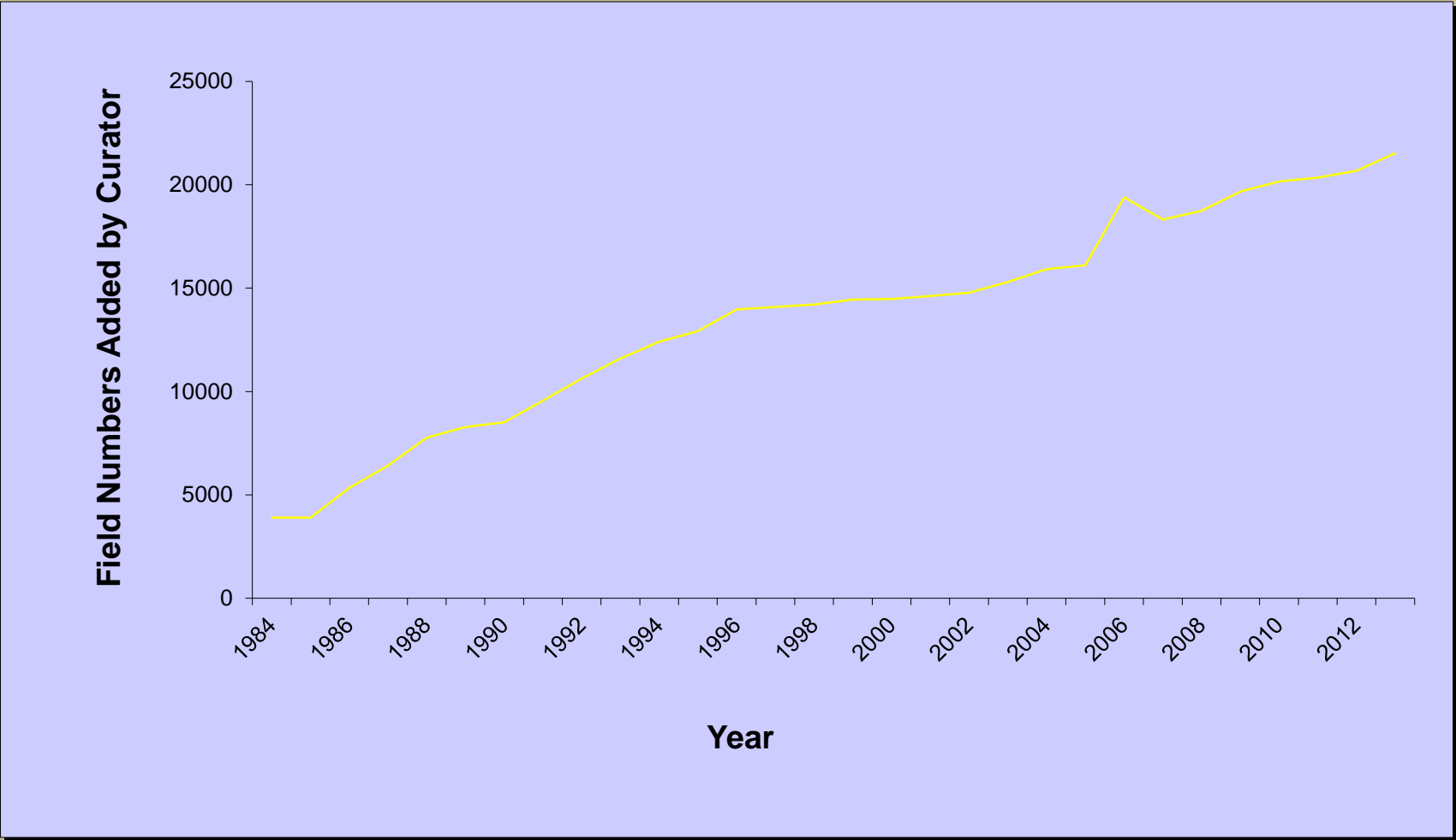
- with F. Snow
- 2014 – present
- Searching for previously undocumented species occurrences and preparing voucher specimens to document the flora of this ecologically significant site



Floristic inventory of the Wade Tract, Arcadia Plantation, an old-growth longleaf pine-wiregrass forest, Thomas County, Georgia

- with W.W. Baker, G. Nelson, W. Platt, K. Robertson
- 2015 – present
- Searching for previously undocumented species occurrences and preparing voucher specimens to document the flora of this ecologically significant site





Voucher collection since 1984



Collaborative Research: The GA-VSC Herbaria Collaborative: Phase I of a Statewide Consortium. National Science Foundation, 2011–2014

- Valdosta State University Herbarium (VSC) in collaboration with University of Georgia Herbarium (GA)
 - Funding released in April 2011
 - DBI-1054366, JR Carter (PI)
 - DBI-1054329, WB Zomlefer (PI), DE Giannasi (co-PI)
- Major VSC outcomes
 - Digitization of VSC and collaborate with UGA to produce on-line atlas of Georgia's flora
 - General enhancement of the VSC collection
 - Process backlog specimens
 - Georeference specimens
 - Outreach

Digitization:

Imaging

Valdosta State University Herbarium
VSC 0050556

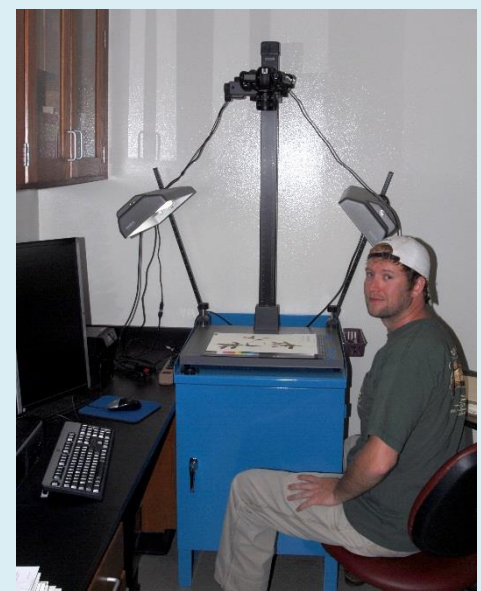


70,781 specimens
imaged

66,712 vascular plants
4,069 non-vascular plants



OPIHOGLOSSACEAE
Botrychium lunariaoides (Michx.) Sw.
U.S.A. GEORGIA. Lowndes County: N30.74464 W83.37199; 0.6 mi E jct. Rocky Ford Rd. (CR 778) and Mt. Zion Rd. (CR 55), Mt. Zion Cemetery, along south side Mt. Zion Rd., across road from Mt. Zion Methodist Church; plants rare and local, six plants observed.
Richard Carter 19676
with W.W. Baker
det. R. Carter
29 Mar 2010
Valdosta State University Herbarium (VSC)



Digitization: Database



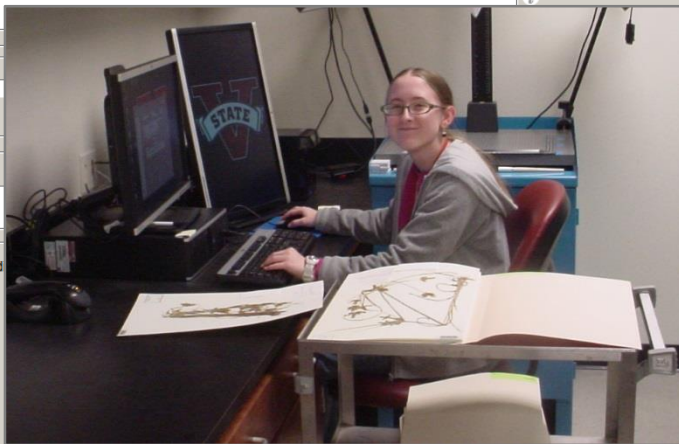
The screenshot shows the Specify 6.5.03 software interface. The main window displays the following information:

- Collection Object:** Catalog Number: VSC0052623, Cataloger: Bartek, Jessica, Cataloged Date: 04/05/2012.
- Determinations:** Taxon: Hypoxis leptocarpa, Current: checked, Determiner: Kral, R.
- Collecting Information:** Collector Number: 47346, Collection Date: 06/06/1972, Locality: Pike County, Alabama, United States.
- Collectors:** Last Name: Kral.
- Attributes:** Phenology, Specimen Description.
- Attachments:** Modified By Agent: Carter, Richard.

The interface includes a menu bar (File, Edit, Data, System, Tabs, Help), a toolbar with various icons, and a search bar at the top right containing 'VSC0052623'. A taskbar at the bottom shows several open windows and system icons.

70,491 voucher specimens databased

66,422 vascular plants
4,069 non-vascular plants





Processing backlog specimens

9,300 backlog specimens mounted, digitized, and accessioned

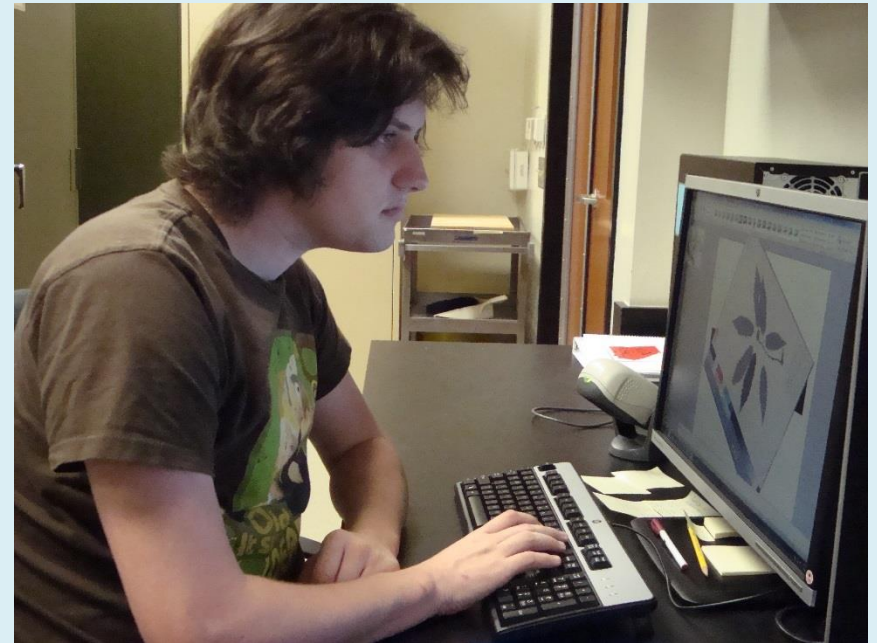
Specimen mounting rates: Average = 7.8 specimens/hr [range 4.8--11.4 specimens/hr, s.d. 2.11]. Statistics based on work of eight student mounters mounting 5,573 specimens during the period 9/2013–3/2015.

8,115 backlog specimens processed for exchange with other herbaria



Georeferencing

- 3,900 specimen records in the database have georeference data uploaded through VSC's customized integrated system that generates specimen labels from field data in an MS Excel spreadsheet through MS Word and Mail Merge and enables data upload directly into the Specify database through the Specify Workbench.
- This system was developed by undergraduate student assistant Phillip Lowe.

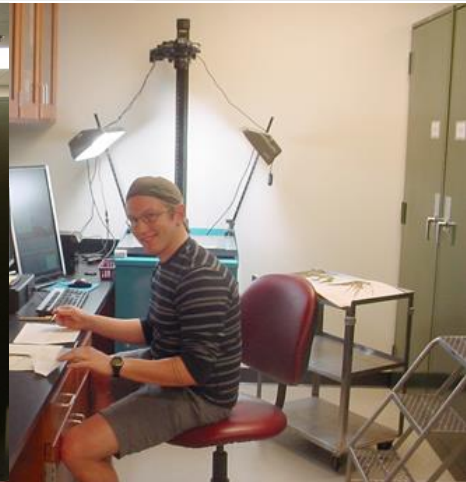




Educational outreach

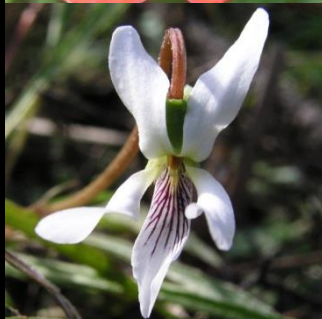
- 15 undergraduate students trained in herbarium curation
- Installation of digital signage in atrium of science building promotes biodiversity collections and botany
- Herbarium tours for local garden clubs, VSU classes, Georgia Governor's Honors Program, Georgia Academy of Science, etc.
- Hosted digitization workshop sponsored by iDigBio 2012; national audience of 30 participants
- Hosted Georgia Herbarium Consortium meeting 2013
- Presentations and demonstrations by PI and student assistant Jessica Bartek at December 2013 digitization workshop sponsored by iDigBio at Florida State University
- Presentations by student assistants Jessica Bartek and Phillip Lowe at the 2014 Annual Meeting of the Association of Southeastern Biologists in Spartanburg, South Carolina; [Jessica Bartek received the SABS award for the best student poster.](#)





15 undergraduate students
trained in herbarium and
digitization techniques





Advances in Wiregrass Georgia: Infrastructural Improvements to Sustain another Half-Century of Herbarium-Based Research and Teaching

3 year project (2015–2018)

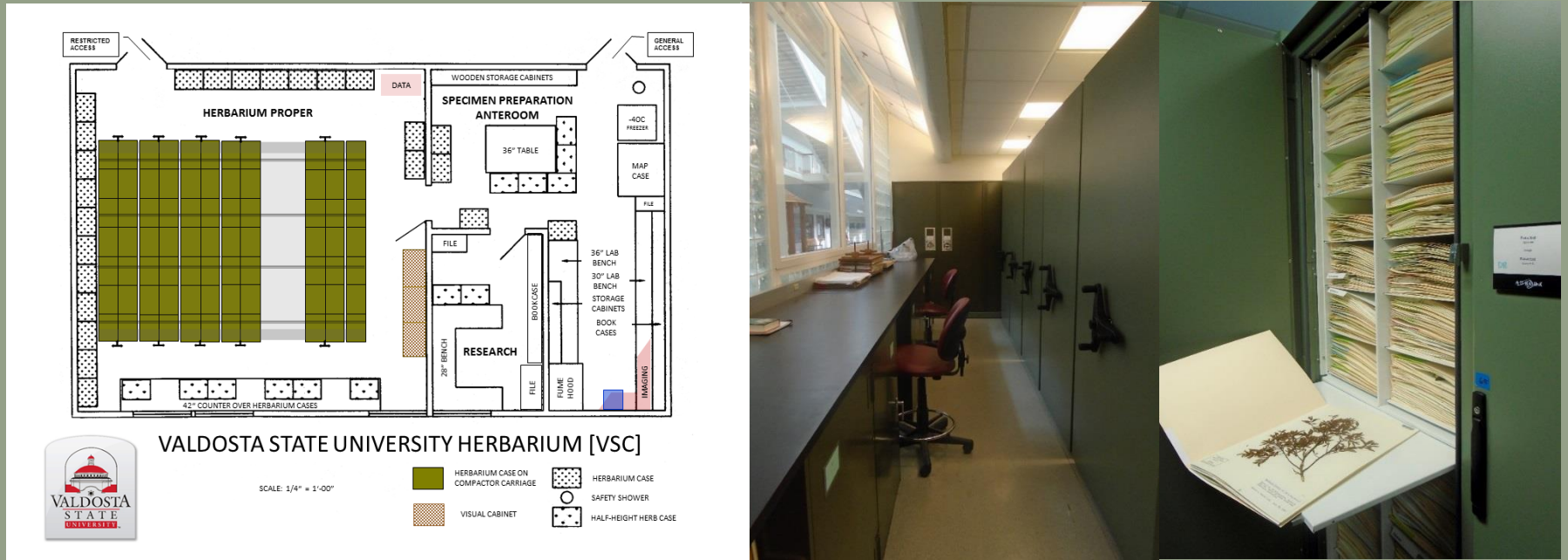
National Science Foundation
(DBI-1458264, 2015—2018, J.R. Carter, PI)





Installation of high-density storage system

The “compactor” system was installed over a two month period, beginning in August 2015.



Installation of compactor system and 41 new cabinets has increased specimen storage capacity by 35%, providing safe and secure storage of this valuable research collection for many years to come.



Processing legacy voucher specimens

This grant also provides funds to mount and digitize 5,000 voucher specimens, providing broad access to additional research materials.



Unmounted backlog specimens



Student assistants mount and digitize valuable backlog specimens.



Derivative data and images are made publically available through the VSU Virtual Herbarium.



Georeferencing

2,500 localities for >14,000 voucher specimens will be accurately georeferenced, increasing their value for research.



Home | Web Application | Standalone App | Collaborative Georeferencing | Developer Resources | Workshops | Support and Contacts

GEOLocate

A Platform for Georeferencing Natural History Collections Data

For Users:

- Overview
- GEOLocate Web Application
- Collaborative Georeferencing
- GEOLocate 3.x (standalone)
- Global Expansion
- Education & Outreach

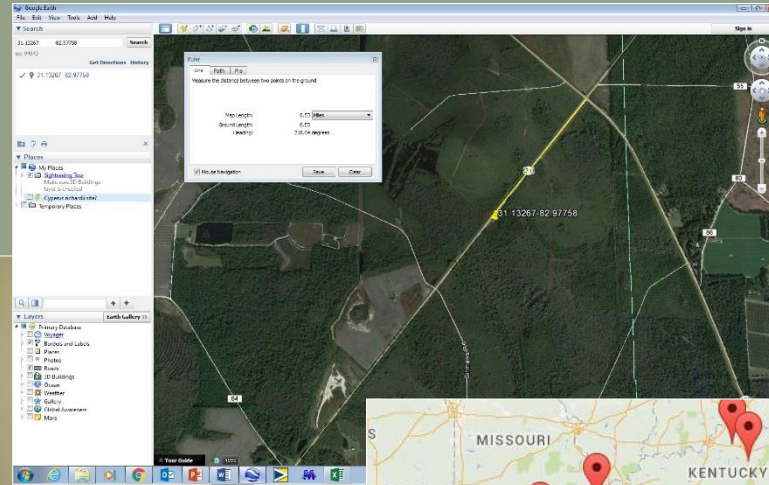
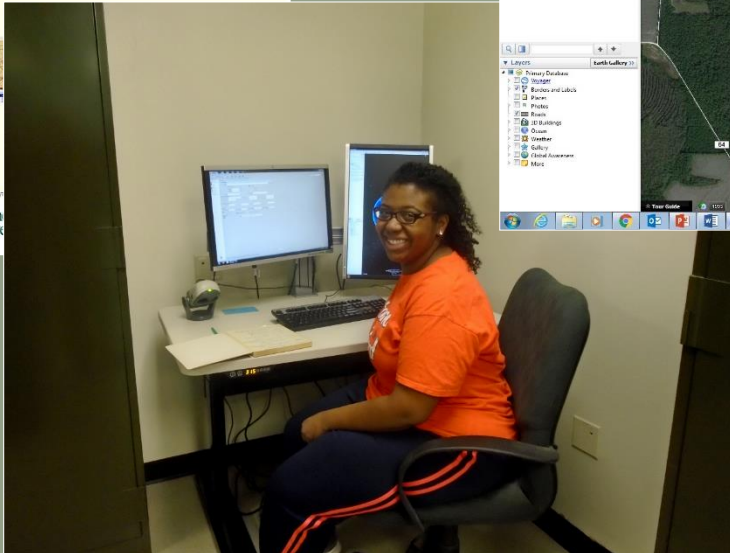
For Developers:

- SOAP Services
- TASON Georeferencing
- Embeddable Web Client

Web Applications: Georeference collections data using your web browser. Quick and easy georeferencing.

Web Services: Integrate georeferencing into your own database and applications using GEOLocate web services.

Copyright © 2010
Tulane University



Standardized methods are employed to determine geographical coordinates for specimen localities from data in legacy maps and field notebooks, thereby enabling accurate mapping of plant record occurrences.



Acquisition of teaching specimens

136 boxes of dormant Vanderbilt University teaching specimens will be transferred to VSU, where they will be inventoried, catalogued, and used to train future biodiversity researchers.





Outreach

A variety of activities educate herbarium assistants and other students, teachers, and the general public about biodiversity collections and their importance in research.



Student assistants work and learn in the herbarium.



Students in formal courses learn about the importance of plants and biodiversity collections.

Outreach to develop connections within the university

Herbarium orientation/tour for students

- Upper level botany courses
- Introductory courses with an organismal focus
- Good way to attract volunteers and paid student assistants

Photographs identifying herbarium assistants are prominently displayed, associating students with the collection.



Talking points:

Why are herbaria important?

- If accuracy and consistency are important in the identification and naming of plants, then the herbarium is essential.
- Most people – many professional biologists included – do not understand the connection between the herbarium and accurate and consistent identification and naming of plants, probably because they've never thought about it.
- After all, popular guides and floristic manuals are used to identify and name plants, not herbarium specimens.
- Floristic manuals are based on taxonomic treatments (1° literature) and voucher specimens in herbaria, and popular guides are based on floristic manuals.
- Voucher specimens in herbaria are the primary source materials for taxonomic treatments.
- Botanical names are based on particular kinds of voucher specimens called type specimens.
- Type specimens are standards preserved in herbaria that enable the accurate and consistent application of plant names.

Herbarium vouchers provide the foundation for much of the scientific and popular botanical literature.

*little - if any - obvious link to herbarium vouchers

3° guides*

2° manuals

1° literature

Herbarium vouchers

Herbaria as infrastructure

- As infrastructure like roads, buildings, and bridges are essential for the basic activities of society, herbaria form the essential underpinning of much scientific research.
- As with society and basic infrastructure, many biologists take herbaria for granted and some unfortunately are unaware of the fundamental role these biodiversity collections play.
- As society requires basic lessons in civics to appreciate the necessity of infrastructure and the importance of maintaining it, biologists require exposure to biodiversity collections and education about their essential importance in science.
- Nowadays many biologists receive little if any training in systematics, and have little if any exposure to biodiversity collections.
- This makes it increasingly difficult to defend the continued maintenance of herbaria and other biodiversity collections by academic institutions.
- Therefore, we curators must strive to educate our colleagues about herbaria and their importance.

Outreach to develop connections within the university

College

- Science Seminar Series
 - Weekly lecture
 - Science departments within COAS
- COAS dean funded design and printing of brochure to promote the herbarium

VSC Outreach 2016

January 26th Women's Hiking Group, Lake Louise field trip and herbarium tour (25 participants)

April 14th Seminar (75 participants) and open-house (40 participants)

April 15th Georgia Botanical Society Spring Pilgrimage, herbarium tours (75 participants)

May 3rd Learning in Retirement *Spring Flora of Lake Louise*, followed by herbarium tour (6 participants)

September 17th Science Saturday *Trees and the Herbarium* (109 students, mostly elementary and middle school)

September 18th Georgia Botanical Society Workshop *Learn to Love the Sedges*, followed by herbarium tour (5 participants)


November 1st Learning in Retirement *Fall Flora of Lake Louise*, followed by herbarium tour (8 participants)

Open house for campus and community

5"x 7" Card/Invitation
.375" border





BLACK Plate
RED Plate PMS 186



The Valdosta State University Herbarium has recently undergone renovation through support from the National Science Foundation. Please join us Thursday, April 14, 2016, for a public lecture highlighting the herbarium, followed by an open-house celebration and tour of the herbarium.

The public lecture will be presented at 4:00PM in Powell Hall Auditorium, and the open-house will follow immediately. Please gather at the east end of the atrium of Bailey Science Center at 5:00PM for the open-house and tour.

*For more information, please contact
Dr. Richard Carter, Biology Department
PHONE 229.333.5338 • EMAIL rcarter@valdosta.edu*



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Dr. Ric
PHONE 229.33*



VSU HERBARIUM

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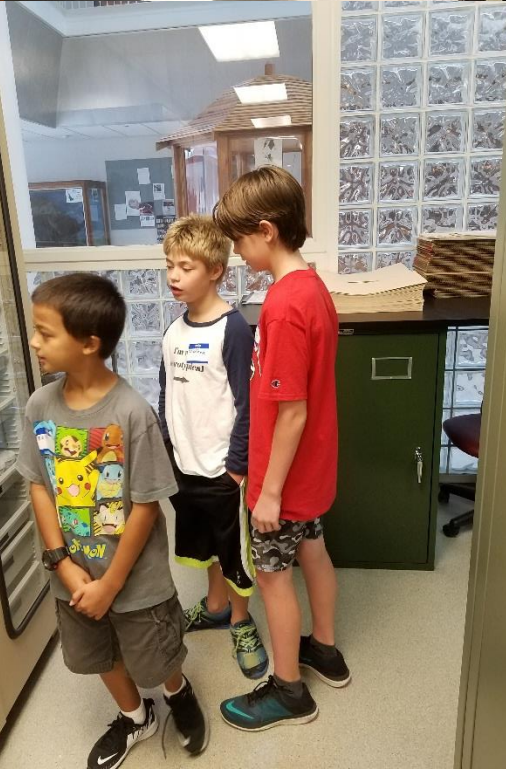
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Biology Department
229.333.5338
rcarter@valdosta.edu



VS_A7_5x7_Invitation_061110T

Science Saturday



Learning in Retirement



Librarians and archivists get it!

They understand

- the importance of the specimen as both physical object and data source (label).
- the value added through digitization of herbarium specimens.
- the role of searchable databases and public access to images and data.




THE VALDOSTA STATE UNIVERSITY VIRTUAL HERBARIUM



- Virtual Herbarium Home Page
- About
- People
- Contact Information
- Loans and Exchanges
- Visits
- Links
- Database
- Login

Specimen Database Search

Please cite!

Search Criteria		Show: <input checked="" type="radio"/>	Hide: <input type="radio"/>
Family:	<input type="text"/>		
Genus:	<input type="text"/>		
Species:	<input type="text"/>	The binomial scientific name (e.g., <i>Pinus palustris</i>)	
Subspecies:	<input type="text"/>	The binomial plus subspecific name (e.g., <i>Marshallia graminifolia</i> ssp. <i>graminifolia</i>)	
Variety:	<input type="text"/>	The binomial plus varietal name (e.g., <i>Ilex decidua</i> var. <i>decidua</i>)	
Common Name:	<input type="text"/>		
Collection Date:	= <input type="text"/>	(YYYY-MM-DD or MM-DD)	
Collection Date:	= <input type="text"/>		
Collector Name:	<input type="text"/>		
Collection Number:	<input type="text"/>		
Barcode:	<input type="text"/>		
Location:	<input type="text"/>		
Habitat:	<input type="text"/>		
More Options:	Show: <input type="radio"/>	Hide: <input checked="" type="radio"/>	
Sort By:	<input type="text" value="Species"/>		
Output Type:	<input type="text" value="Thumbnails"/>		

Collaborative effort between VSU Herbarium and Michael Holt,
VSU Odum Library, enabled by VSU Faculty Research Seed Grant

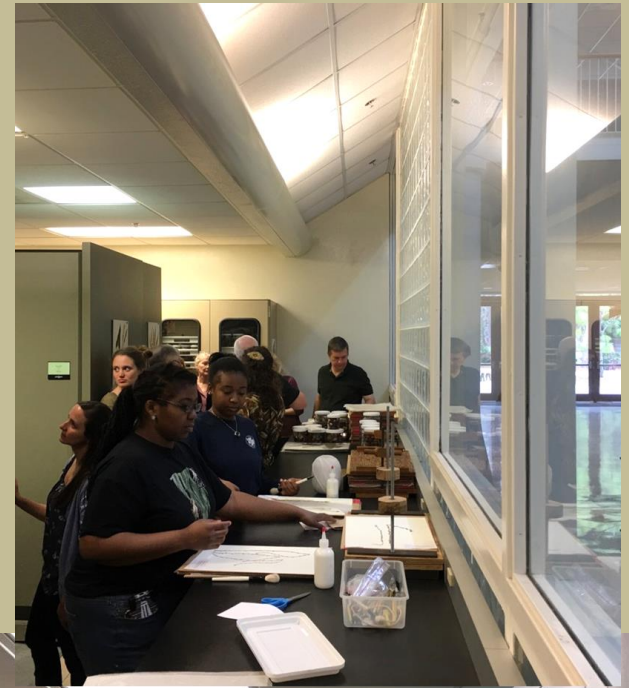
<http://herb.valdosta.edu/>

Stop 4 – VSU Historical Plants Tour



Georgia Herbarium Alliance

- Initiated by Wendy Zomlefer and David Giannasi (GA)
- Meet \pm biennially
- VSU Herbarium has hosted the GHA twice, most recently in February 2017



Society of Herbarium Curators

- <http://www.herbariumcurators.org/>
- *The Vasculum*
 - Outlet for announcements and articles about herbaria
- Listserve

HERBARIA mailing list is co-sponsored by the American Society of Plant Taxonomists and the Society of Herbarium Curators.

HERBARIA@NACSE.ORG

<https://www.NACSE.ORG/mailman/listinfo/herbaria>



Connections with iDigBio

- Hosted two workshops on campus sponsored by iDigBio
 - featuring tours of the VSU Herbarium
 - with students demonstrating digitization work
- WeDigBio Transcription Blitz (2015)

FSU-VSU Transcription Blitz 2015



Summary

- Know your collection
 - History
 - Strengths
 - Unique qualities
 - Mission statement
- Use your collection
 - Research
 - Teaching
 - Direct student involvement
- Promote your collection
 - Digitization
 - Public lectures
 - Tours
 - Brochure
 - Publications
- Develop constituencies
 - Locally on campus
 - Community at large
- Validate your collection
 - Document use and activities
 - Service activities
 - Annual reports
 - Funding
- Network through existing organizations
 - Society of Herbarium Curators
 - Georgia Herbarium Alliance
 - Georgia Botanical Society
 - SERNEC
 - iDigBio

