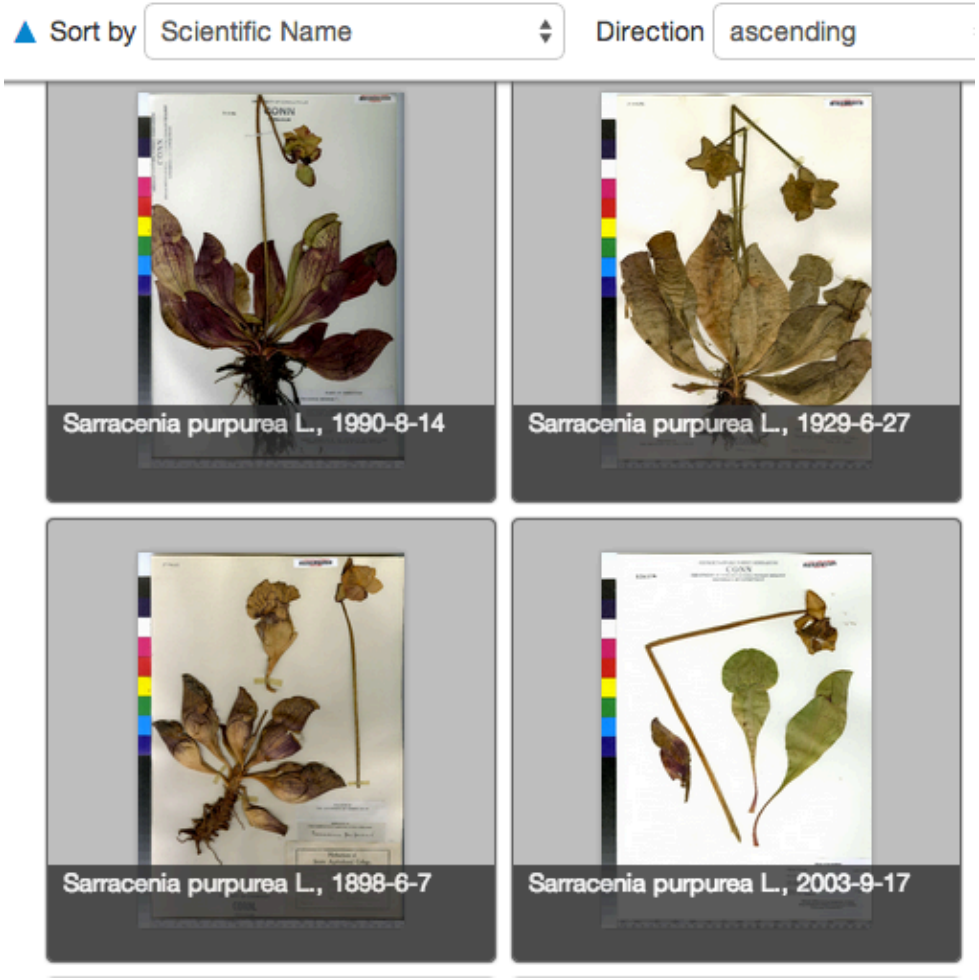
Citizen science, crowd sourcing, public participation, and BIOSPEX

Libby Ellwood, Austin Mast, , Robert Bruhn, Jeremy Spinks, Greg Riccardi

Florida State University


...and this thing, if it does indeed exist, offers enlightenment, hope, and the potential to unlock the mysteries of the universe to all people? Sounds very powerful and maybe too dangerous to be trusted to the masses. What did you call it again?
Science, Senator. It's called science.
mHicks
©2012 Union of Concerned Scientists

The Big Challenge



Clay Shirky's "Cognitive Surplus"

http://www.informationisbeautiful.net/2010/cognitive-surplus-visualized/

Public Participation in Scientific Research (PPSR)

aka Citizen Science

Amateur Science

Civic Science

Crowdsourced Science

Volunteer Monitoring

Public Participation in Scientific Research (PPSR)

: projects in which volunteers partner with scientists to answer real-world questions

(Cornell Lab of Ornithology)

: the systematic collection and analysis of data; development of technology; testing of natural phenomena; and the dissemination of these activities by researchers on a primarily avocational basis

(OpenScientist)

History of PPSR

Inadvertent scientist

- Science, but for a different primary purpose

Gentleman scientist

- Self-funded, self-directed science as a hobby

PPSR

- Collaborative science between citizen and scientist

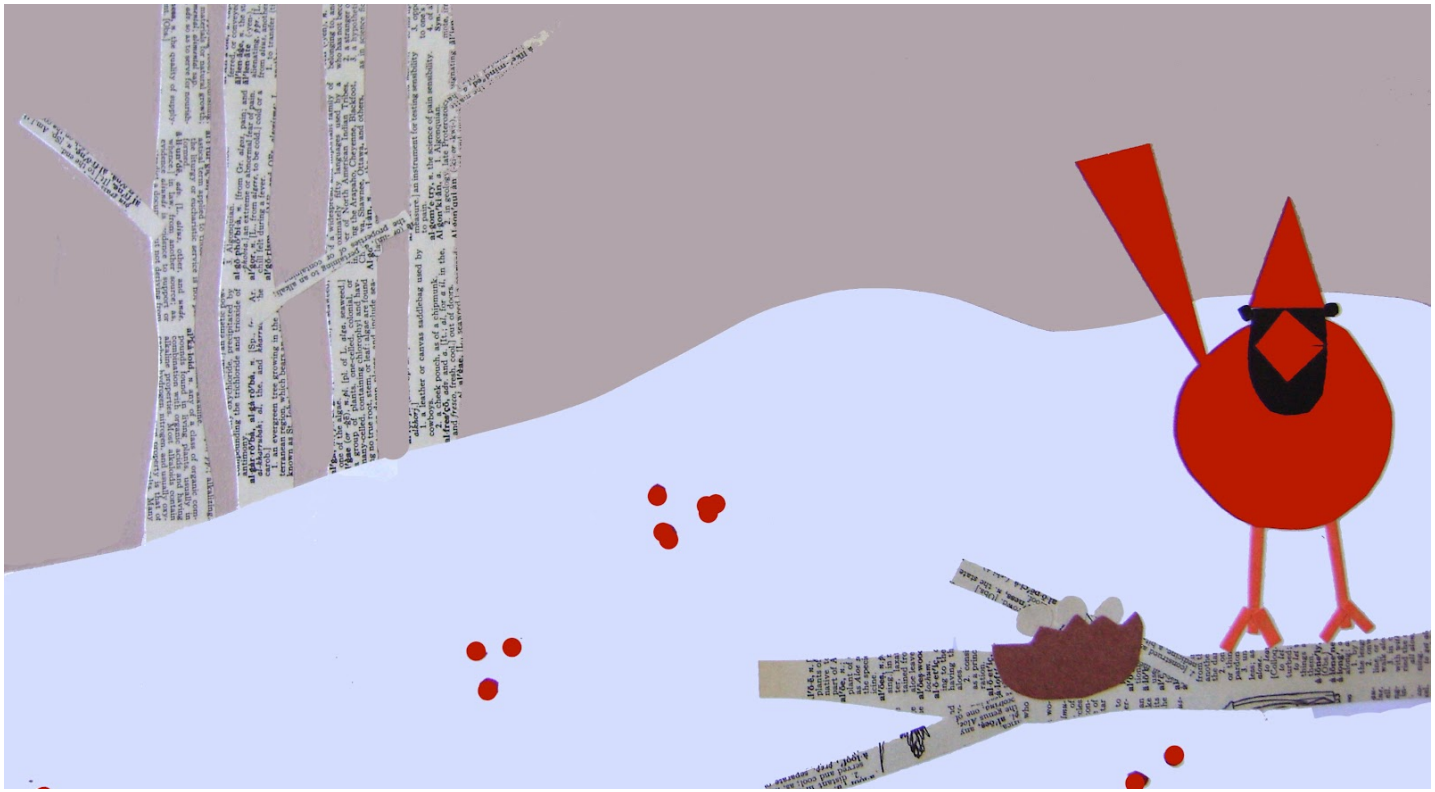
April 14, 1644: 的n Seiryoden Palace, Kyoto, we enjoyed watching cherry blossoms and took sake provided by the emperor.

The translation of the highlighted sentence is shown in red. The black entry is the date, according to the Japanese calendar.

Benjamin Franklin

Audubon Christmas Bird Count

oldest citizen science project



Citizen science is gaining in popularity and technological advances provide new ways of participating with minimal training.

New England Leaf Out Project (NELOP)

NEW ENGLAND LEAF OUT PROJECT

Field Station Concordia and the New England Leaf Out Project have teamed up on a citizen science project to collect leaf out times.

We are investigating the effects of climate change on the tree species of New England. Using both remote sensing and direct observations, we will monitor leaf out times across the region, and whether trees leaf out earlier now than they did in the past due to warming temperatures.

We hope you will help us gather observations of leaf out times this spring to add to the available database of current and historical observations.

If you live in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island or Connecticut, all you need to do is:

What is leaf out?

Leaf out: Please record the date that you first see one, or up to several, new leaves on the tree. In this study, we count a new leaf when it has mostly emerged from the bud and its final shape is

Red Oak, © Richard Primack

Everill et al. In Press, AJB.

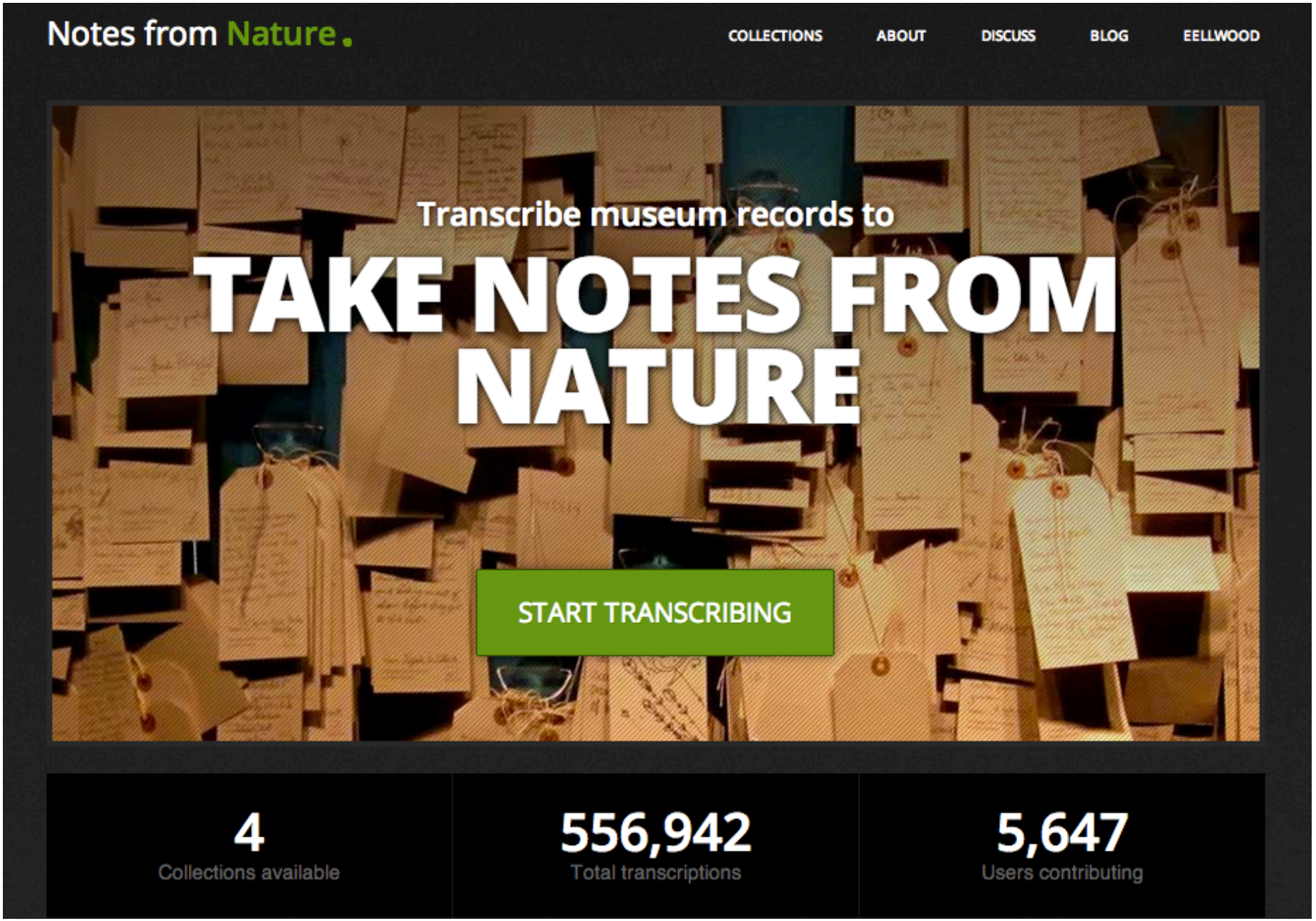
Digitizing Biodiversity Specimens

- Imaging
- Transcribing Specimen Label and Ledger Text
- Georeferencing
- Annotating

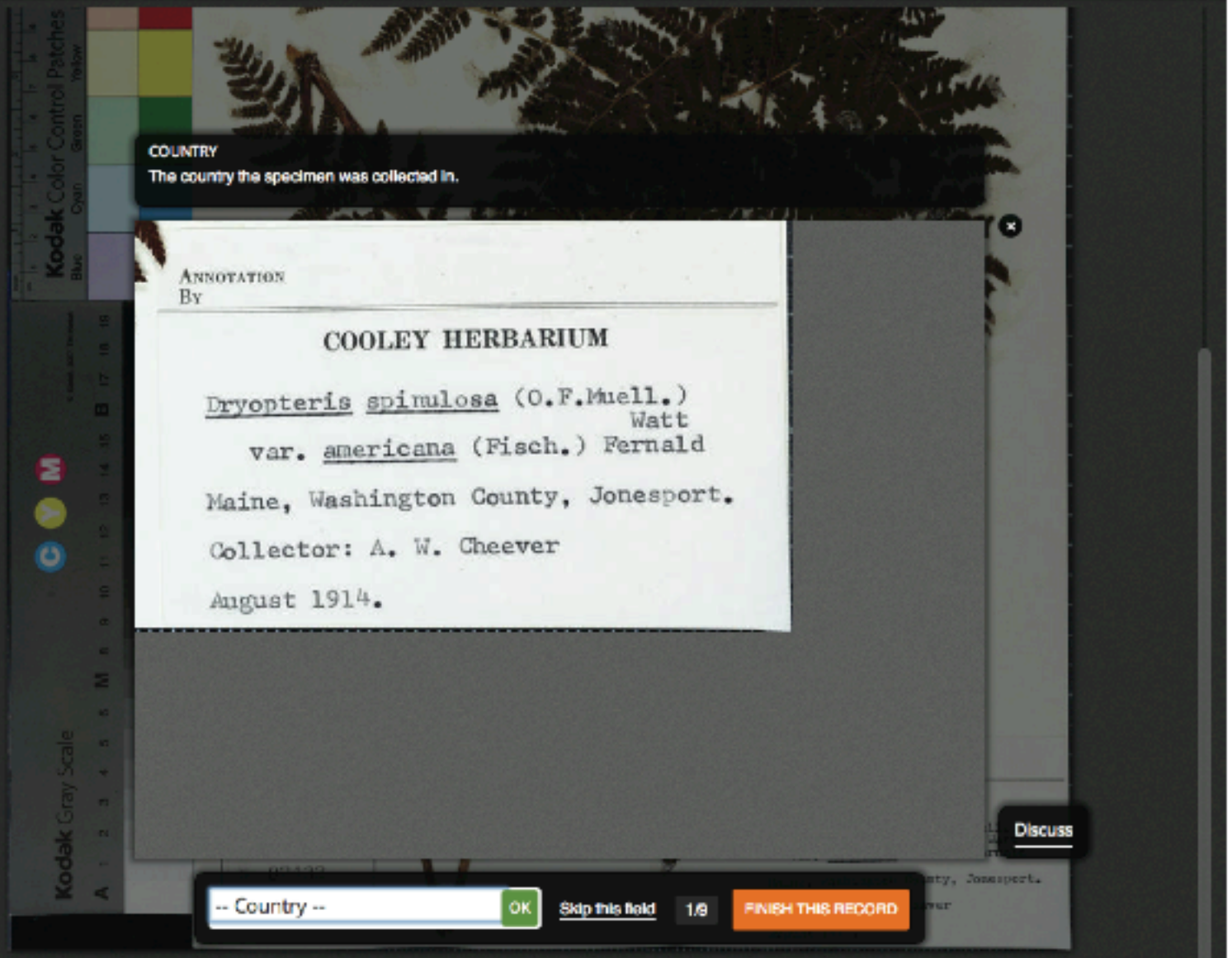
iDig'dBio@

Robert K. Godfrey Herbarium
at Florida State University

iDigBio's new User Engagement for Public Participation in Digitization Working Group is planning an iDig'dBio@ Imaging Blitz at Florida State University's Robert K. Godfrey Herbarium on Saturday, September 13. The goal of the blitz is to engage volunteers in the imaging of 3000 specimens over 8 hours and, later, the transcription of those specimens on Zooniverse's Notes from Nature public engagement website, while increasing public understanding of the importance of specimens. The working group is building iDig'dBio@ Blitz Kits that can be repurposed for common digitization activities by any institution. For more information on the blitz or the working group, please contact Austin Mast or Libby Ellwood. The blitz is co-sponsored by the Southeastern Regional Network of Expertise and Collections.



www.notesfromnature.org


COUNTRY
The country the specimen was collected in.
ANNOTATION
BY
COOLEY HERBARIUM
Dryopteris spinulosa (O.F.Muell.) Watt
var. americana (Fisch.) Fernald
Maine, Washington County, Jonesport.
Collector: A. W. Cheever
August 1914.
Discuss
-- Country --
OK
Skip this field
1/9
FINISH THIS RECORD

ATLAS OF LIVING AUSTRALIA
sharing biodiversity knowledge

Les herbonautes
L'herbier numérique collaboratif citoyen

Smithsonian

SMITHSONIAN DIGITAL VOLUNTEERS: TRANSCRIPTION CENTER

ZOONIVERSE
REAL SCIENCE ONLINE

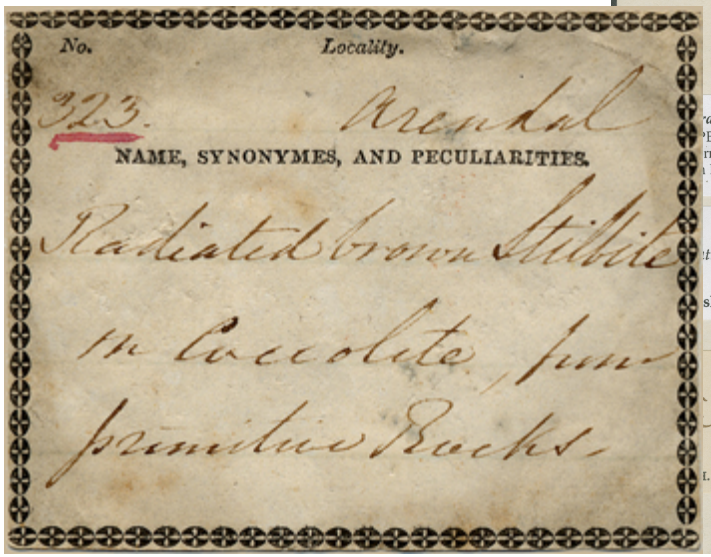
BSBI Botanical Society of the British Isles

herbaria@home
recording historical biodiversity

log in | register

DISCOVER LIFE

Home • All Living Things • IDnature guides • Global mapper • Albums • Labels • Search • Help
About • News • Events • Research • Education • Projects • Study sites • Polistes Foundation


No. Locality.

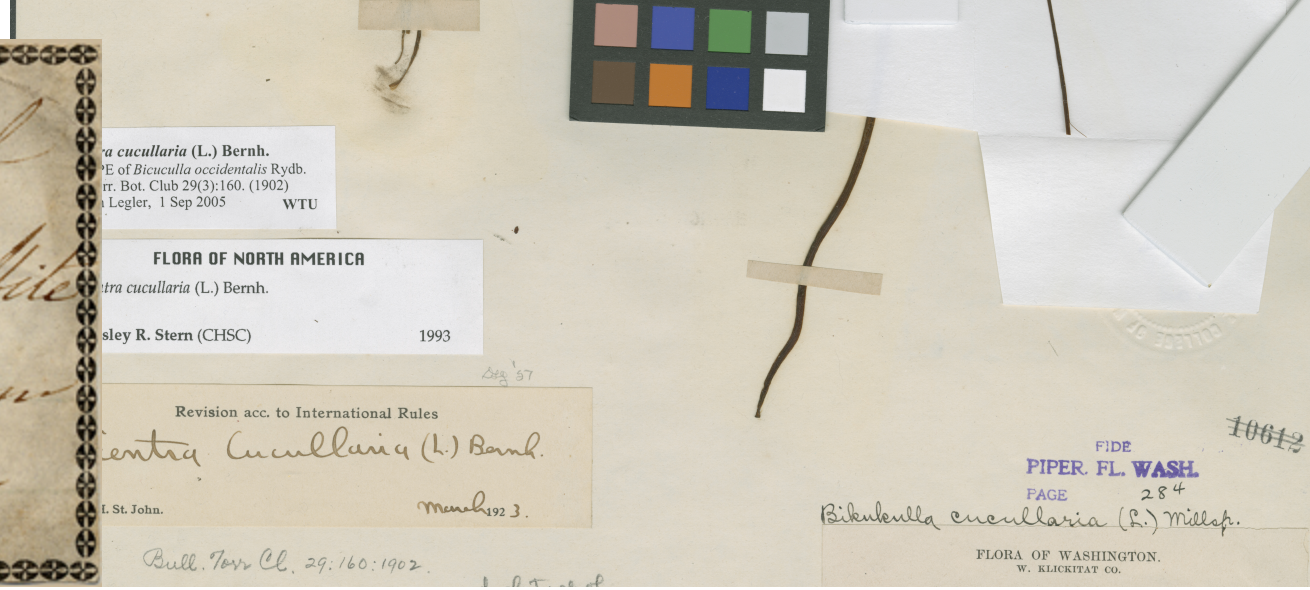
223. Arendal

NAME, SYNONYMES, AND PECULIARITIES.

Radiated brown Stilbite

in Chocolate, from

primitive Rocks.


ra cucullaria (L.) Bernh.
'E of *Bicuculla occidentalis* Rydb.
rr. Bot. Club 29(3):160. (1902)
Legler, 1 Sep 2005 WTU

FLORA OF NORTH AMERICA
tra cucullaria (L.) Bernh.
sley R. Stern (CHSC) 1993

Revision acc. to International Rules
Dicentra Cucullaria (L.) Bernh.
I. St. John. March 1923.

Bull. Torr. Cl. 29:160:1902.

FIDE
PIPER. FL. WASH.
PAGE 284
Bikukulla cucullaria (L.) Millsp.
FLORA OF WASHINGTON.
W. KLICKITAT CO.

PLANTS OF OKLAHOMA
ROBERT BEBB HERBARIUM
The University of Oklahoma

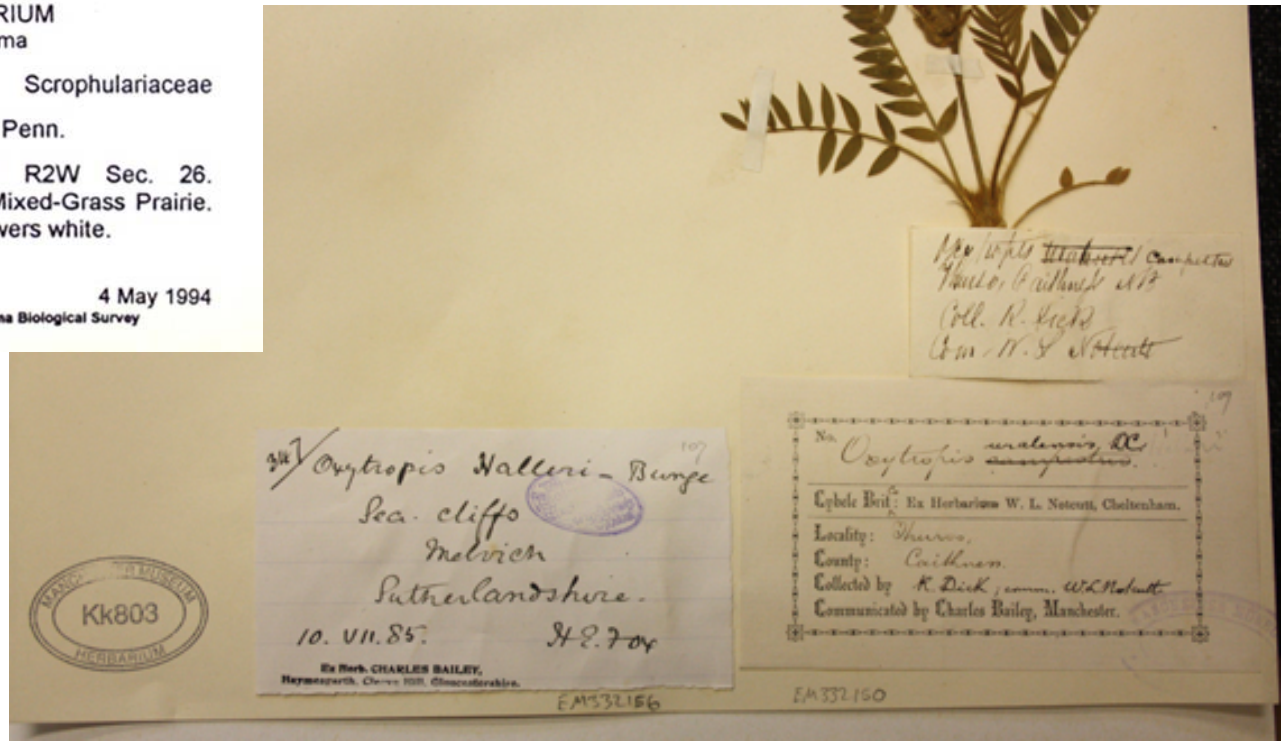
Oklahoma County Scrophulariaceae

Penstemon oklahomensis Penn.

SE corner of Tinker AFB. T11N R2W Sec. 26. Topography: rolling upland. Habitat: Mixed-Grass Prairie. Herbaceous perennial. 2-3 dm tall. Flowers white.

F. L. Johnson
TNK017 4 May 1994
Plant Inventory of Tinker Air Force Base by Oklahoma Biological Survey


COOK DISTRICT
Natural Order: Rutaceæ
Generic name: Citrus
Specific name: Garrawayi, Bail.
Vernacular name:
Habitat: Mt White, Coen.
Collector: R.W. Garraway
Remarks: May 1904.
F. M. BAILEY.


Oxytropis Halleri - Bunge
Sea cliffs
Melvich
Sutherlandshire.
10. VII. 85. H.C. Watson

Ex Herb. CHARLES BAILEY,

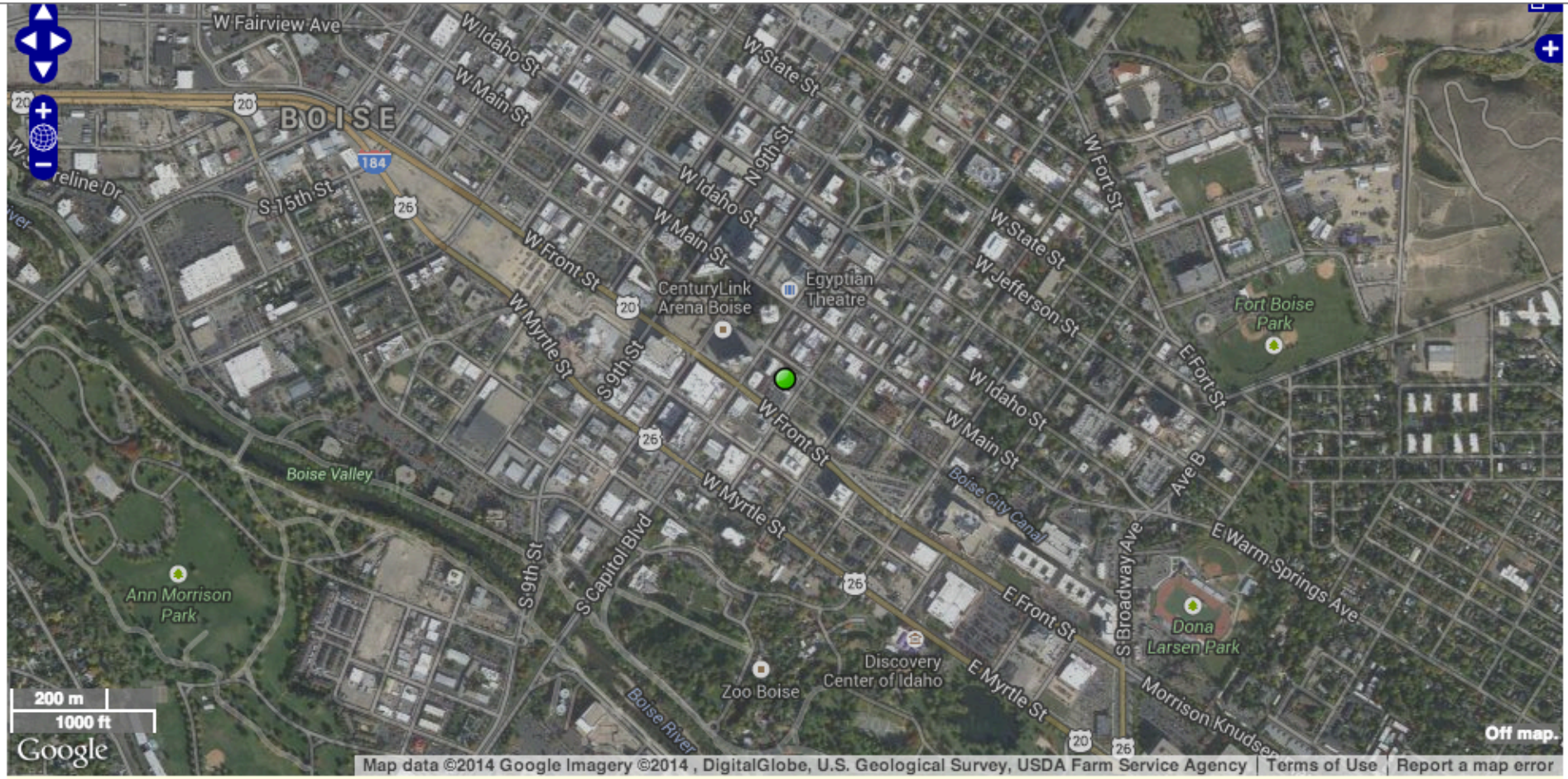
Kk803

No. Oxytropis uralensis, DC.
Cybele Brit: Ex Herbariums W. L. Notcutt, Cheltenham.
Locality: Thurso,
County: Caithness.
Collected by R. Dick, comm. W.L. Notcutt
Communicated by Charles Bailey, Manchester.

EM332156

EM332150

GEOLocate



Workbench | 1 possible location found

Georeference | Options | Draw polygon | Place marker | Measure

Locality String: Boise

Country: UNITED STATES OF AMERICA

State: Idaho

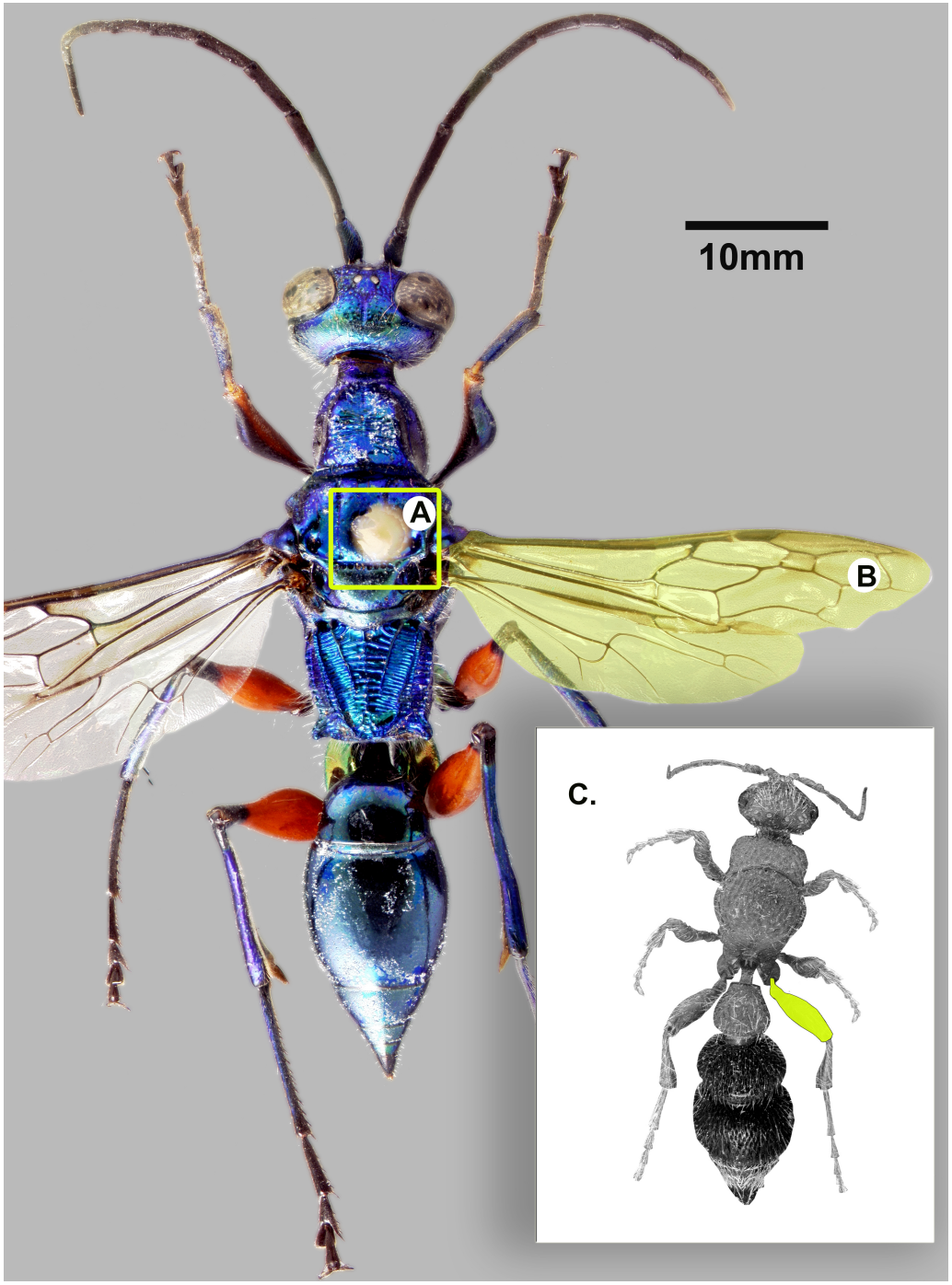
County:

latitude: 43.61361 | longitude: -116.2025 | uncertainty: 3036 m | error polygon

43.61361 -116.2025 3036Unavailable

http://www.museum.tulane.edu/geolocate/

B: “Outline the wings of the specimen”



Ampulex compressa (F.) from the Museum für Naturkunde Berlin (morphbank.net/?id=102143)

http://www.biospex.org/

Origin of BIOSPEX

Public Participation Workshop Participants identified need for system that would

- lower barriers to creation and management of public participation projects,
- make data flow more easily among relevant platforms,
- build capacity for recruiting and engaging with public participants, and
- enable co-created citizen science projects.

http://www.biospex.org/

BIOSPEX.ORG

BIOSPEX

Lead Public Digitization Expeditions

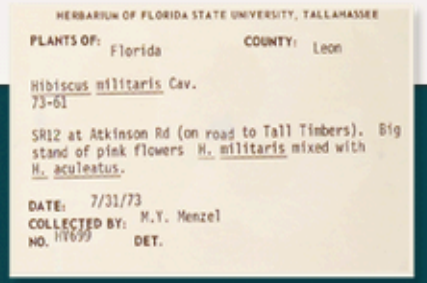
Use BIOSPEX to provision, advertise, and lead public
Biodiversity Specimen Digitization Expeditions

See how BIOSPEX will help liberate data from museum cabinets

START

#1

A curator of plant specimens digitally images all 21,000 of her Florida specimens and runs optical character recognition (OCR) software on the images, then uses BIOSPEX to bundle the specimen images using the OCR text string into about 20 expeditions that each ignite public interest for their themes or research importance. Groupings could be made by state park of origin, decade of collection, likelihood of handwriting on the label (using an OCR quality parameter), rarity, or invasiveness.


HERBARIUM OF FLORIDA STATE UNIVERSITY, TALLAHASSEE

PLANTS OF: Florida COUNTY: Leon

Hibiscus militaris Cav.
73-61

SR12 at Atkinson Rd (on road to Tall Timbers). Big stand of pink flowers H. militaris mixed with H. aculeatus.

DATE: 7/31/73
COLLECTED BY: M.Y. Menzel
NO. H9699 DET.

#2

Descendants of a famous ornithologist are interested in reconstructing the paths of his field trips. They gather together 32,000 specimen records from 42 different museums by exporting files from a specimen portal, such as that at iDigBio. A large fraction of the specimens do not have latitude and longitude associated with them, but they do have locality information that can be used to assign latitude and longitude.

#3

An environmental group is concerned about the health of a local river. They gather together 12,000 specimen records of all types (fish, invertebrates, aquatic plants, etc.) that mention the river by name using the same protocol as the ornithologist's family.

NEXT

#1

The curator then uses BIOSPEX to deploy the expeditions a few at a time to an existing website with a large citizen science community for label transcription.

#2

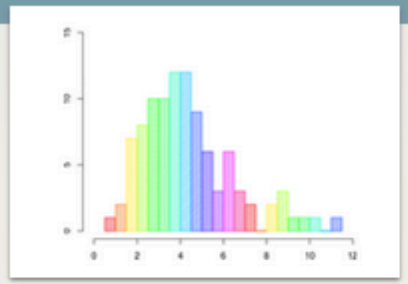
The family uses BIOSPEX to bundle the locality records into sets that make the georeferencing efficient (e.g., by collection year) then deploys them a few expeditions at a time to a website with a large citizen science community for assignment of latitude and longitude.

#3

The environmental group uses BIOSPEX to bundle those from the same taxonomic groups (e.g., all the fish) into expeditions for crowd-sourced georeferencing.

NEXT

#1

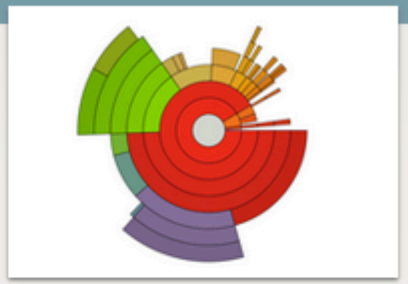


The curator processes the resulting transcriptions in BIOSPEX later and exports the data back to her local data management system.

#2

The family later downloads the complete data set to map the trips and sends the latitude and longitude data back to the 42 different museums that hold the specimens from BIOSPEX.

#3



The environmental group uses the map of historical records that is produced as a baseline for understanding the distribution of diversity that they see today and that they are documenting using another citizen science tool, such as citsci.org. The group sends the latitude and longitude data back to the museums that hold the specimens from BIOSPEX so that the data can be reused.

ABOUT

BIOSPEX

The BIOSPEX data management system is a project of iDigBio, The National Resource for Advancing Digitization of Biodiversity Collections. For more information on the project, please contact Austin Mast or Greg Riccardi.

Join our mailing list

iDigBio Integrated Digitized Biocollections

UF University of Florida

Florida State University 1851

Florida Museum of Natural History

NSF

iDigBio is funded by a grant from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program (Cooperative Agreement EF-1115210). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

BIOSPEX

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iDigBio is funded by a grant from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program (Cooperative Agreem
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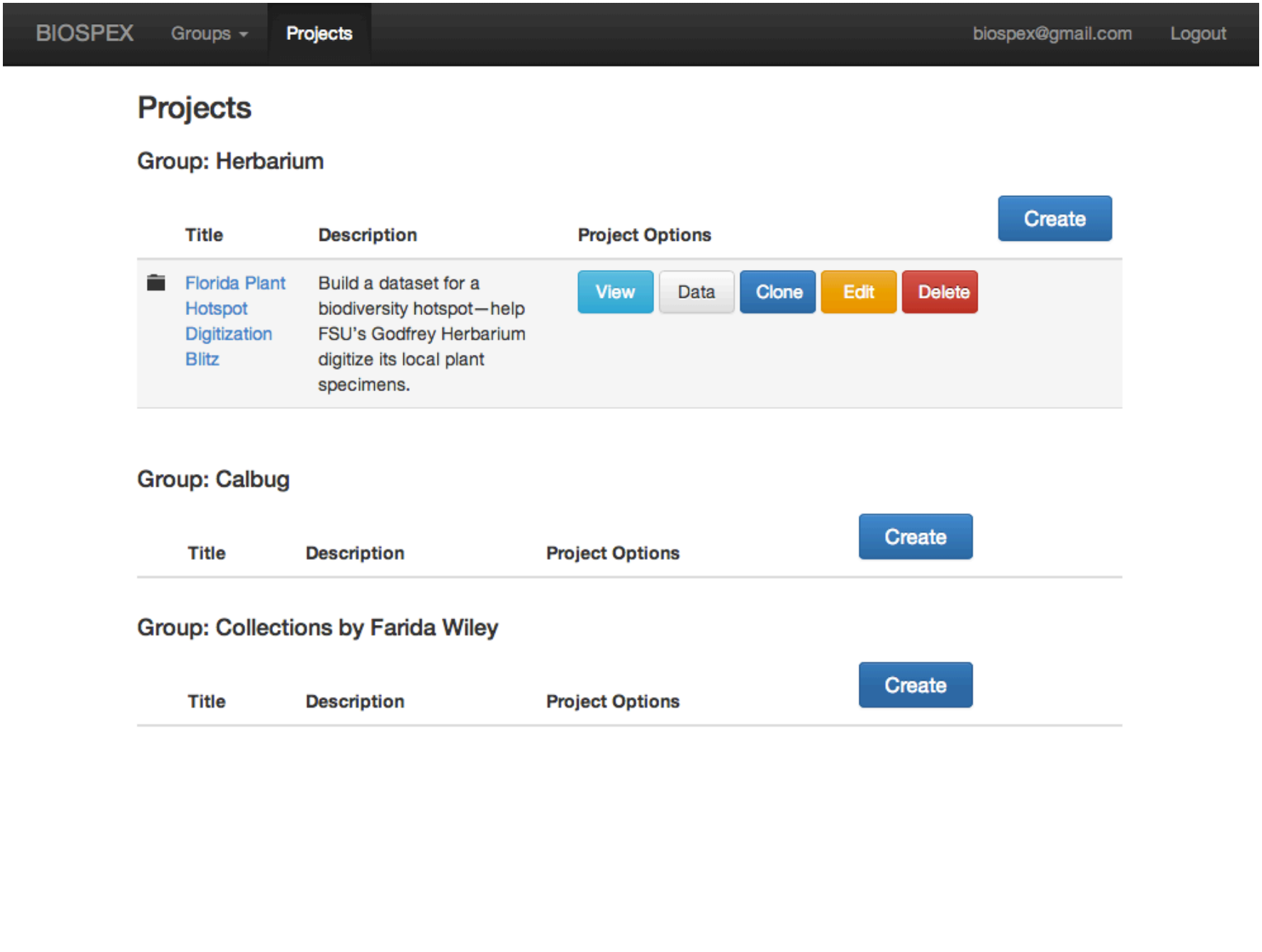
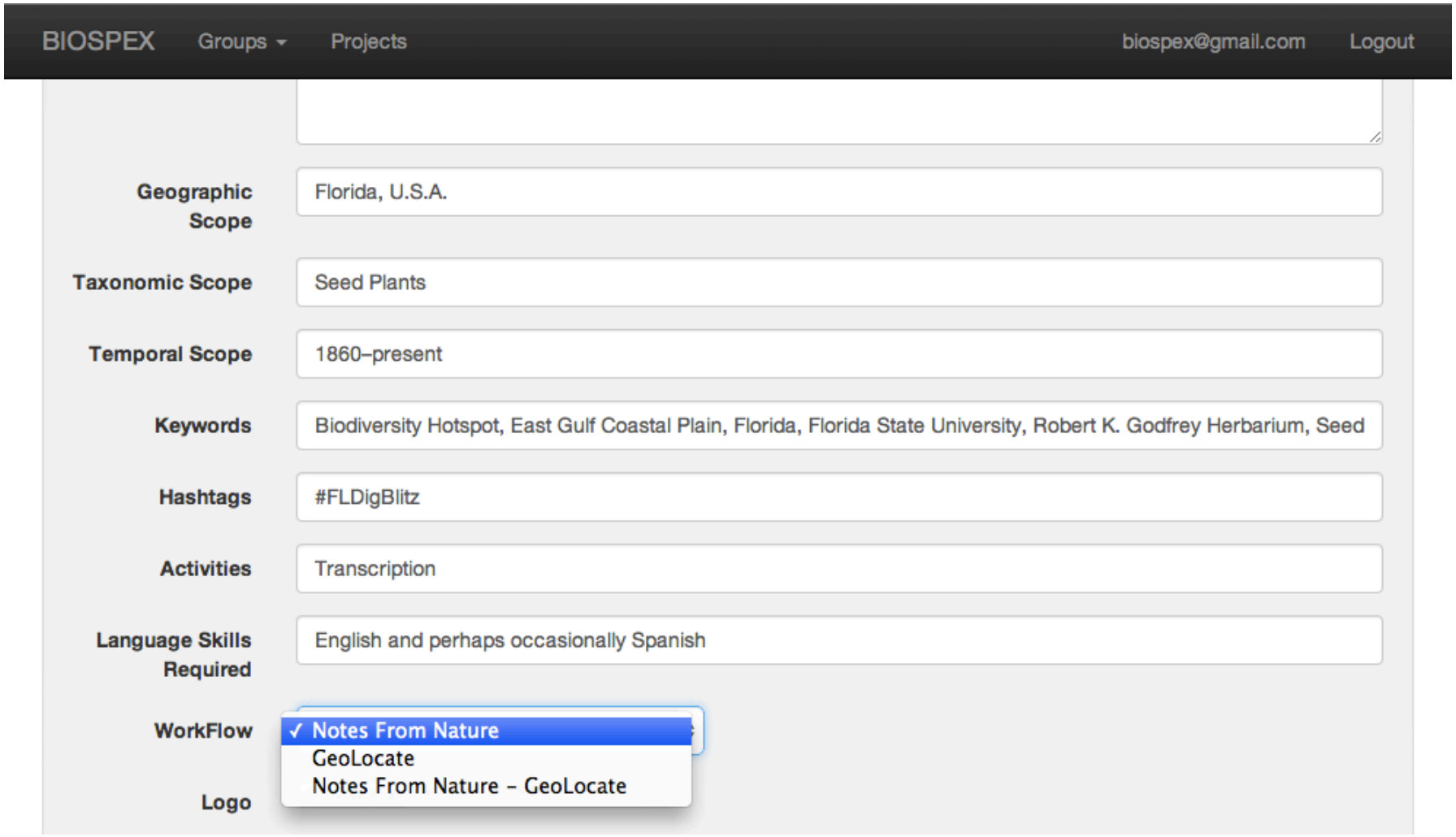
Foundation.


BIOSPEX
Groups
Projects
biospex@gmail.com
Logout
Projects
Group: Herbarium
Title
Description
Project Options
Create
Florida Plant Hotspot Digitization Blitz
Build a dataset for a biodiversity hotspot—help FSU's Godfrey Herbarium digitize its local plant specimens.
View
Data
Clone
Edit
Delete
Group: Calbug
Title
Description
Project Options
Create
Group: Collections by Farida Wiley
Title
Description
Project Options
Create


BIOSPEX
Groups
Projects
biospex@gmail.com
Logout
Geographic Scope
Florida, U.S.A.
Taxonomic Scope
Seed Plants
Temporal Scope
1860–present
Keywords
Biodiversity Hotspot, East Gulf Coastal Plain, Florida, Florida State University, Robert K. Godfrey Herbarium, Seed
Hashtags
#FLDigBlitz
Activities
Transcription
Language Skills Required
English and perhaps occasionally Spanish
WorkFlow
✓ Notes From Nature
GeoLocate
Notes From Nature - GeoLocate
Logo

BIOSPEX Login Register

Florida Plant Hotspot Digitization Blitz

Build a dataset for a biodiversity hotspot—help FSU's Godfrey Herbarium digitize its local plant specimens.

The Florida State University's Robert K. Godfrey Herbarium seeks to digitally image and database 100% of its current Florida specimens in a 24-month period starting May 1, 2014 using a combination of staff and volunteers. The approach is purposefully groundbreaking, involving volunteers in all steps of the digitization process on- and off-site using new tools (e.g., Notes from Nature and BIOSPEX). The herbarium is the most extensive plant collection documenting plant diversity in the Florida panhandle—a national biodiversity hotspot with many very narrowly distributed plant species and subspecies. As such, it represents an irreplaceable resource to researchers, natural resource managers, policy makers, and nature enthusiasts. The data will be made available online through the Godfrey Herbarium website, iDigBio, and the Global Biodiversity Information Facility.

How to Participate

This project has the following active expeditions:

Expedition	% Complete	Join In
Apalachicola National Forest #1	85%	Notes from Nature
Apalachicola National Forest #1	35%	GeoLocate
Apalachicola National Forest #2	15%	Notes from Nature

Managed by	The Florida State University's Robert K. Godfrey Herbarium
Contact	Austin Mast
Website	http://herbarium.bio.fsu.edu
Circumscription	The project targets approximately # specimens collected in Florida that have not yet been digitally imaged or databased to date.
Strategy	The Godfrey Herbarium will host a series of digital imaging blitzes onsite with a goal of producing 3000 images at each blitz. These will be wrapped into 500-specimen "expeditions" with themes that make them interesting (e.g., all from swamp habitat) or lead to greater efficiencies (e.g., all from same collector) for online transcription via Notes from Nature and/or similar tools.
Incentives	Volunteers who contribute 3 days onsite during the imaging blitzes or >500 online transcriptions will be sent a coffee mug or water bottle with the project logo on it.
Geographic Scope	Florida, U.S.A.
Taxonomic Scope	Seed Plants
Temporal Scope	1860–present
Language Skills Required	English and perhaps occasionally Spanish

Apalachicola National Forest #1

Florida Plant Hotspot Digitization Blitz

Process

Description: Help us transcribe specimens from the Apalachicola National Forest in Florida's Panhandle!

Keywords: Apalachicola National Forest, Leon County, Wakulla County, Liberty County, Florida, Plants, Pitcher Plant Savannas, Pine Flatwoods

Created: *07/21/2014*

Updated: *07/21/2014*

Data

Clone

Edit

Delete

Subjects: 800

Citstitch Hackathon

CITSTITCH
HACKATHON

Co-sponsored with Notes from Nature, December 3–5, 2014

Public Pa[illegible]pation Interoperability Hackathon
Sponsor[illegible]o and Zooniverse's Notes from Nature
[illegible]mber 3–5, 2014 in Gainesville, FL, USA

Applications due Sept 1

[illegible]gBio (www.idigbio.org) and Zooniverse's Notes from Nature Project (www.notesfromnature.org) are pleased to announce the CitStitch Hackathon. The goal of the event is to build interoperability among projects that enables public participation in the digitization of biodiversity research specimens in useful and exciting ways. Two or more development tracks will be identified by hackathon participants during one or more remote meetings prior to the hackathon. These tracks could involve such things as (1) innovative cross-platform ways to deploy and manage public participation projects, (2) services for data analysis and visualization to engage the public or inform project management, (3) novel ways to advertise and grow public participation projects, or (4) ingestion of crowdsourced data into biodiversity collection data management systems.

Co-organized by Austin Mast (FSU) & Rob Guralnick (UC-Boulder)

TWO NEW PUBLIC PARTICIPATION WORKING GROUPS

Congratulations to iDigBio's Public Participation in Digitization Working Group, which accomplished each of its **nine goals**! The public participation in digitization work has now matured to the point where it requires greater working group specialization. The original working group has been retired and replaced by two new ones: a **group focused on interoperability among the major cyberinfrastructure components in the domain** and a **group focused on public participant engagement online and onsite.** Both working groups are actively recruiting new members. The current interoperability group is planning the CitStitch Hackathon for December 2014. If interested in the working groups, please contact **Austin Mast** or **Libby Ellwood**.

CITSTITCH HACKATHON

Acknowledgements

Austin Mast

Robert Bruhn

Jeremy Spinks

Greg Riccardi

iDigBio
Integrated Digitized Biocollections

FLORIDA STATE UNIVERSITY
VIRES ARTES MORES
1851

NSF

Contact: Libby Ellwood
eellwood@bio.fsu.edu