Thrills and spills: sharing experiences, insights, and products on education, outreach, diversity & inclusion

ADBC Summit 2019

Outline

- 75 mins total
- 5 minute lightening talks
- Q&A/Discussion after everyone goes…

Digital Fossils: There’s an App for That

Bruce S. Lieberman

Biodiversity Institute, University of Kansas

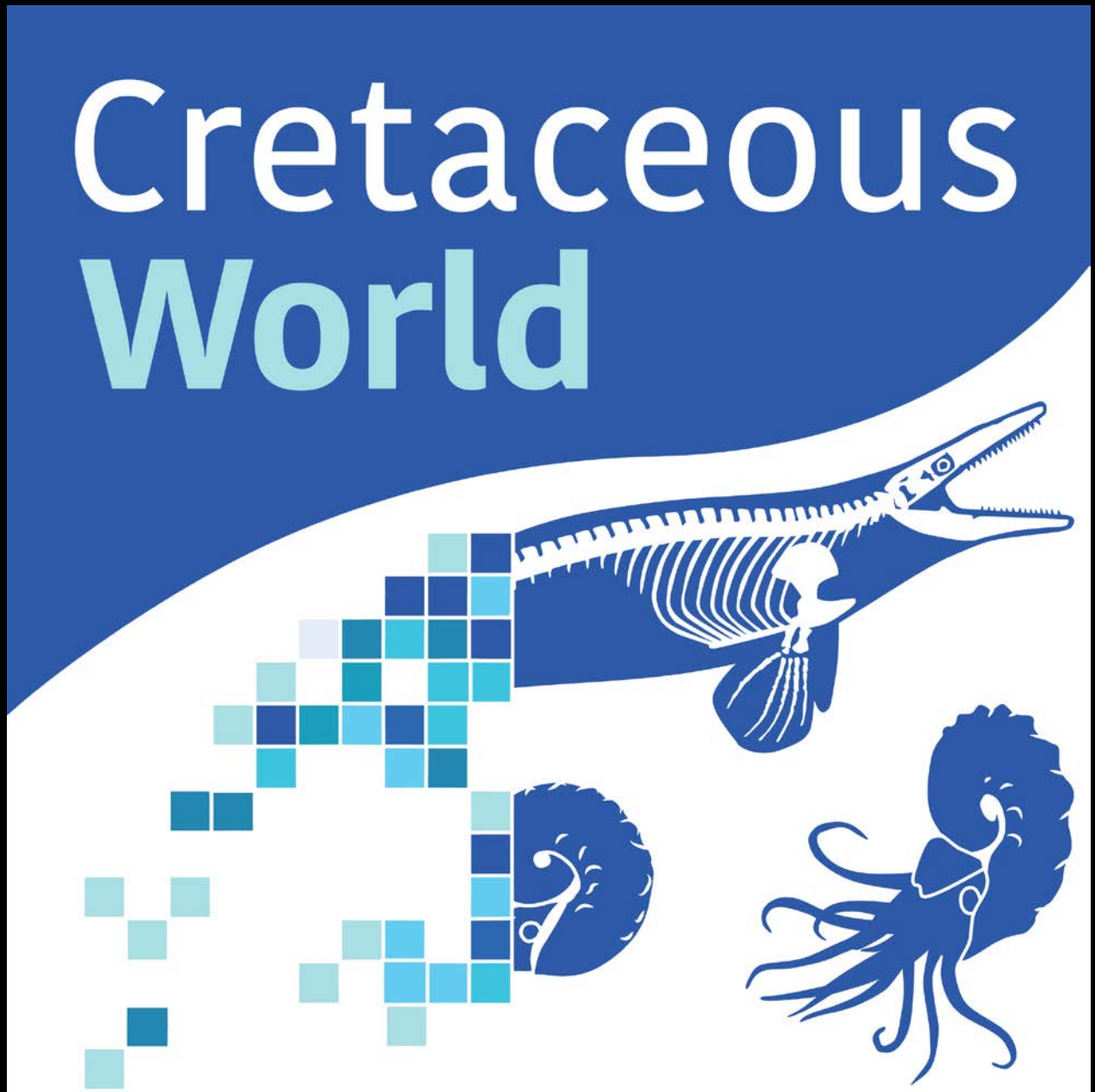
The PALEONICHES - TCN

Ordovician
Cincinnati Region

Pennsylvanian
Midcontinent U.S.

Neogene
Southeastern U.S.

The Cretaceous World - TCN



PALEONICHES – TCN: Outreach

Digital Atlas of Ancient Life

Guide to Ordovician, Pennsylvanian, and Neogene fossils

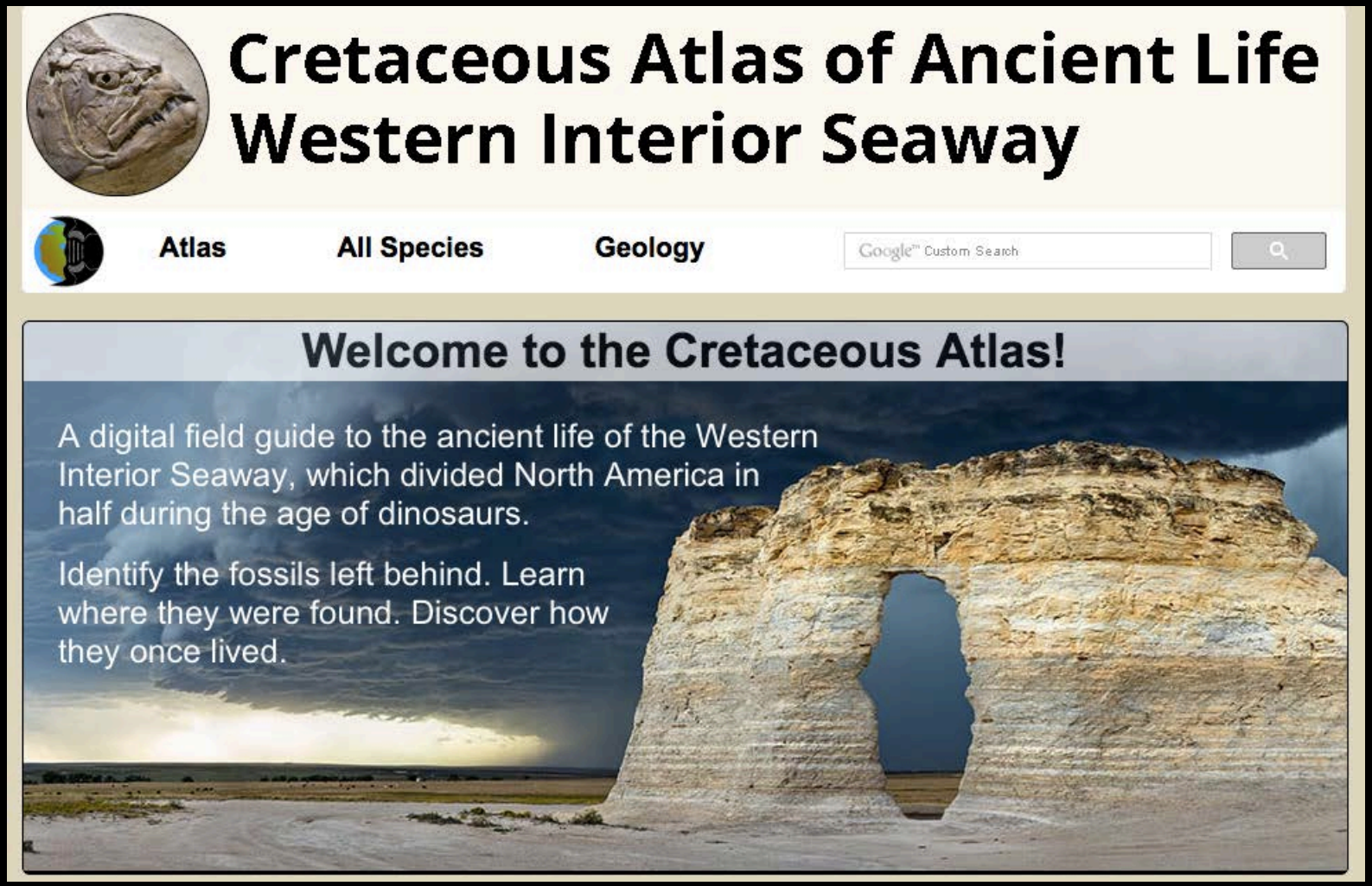
www.digitalatlasofancientlife.org

@PaleoDigAtlas

Digital Atlas App

Free for iPhone/iPad

Cretaceous World – TCN: Outreach



Hendricks et al. 2015. Palaeontologia Electronica

PALEONICHES – TCN: Outreach

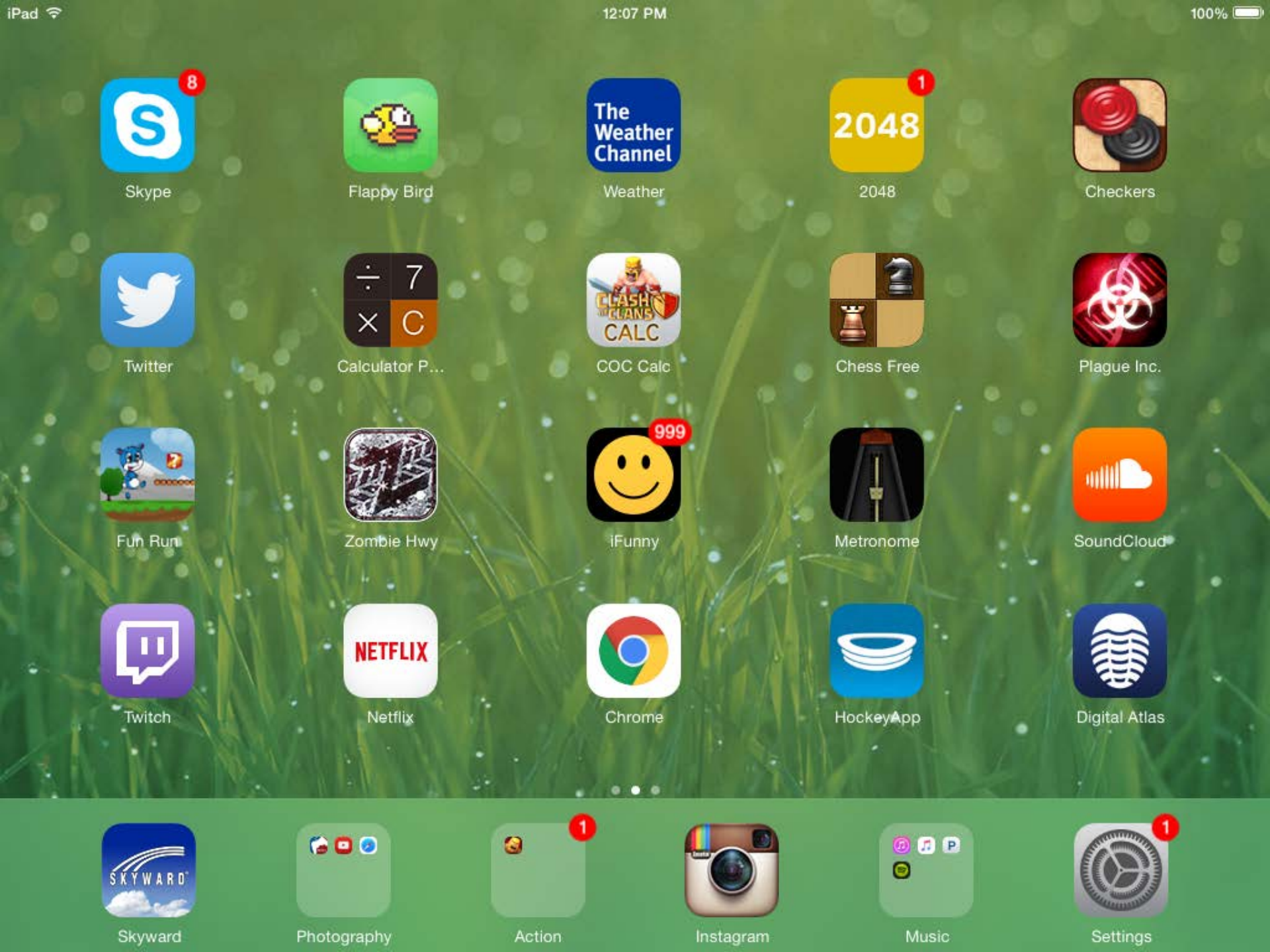
Digital Atlas of Ancient Life Website: www.digitalatlasofancientlife.org

Described in Hendricks, Stigall, and Lieberman. 2015. *Palaeontologia Electronica*

More than 1,250 species represented

DIGITAL ATLAS OF ANCIENT LIFE *APP*

- Derived from *Digital Atlas of Ancient Life* website
- Works on both *iPad* and *iPhone*
- *App* is available for free at *Apple App Store*
- Programmers Rod and Zach Spears


iPad
12:07 PM
100%
Skype
Flappy Bird
Weather
2048
Checkers
Twitter
Calculator P...
COC Calc
Chess Free
Plague Inc.
Fun Run
Zombie Hwy
iFunny
Metronome
SoundCloud
Twitch
Netflix
Chrome
HockeyApp
Digital Atlas
Skyward
Photography
Action
Instagram
Music
Settings

Digital Atlas of Ancient Life
Electronic Field Guide

Explore taxonomic information, images and maps for three Paleontological time periods.

START

BROWSE

TIME PERIOD

Information

The Digital Atlas of Ancient Life Electronic Field Guide App is supported by a grant from the National Science Foundation to principal investigators Dr. Bruce Lieberman (University of Kansas), Dr. Alycia Stigall (Ohio University), and Dr. Jonathan Hendricks (San Jose State University). The grant is titled, "Digitizing Fossils to Enable New Syntheses in Biogeography - Creating a PALEONICHES-TCN" (TCN stands for Thematic Collections Network).

This project is related to a broader natural history specimen digitization effort supported by the National Resource for Advancing Digitization of Biodiversity Collections (ADBC) called Integrated Digitized Biocollections, or iDigBio.

The main portal page for the Digital Atlas of Ancient Life project can be accessed at www.digitalatlasofancientlife.org. For additional information about the project, please see the recently published open-access paper by Hendricks, Stigall, and Lieberman (2015) in Palaeontologia Electronica. The individual websites can be accessed at: Ordovician Atlas, Pennsylvanian Atlas, and Neogene Atlas.

Funding for development and construction of this webpage was provided by the National Science Foundation (EF-1206757, EF-1206769, and EF-1206750)

Version: 1.0 (26)

Created by Rod Spears
Designed by Zach Spears

gital Atlas of Ancient Life Electronic Field Guide

Explore taxonomic information, images and maps for three Paleontological time periods.

Tap on a fossil to dig deeper into the taxonomic information.

Back

Phylum

Arthropoda

Brachiopoda

Bryozoa

Cnidaria

Echinodermata

Hemichordata

Mollusca

Porifera

Trace Fossils

Phylum
Arthropoda

Class
Trilobita

Back

Class Trilobita

Asaphida

Lichida

Phacopida

Ptychopariida

Class
Trilobita

Order
Phacopida

Family
Calymenidae

Genus
Flexicalymene

Species
Flexicalymene me...

Back

Flexicalymene meeki

(Foerste, 1910)

Geological Range

Maysvillian to Richmondian Age, C2 to C6 sequences

Paleogeographical Distribution

Ohio, Indiana, Kentucky, Virginia, New York, and Minnesota

Remarks

The most commonly found trilobite in Cincinnatian strata. Characterized by 13 (rarely 12) segments, sub triangular glabella, three glabellar furrows, and blunt, rounded genal spines.

Stratigraphic Occurrences

Richmondian C6
- Bull Fork Formation
- Dillsboro Formation
- Elkhorn Formation
- Upper Whitewater Formation

Richmondian C5
- Bull Fork Formation
- Dillsboro Formation
- Liberty Formation
- Waynesville Formation
- Whitewater Formation

Richmondian C4
- Arnheim Formation

Maysvillian C3
- Corryville Formation
- Dillsboro Formation
- Gilbert Formation
- Grant Lake Formation
- Mount Auburn Formation

Maysvillian C2
- Bellevue Formation
- Calloway Creek Formation
- Fairmount Formation
- Fairview Formation
- Mount Hope Formation

Flexicalymene meeki

(Foerste, 1910)


Class
Trilobita


Order
Phacopida


Family
Calymenidae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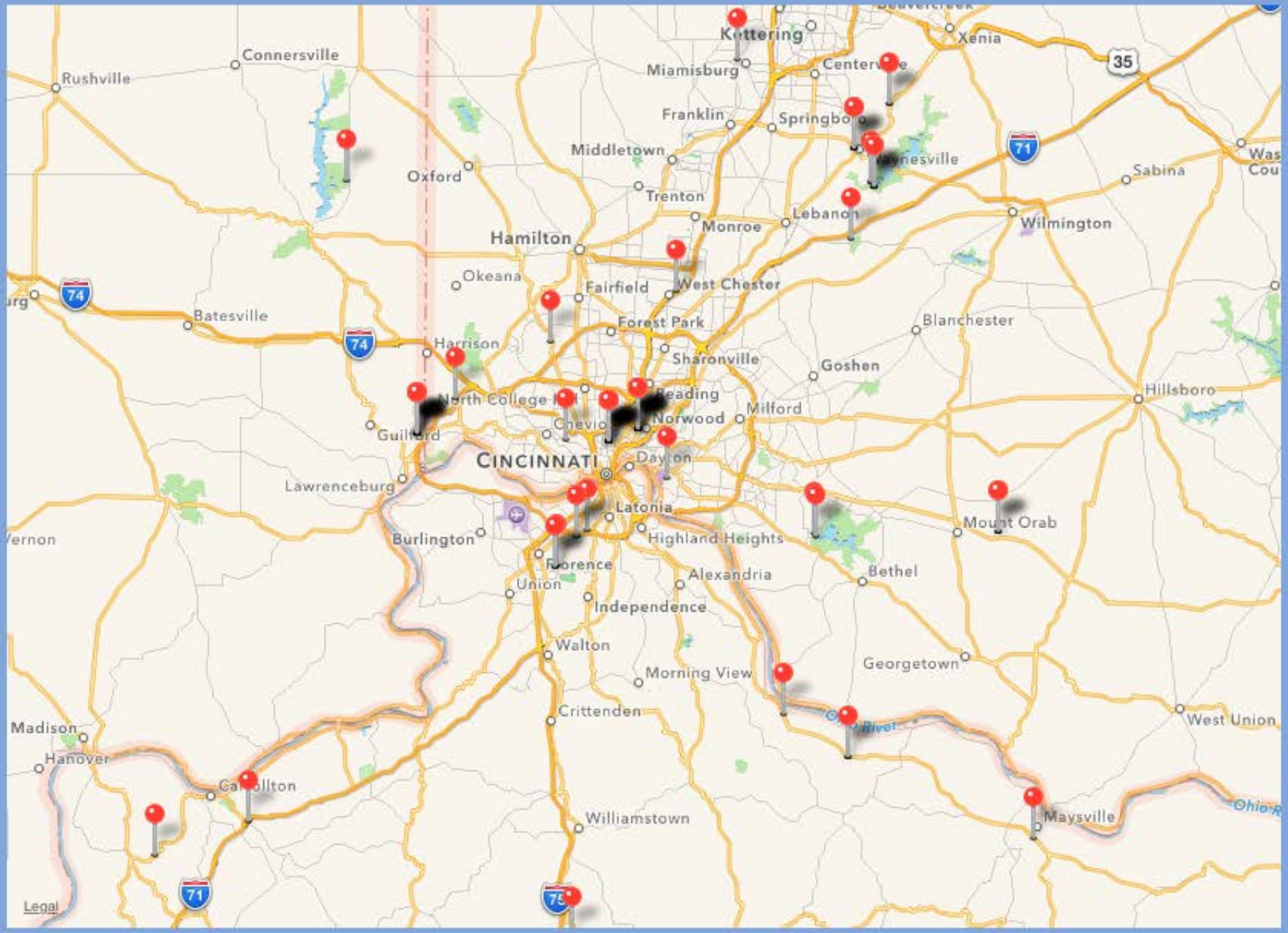

Class
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Order
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Flexicalymene me...

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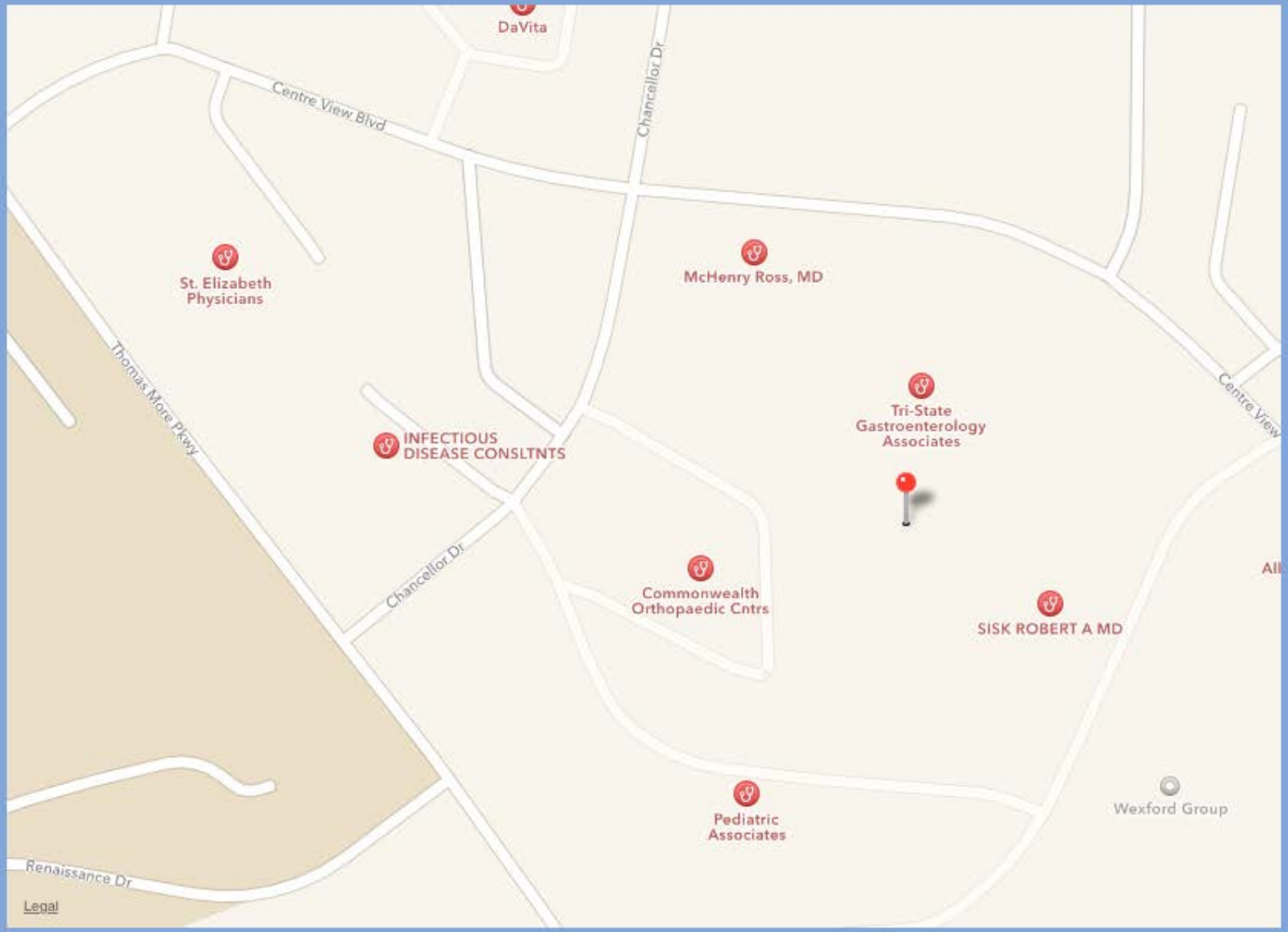
(Foerste, 1910)



Acantholabia sarasotaensis

Agathotoma candidissima

Agladrillia aulakoessa

Agladrillia rabdotacona

Agnocardia acrocome

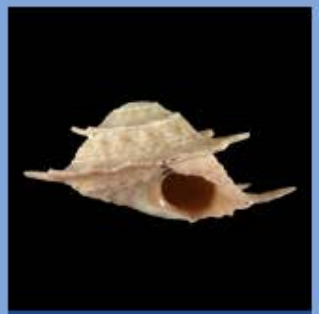
Architectonica chipolana

Architectonica nobilis

Arene agenea

Arene solariella

Arene tricarinata



Astralium phoebium

Bellaspira pentagonalis

Class
Gastropoda

Order
Heterobranchia

Family
Architectonicidae

Genus
Architectonica

Species
Architectonica no...

Back

Architectonica nobilis

Roding, 1798

Geological Range

Late Miocene to Middle Pleistocene; Recent.

Paleogeographical Distribution

Panama to Virginia.

Remarks

For information on the modern distribution of the species, see Malacolog and WoRMS.

Stratigraphic Occurrences

Middle Pleistocene
- Bermont Formation (S. FL)

Early Pleistocene
- Caloosahatchee Formation (S. FL)
- Nashua Formation (N. FL)

Late Pliocene
- Duplin Formation (SC, NC)
- Duplin / Raysor formations (GA)
- Jackson Bluff Formation (N. FL)
- Mare Formation (Venezuela)
- Raysor Formation (SC)
- Tamiami Formation (S. FL)
- Tamiami Formation (Lower) (S. FL)
- Tamiami Formation (Ochopee Limestone) (S. FL)
- Tamiami Formation (Pinecrest Beds) (S. FL)
- Yorktown Formation (VA)

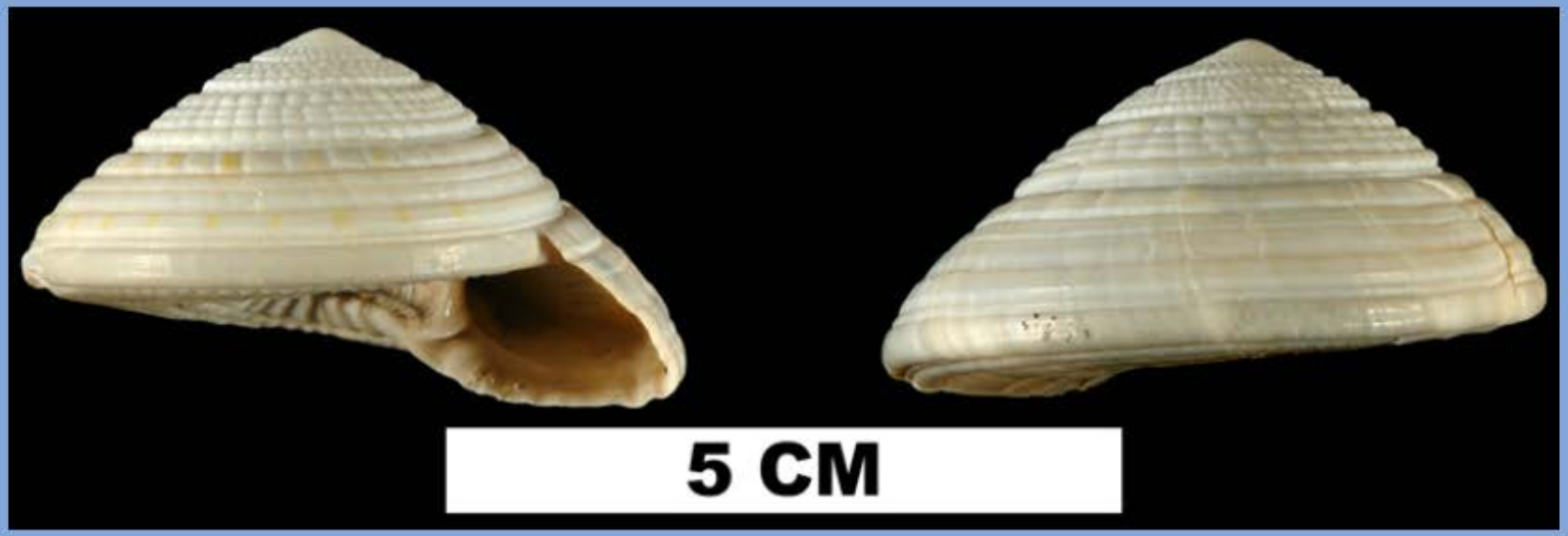
Early Pliocene
- Bowden Formation (Jamaica)
- Cayo Agua Formation (Panama)
- Playa Grande Formation (Maiquetia Member) (Venezuela)

Late Miocene
- Chagres Formation (Panama)
- Gatun Formation (Upper) (Panama)
- Gatun Formation (Middle) (Panama)
- Gatun Formation (Lower) (Panama)

Pleistocene				Pliocene		Miocene					
Late	Middle	Early		Late	Early	Late		Middle		Early	
Tarantian 0.126–0.0117	Ionian 0.781–0.126	Calabrian 1.80–0.781	Gelasian 2.58–1.80	Piacenzian 3.600-2.58	Zanclean 5.333-3.600	Messinian 7.246-5.333	Tortonian 11.62-7.246	Serravallian 13.82-11.62	Langhian 15.97-13.82	Burdigalian 20.44-15.97	Aquitanian 23.03-20.44

Architectonica nobilis

Roding, 1798



Class
Gastropoda

Order
Heterobranchia

Family
Architectonicidae

Genus
Architectonica

Species
Architectonica no...

Class
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Order
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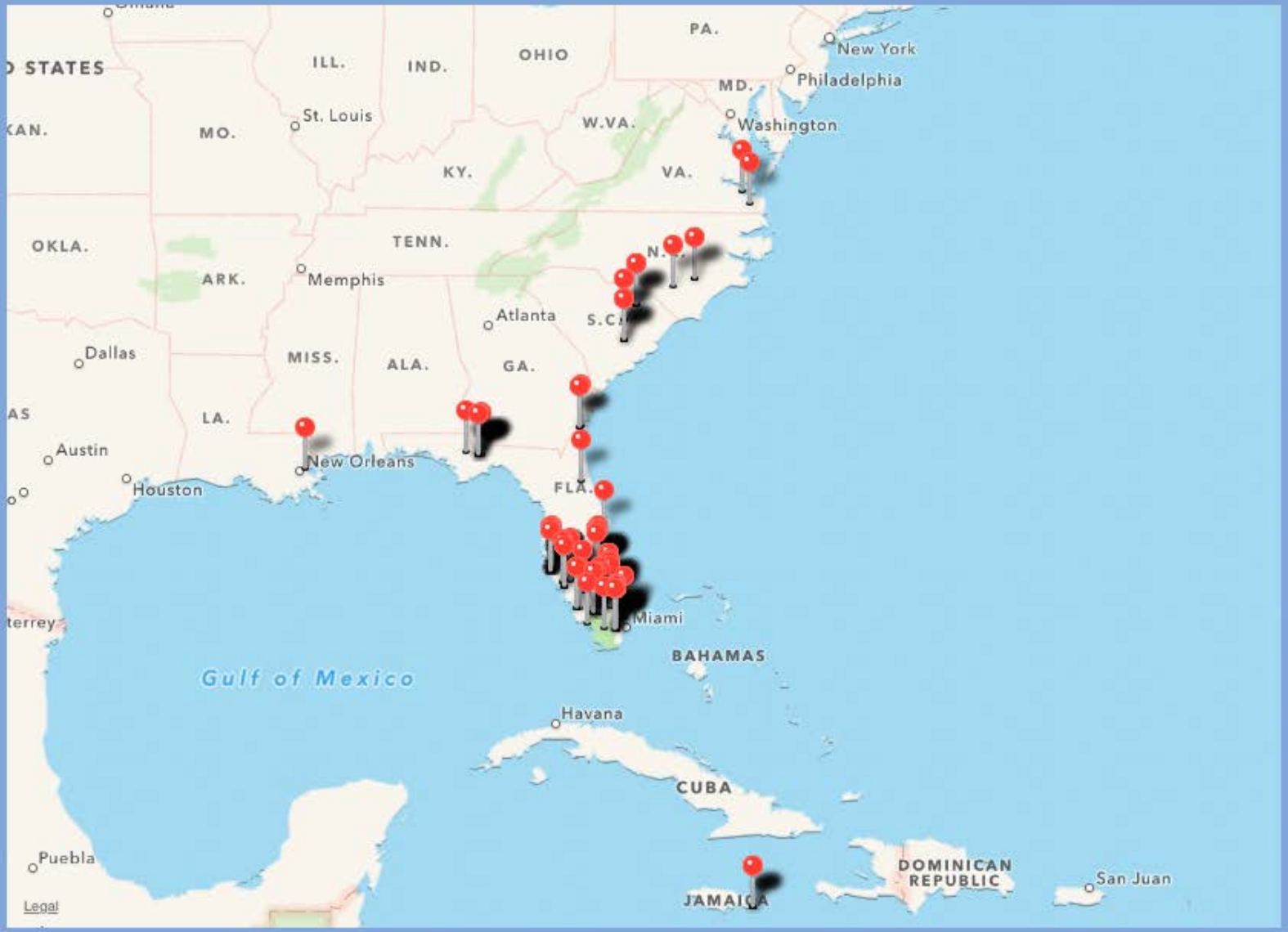
Architectonica nobilis

Roding, 1798



Conclusions

Digitizing museum collections enables knowledge transfer to the general public

Thanks to:

Julien Kimmig, Rod & Zach Spears, Jim Beach (KU)

Jon Hendricks (PRI)

Alycia Stigall (Ohio U.)

Funding

NSF Advancing the Digitization of Biological Collections

NSF Emerging Frontiers

WE DIG FL PLANTS

Digitizing Natural History Together

Team Challenge 2019!

WeDigFLPlants is pleased to announce the second **Team Challenge**. Five-person teams will compete to contribute data about the greatest number of Florida-collected plant specimens during the Worldwide Engagement for Digitizing Biocollections (WeDigBio) 2019 Event. Winning team members get great-looking t-shirts with the logo on the front (similar to the picture) and their team name across the back. We will also send a t-shirt to the top three most valuable players—participants with the greatest number of contributions who were not on the winning team. There are no restrictions for team composition. You could recruit enough participants to form one or more teams from a student group, a chapter of the Florida Native Plant Society, a Florida Master Gardener group, your high school graduating class, your book club, scattered friends from around the world—the possibilities are endless.

When: The team challenge starts as soon as it is October 17 somewhere in the world and ends when it is no longer October 20 anywhere in the world. This corresponds to the start and end of WeDigBio 2019 (see wedigbio.org for more info on that event, if you are interested).

Where: You can participate in the competition from anywhere in the world where you can access the internet.

EXPEDITIONS

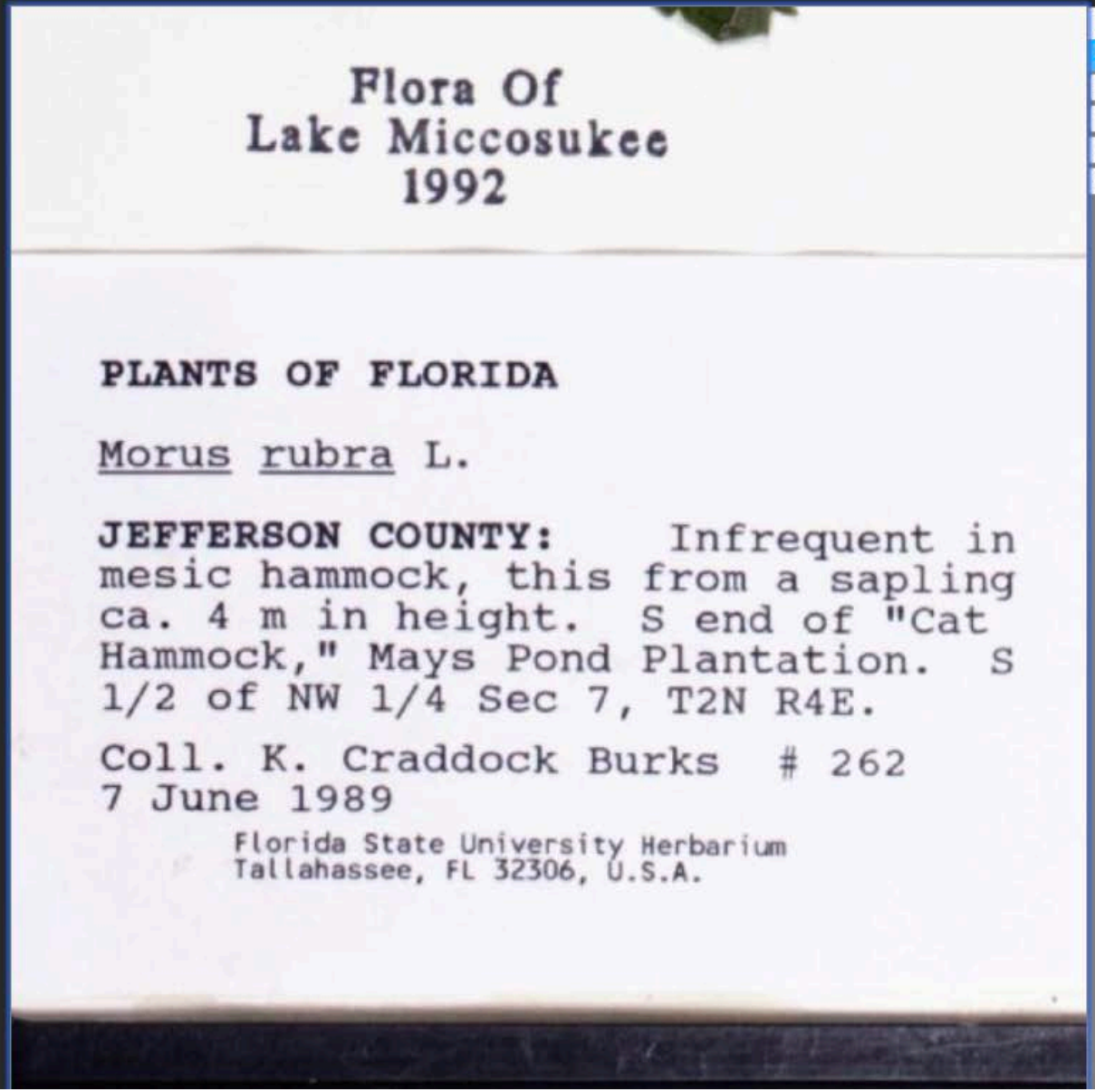
VIEW COMPLETED EXPEDITIONS

31 Expeditions | 94973 Transcriptions | 1912 Transcribers

TITLE DATE

3602 Transcriptions 58.74% completed

2140 Transcriptions 57.39% completed



Flora Of
Lake Miccosukee
1992

PLANTS OF FLORIDA

Morus rubra L.

JEFFERSON COUNTY: Infrequent in mesic hammock, this from a sapling ca. 4 m in height. S end of "Cat Hammock," Mays Pond Plantation. S 1/2 of NW 1/4 Sec 7, T2N R4E.

Coll. K. Craddock Burks # 262
7 June 1989

Florida State University Herbarium
Tallahassee, FL 32306, U.S.A.

TASK | TUTORIAL

Florida County

County

Select...

NEED SOME HELP WITH THIS TASK?

Next →

SCOREBOARD

Team Challenge 2018

2784

Transcriptions

#	Team	Transcriptions
1	CrossCoasters	683
2	MAGFLORA	592
3	The Botaniers :P	305
4	I Wet My Plants	295
5	Dank	262

Wisconsin State Herbarium

Department of Botany

UNIVERSITY OF WISCONSIN–MADISON

Professor Ken Cameron, Director

LAPI & Global Plants Initiative

WisFlora Project*

Tritrophic TCN

Lichens and Bryophytes TCN*

Microfungi TCN

Great Lakes Invasives TCN*

Endless Forms TCN

Pteridophytes TCN

IMLS Cryptogam Digitization*


5
A Nekoosa Paper

Wisconsin State Herbarium
Department of Botany
UNIVERSITY OF WISCONSIN–MADISON

HERBARIUM CURATION WORKSHOPS

I. Field Collection and Specimen Preparation
II. Mounting Herbarium Specimens
III. Databasing & TCN Web Portals
IV. Specimen Imaging
V. Georeferencing
VI. Filing

Certificate of Training

this certifies that

Kelly Martin

has successfully completed

the Herbarium Curation Training Program – administered by the Wisconsin State Herbarium: workshops attended include vascular plant mounting, transcribing/digitizing, filing, data management, and geo-referencing

Signed _____ *Date* _____

Mary Ann Feist – Herbarium Curator, Wisconsin State Herbarium
Sharon West – Microfungi TCN Project Manager, WIS

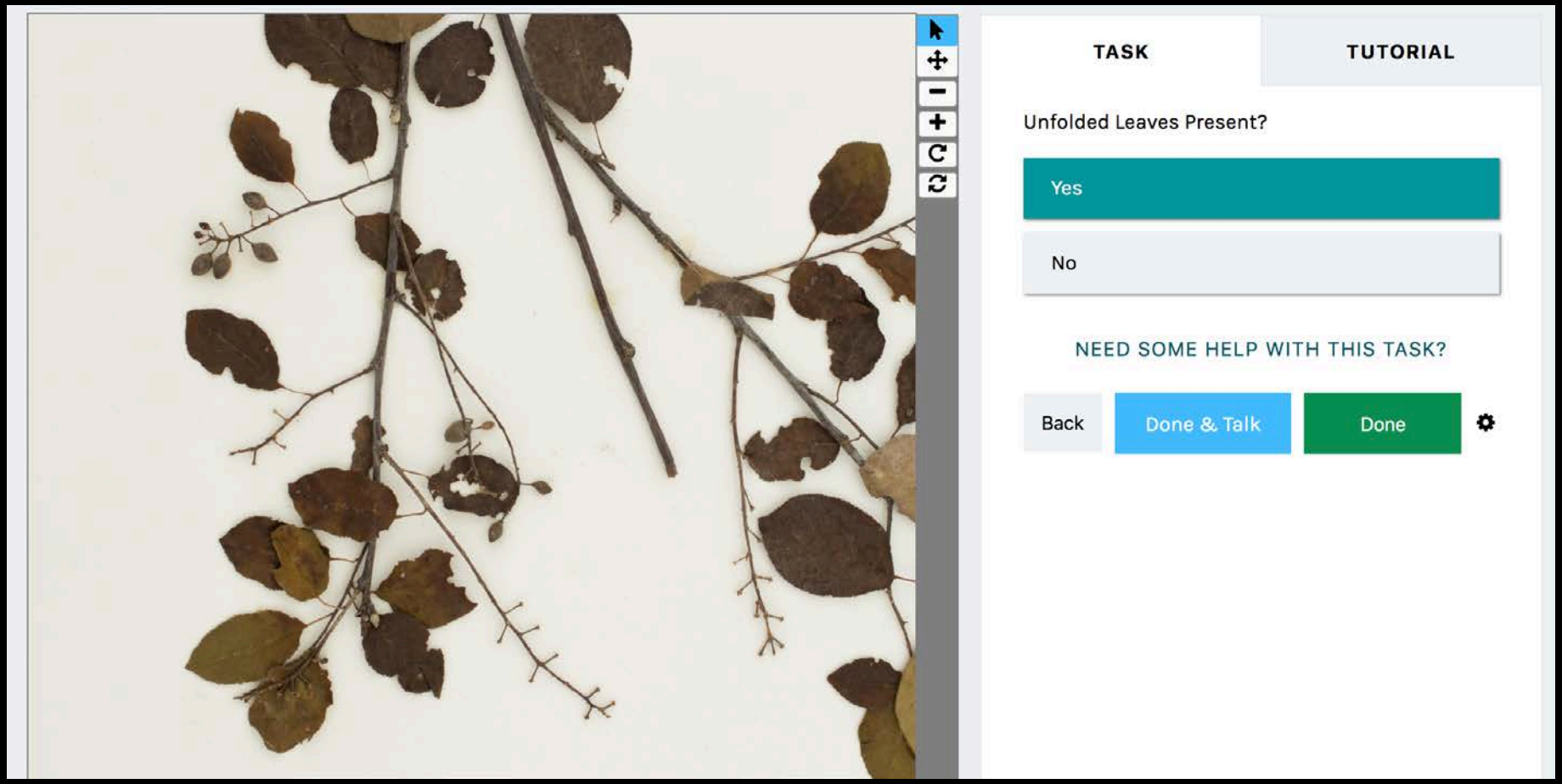
Thrills and Spills: Notes from Nature

M.W. Denslow

iDigBio Summit 2019

NSF Award 1410069

Notes from Nature (NfN)



NfN Basics

- Over 2 million transcriptions
- Over 17,000 registered users
- Over 200 expeditions

NfN *THRILLS*

- Over 2 million transcriptions
- Over 17,000 registered users
- Over 200 expeditions

NfN (1.0) Spills

- Images sets very limited
- Loading images challenging
- Backend specialized

We were getting interest, but how could we possibility keep this going?!

NfN (2.0) Thrills

- Proof of concept leads to further development
  - Thank to NSF and community support!
- More control of backend

We can build smaller thematic expeditions, which are much more effective!

NfN 3.0 Thrills and Spills

- Giving more control to the community

As our primary funding runs down how do we keep NfN flourishing?

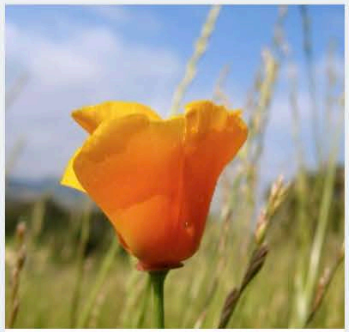
Notes from Nature

Transcribe museum records!

s Volunteer

All | Plants | Bugs | Butterflies | Labs

NOTES FROM NATURE - SOUTHEASTERN U.S. BIODIVERSITY



NOTES FROM NATURE - CAPTURING CALIFORNIA'S FLOWERS

NOTES FROM NATURE - BUTTERFLIES

NOTES FROM NATURE - PLANTS OF ARKANSAS

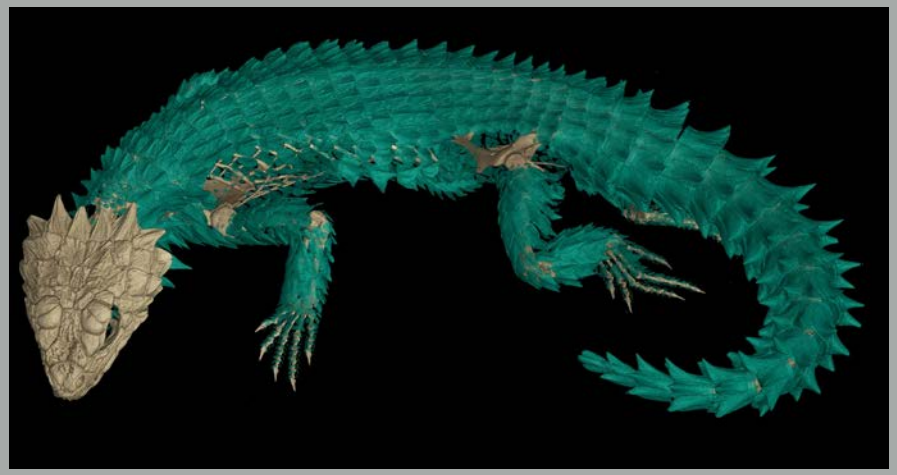
NOTES FROM NATURE - CALBUG

NfN 3.0 Thrills?

- Organization Model
  - Organization = Notes from Nature
  - Projects = Southeastern U.S. Biodiversity
  - Expeditions = Dr. T's Ferntastic Collection

- More content
- More user permission and access to backend

openVertebrate (oVert) Thematic Collection Network

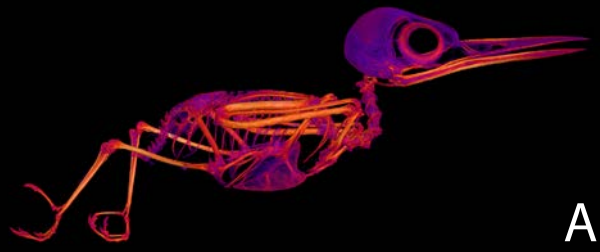


David C. Blackburn
Associate Curator of Herpetology
Florida Museum of Natural History
University of Florida

Thrills and spills: sharing experiences, insights, and products on education, outreach, diversity & inclusion

University of Florida
October 2, 2019

#oVertTCN



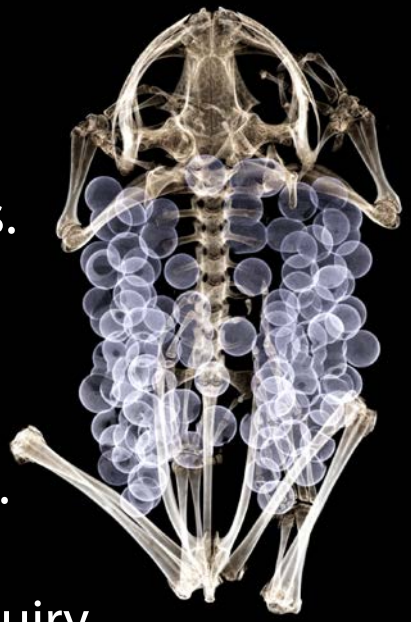
Digital Collection Objects

Add value to natural history collections.

Increase and democratize access.

Facilitate discoveries across disciplines.

Expand opportunities for object-based inquiry.



oVert

K12 classrooms

Academy of Holy Names
Tampa, Florida

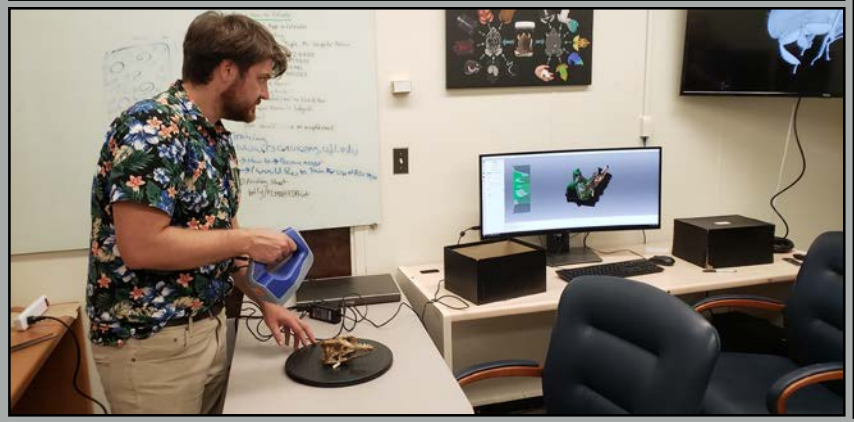
Undergrad Teaching

Chris Sheil
John Carroll University

Art: “Creature Design” class

Lars Grant-West
Rhode Island School of Design

Working with teachers to develop new learning activities that make use of 3D data in classrooms



Teacher: Bridget Armstrong School: Okeeheelee Middle School Armstrong_Evidence of Evolution Homologous Structures	Abstract: This lesson plan uses the products of the oVERT project, at the University of Florida, in order to make the Evidence of Evolution section of the Middle School Scope and Sequence both more hands on, and more attractive to students of the technological age. Specifically, it uses the CT (Computed Tomography) scans of vertebrate forelimbs, both as 3D models and as shapefiles, to enhance and illustrate the concepts of homologous structures, and the evolution of anatomical structures as a function of their use (i.e. locomotion, grasping, and burrowing).
Teacher: Jennifer Broo School: Mariemont High School Broo_Origin and Diversity of Armor in Girdled Lizards	Abstract: The girdled lizards (Cordylidae) are a family of distinctively armored lizards endemic to Sub-Saharan Africa. Students examine lizards in this family to classify the lizards based on morphological characteristics. Students graph data on the percentage of osteoderm coverage in each lizard group and discover that natural selection due to predation has resulted in lightly armored lizards living in large rocks and more heavily armored lizards living in open areas. Students then compare their morphological classification to phylogenetic trees created from DNA analysis and discover that convergent evolution is responsible for differences in osteoderm coverage within the Cordylidae family and in the animal kingdom.

June 2019

bit.ly/UF3DCPET2019

Digital Models for Teaching

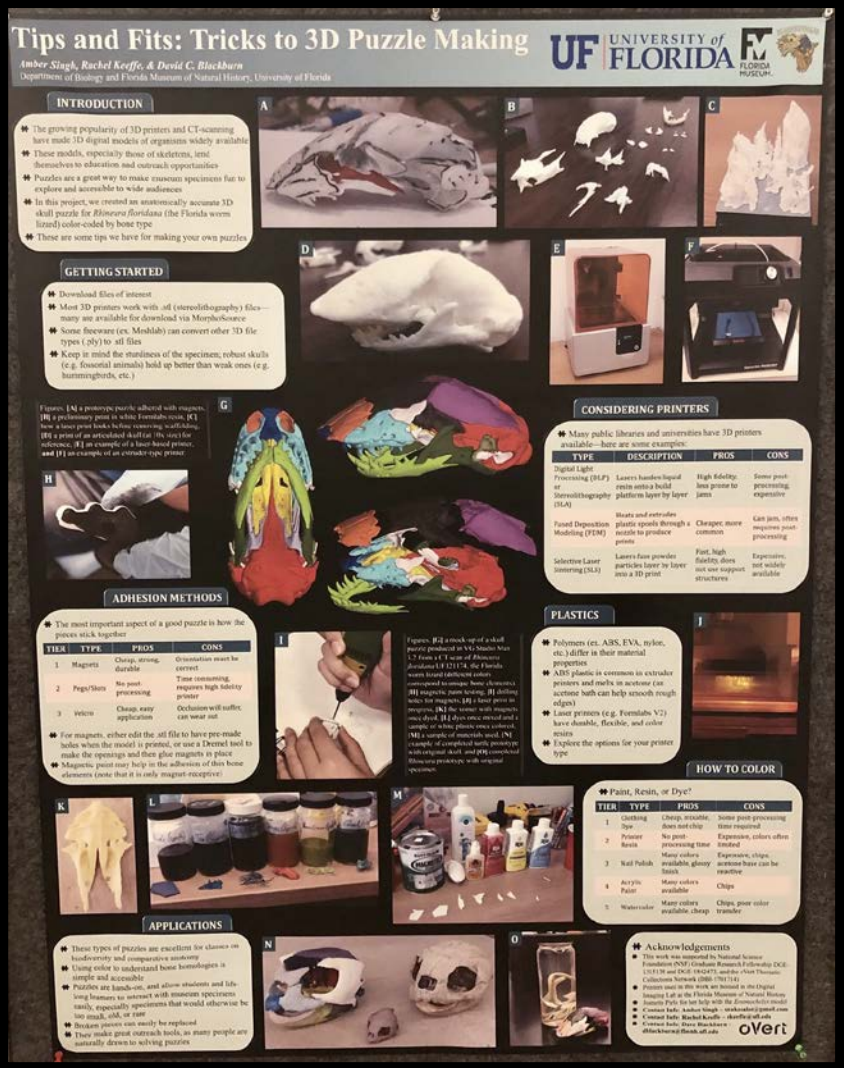
Sketchfab

oVert

Dermophis
family Dermophiidae

coming soon: new MorphoSource viewer

3D-printed Puzzles for Teaching & Outreach



oVert

BCEENET

BIOLOGICAL COLLECTIONS IN ECOLOGY AND EVOLUTION NETWORK

Widener University

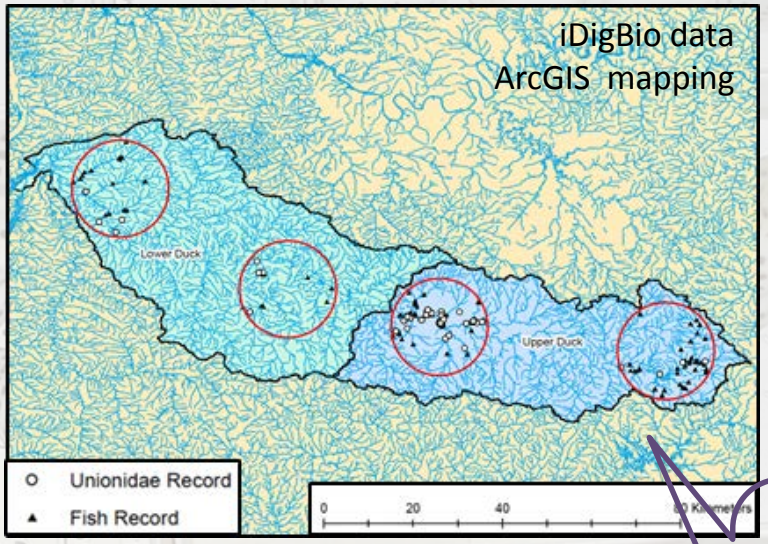
NSF

Delaware Museum of Natural History

Widener University

BIOL 350: Natural History Collections

Spring 2018



Course-based Undergraduate Research Experience (CURE)

Surprising how few academics knew about digitized natural history collections and their uses!

RCN-UBE incubator: Network for the integration of NHCs in Ecology and Evolutionary Biology CUREs

Overview:

- 1 year, NSF RCN –UBE incubator grant
- Steering Committee: iDigBio + faculty from mid-Atlantic Univ
- Goal: get a network up and running
- Activities: survey (now) and workshop (spring)
- Major outcome: 5 year, NSF RCN grant application

Survey (< 10 min):

- What do museum professionals know about CURES and how to get involved?
- What do faculty know about NHCs & how to use them?
- What resources/skills are essential?
  - Contribute to ongoing iDigBio & BLUE discussions

https://tinyurl.com/bceesurvey

Related Networks

Natural History Collection Data

BCEENET
BIOLOGICAL COLLECTIONS IN ECOLOGY AND EVOLUTION NETWORK

BLUE
Biodiversity Literacy in Undergraduate Education

NHODE – Natural History Organizations for (bio)Diversity and Education Network (in development)

Quantitative biology education

QUBES

BEDE Network

STUB – Statistical Thinking in Undergraduate Biology

CURE development

CCURI
Community College Undergraduate Research Initiative

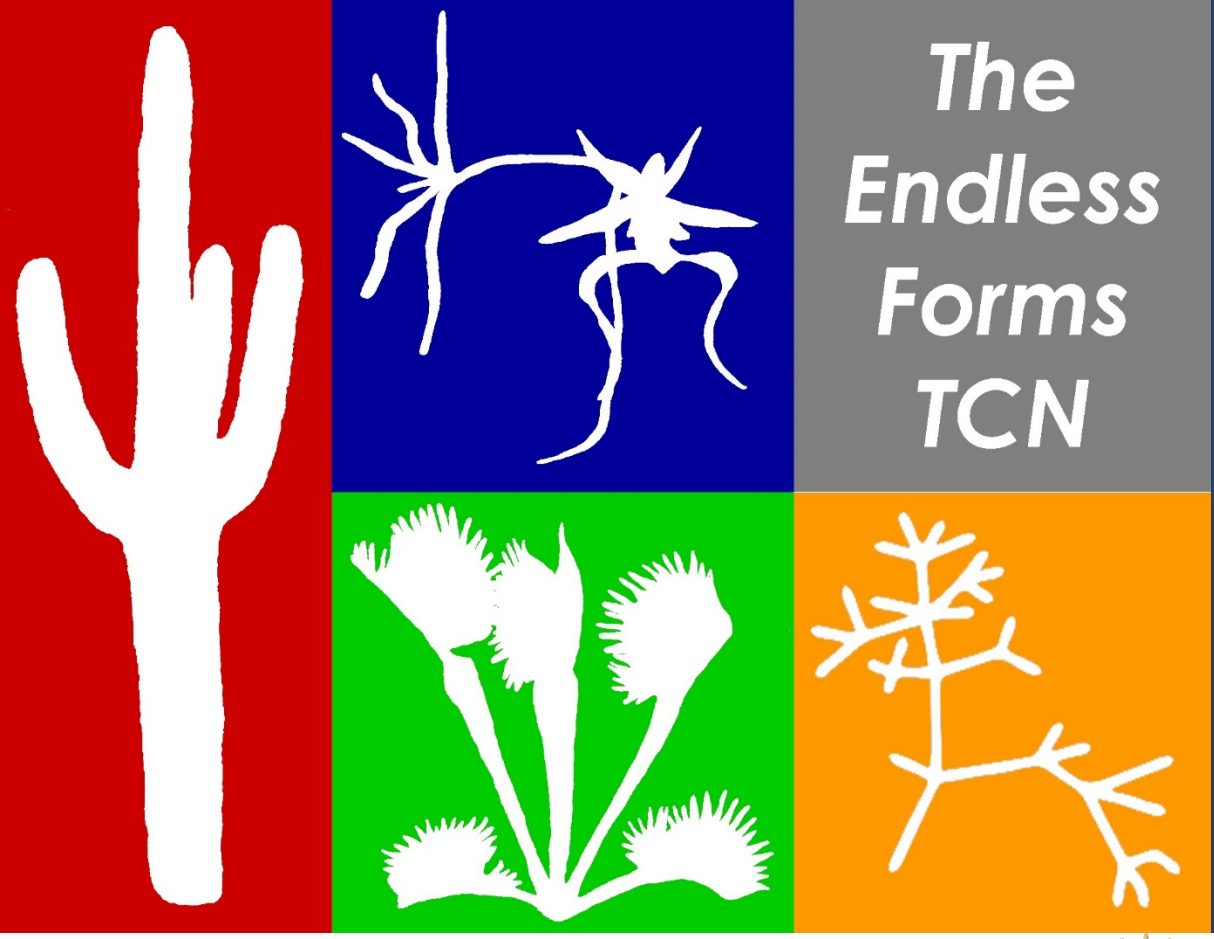
CUREnet
Course-based Undergraduate Research Experience

BCEENET

BIOLOGICAL COLLECTIONS IN ECOLOGY AND EVOLUTION NETWORK

Liz Shea (co-PI)
eshea@delmnh.org
Jean Woods (co-PI)
jwoods@delmnh.org
Janice Krumm (lead PI)
jlkrumm@widener.edu

https://tinyurl.com/bceesurvey



The Endless Forms TCN

Matthew Pace, Lin Li, & Barbara Thiers

The New York Botanical Garden

mpace@nybg.org

LLi@nybg.org

bthiers@nybg.org

NYBG

NSF

CALIFORNIA ACADEMY OF SCIENCES

BRIT
Botanical Research Institute of Texas
Plant to planet.

Missouri Botanical Garden

Berkeley
University of California

Harvard University

The Academy of Natural Sciences of Drexel University

Wisconsin
University of Wisconsin–Madison

University of Minnesota

FIELD MUSEUM

University of Michigan

UMASS Amherst

Texas
The University of Texas at Austin

Illinois Natural History Survey
Prairie Research Institute

Marie Selby Botanical Gardens

Endless Forms Conservation Internship

- Digitize 2,000,000 herbarium specimens of carnivorous, epiphytic, and succulent plants in 15 families from all global regions
- NYBG partnered with a local NYC High School
- 5 high school students worked at NYBG for 1 month
- They learned about the project, the plants involved, and the conservation threats facing the world's plants
- Students learned basic GIS techniques, and worked on 2 species / student, producing draft conservation assessments

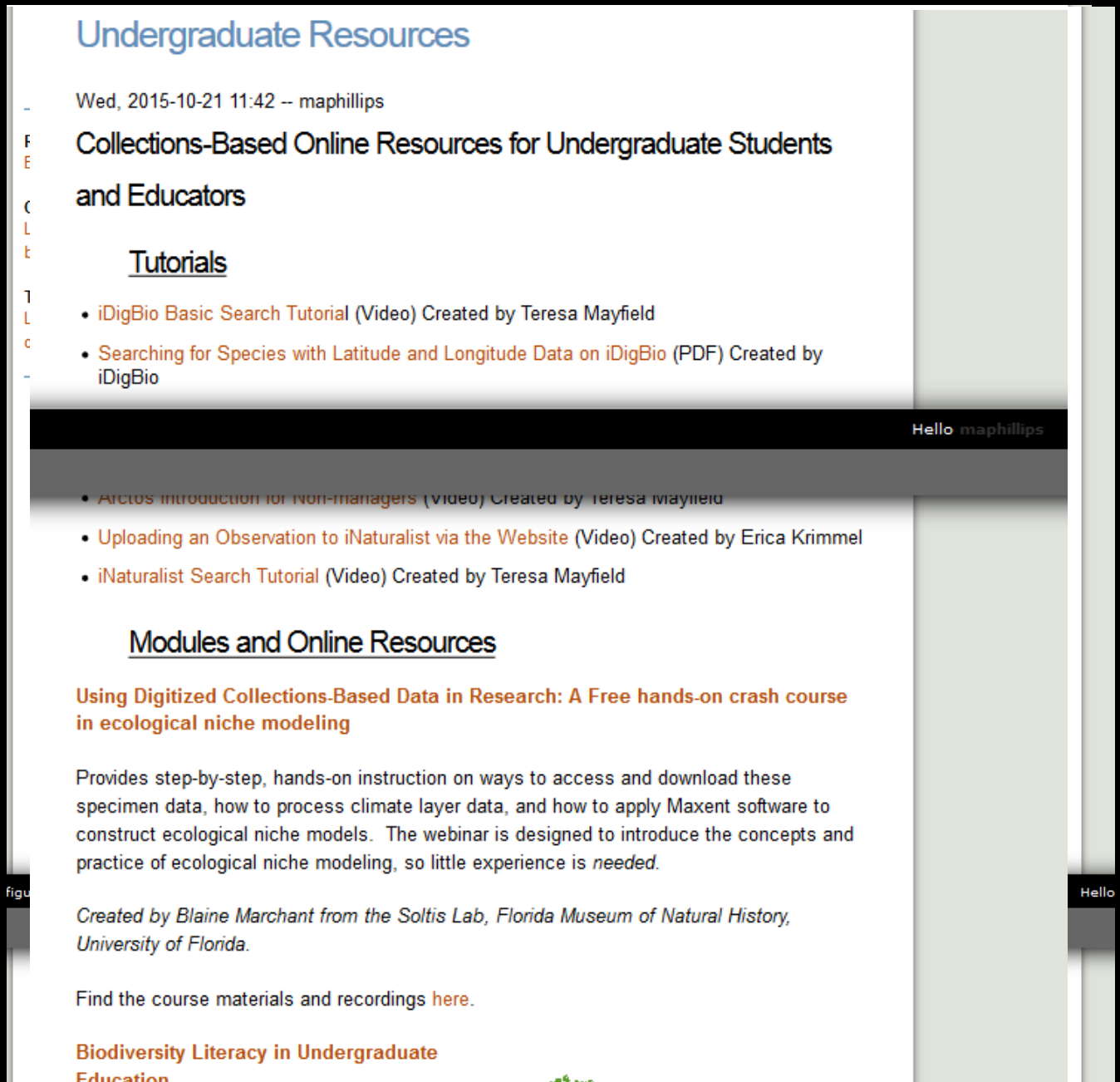

What's Happening To
Our Plants?

- Students presented their research to NYBG Science staff

- They were interviewed by the NYBG marketing department, and their presentations were filmed

- When asked about how this internship changed their understanding of plant conservation, the students all said this internship completely changed their world view of conservation, and improved their understanding of data gathering & analysis

https://www.idigbio.org/education



Undergraduate Resources

Wed, 2015-10-21 11:42 -- maphillips

Collections-Based Online Resources for Undergraduate Students and Educators

Tutorials

- iDigBio Basic Search Tutorial (Video) Created by Teresa Mayfield
- Searching for Species with Latitude and Longitude Data on iDigBio (PDF) Created by iDigBio

Hello maphillips

- Arctos Introduction for Non-managers (Video) Created by Teresa Mayfield
- Uploading an Observation to iNaturalist via the Website (Video) Created by Erica Krimmel
- iNaturalist Search Tutorial (Video) Created by Teresa Mayfield

Modules and Online Resources

Using Digitized Collections-Based Data in Research: A Free hands-on crash course in ecological niche modeling

Provides step-by-step, hands-on instruction on ways to access and download these specimen data, how to process climate layer data, and how to apply Maxent software to construct ecological niche models. The webinar is designed to introduce the concepts and practice of ecological niche modeling, so little experience is *needed*.

Created by Blaine Marchant from the Soltis Lab, Florida Museum of Natural History, University of Florida.

Find the course materials and recordings here.

Biodiversity Literacy in Undergraduate Education

Biodiversity Literacy in Undergraduate Education

This is a project that is focused on bringing collections data into undergraduate classrooms and using it to teach data skills. It evolved from a meeting in November 2016 called, "Integrating Resources and Growing the Community: Data Resources and Data Literacy".

Biodiversity Literacy in Undergraduate Education

Resources

Movement: Nature's Flying Machines

Blake Cahill, Anna Monfils, Debra Linton
Version: 1.0

citizen science, quan... 217 74 0 05.23.2019

Data is the New Science

Anna Monfils, Debra Linton, Libby Ellwood, Molly Phillips
Version: 1.0

389 178 0 04.12.2019

Following the Data

Anna Monfils, Debra Linton, Molly Phillips, Libby Ellwood
Version: 1.0

330 86 0 04.09.2019

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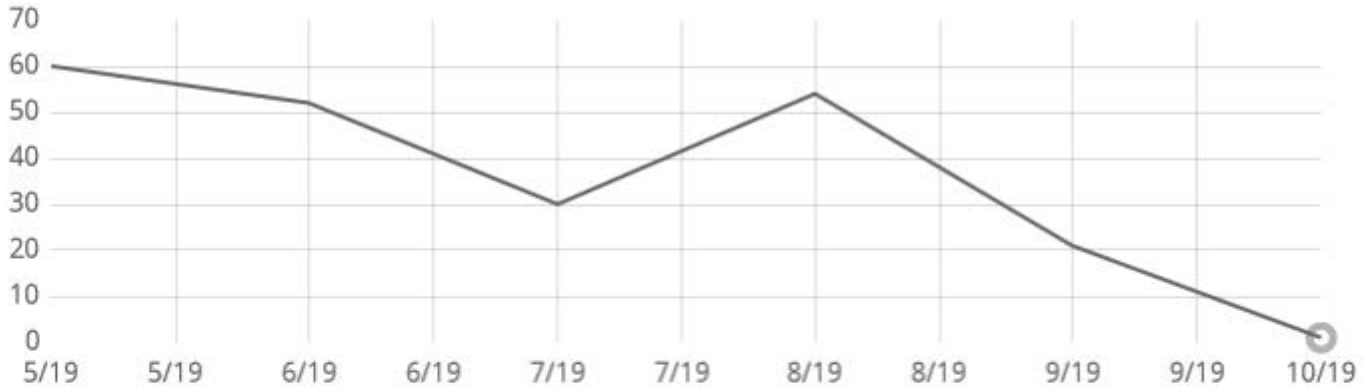

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