Welcome to ADBC!



The iDigBio Team

ADBC Summit 2019







iDigBio is funded by grants from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program [DBI-1115210 (2011-2018) and DBI-1547229 (2016-2021)]. 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. *© 2011-2019 iDigBio*

A couple of reminders…

- Wi-Fi
  - **HiltonHonors**
    - "I have a promotional code" = **Hiltonmeetings**
  - **Eduroam**
    - https://getonline.ufl.edu/

- Please silence your mobile devices
- Please mute your computer speakers & microphone

Summit Information

- **Use the Wiki:**
  - Wiki is continually updated with the latest info
  - https://www.idigbio.org/wiki/index.php/ADBC_Summit_2019

iDigBio, Coordinating Center for NSF's Program to Improve Accessibility to Specimen-based Data in U.S. Biodiversity Collections

01 October 2019

Gil Nelson, Director of iDigBio
Florida Museum of Natural History
University of Florida, Gainesville

iDigBio is funded by grants from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program [DBI-1115210 (2011-2018) and DBI-1547229 (2016-2021)]. 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. *© 2011-2019 iDigBio*

iDigBio: 9th Year

Began summer 2011

Renewal summer 2016





<u>Principal Investigators:</u>

Greg Riccardi, Digitization & Training (FSU)

Jose Fortes, Cyberinfrastructure (UF/ACIS)

Pam Soltis, Research Collaborations (FLMNH)

Bruce MacFadden, EODI Collaborations (FLMNH)

Gil Nelson, Director (FLMNH)

Context: Biodiversity Collections



Institutional collections in U.S. date back to 1812,
with some specimens collected 250 years ago

1,591 collections in USA



1 billion specimens in USA



3 billion specimens globally

Context: Biodiversity Collections



The largest source of information on biological diversity (outside nature)

1,591 collections in USA

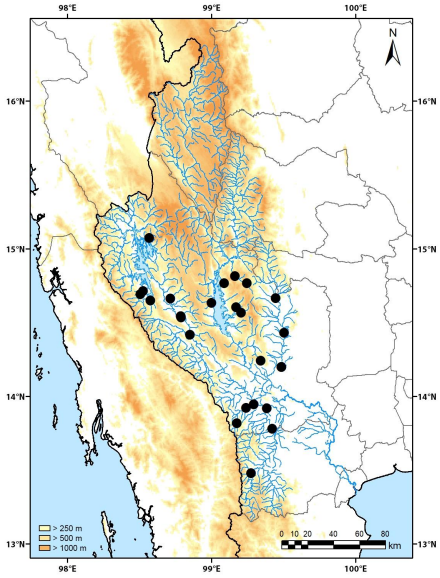


1 billion specimens in USA



3 billion specimens globally

Natural History Collections are fundamental to understanding biodiversity and to address "Big Science" questions:

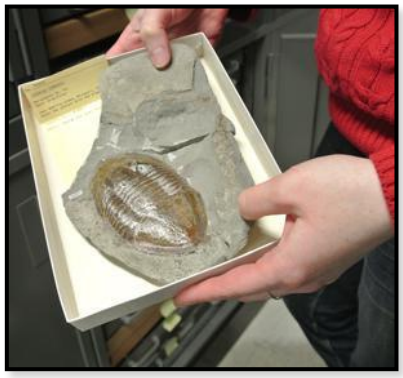


- **How many species are there?**
- **How are species distributed on the planet, and why?**
- **How do species vary, and what factors are responsible?**
- **Etc.**

Specimens of extinct species

– only source of information on those species

– paleoenvironments



Context: Biodiversity Collections



<u>Problem</u>: Data in collections have been inaccessible to most potential users



1 billion specimens in USA



3 billion specimens globally

NSF's Advancing Digitization of Biodiversity Collections Program, based on the national digitization effort as outlined in NIBA Strategic Plan, was launched in 2010 with the goal:

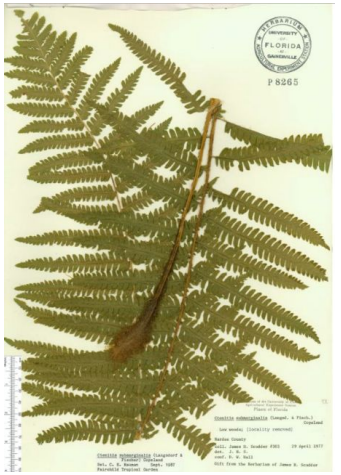
To digitize and make available online data associated with all specimens in all non-federal natural history collections in the U.S.



Funding:
1. Thematic Collections Networks (TCNs)
2. Central coordinating unit (iDigBio)

1. Thematic Collections Networks

- **Two-to-four year awards to collaborating institutions to digitize existing specimens based on a research theme**
- **Institutions digitize and mobilize the specimen-based data (but not necessarily pursue the research)**
- **Major emphasis has been on databasing, georeferencing, and imaging**



26 Thematic Collections Networks (TCNs)

- **InvertNet**: An Integrative Platform for Research on Environmental Change, Species Discovery and Identification (*Illinois Natural History Survey, University of Illinois*)
- **Plants, Herbivores, and Parasitoids**: A Model System for the Study of Tri-Trophic Associations (*American Museum of Natural History*)
- **North American Lichens and Bryophytes**: Sensitive Indicators of Environmental Quality and Change (*University of Wisconsin Madison*)
- **Digitizing Fossils** to Enable New Syntheses in Biogeography-Creating a PALEONICHES-TCN (*University of Kansas*)
- **The Macrofungi Collection Consortium**: Unlocking a Biodiversity Resource for Understanding Biotic Interactions, Nutrient Cycling and Human Affairs (*New York Botanical Garden*)
- **Mobilizing New England Vascular Plant Specimen Data** to Track Environmental Change (*Yale University*)
- **Southwest Collections of Arthropods Network** (SCAN): A Model for Collections Digitization to Promote Taxonomic and Ecological Research (*Northern Arizona University*)
- **The Macroalgal Herbarium Consortium**: Accessing 150 Years of Specimen Data to Understand Changes in the Marine/Aquatic Environment *(University of New Hampshire*)
- Developing a Centralized Digital Archive of **Vouchered Animal Communication Signals** (*Cornell University*)
- **Fossil Insect Collaborative**: A Deep-Time Approach to Studying Diversification and Response to Environmental Change (*University of Colorado at Boulder*)
- **Great Lakes Invasives**: Documenting the Occurrence through Space and Time of Aquatic Non-indigenous Fish, Mollusks, Algae, and Plants Threatening North America's Great Lakes (*University of Wisconsin Madison*)
- **InvertEBase**: Reaching Back to See the Future: Species-rich Invertebrate Faunas Document Causes and Consequences of Biodiversity Shifts (*Field Museum of Natural History*)
- **The Key to the Cabinets**: Building and Sustaining a Research Database for a Global Biodiversity Hotspot (*Appalachian State University*)
- **The Microfungi Collections Consortium**: A Networked Approach to Digitizing Small Fungi with Large Impacts on the Function and Health of Ecosystems (*INHS, University of Illinois*)
- **Documenting Fossil Marine Invertebrate Communities of the Eastern Pacific:** Faunal Responses to Environmental Change over the last 66 million years (University of California-Berkeley)
- **Cretaceous World**: The Cretaceous World: Digitizing Fossils to Reconstruct Evolving Ecosystems in the Western Interior Seaway (*University of Kansas*)
- **LepNet**: Lepidoptera of North America Network: Documenting Diversity in the Largest Clade of Herbivores (*Northern Arizona University*)
- **MAM**: The Mid-Atlantic Megalopolis: Achieving a greater scientific understanding of our urban world (*University of Pennsylvania*)
- **SoRo**: Using Herbarium Data to Document Plant Niches in the High Peaks and High Plains of the Southern Rockies (*University of Colorado*)
- **oVert**: Open Exploration of Vertebrate Diversity in 3D (*University of Florida*)
- **Capturing California's Flowers**: Using Digital Images to Investigate Phenological Change in a Biodiversity Hotspot (*California Polytechnic State University San Luis Obispo*)
- **The Pteridological Collections Consortium**: An Integrative Approach to Pteridophyte Diversity Over the Last 420 Million Years (*University of California – Berkeley*)
- **Digitizing "Endless Forms"**: Facilitating Research on Imperlied Plants with Extreme Morphologies (*New York Botanical Garden*)
- Digitizing Collections to **Trace Parasite-Host Associations** and Predict the Spread of Vector-Borne Disease (*Purdue University*)
- American Crossroads: **Digitizing the Vascular Flora of the South-Central United States** (*Botanical Research Institute of Texas*)
- **Enhancing Access to Taxonomic and Biogeographical Data** to Stem the Tide of Extinction of the Highly Imperiled Pacific Island Land Snails (*Bernice P. Bishop Museum*)

2. iDigBio

- **Engage the collections community** – find the specimens
- **Enable digitization of biodiversity collections data**
  - Develop efficient & effective standards & workflows
  - Workforce education & training via workshops/webinars
- **Provide portal access to biodiversity data**
  - Enable data access & discoverability
  - Respond to cyberinfrastructure needs



- **Promote use of data to address environmental and economic challenges**
  - Researchers, educators, general public, policy-makers, etc.
- **Assist in planning long-term sustainability of national digitization effort**

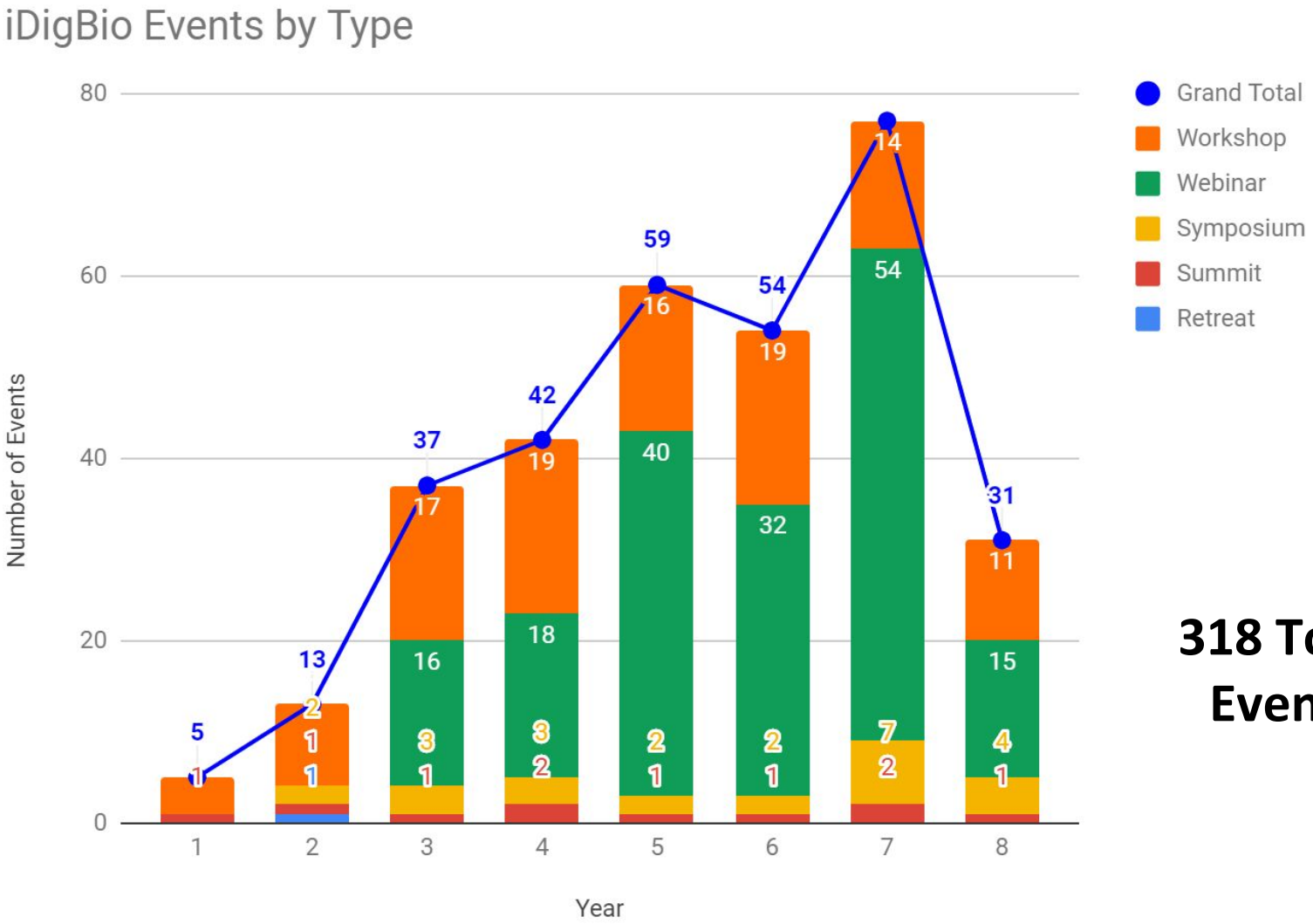
All of this has required iDigBio to engage the collections community through workshops, webinars, and other events to develop workflows, train IT and collections staff, mobilize data, etc.



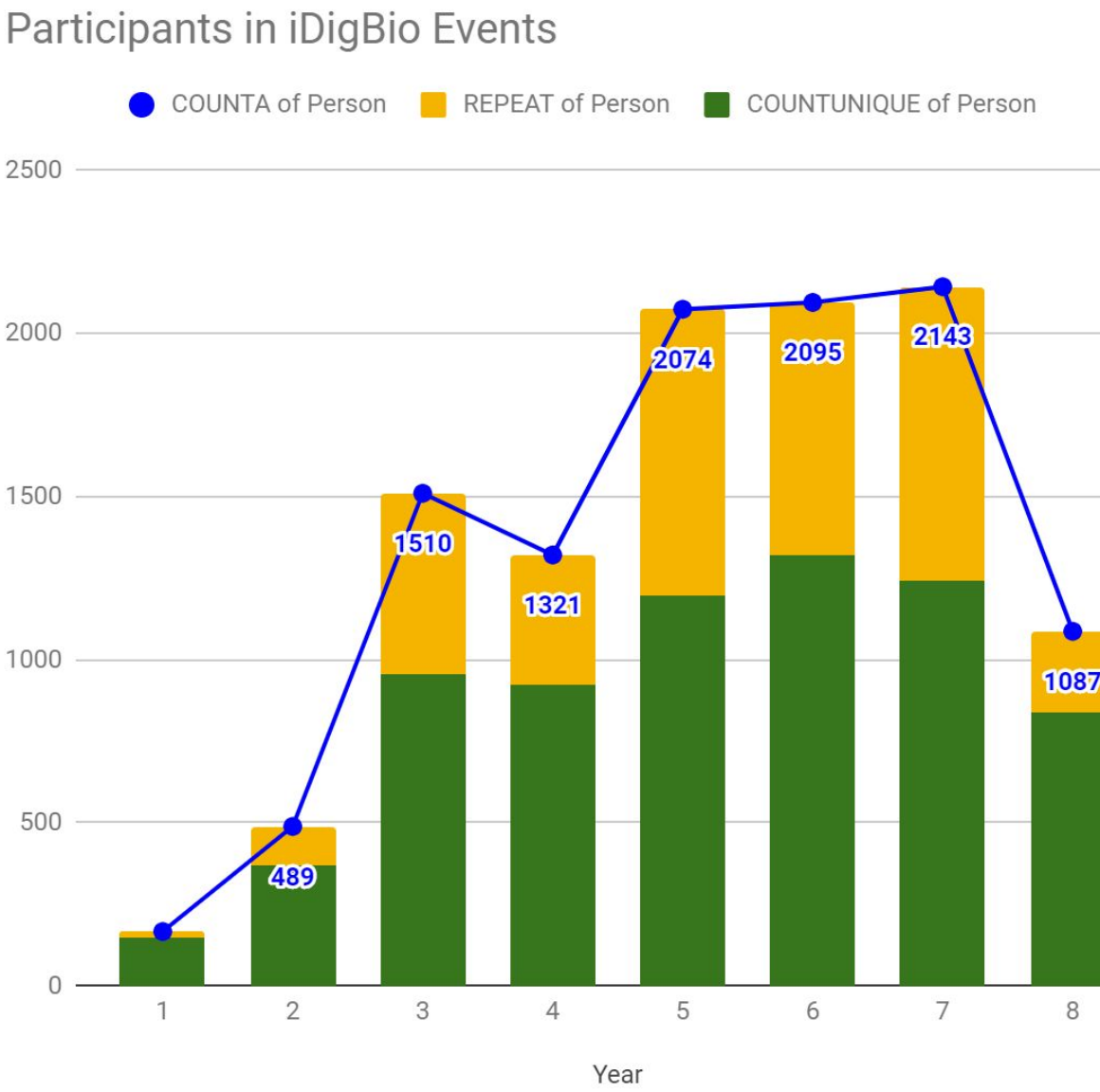




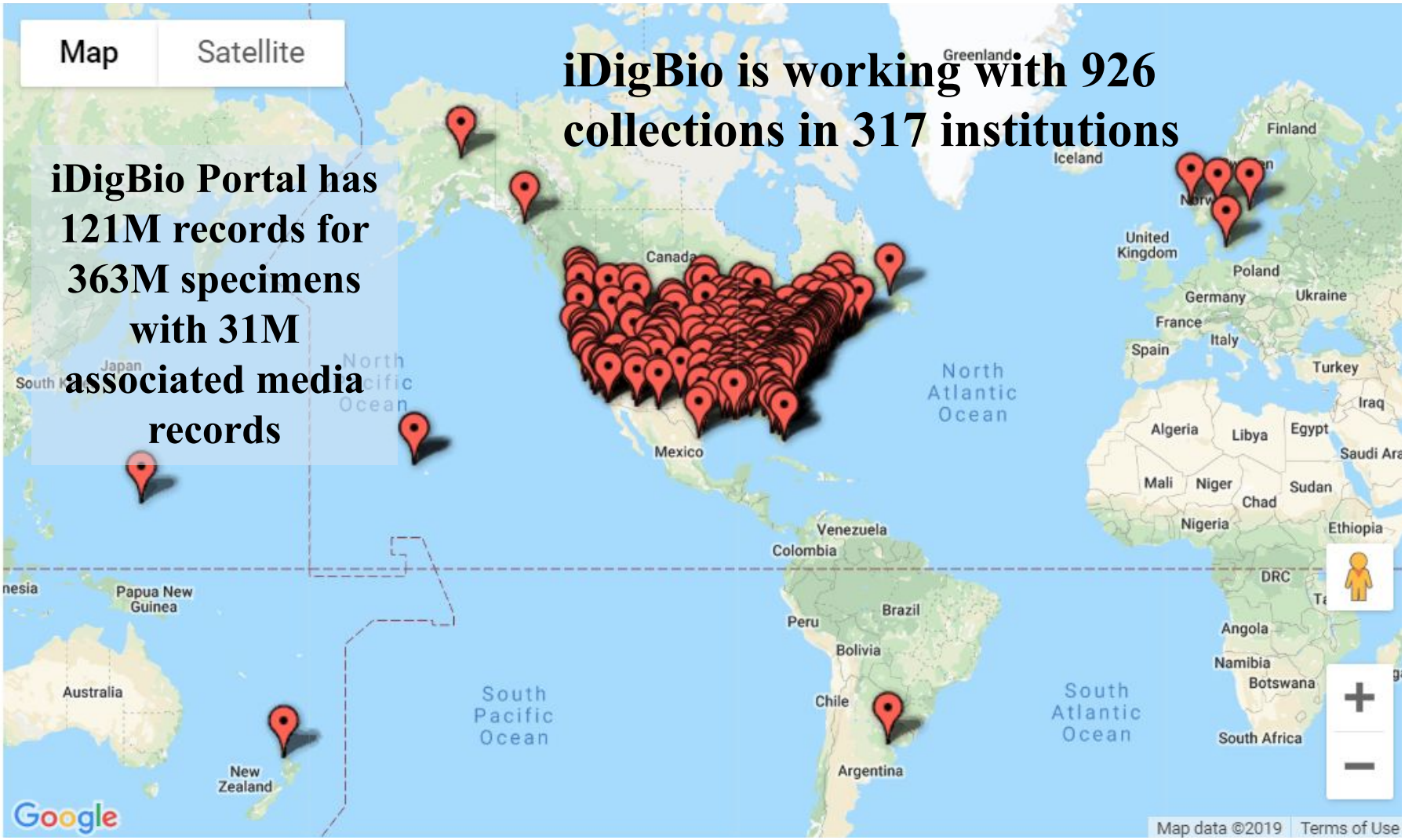




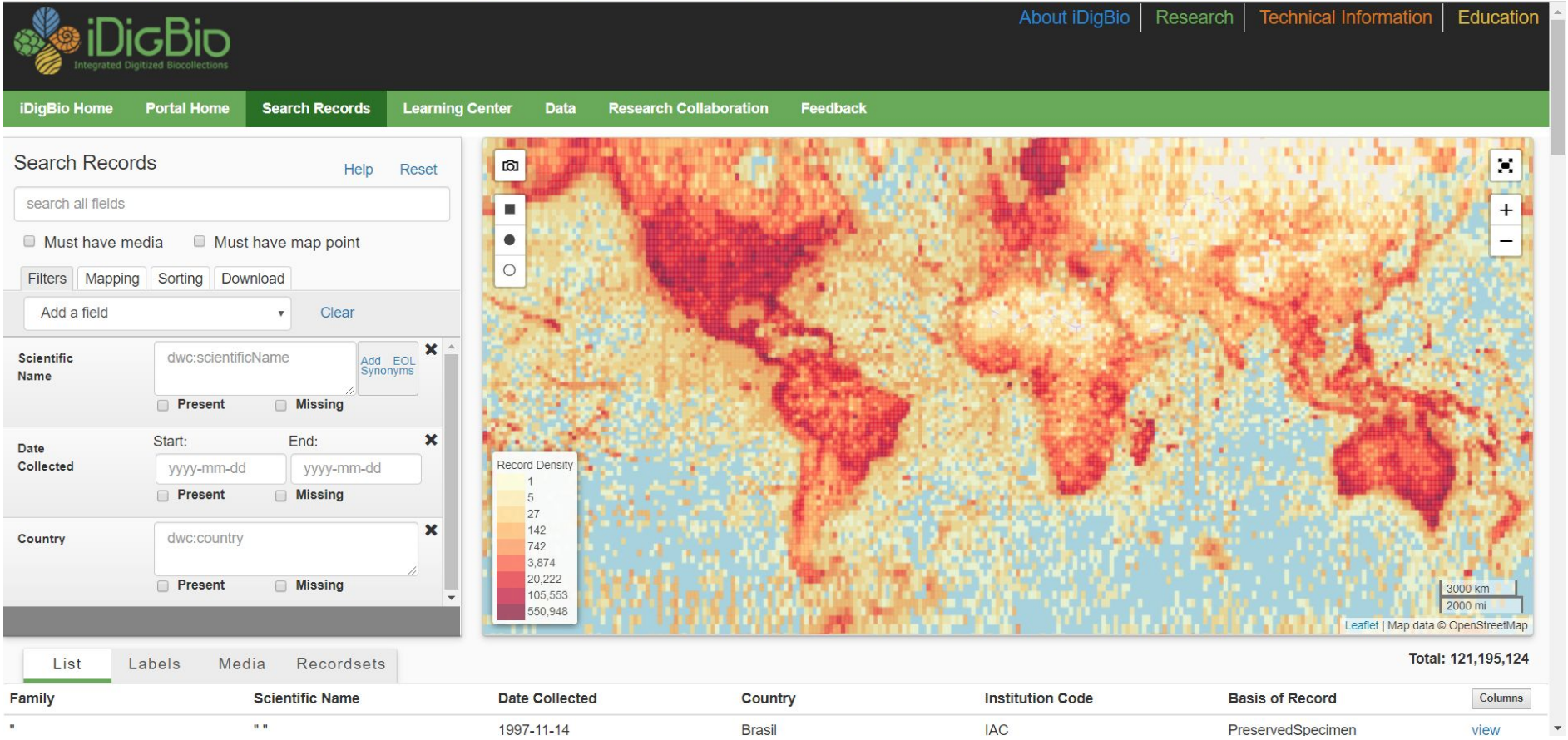
318 Total Events



10,886 Total Participants


Map
Satellite
iDigBio is working with 926 collections in 317 institutions
iDigBio Portal has 121M records for 363M specimens with 31M associated media records
Greenland
Iceland
Finland
United Kingdom
Poland
Germany
Ukraine
France
Spain
Italy
Turkey
Iraq
Algeria
Libya
Egypt
Saudi Ara
Mali
Niger
Sudan
Chad
Nigeria
Ethiopia
DRC
Angola
Namibia
Botswana
South Africa
Canada
Mexico
North Atlantic Ocean
North Pacific Ocean
South Pacific Ocean
South Atlantic Ocean
Venezuela
Colombia
Peru
Brazil
Bolivia
Chile
Argentina
Papua New Guinea
Australia
New Zealand
Google
Map data ©2019
Terms of Use

Flexible search across all data, indexed fields, media, geolocation, map boundary, auto-completion, synonyms, …



https://www.idigbio.org/portal

View search results as list, labels, or media

List | Labels | Media | Recordsets

Total: 188,896

Family	Scientific Name	Date Collected	Country	Institution Code	Collected By	Locality	Occurrence ID	Catalog Number	Columns
Suberitidae	Tuberella aaptos	1899-10-19	Puerto Rico	USNM	United States Fish Commis...	Mayaguez Harbor	http://n2t.net/ark:/65665/33f...	7662	view
Pieridae	Abaeis nicippe	1981-10	Puerto Rico	UPRM	Emmer, J. C.	Guayanilla	23df77d9-ccb0-11e4-8f8b-0...	4626	view
Pieridae	Abaeis nicippe	11/15/81	Puerto Rico	UPRM	De Jesèªs, L.	Ponce	23df7219-ccb0-11e4-8f8b-0...	4624	view
Pieridae	Abaeis nicippe	11/15/87	Puerto Rico	UPRM	De Jesèªs, L.	Ponce	23df79b7-ccb0-11e4-8f8b-0...	4627	view
Pieridae	Abaeis nicippe	9/4/89	Puerto Rico	UPRM	Blanco, J.	Aguadilla	23aa6184-ccb0-11e4-8f8b-...	820	view
Pieridae	Abaeis nicippe	11/14/48	Puerto Rico	UPRM	Torres, C.	Mayaguez	23df75f4-ccb0-11e4-8f8b-0...	4625	view
Caligidae	Abasia sp.	1977-10-07	Puerto Rico	USNM	S. Altchuler	La Parguera	http://n2t.net/ark:/65665/3e...	266843	view
Delphacidae	Abbrosoga errata	1914-07-27	PUERTO RICO	AMNH	Unknown	Maricao	urn:uuid:886a07f8-d8e1-11...	UDCC_TCN 00016869	view
Delphacidae	Abbrosoga errata	1947-11-14	Puerto Rico	USNM	*no data*	Toro Negro Mt.; P.R.	http://n2t.net/ark:/65665/3e...	*no data*	view
Delphacidae	Abbrosoga errata	1962-07-01	PUERTO RICO	USNM	J. Maldonado Capriles	Puntita	urn:uuid:28ab0c86-ca62-11...	UDCC_TCN 00042679	view
Delphacidae	Abbrosoga errata	1999-08-08	PUERTO RICO	LBOB	C. W. O'Brien & P. Kovarik	Hwy 120, km 14, Miricao St	urn:uuid:93afd71e-ca62-11...	UDCC_TCN 00042678	view

List | Labels | Media | Recordsets

Abbrosoga errata Caldwell & Martorell,1951 — *Delphacidae*



PUERTO RICO, Maricao, none, Maricao
Lat: 18°10' 58" **Lon:** -66°58' 49"
AMNH, UDCC_TCN 00016869, Unknown

Animalia, Arthropoda, Insecta, Hemiptera 1914-07-27

Abelmoschus moschatus medik. Medik. — *Malvaceae*



Puerto Rico, Mayagüez (MITA).
Lat: 18°12' 15" **Lon:** -67°6' 1"
NY, 01007392, A. H. Liogier

Plantae, Tracheophyta, Magnoliopsida, Malvales 1981-03-

Pecten mayaguezensis Dall & Simpson — *Pectiniidae*



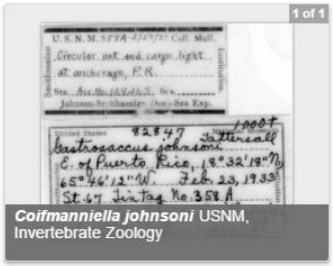
Puerto Rico, Mayaguez Harbor
Lat: 18°25' 30" **Lon:** -67°9' 11"
USNM, Invertebrate Zoology, 160062, United States Fish Commission

Animalia, Cnidaria, Anthozoa, Scleractinia

List | Labels | Media | Recordsets



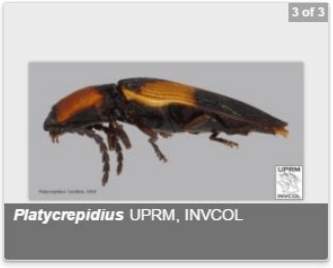
Anolis cristatellus wileyae MCZ, Herp



Coifmanniella johnsoni USNM, Invertebrate Zoology



Adiantum obliquum US, Botany

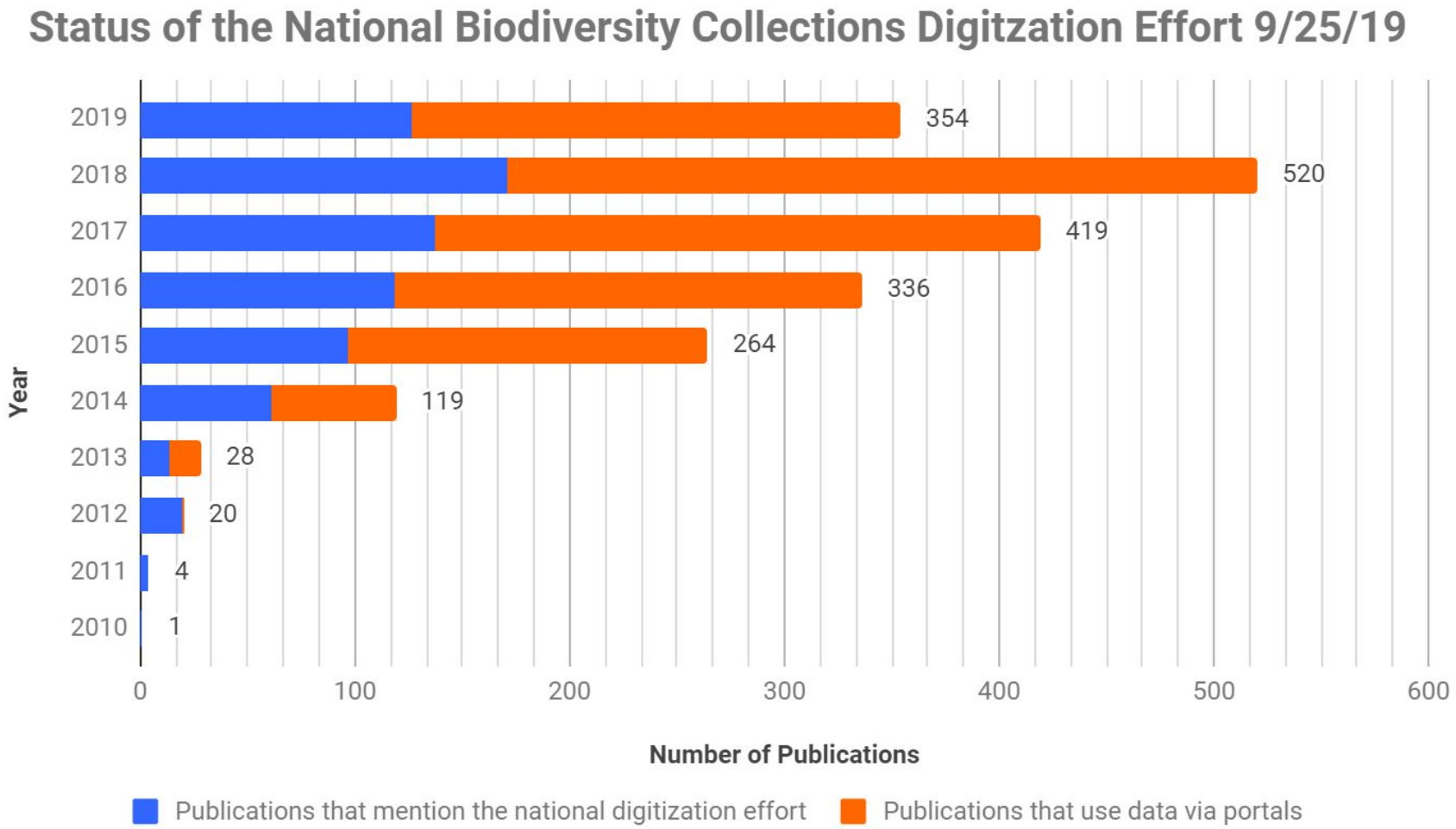


Platycrepidius UPRM, INVCOL

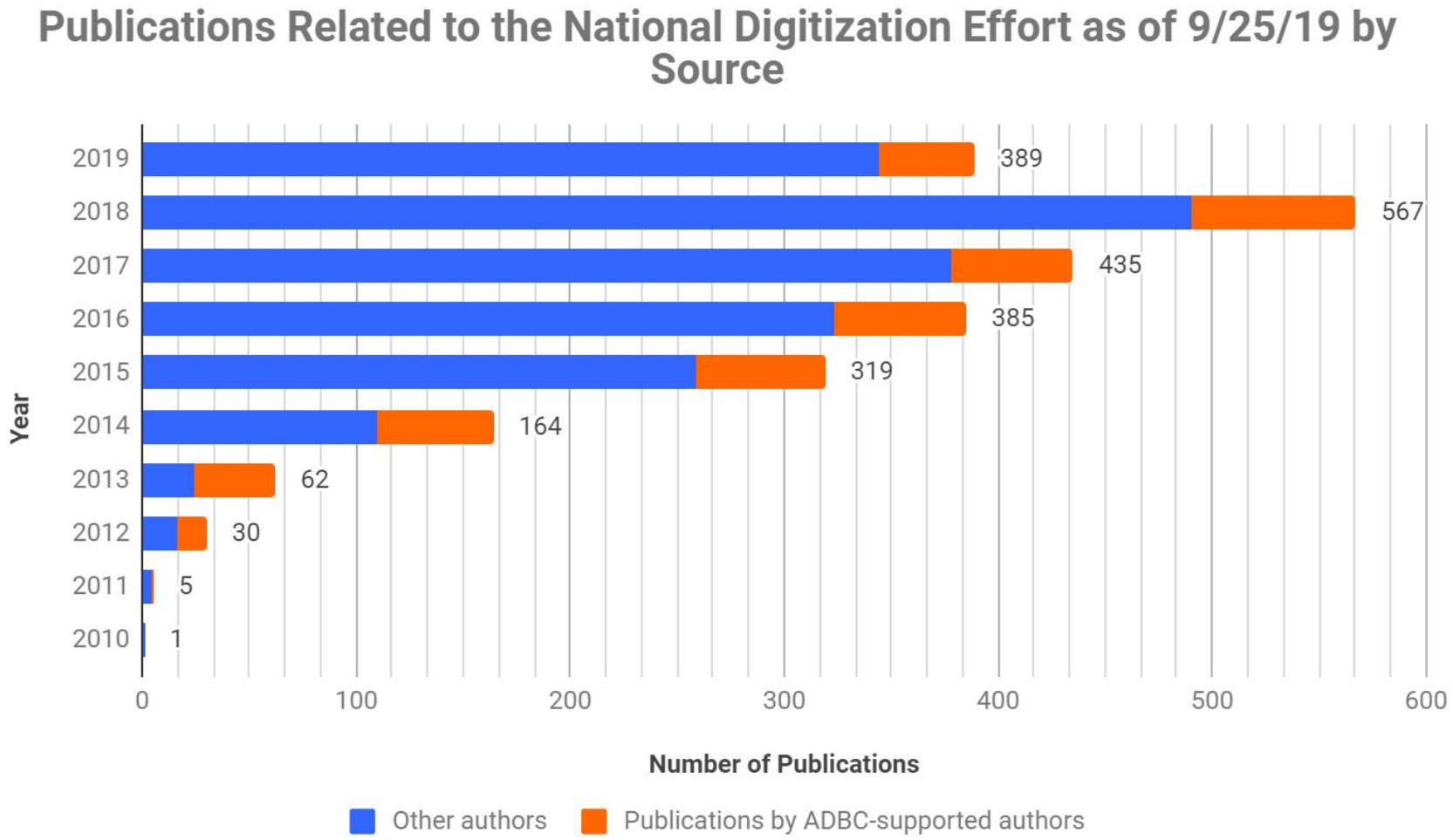


Coereba flaveola TTRS, Ornithology

Publications Citing Portal Data Use



Publications by ADBC Authors



Collections Data in Action: beyond acronyms





A2iA
ABBYY
ACIS
ADBC
ALA
AmphibiaWeb
APC
API
APNI
Arbor
ArcGIS
Arctos
ARK
ARPHA
AudioNote
Audubon Core
AutoMontage
Axiell
bccvl
BCoN
BoL
BerkeleyMapper
BHL
BHL - China
BHL - Europe
Bio2RDF
BioCASe
biocode
BioGeoMancer
BioGUID
BioNames
BioOffice
BioSharing
BIOTA
BioVeL
BiSciCol
BISON
BITC
BOLDSystems
BONAP
BSA
BugGuide
CABIN
CF21

COOL
CETAF
CNABH
Collections Education
CollectionsWeb
CONABIO
COS
CIPA
CRIA
CrossRef
CSIRO
CyVerse
DAMS
DataCarpentry
Software Carpentry
DataCite
DataONE
DataONE Dash
DataTurbine
DBTNT
DiGIR
Digital Florida
Digitarium
DINA
Discover Life
DIVA-GIS
djatoka
DOI
DroidDB
Drupal
Dryad
DSLR
DwC
DwC Terms
EarthCube
eBiodiversity
eBird
EcoInforma
ECOS
Effechecka
EMu
KE EMu
EnviroAtlas
EOL

Exploring Genomics
Data
Fauna Europaea
FIC
FishBase
FishNet2
FLOW
FOSSIL
From the Page
Fuzzy Gazetteer
GBIF
GCI
Grey Card Index
GDAL
GenBank
geneious
Gene Ontology
Geopaparazzi
Geotag Photos Pro
Thesaurus of
Geographic Names
GitHub
GIMP
GLANSIS
GloBI
GLOBIS
GNIS
GEOLocate
Georeferencing
Georeferencing
Calculator
GEOS
Geotools
GLI
GigaPan
CaptureStudio
Global Plants
GLoBIS
GLOBIS-B
GNA
Google Analytics
Google Earth
Google Maps
Hadoop

herbaria@home
HERBIS
Hymenoptera Online
ICBN
ICR
ICZN
IdentificationKey web
service
iDigBio
IDQ
ISBER
IGSN
IH
IK
ILDIS
ImageMagick
iNaturalist
INBio
Index Fungorum
InverteBase
InvertNet
iPlant
IPNI
IPT
IPT 2
IrfanView
iSamples
ITIS
IUCN
Red List
IWGSC
JAI
Jetstream
JPEG 2000
JSON
JSTOR
JSTOR Plant Science
JTS
KML
Kurator
LBCC
LepNet
LibXML
Libraries of Life
LifeDesks
Magnolia grandiFLORA

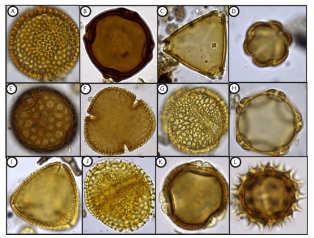
MaM
MaNIS
MANTIS
MapWindo
MapReduc
MapsData
MBB
Mendeley
MIBBI
MiCC
MOBOT
ModestR
MOL
Morphbank
Morphobank
MorphoSource
Morphster
MHC
mx
MySQL
NameBank
ClassificationBank
National Biodiversity
Data Center
NatureServe
NCSA
NEOMAP
NEON
NeotomaDB
NESCent
NEVP
NIBA
NIMBUS
NLP
Notes from Nature
NSCA
NSF
NSII
OBIS
OBO Foundry
OCR
OCRopus
ODBC
OA
Open Annotation
Open Atrium
Atrium
openModeller
ORCID

ORNIS
Phylojive
Phylolink
Picturae
Planting Science
PLANTS Database
Plazi
PlutoF
PNW Herbaria
PostGIS
PostgreSQL
prefixcommons
pro-iBiosphere
PROJ.4
Psyl'list
Python
QGIS
R
Raintree
RDA
RDF
Recorder 6
Re:discovery
Redmine
ReFindit
REST
ridigbio
RMCA
ROpenSci
RStudio

speciesLink
Tesseract
The Field Book Project
TNRS
TOLKIN
TORCH
tranScriptorium
Transkribus
TreeBASE
Trifacta
TROPICOS
TRY
TTD
Tri-Trophic TCN
TurboScan
uBio
UFBI
UNITE
Universal Chalcidoidea
Database
USVH
VACS
VASCAN
Vernon Systems
VertNet
ViBRANT
VIVO
VMWare
WCSP
Windows Azure

Got More? http://bit.ly/adbcterms





Digitization

Collection Management Software

- Arctos
- Symbiota
- Specify
- Axiell EMu
- CollectionSpace

Community Building

- SPNHC
- GRBio to GBIF
- Darwin Core Hour
- Small Collections Network
- Entomological Collections Network
- Working Groups:
  - DROID, GWG, SWG, PaleoDigi, EODI, …

Data Mobilization

- Biodiversity Information Standards
- DwC - Darwin Core
- GBIF INTEGRATED PUBLISHING TOOLKIT (IPT)
- IPT - Integrated Publishing Toolkit
- OpenRefine
- GEOLocate
- DAMS – Digital Asset Management
- ABBYY, Tesseract
- *Global unique identifiers*
  - GUID, UUID, ARK, IGSN





an alliance for biodiversity knowledge

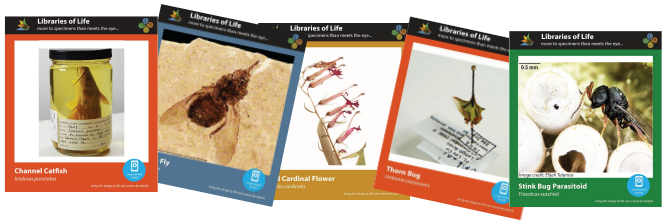
Data Aggregation

Facilitating Research Access and Use

- EOL - Encyclopedia of Life
- BHL – Biodiversity Heritage Library
- neon – National Ecological Observatory Network
- CYVERSE - facilitating scientific research in the cloud

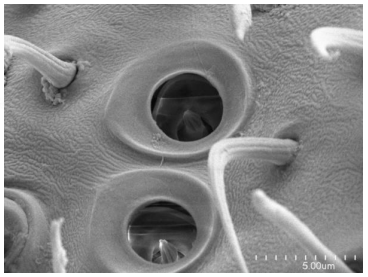
Aggregating Specimen Data

- GBIF – Global Biodiversity Information Facility
- ALA, DigiVol – Atlas of Living Australia
- iDigBio
- DiSSCo - Distributed System of Scientific Collections
- BISON – Biodiversity Serving our Nation
  - United States GBIF Node
- Canadensys
- CONABIO (Mexico)
- CRIA (Brazil) and SpeciesLink
- USVH – United States Virtual Herbarium
- SiBBr – Brazilian Biodiversity Information System
- VertNet



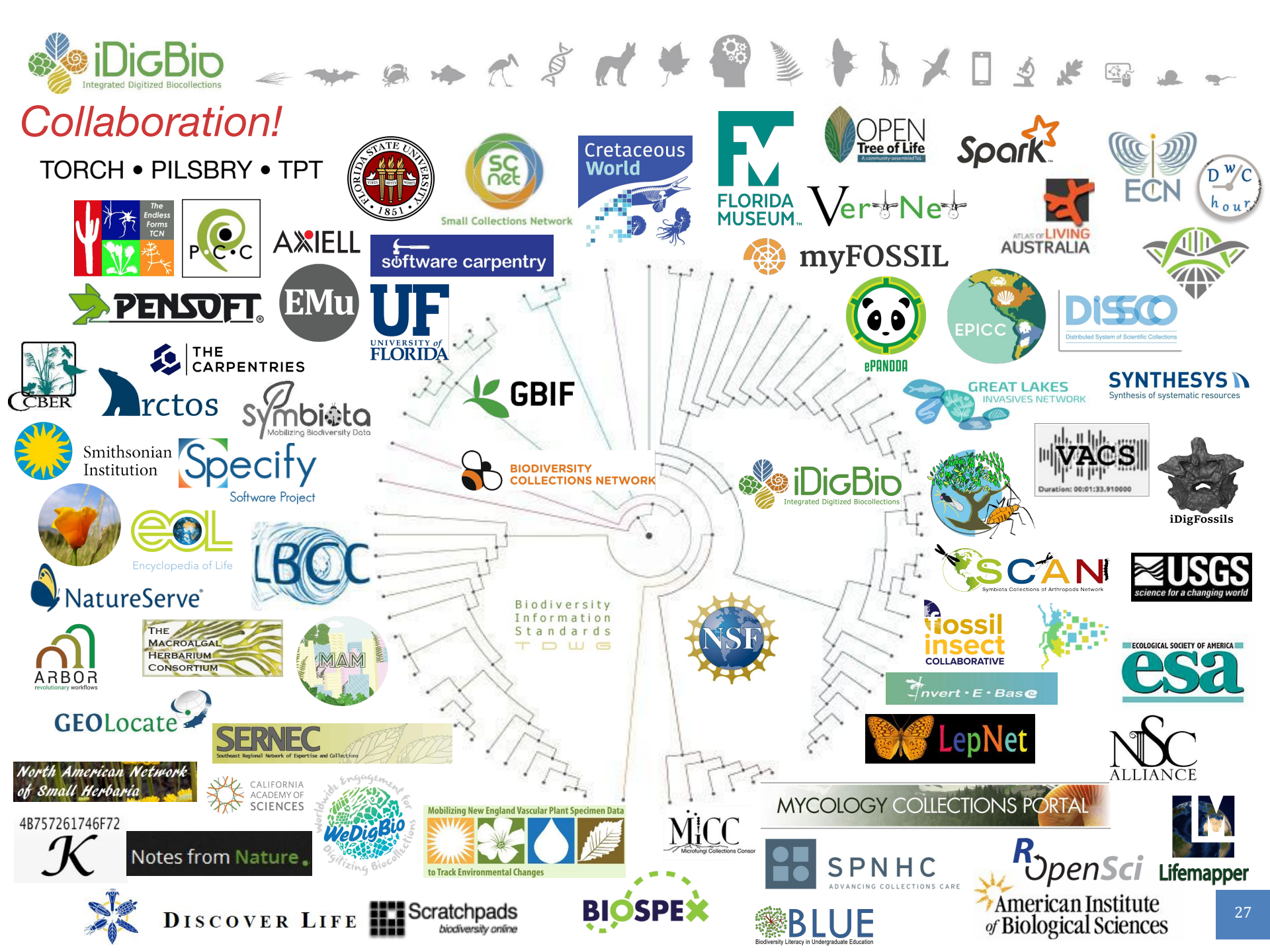
Education, Outreach, Inreach

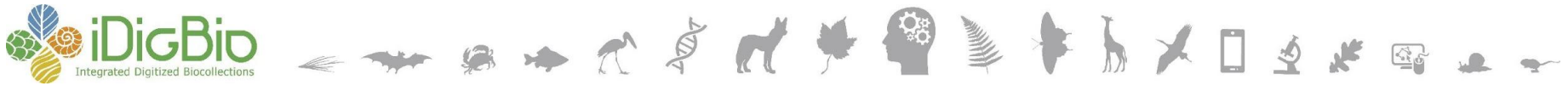
- AIM-UP!
  - Advancing Integration of Museums into Undergraduate Programs; using collections data in undergraduate education
- BLUE
  - Biodiversity Literacy in Undergraduate Education
- Notes from Nature
  - Crowdsourcing collections transcription, creating communities
- iNaturalist
  - observation app, connecting scientists and the general public
- ePandda
  - Enhancing Paleontological and Neontological Data Discovery API, connecting scientific literature with specimens
- The Carpentries - Data Carpentry & Software Carpentry, Reproducible Science Curriculum,…
  - **Biodiversity informatics skills** for those in the biodiversity community. Focus on tidy data, fit for reproducible research.



Publishing

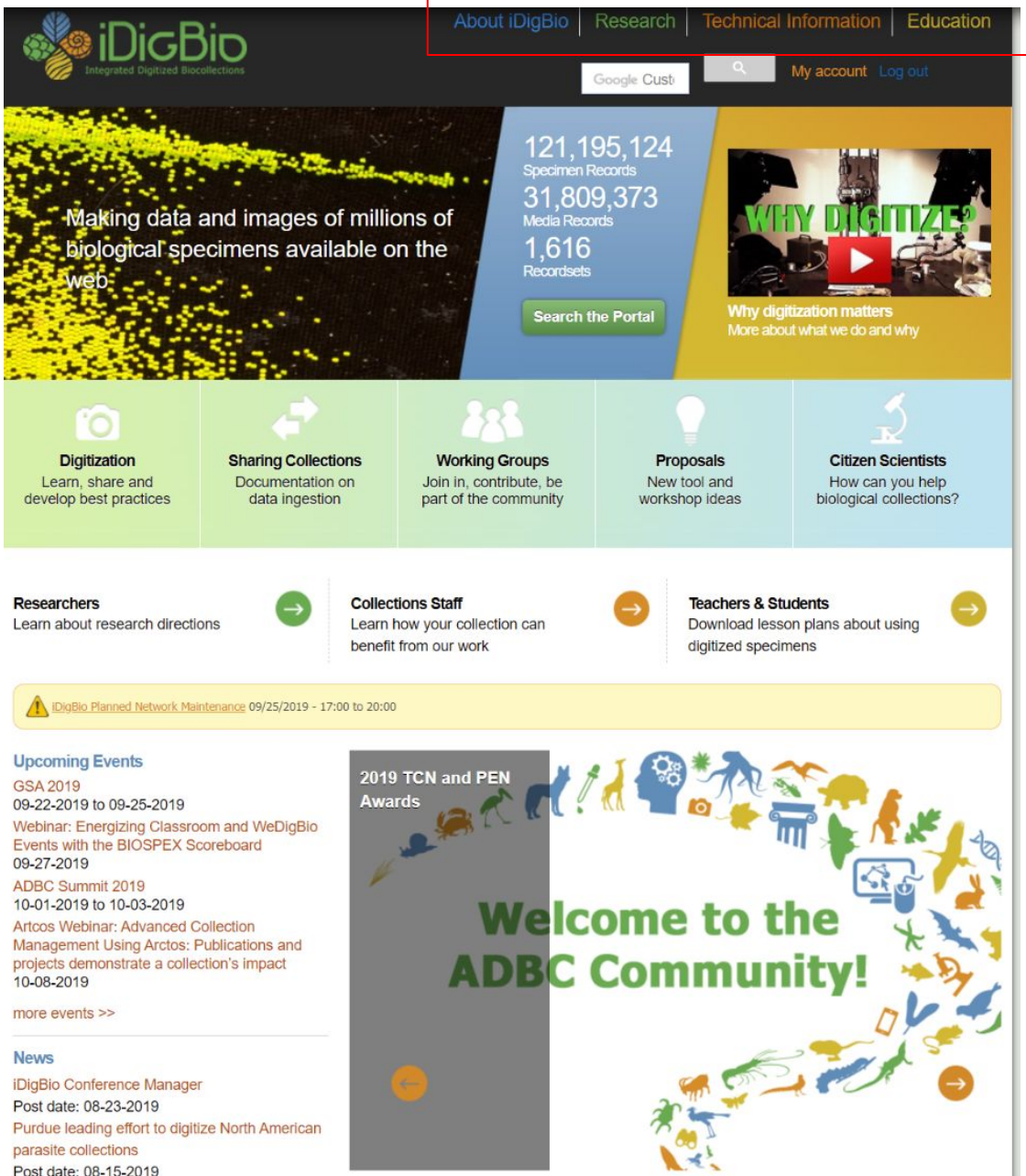
- Pensoft
  - ARPHA Writing Tool (AWT), BISS
- DataCite, DOI (Digital Object Identifier)
  - Find, share and reuse, cite data, connect and get credit
- Mendeley
  - Free reference manager; organize papers, read & annotate your PDFs
- ORCiD
  - Open Researcher and Contributor ID
- DataONE
  - Data Observation Network for Earth (DataONE) – data repository and data management best practices
- Data Dryad
  - Curated resource making the data underlying scientific publications discoverable, freely reusable, and citable general-purpose home for a wide diversity of data types
- Figshare
  - online repository where researchers can preserve and share their research outputs, including figures, datasets, images, and videos. #openData


iDigBio
Integrated Digitized Biocollections
Collaboration!
TORCH • PILSBRY • TPT
The Endless Forms TCN
P·C·C
AXIELL
Small Collections Network
Cretaceous World
FLORIDA MUSEUM
OPEN Tree of Life
Spark
ECN
D W C hour
VerNet
ATLAS OF LIVING AUSTRALIA
myFOSSIL
software carpentry
PENSOFT
EMu
UF UNIVERSITY of FLORIDA
ePANDDA
EPICC
DISCO
Distributed System of Scientific Collections
CBER
THE CARPENTRIES
Arctos
Symbiota
Mobilizing Biodiversity Data
GBIF
GREAT LAKES INVASIVES NETWORK
SYNTHESYS
Synthesis of systematic resources
Smithsonian Institution
Specify
Software Project
BIODIVERSITY COLLECTIONS NETWORK
iDigBio
Integrated Digitized Biocollections
VACS
Duration: 00:01:33.910000
iDigFossils
eol
Encyclopedia of Life
LBCC
NatureServe
SCAN
Symbiota Collections of Arthropods Network
USGS
science for a changing world
Biodiversity Information Standards
TDWG
NSF
fossil insect COLLABORATIVE
ARBOR
revolutionary workflows
THE MACROALGAL HERBARIUM CONSORTIUM
MAM
ECOLOGICAL SOCIETY OF AMERICA
esa
GEOLocate
invert·E·Base
LepNet
SERNEC
Southeast Regional Network of Expertise and Collections
NSC ALLIANCE
North American Network of Small Herbaria
CALIFORNIA ACADEMY OF SCIENCES
WeDigBio
Worldwide Engagement for Digitizing Biocollections
Mobilizing New England Vascular Plant Specimen Data to Track Environmental Changes
MICC
Microfungi Collections Consor
MYCOLOGY COLLECTIONS PORTAL
4B757261746F72
K
Notes from Nature
SPNHC
ADVANCING COLLECTIONS CARE
ROpenSci
Lifemapper
American Institute of Biological Sciences
DISCOVER LIFE
Scratchpads
biodiversity online
BIOSPEX
BLUE
Biodiversity Literacy in Undergraduate Education



iDigBio Resources

https://www.idigbio.org



https://www.idigbio.org/about-idigbio



General

- iDigBio and TCN info
- Code of Conduct
- TCN Resources page
- Collaborators map
- ADBC proposal tips
- Staff Directory
- Calendar of upcoming events (workshops, webinars…)
- News
- Event recaps
- Press releases
- Community announcements

https://www.idigbio.org/content/thematic-collections-networks



Thematic Collections Networks

Tue, 2011-10-04 14:31 -- acisadmin

Each Thematic Collections Network (TCN) is a network of institutions with a strategy for digitizing information that addresses a particular research theme, such as impacts of climate change or biota of a region. Once digitized, data are easily accessed and available for other research and educational use. Other institutions and collections may join an existing TCN as a Partner to Existing Network (PEN). The following are the TCNs, and any associated PENs, currently funded by the Advancing Digitization of Biodiversity Collections (ADBC) project:

Award Year 2019

- (TCN) Digitizing collections to trace parasite-host associations and predict the spread of vector-borne disease: (TPT)
- (TCN) American Crossroads: Digitizing the Vascular Flora of the South-Central United States: (TORCH)
- (TCN) Enhancing Access to Taxonomic and Biogeographical Data to Stem the Tide of Extinction of the Highly Imperiled Pacific Island Land Snails: (PILSBRY)

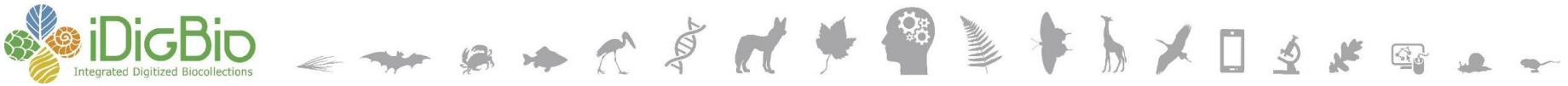
Award Year 2018

- (TCN) Capturing California's Flowers: Using Digital Images to Investigate Phenological Change in a Biodiversity Hotspot (CAP)
- (TCN) The Pteridological Collections Consortium: An Integrative Approach to Pteridophyte Diversity Over the Last 420 Million Years (PCC)
- (TCN) Digitizing "Endless Forms": Facilitating Research on Imperiled Plants with Extreme

Researchers
Browse our specimen portal

Collections Staff
Learn how your collection can benefit from our work

Teachers & Students
Learning resources & opportunities to engage



iDigBio Integrated Digitized Biocollections

About iDigBio | Research | Technical Information | Education

My Account Log Out

iDigBio Home | Wiki | Working Groups | Workshops | Wiki Formatting Help

Djennings Talk Preferences Watchlist Contributions

Wiki Home
Workshop Summaries
Working Group List
Specimen Portal

iDigBio Data Ingestion
Ingestion Queue Dashboard
Published data
Ingestion Guidance
Data API
Digitization Resources

iDigBio Working Groups

iDigBio Research

Navigation Tools

Tools

Page | Discussion

Read | Edit | View history | Delete | Move | Protect | Search

Digitizing collections to trace parasite-host associations and predict the spread of vector-borne disease

Contents [hide]

1 Digitizing collections to trace parasite-host associations and predict the spread of vector-borne disease
- 1.1 Project Summary
- 1.2 Current Research
- 1.3 Project Websites & Social Media
- 1.4 Citizen Science & Outreach Projects
- 1.5 Project Leadership
- 1.6 Project Collaborators
- 1.7 Protocols & Workflows
- 1.8 Publications
- 1.9 Professional Presentations
- 1.10 Other project documentation

Digitizing collections to trace parasite-host associations and predict the spread of vector-borne disease[edit]

Project Summary[edit]

Arthropod parasites (specifically, insects and their relatives) are responsible for economically critical issues in human health, wildlife conservation, and livestock productivity. Because natural history collections are permanent repositories for past and present parasite specimens, these collections and their data can help address these significant societal challenges in human and animal health and safety. Natural history collections often contain specimens and ancillary materials that are completely unknown to the broader community, yet represent irreplaceable knowledge about organismal habitats, distributions, and parasite-host associations. Further, these collections yield information that can be used to model ecological processes and changes in species distributions, predict the future spread of human and animal disease, update taxonomy, and help identify under-represented parasite groups in urgent need of sampling and threatened parasite diversity in need of conservation. This project will provide digital records (i.e., specimen label data and images) of invaluable arthropod parasite collections to make research-ready baseline data accessible online, catalyzing new research and education initiatives. These newly digitized data will have immediate and long-lasting benefits for our understanding of organismal associations, biodiversity, and beyond.

TPT-TCN

Quick Links
- Project Summary
- Current Research
- Project Websites
- Publications

The Terrestrial Parasite Tracker Thematic Collection Network (TPT-TCN) will digitize over one million arthropod specimens representing species that are significant parasites and disease vectors of vertebrates in the United States. This digitization effort will integrate millions of vertebrate host records with vector and disease monitoring data shared by state and federal agency collaborators, creating a novel foundation for integrative, long-term research. This project is a collaboration of taxonomists and curators from vertebrate and invertebrate collections, as well as epidemiologists, ecologists, data-scientists, and biodiversity informatics specialists. This reach is further extended by the 26 collaborating research collections and other initiatives. This project will empower ongoing citizen science and public awareness campaigns with the tools to understand distribution changes of arthropod vectors and associated diseases due to environmental change and global movement. Public education initiatives include partnering with natural history museums to educate the public about parasites via science-focused lectures, exhibits, summer youth programs, informal presentations, and developing new online educational resources for teachers in underserved communities. All specimen images generated by this project will be used for the development of a rapid identification tool for parasites which will be made accessible through the internet and smartphone apps and shared with iDigBio (idigbio.org). The TPT-TCN will also develop and implement undergraduate teaching modules focused on data held in natural history collections. These modules will be disseminated to academic institutions across the United States and made available online.

Current Research[edit]

Project Websites & Social Media[edit]

Citizen Science & Outreach Projects[edit]

Project Leadership[edit]

Project Sponsor: Purdue University (NSF Award 1901932)

Principal Investigators (PIs): Stephen Cameron (PI), Jennifer Zaspel (co-PI)

Project Collaborators[edit]

Protocols & Workflows[edit]

Publications[edit]

Professional Presentations[edit]

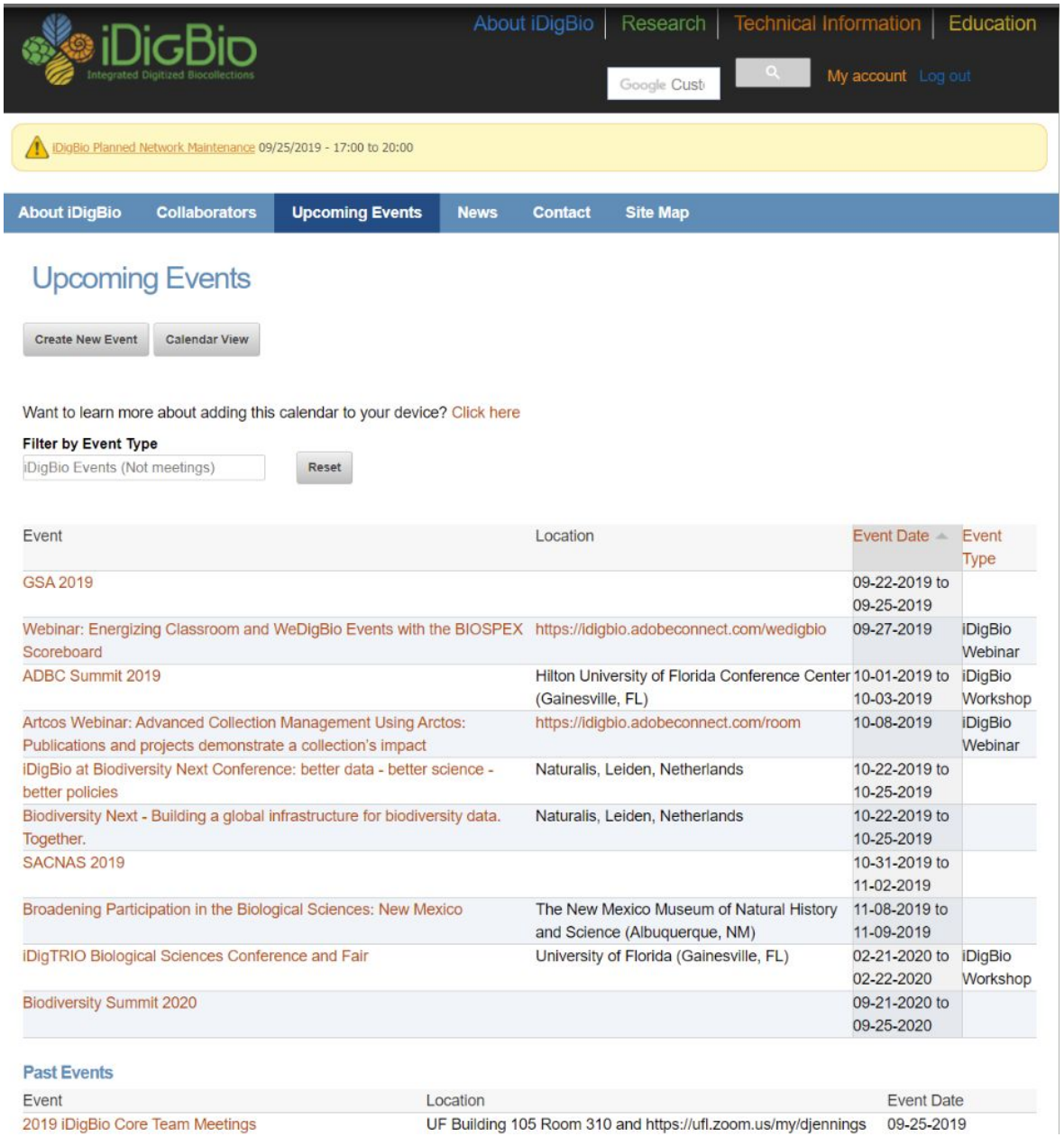
Other project documentation[edit]

[Mark this page as patrolled]

FEEDBACK

FEEDBACK

https://www.idigbio.org/outreach-events-sidebar



iDigBio Integrated Digitized Biocollections

About iDigBio | Research | Technical Information | Education

Google Cust | My account | Log out

iDigBio Planned Network Maintenance 09/25/2019 - 17:00 to 20:00

About iDigBio | Collaborators | Upcoming Events | News | Contact | Site Map

Upcoming Events

Create New Event | Calendar View

Want to learn more about adding this calendar to your device? Click here

Filter by Event Type

iDigBio Events (Not meetings) | Reset

Event	Location	Event Date	Event Type
GSA 2019		09-22-2019 to 09-25-2019	
Webinar: Energizing Classroom and WeDigBio Events with the BIOSPEX Scoreboard	https://idigbio.adobeconnect.com/wedigbio	09-27-2019	iDigBio Webinar
ADBC Summit 2019	Hilton University of Florida Conference Center (Gainesville, FL)	10-01-2019 to 10-03-2019	iDigBio Workshop
Artcos Webinar: Advanced Collection Management Using Arctos: Publications and projects demonstrate a collection's impact	https://idigbio.adobeconnect.com/room	10-08-2019	iDigBio Webinar
iDigBio at Biodiversity Next Conference: better data - better science - better policies	Naturalis, Leiden, Netherlands	10-22-2019 to 10-25-2019	
Biodiversity Next - Building a global infrastructure for biodiversity data. Together.	Naturalis, Leiden, Netherlands	10-22-2019 to 10-25-2019	
SACNAS 2019		10-31-2019 to 11-02-2019	
Broadening Participation in the Biological Sciences: New Mexico	The New Mexico Museum of Natural History and Science (Albuquerque, NM)	11-08-2019 to 11-09-2019	
iDigTRIO Biological Sciences Conference and Fair	University of Florida (Gainesville, FL)	02-21-2020 to 02-22-2020	iDigBio Workshop
Biodiversity Summit 2020		09-21-2020 to 09-25-2020	

Past Events

Event	Location	Event Date
2019 iDigBio Core Team Meetings	UF Building 105 Room 310 and https://ufl.zoom.us/my/djennings	09-25-2019

https://www.idigbio.org/content/idigbio-code-conduct

iDigBio Code of Conduct

Tue, 2019-09-17 11:33 -- javarkas



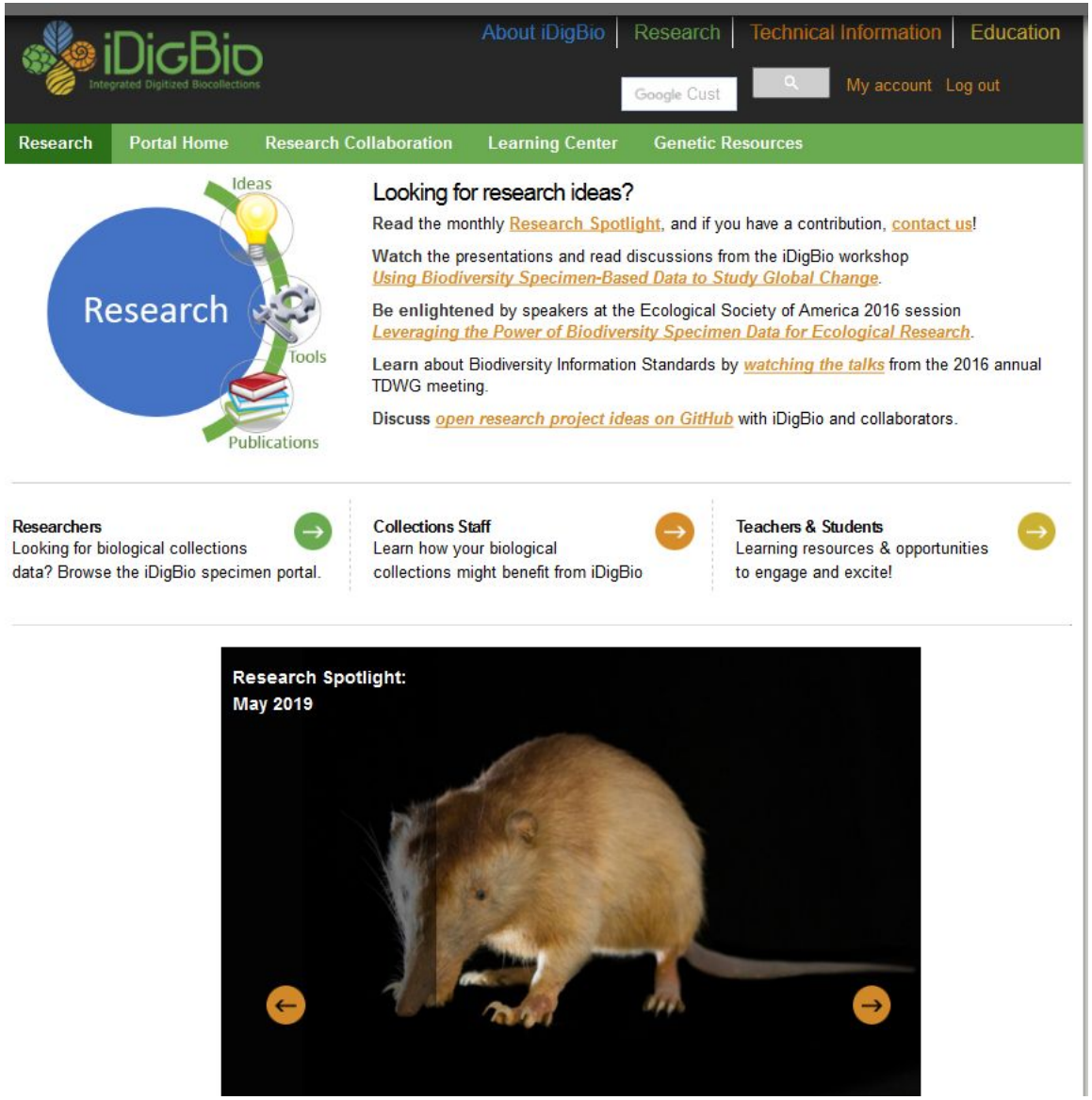
This Code of Conduct is a living document. We value your insights, feedback and comments. Please send comments and suggested edits to Molly Phillips mphillips@flmnh.ufl.edu

iDigBio has been providing professional development, resources, and community for biodiversity digitization since 2011. Each year, iDigBio hosts the ADBC Summit and organizes dozens of in-person and virtual events. The iDigBio website hosts a variety of community and internally generated content such as workflows, reports, and blog posts. iDigBio also facilitates several active email listservs and social media accounts.

iDigBio values the diversity of views, expertise, opinions, backgrounds, and experiences reflected among our ADBC partners and the broader biodiversity sciences community and is committed to providing a safe, productive, and welcoming environment for all participants of iDigBio-facilitated meetings, events, and virtual spaces. iDigBio-facilitated meetings and events can serve as an effective forum to consider and debate science-relevant viewpoints in an orderly, respectful, and fair manner. This Code of Conduct is important for promoting

Researchers
Browse our specimen portal
Collections Staff
Learn how your collection can benefit from our work
Teachers & Students
Learning resources & opportunities to engage

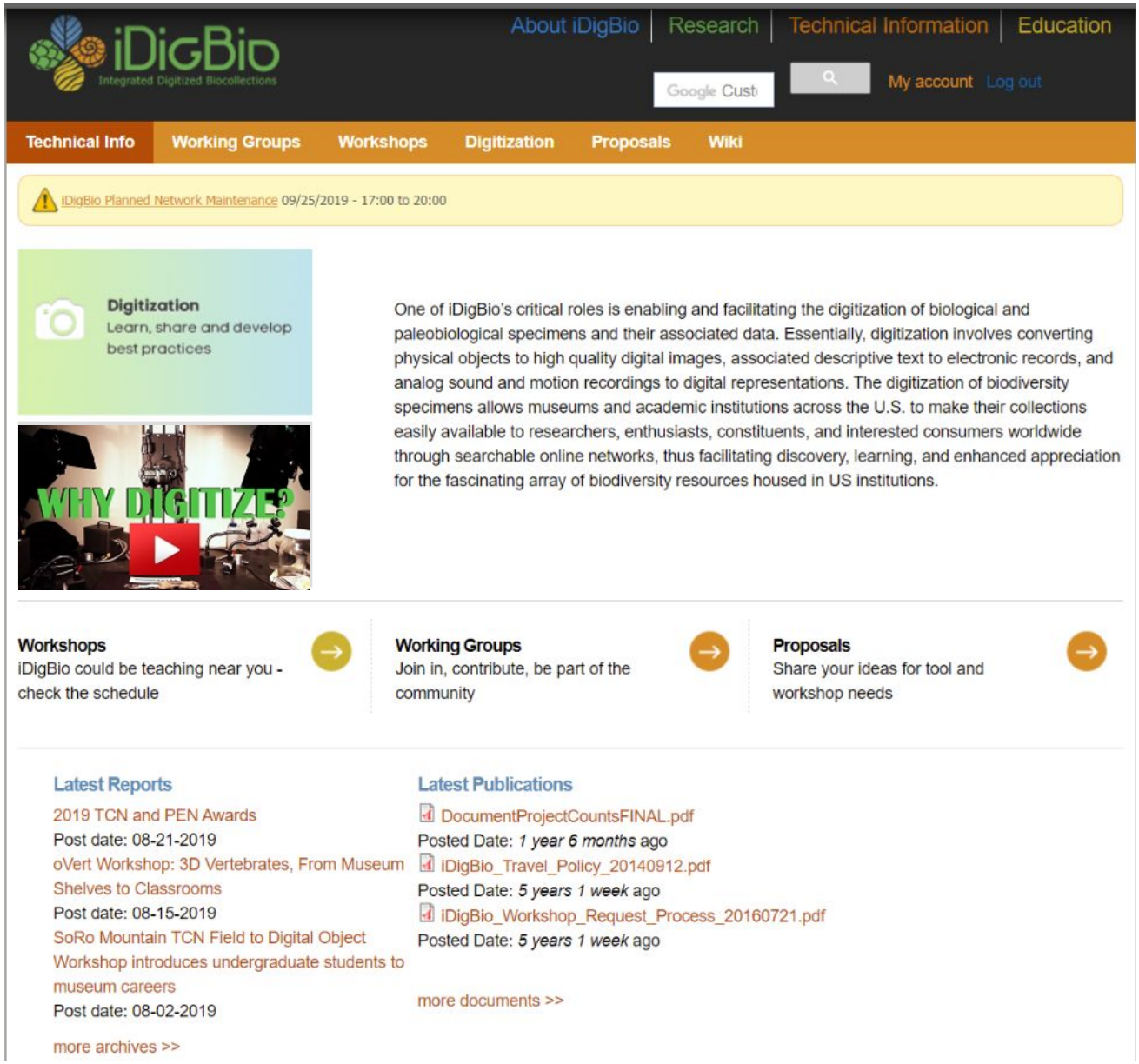
https://www.idigbio.org/research



Research

- Monthly Research Spotlights
- List of genetic repositories
- Links to ADBC research
- Tutorials
- API information
- iDigBio R package
- Research tools
- Collaborators
- Links to GitHub

https://www.idigbio.org/technical-info



Technical Information

- Working group information
- Digitization workflows
- Equipment recommendations
- Workshop summaries
- Workshop and webinar recordings
- Data ingestion guidance

https://www.idigbio.org/wiki/index.php/Main_Page

iDigBio Integrated Digitized Biocollections

About iDigBio | Research | Technical Information | Education

My Account | Log Out

iDigBio Home | Wiki | Working Groups | Workshops | Wiki Formatting Help

Djennings Talk Preferences Watchlist Contributions

Wiki Home
Workshop Summaries
Working Group List
Specimen Portal
iDigBio Data Ingestion
Ingestion Queue Dashboard
Published data
Ingestion Guidance
Data API
Digitization Resources
iDigBio Working Groups
iDigBio Research
Navigation Tools
Tools

Page | Discussion

Read | Edit | View history | Delete | Move | Protect | Search

Digitization Resources

This page provides resources and information for the series of digitization training workshops being conducted by iDigBio as well as a plethora of digitization information and resources. Included is a growing list of links to documents, websites, videos, presentations, and other important information related to biological collection digitization.

Contents [hide]

1 iDigBio Introduction
2 Recommendations for the Acquisition, Processing, and Archiving of Digital Media
3 Interest/Working Groups
4 Digitization Avenue
5 iDigBio Workshops, Reports, and Wikis
6 Videos- Digitization Resources and Workflows

Digitizing the Past and Present for the Future

iDigBio Integrated Digitized Biocollections

Digitization	
How to digitize? (Five clusters)	Workshops and Symposia
Digitization Videos	Biblio entries
Connect with iDigBio	
Specimen Portal	Upcoming Events
iDigBio on facebook	Follow iDigBio on twitter

iDigBio Introduction[edit]



"Introduction to iDigBio" 02:04

More than 1,600 natural history collections across the United States house over 1 billion biological specimens ranging from fungi to fish to fossils. This video describes the iDigBio project. It explains why digitized information and ready access to it are important, provides an overview of the digitization process and highlights some of the challenges faced when working with different types of natural history collections.

Recommendations for the Acquisition, Processing, and Archiving of Digital Media[edit]

iDigBio has created recommendations for capturing, processing, and storing digital media.

Recommendations for the Acquisition, Processing, and Archiving of Digital Media

Interest/Working Groups[edit]

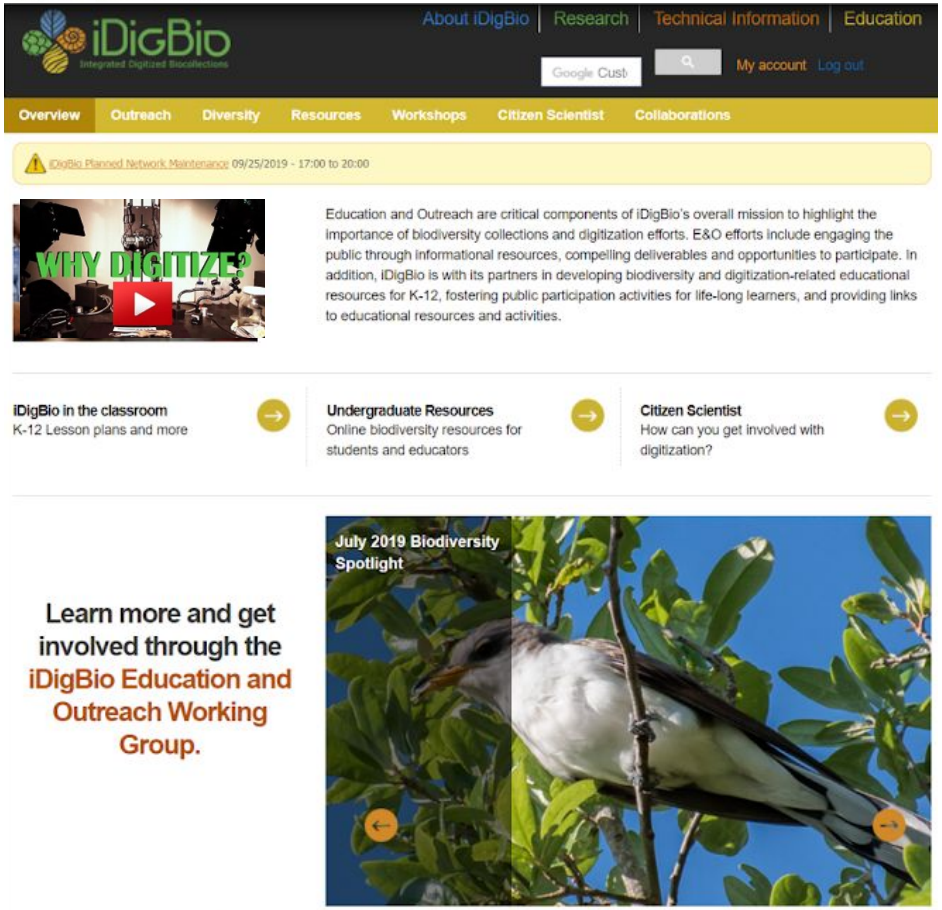
The following links take you to Interest/Working Groups focused on Digitization. For other working groups please use the following link iDigBio Working Groups

- International Whole-Drawer Digitization Interest Group
- NANSH Working Group (North American Network of Small Herbaria)
- Fluid-preserved Arthropod and Microscopic Slide Imaging Interest Group
- Paleontology Digitization Working Group
- Small Collections Network Working Group
- Vertebrate Digitization Intererst Group
- Field Station Interest Group

FEEDBACK

FEEDBACK

https://www.idigbio.org/education



Education

- Links to ADBC educational products
- Diversity and Inclusion
- Monthly Biodiversity Spotlights
- Portal Curiosities
- Coding Corner
- K-12 lesson plans
- Undergraduate modules
- Information about Citizen Science
- Educational collaborators

Researchers
Browse our specimen portal

Collections Staff
Learn how your collection can benefit from our work

Teachers & Students
Learning resources & opportunities to engage

K-12 Resources

Fri, 2013-12-27 14:11 -- kevinlove

Online Resources for K-12 Students and Ed

Welcome to our page for aggregating educational resources educators from the **Advancing Digitization of Biodiversit**

If you use any of these resources please consider fillin questionnaire.

What are you looking for?

- Lesson Plans
- Tutorials
- Videos
- Apps and Websites

Lesson Plans

Project	Grade /Standards	Keywords
		Middle School
iDigPaleo	MS-LS4-1,2 (NGSS)	fossils, paleo, insects
iDigPaleo	MS-LS4-1 (NGSS)	fossils, paleo, ecosyster insects
iDigBio	MS-LS2-1,2,4,5 (NGSS)	ecosystems, co-occurre conservation, plants, birc
WeDigFLPlants	SC.912.CS-PC3.4 SC.912.N.1.4	citizen science, biodiver museum, herbarium, pla

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

BLUE is a collaboration among individuals from the biodiversity, data, and educational communities that are working together to identify core

BLUE
Biodiversity Literacy in Undergraduate Education

https://www.idigbio.org/education/citizen-scientist



Citizen Scientist

Fri, 2013-12-27 14:11 -- kevinlove

Public engagement in scientific research (sometimes referred to as citizen science) is not new, but new web resources (e.g., from the Zooniverse, Cornell Lab of Ornithology, and USA National Phenology Network suites of projects) provide scientists with opportunities to engage the public in ways and at scales not previously possible. At the same time, the public is increasingly provided with opportunities to learn how to do science and, in some cases, co-design and implement the experiments with scientist partners (e.g., with functionality at CitSci.org). This is leading to a democratization of science, in which the public has a more direct role in doing research meaningful to them (e.g., determining floristic changes in a local natural area).

Researchers
Browse our specimen portal

Collections Staff
Learn how your collection can benefit from our work

Teachers & Students
Learning resources & opportunities to engage

Many of the current ecological/environmental citizen science projects focus on generating present-day occurrence data on populations, species, and communities. Biodiversity research collections (biocollections) represent an opportunity to produce complementary historical baseline data on distributions using the roughly 1 billion specimens in U.S. institutions collected over the past 250 years. However, information about a majority of those specimens has yet to be digitized and made available to the world online. iDigBio is working to enable the creation of this digital historical baseline in many ways, including ways that engage the public in the digitization of specimens that are most relevant to the contributor's interests. Engaging the public in digitization intersects in powerful ways with iDigBio's Education and Outreach goals, as well its Digitization, Cyberinfrastructure, and Research goals.



This year, iDigBio is excited to partner with other projects to produce the inaugural Worldwide Engagement for Digitizing Biocollections (WeDigBio) Event—a potentially huge boost for engaging the public in digitization and increasing science literacy in this domain. The event's core leadership team includes researchers from Florida State University, Smithsonian Institution, University of Florida's Florida Museum of Natural History, Australian Museum, and the major online transcription platforms, including the U.S.-based Smithsonian Transcription Center, Zooniverse Notes from Nature, and Symbiota, the Australia-based DigiVol, the UK-based Herbaria@Home, and the France-based

https://www.idigbio.org/content/broadening-participation-biology

Broadening Participation in Biology

Tue, 2018-02-20 10:14 -- maphillips



Researchers
Browse our specimen portal

Collections Staff
Learn how your collection can benefit from our work

Teachers & Students
Learning resources & opportunities to engage

Just like in all other STEM disciplines, the biodiversity sciences has a human diversity problem. iDigBio is committed to broadening participation for all underrepresented groups and is working to do so through multiple initiatives:

NSF-Funded Workshop Series



Broadening Diversity in the Biological Sciences: A Series of Workshops for Undergraduate and Graduate Students included three workshops for undergraduate students and recent graduates that focused on opportunities for careers and graduate study in field and environmental biology, biodiversity, ecology, and evolution.

- Florida Museum Shadowing Day
- Orlando Workshop

https://www.idigbio.org/content/outreach

benefit from our work

Teachers & Students
Learning resources & opportunities to engage

Outreach Materials created through ADBC

Are you looking for outreach materials to help engage with people about biodiversity, digitization, or iDigBio?



Libraries of Life Collection Cards were created by the iDigBio Augmented Reality Public Education/Outreach Working Group. The fifteen cards each feature a different project funded by NSF's Advancing Digitization of Biodiversity Collections program, and each card launches a 3D model in the mobile device's viewer that brings specimens to life for the public. **The cards are available to download and print through the app**, and further resources are available at www.libraries-of-life.org, including educational materials.

The MicroFungi Portal also has an outreach page that has educational videos and articles about early mycologists.

Citizen/Community Science

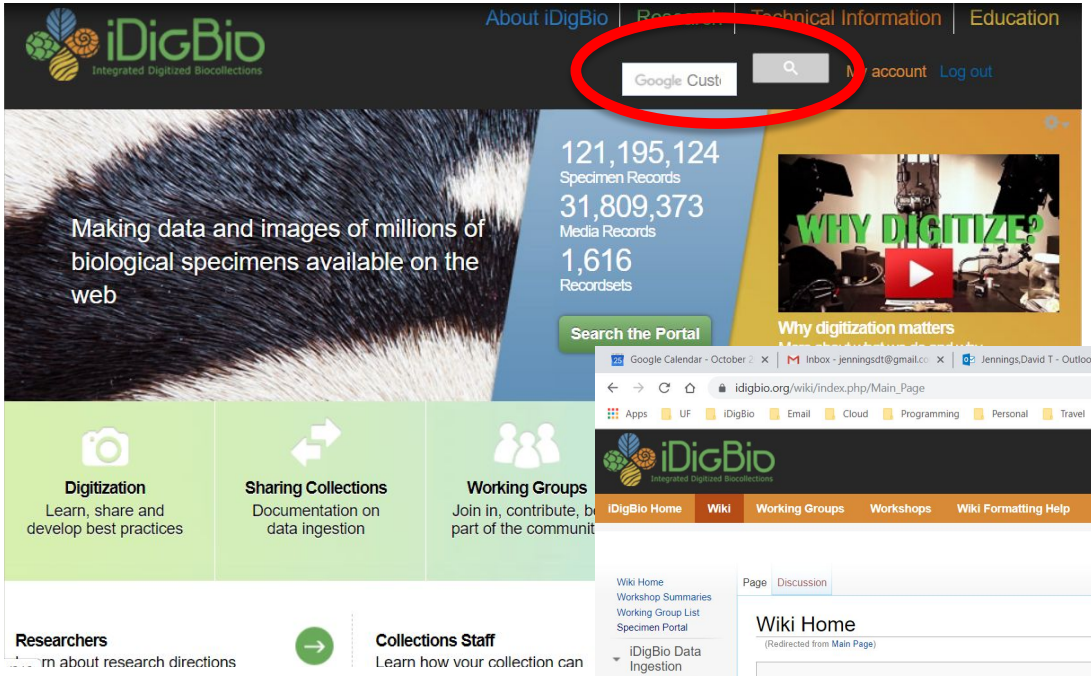
The SoRo TCN has created an iNaturalist project for citizen scientists to help document the biodiversity at the Rocky Mountain Biological Laboratory.

Notes from Nature Outreach Activity: Notes from Nature is an excellent outreach tool because people can directly participate in the digitization of museum collections. The website hosts multiple collections at all times and is fun and easy to use. iDigBio has created an activity intended for a tabling event --- for a general, or younger audience. We used this activity with Girl Scouts, but it could be easily adapted for other groups. Visit the K-12 page to find Notes from Nature activities meant for formal education.

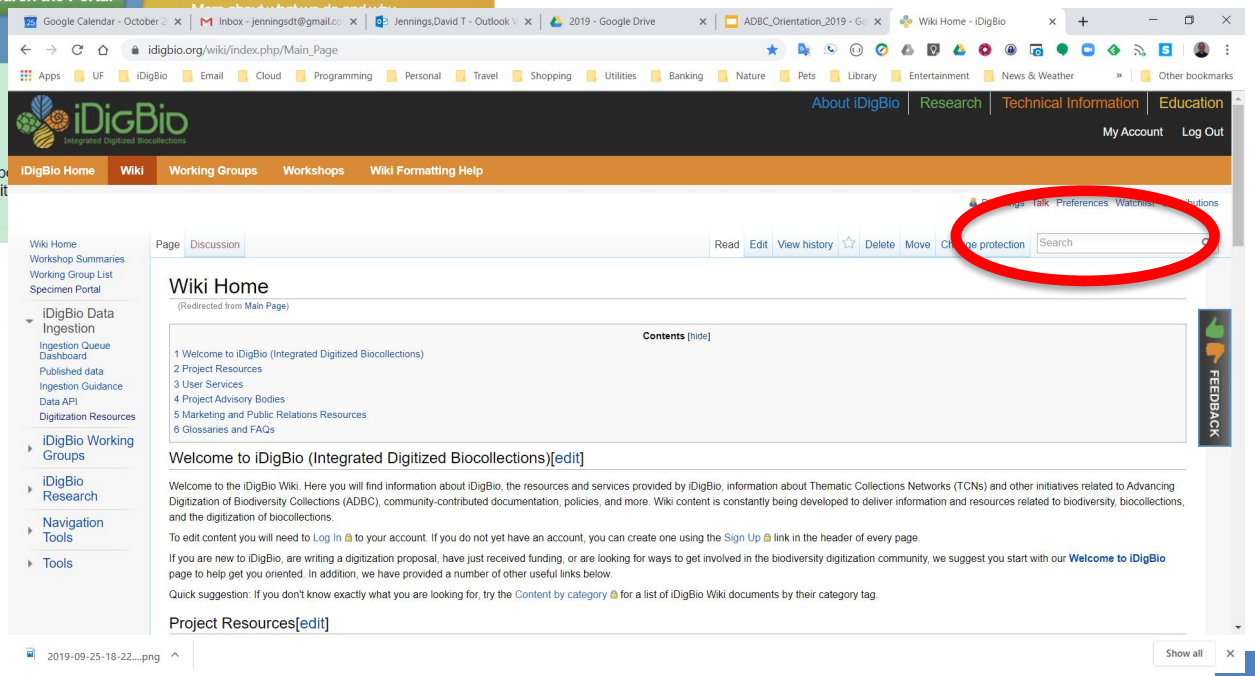
Outreach Videos

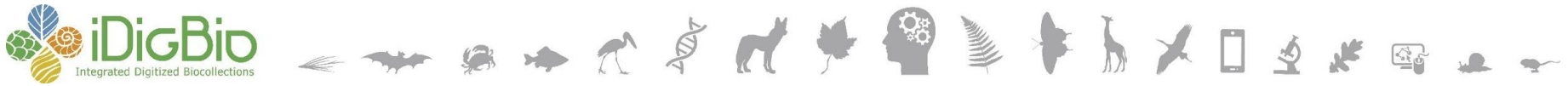
One of the members of the Mid-Atlantic Megalopolis TCN has created a 3-video series on the importance of digitization and collections.

I can't find X, or I want to know about Y



Use the search boxes!





workflows

About 2,110 results (0.27 seconds)

Webinar: Towards user-definable, semi-automated **workflows** for ...
https://www.idigbio.org/.../webinar-towards-user-definable-semi-automated- **workflows**-curating-biodiversity-data
In the FilteredPush project, we have developed automated **workflows** for quality control of biodiversity data, first as proof-of-concept desktop software in the ...

Digitization **Workflows** | iDigBio
https://www.idigbio.org/content/digitization-**workflows**
Jun 10, 2012 **...** Efficient and effective **workflows** are at the heart of successful biological and paleontological collections digitization. Much work has been done ...

Workflow Modules and Task Lists | iDigBio
https://www.idigbio.org/content/**workflow**-modules-and-task-lists
Aug 24, 2012 **...** One outgrowth of the DROID (Developing Robust Object-to-Image-to-Data) **workflow** workshop held in May 2012 was the establishment of a ...

Workflow | iDigBio
https://www.idigbio.org/tags/**workflow**
Mass Digitizing a Working Herbarium using a conveyor belt: **Workflows**, Strategies, ... Webinar: Towards user-definable, semi-automated **workflows** for curating ...

Workflows | iDigBio
https://www.idigbio.org/tags/**workflows**
This session at GSA 2016 will focus on paleontology/geo databases, data standards related to paleontology, and mobilization of research-quality paleontology ...

Developing Robust Object to Image to Data **Workflows** Workshop ...
https://www.idigbio.org/.../developing-robust-object-image-data-**workflows**- workshop
Developing Robust Object to Image to Data (DROID) **Workflows** Workshop. Building 105,

iDigBio Integrated Digitized Biocollections

iDigBio Home | Wiki | Working Groups | Workshops | Wiki Formatting Help

- Wiki Home
- Workshop Summaries
- Working Group List
- Specimen Portal
- iDigBio Data Ingestion
  - Ingestion Queue Dashboard
  - Published data
  - Ingestion Guidance
  - Data API
  - Digitization Resources
- iDigBio Working Groups
- iDigBio Research
- Navigation Tools
- Tools

Special page

Search results

workflows Search

Content pages | Multimedia | Help and Project pages | Everything | Advanced

Create the page "Workflows" on this wiki!

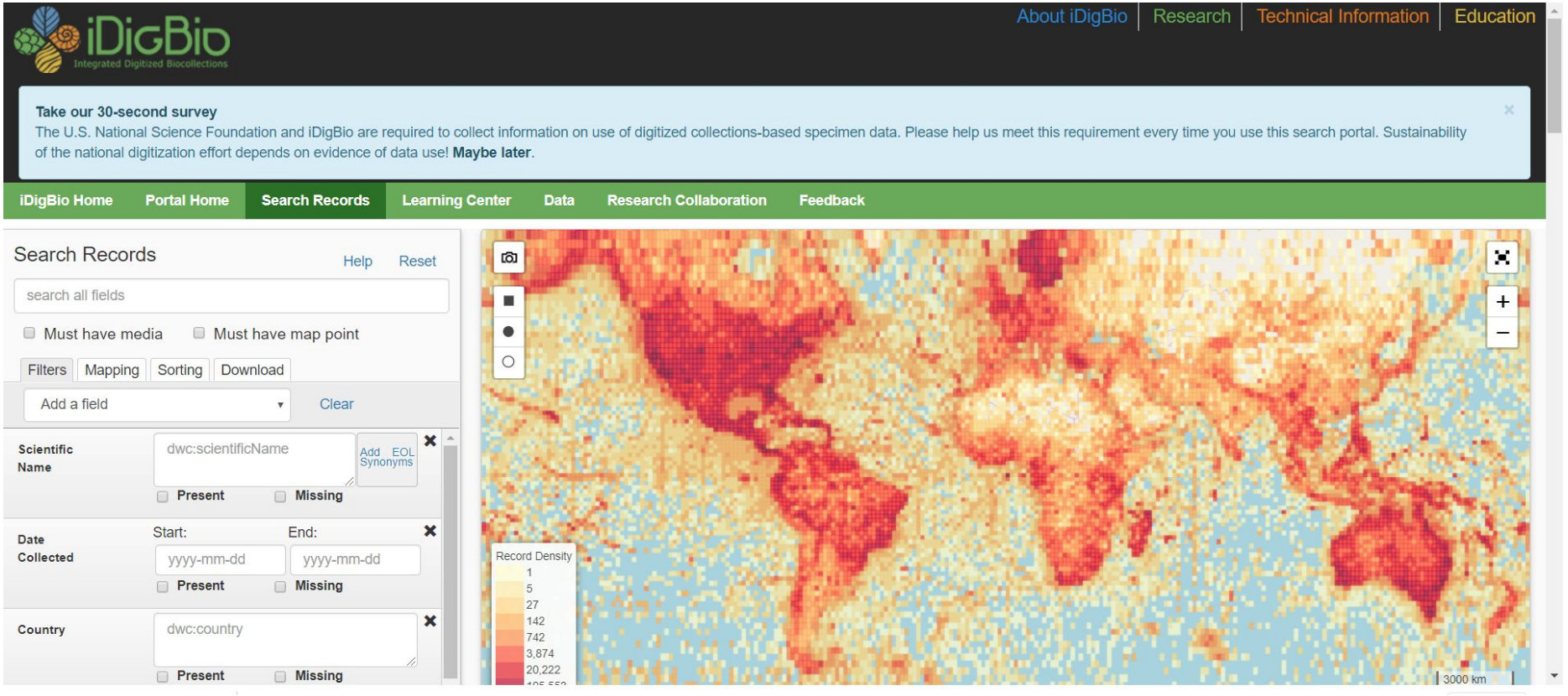
Page title matches

Collections Digitization Workflows
...ributions of existing **workflows** and protocols are encouraged, whether such **workflows** were developed by the contributor or discovered while searching the interne ...s://www.idigbio.org/content/digitization-**workflows** iDigBio's Collaborative **Workflows** Page] ==
3 KB (387 words) - 07:47, 7 May 2015

OCR / NLP Workflows
4 KB (581 words) - 10:15, 25 August 2014

Digitization Workflows and Protocols
...utions we visited. The following links provide information on Digitization **Workflows** and Protocols. * [http://tcn.amnh.org/documents **Workflows**, protocols, etc. from Tri-

Flexible search across all data, indexed fields, media, geolocation, map boundary, auto-completion, synonyms, ...

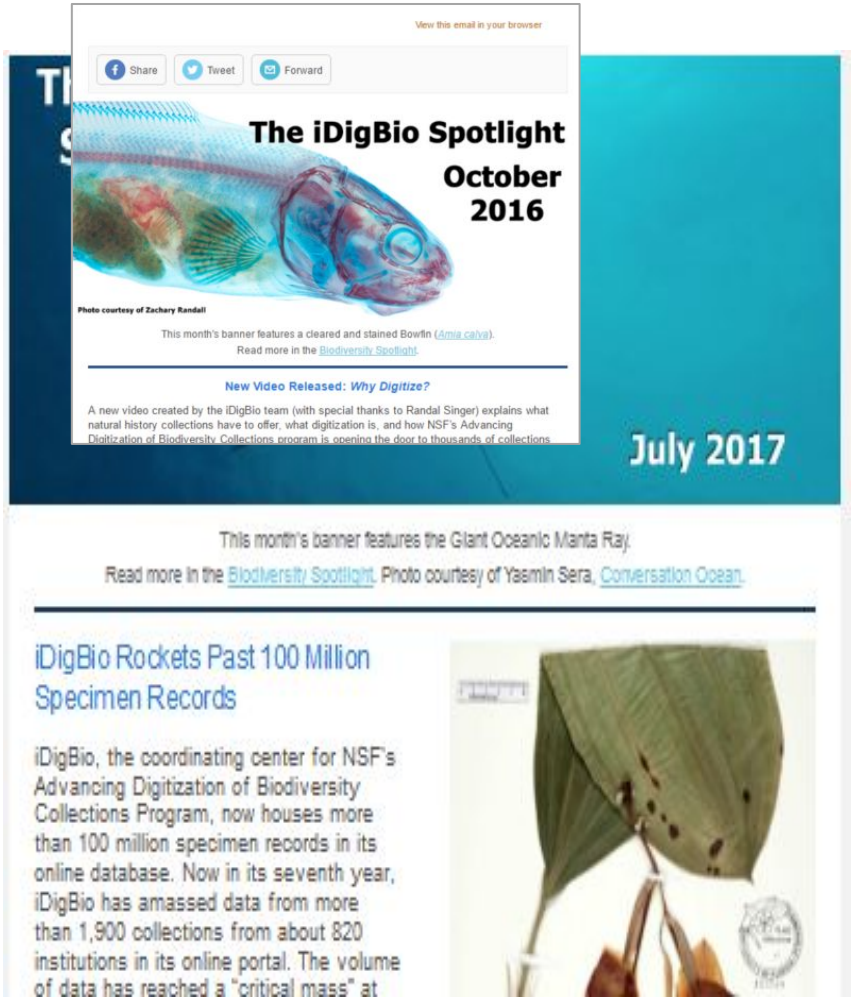


https://www.idigbio.org/portal

Get Involved!

Step 1: Sign up for the iDigBio Newsletter

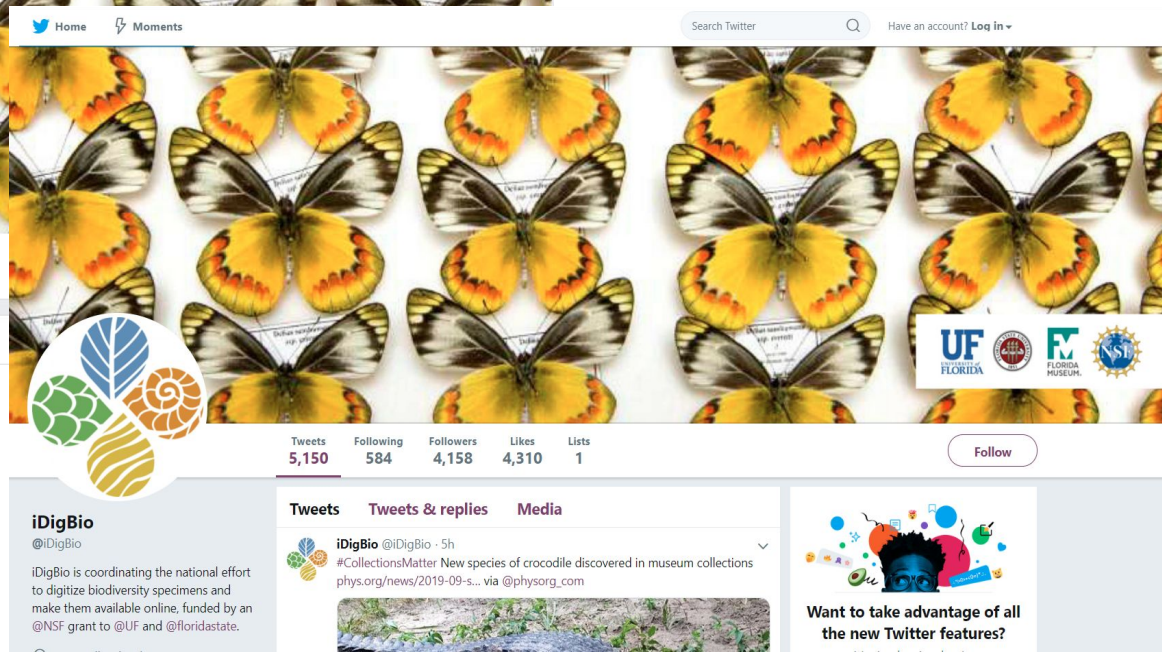
- TCN and digitization news
- Upcoming workshops and webinars
- Event recaps
- Articles featuring innovative collections-based research Biodiversity Spotlights



https://www.idigbio.org/newsletter-subscribe

Step 2: Social media





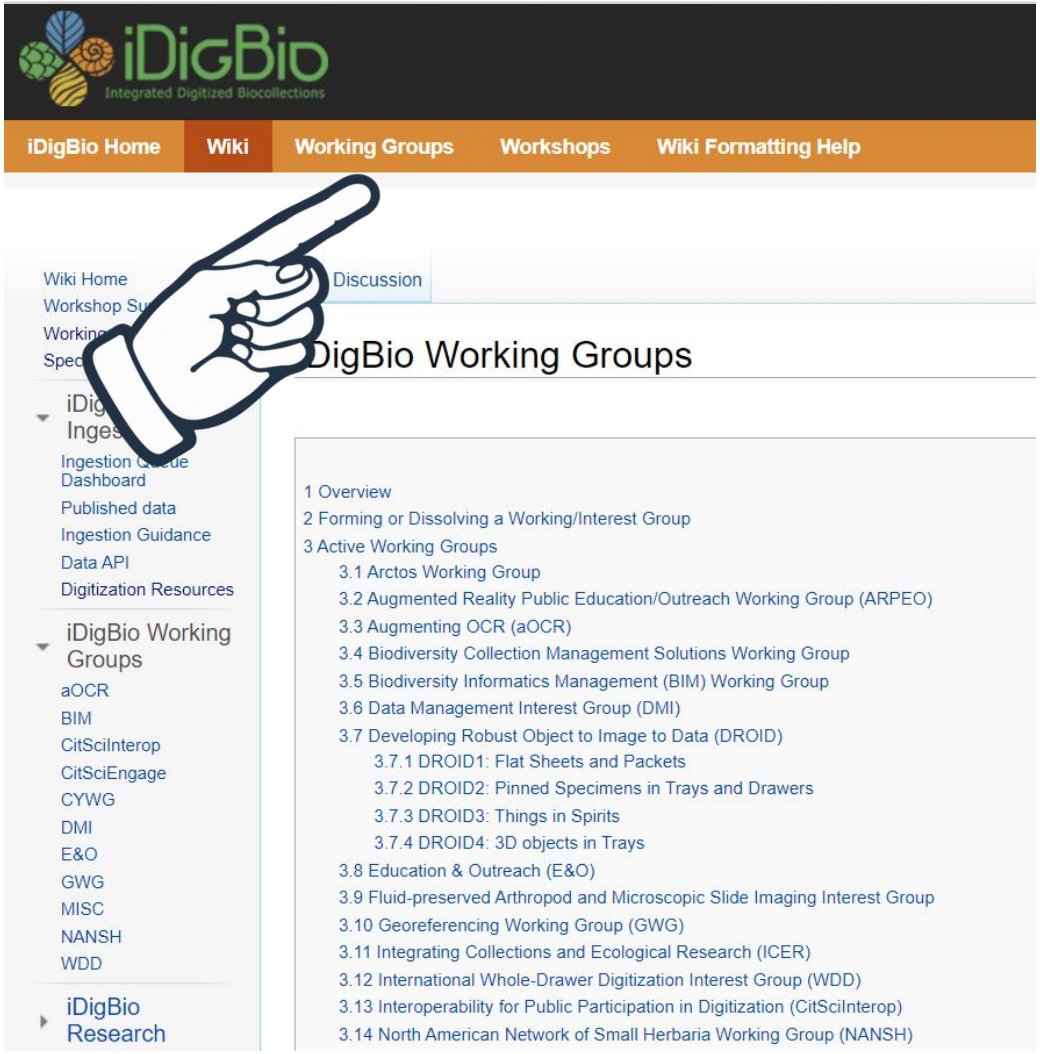
vimeo.com/idigbio

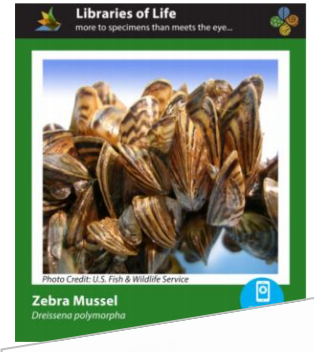
idigbio.org/rss-feed.xml

idigbio.org/events-calendar/export.ics

www.idigbio.org/wiki

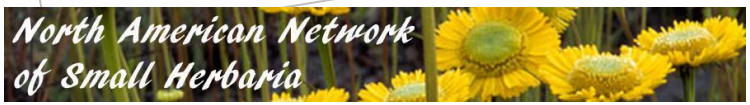
Step 3: Get involved with a Community Working Group









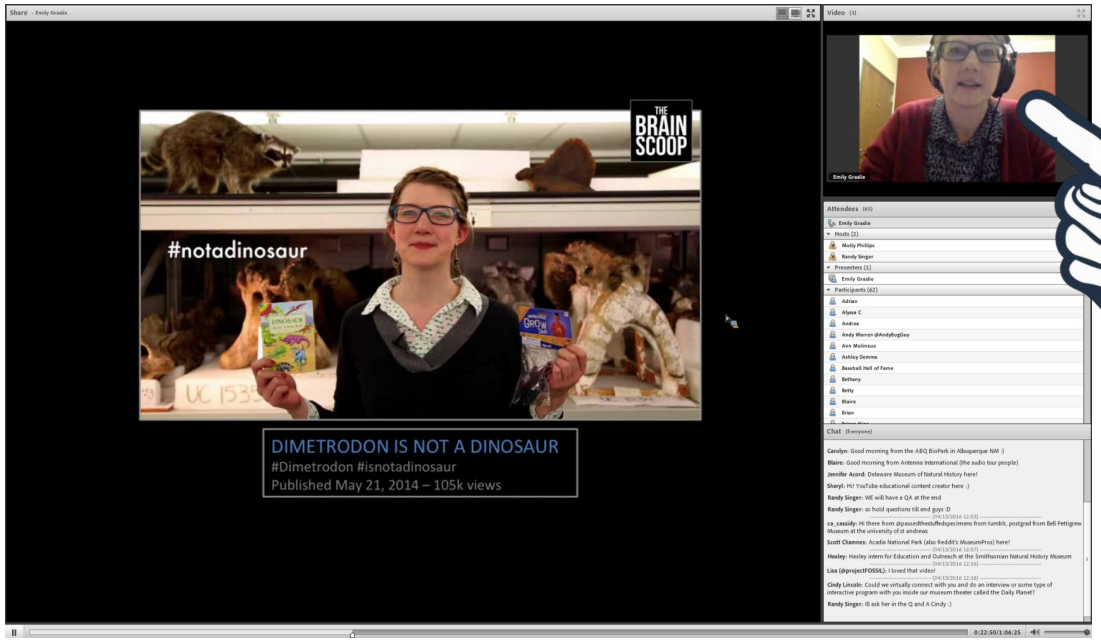


Documentation
API development
Workflows
Standards
Best practices
Hackathons
Workshops, Webinars



Step 4: Watch a webinar…or star in one!

https://www.idigbio.org/tags/webinar
https://www.idigbio.org/wiki/index.php/Web_Conferencing

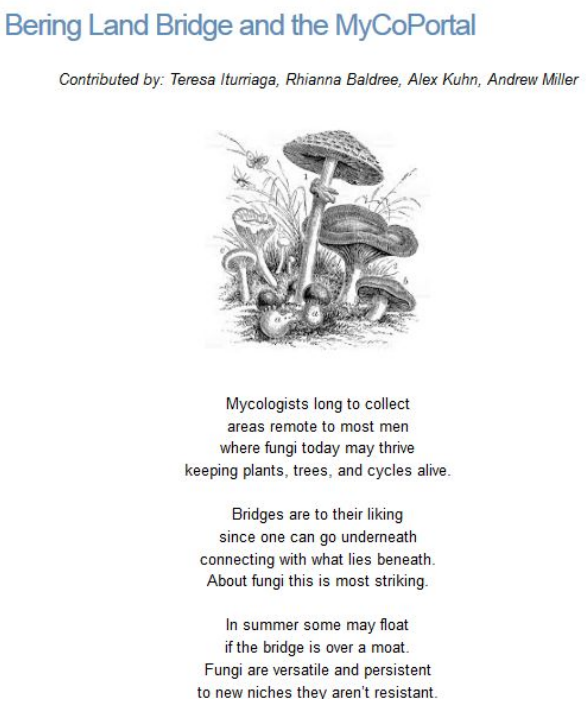


Workshops
Symposia
Webinars

Be like Emily: get a headset preferably with a microphone!

Step 5: Contribute to the iDigBio website

- Submit an article for the **Research Spotlight**
- Write an article about **your project**
- Contribute your **workflows**
- **Update** your individual TCN wiki pages
- Write about your **iDigBio experience**
- Post an **event**
- Share education/outreach **resources**



Bering Land Bridge and the MyCoPortal

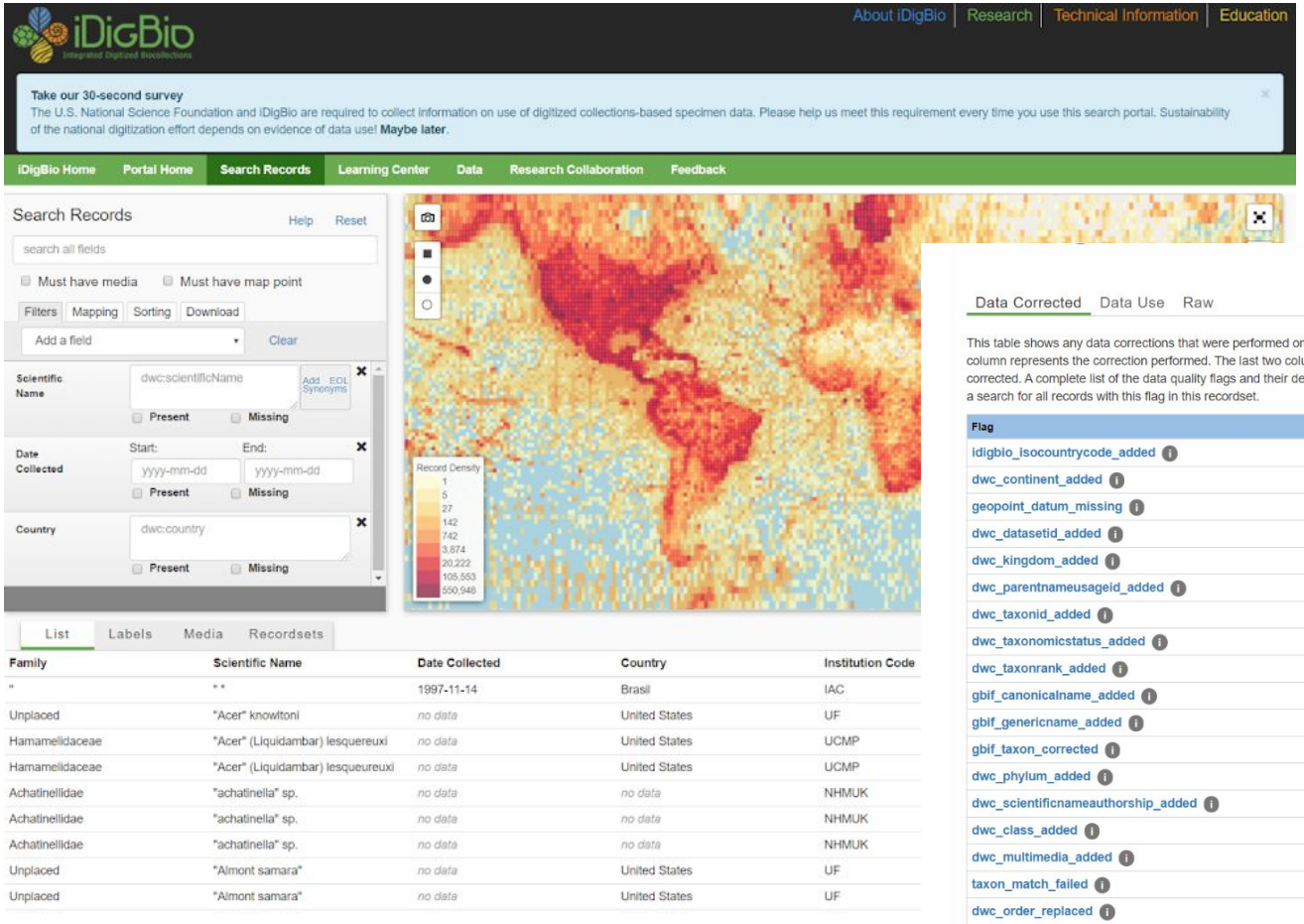
Contributed by: Teresa Iturriaga, Rhianna Baldree, Alex Kuhn, Andrew Miller

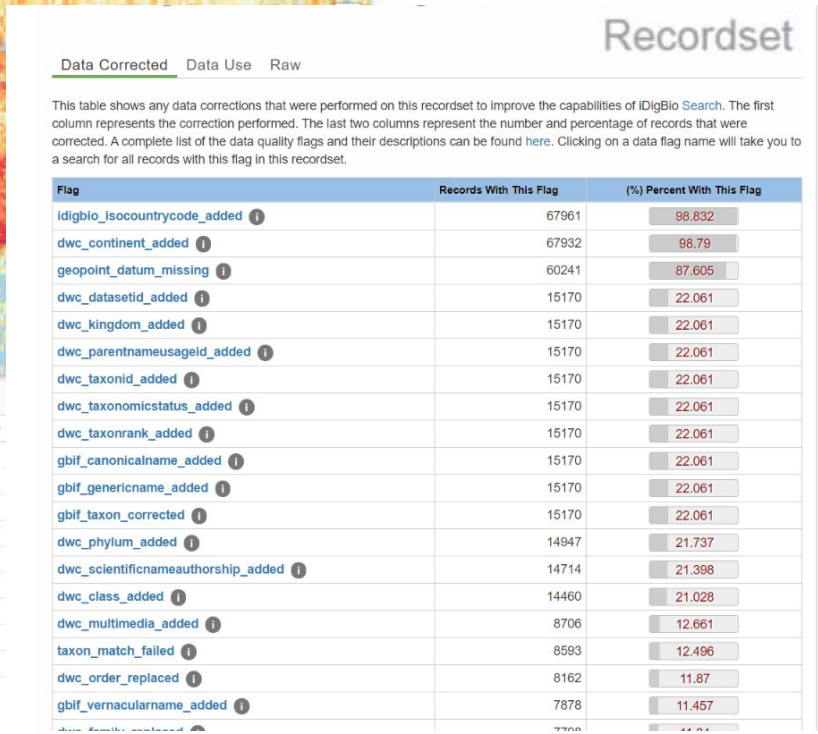
Mycologists long to collect
areas remote to most men
where fungi today may thrive
keeping plants, trees, and cycles alive.

Bridges are to their liking
since one can go underneath
connecting with what lies beneath.
About fungi this is most striking.

In summer some may float
if the bridge is over a moat.
Fungi are versatile and persistent
to new niches they aren't resistant.

Step 6: Use the portal for research and data cleaning – feedback!





Step 7: Collaborate!



TCN Responsibilities

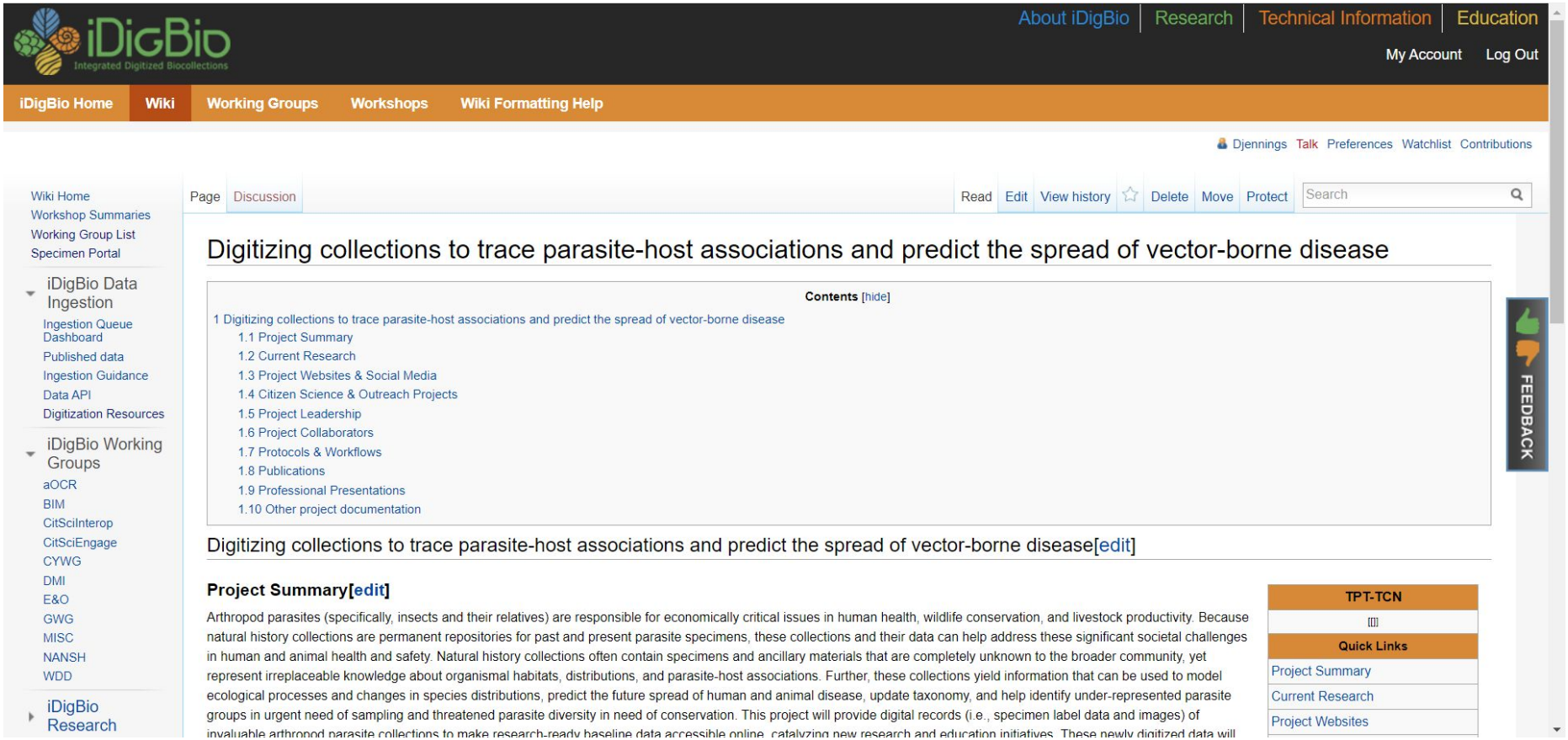
TCN Responsibilities (1 of 2)

- **Maintain a TCN wiki page**
  - https://www.idigbio.org/wiki/index.php/TCNs
- Submit requested info for Summit resources
- Provide feedback via annual community survey and other solicitations
- **Prepare annual report for NSF**
  - https://www.idigbio.org/wiki/images/3/34/ADBC_AnnualReportInfoSheet.pdf

TCN Responsibilities (2 of 2)

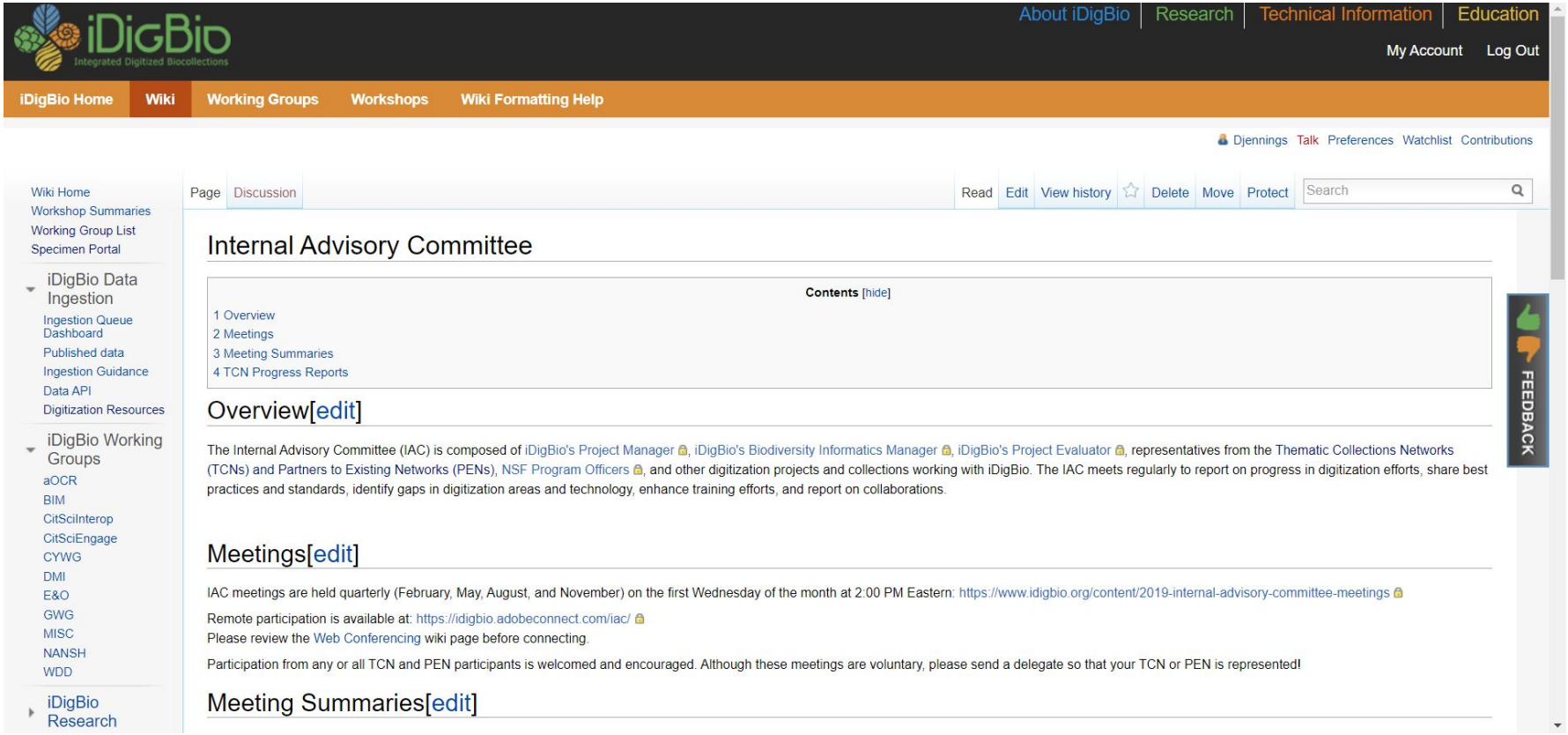
- Participate in quarterly TCN meetings
  - Feb, May, Aug, and Nov on first Wed @ 2:00 PM Eastern; minutes published on wiki
  - https://www.idigbio.org/content/2019-internal-advisory-committee-meetings
- **Submit quarterly reports to iDigBio**
  - Due by the quarterly meeting; published on wiki
  - https://www.idigbio.org/content/tcn-quarterly-progress-report-idigbio

https://www.idigbio.org/wiki/index.php/Digitizing_collections_to_trace_parasite-host_associations_and_predict_the_spread_of_vector-borne_disease



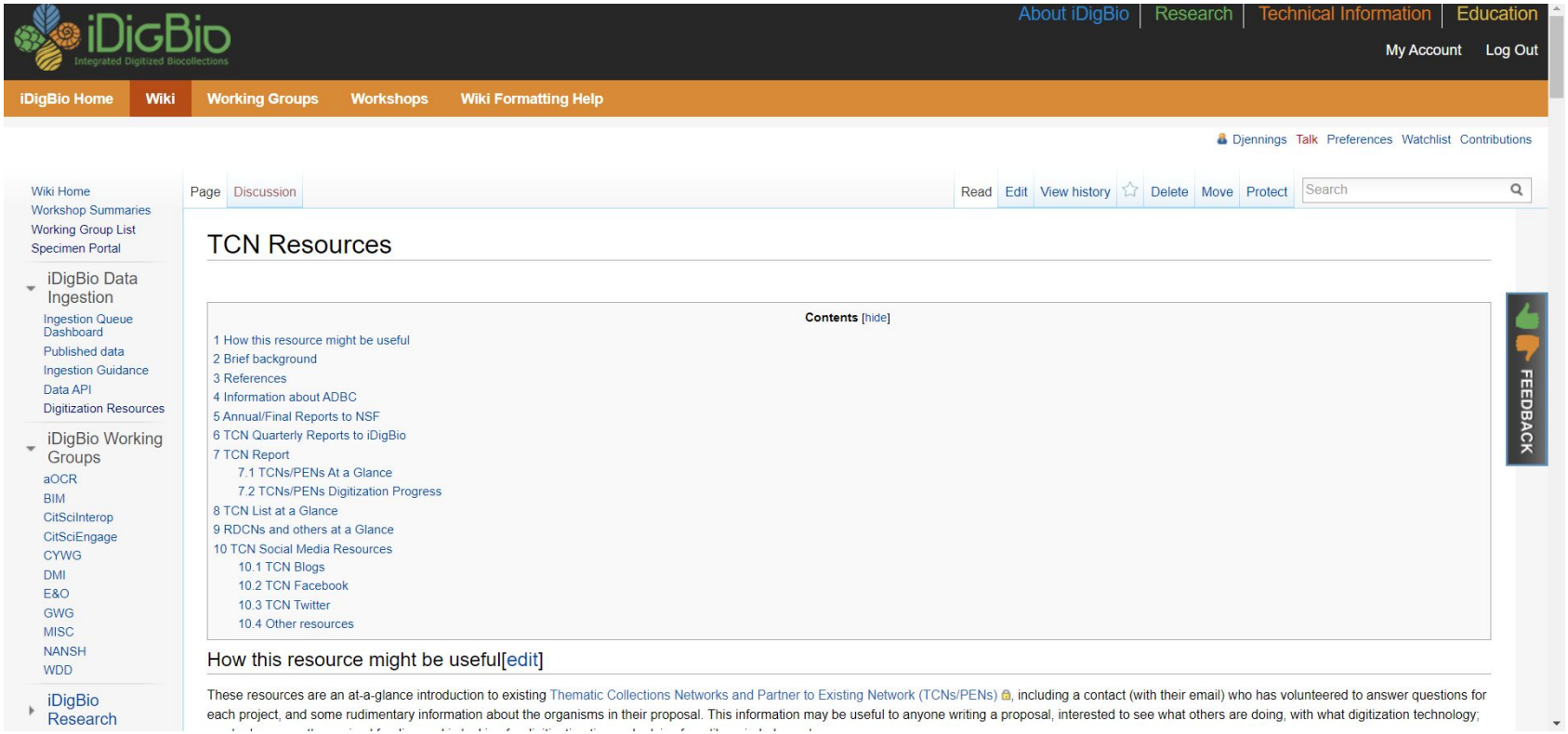
Quarterly Meeting Minutes & Reports

- https://www.idigbio.org/wiki/index.php/Internal_Advisory_Committee



TCN Resources

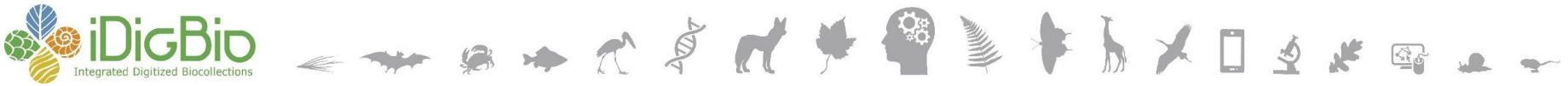
- https://www.idigbio.org/wiki/index.php/TCN_Resources



Other Helpful Resources

- Welcome to iDigBio: https://www.idigbio.org/wiki/index.php/Welcome_to_iDigBio
- MediaWiki Reference Card: https://meta.wikimedia.org/wiki/File:MediaWikiRefCard.pdf
- Workshop Planning and Deliverables: https://www.idigbio.org/wiki/index.php/Workshop_Planning_and_Deliverables
- Content Style Guide and Workflow: https://www.idigbio.org/wiki/index.php/Content_Style_Guide_and_Workflow

How To Get Your Data To iDigBio



What's In This For You?

Meet the iDigBio Staff

Overview of the ingestion process

Learn how to get your data ***published***

iDigBio Data Mobilization Staff

Caitlin "Cat" Chapman
cchapman@floridamuseum.ufl.edu

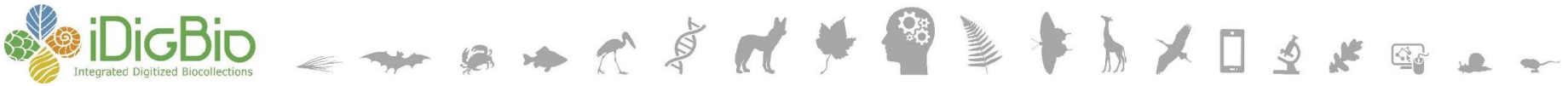


Biodiversity Informatics Coordinator

Dan Stoner
dstoner@acis.ufl.edu



Data Integration Expert



data@idigbio.org

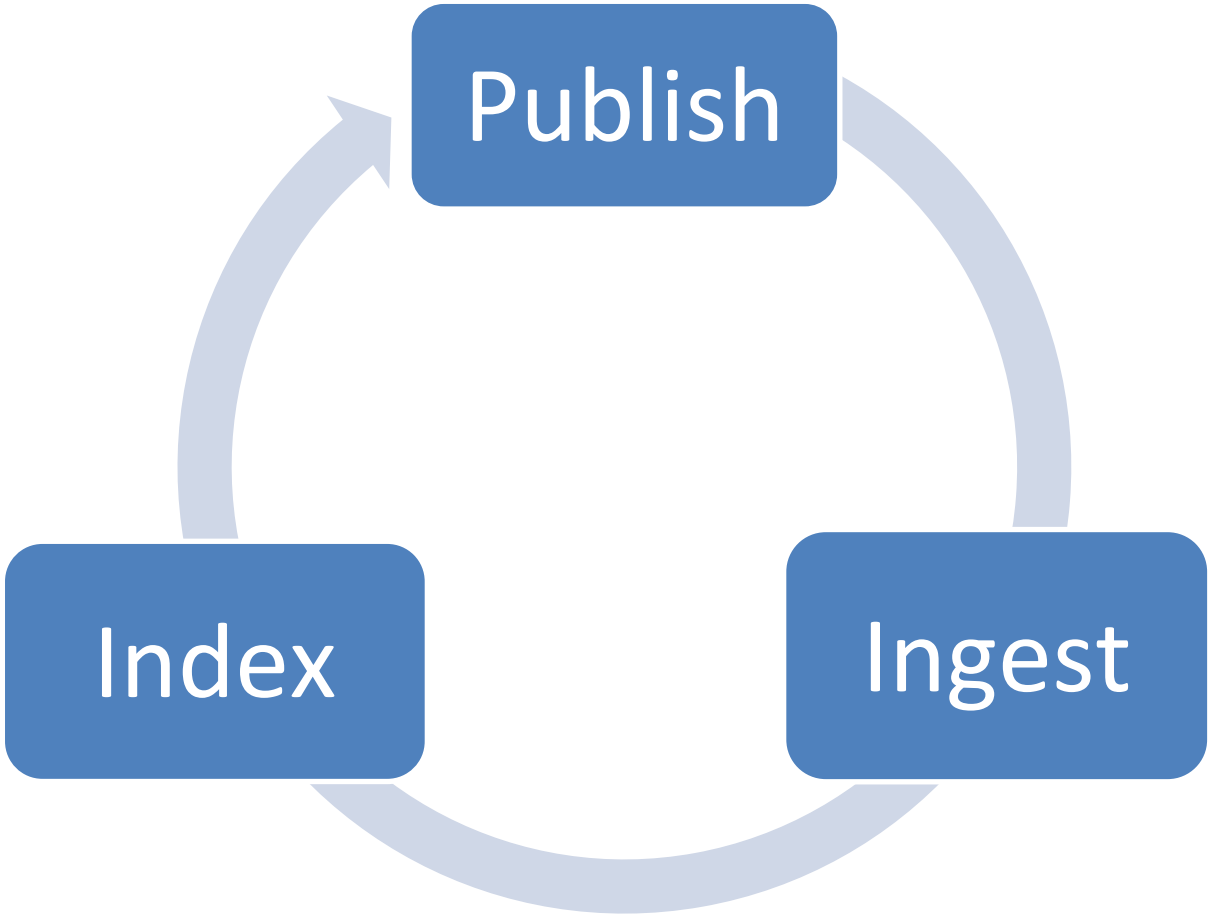
The go-to guide for data ingestion

Everything you wanted to know about preparing data for ingestion:

https://www.idigbio.org/wiki/index.php/Data_Ingestion_Guidance

- Identifiers
- **Darwin Core** – occurrence data (specimen records)
- **Audubon Core** - media

Ingestion Process



What do we mean by publishing data?

making biodiversity data publicly accessible & discoverable, in a standardized form, via a URL.

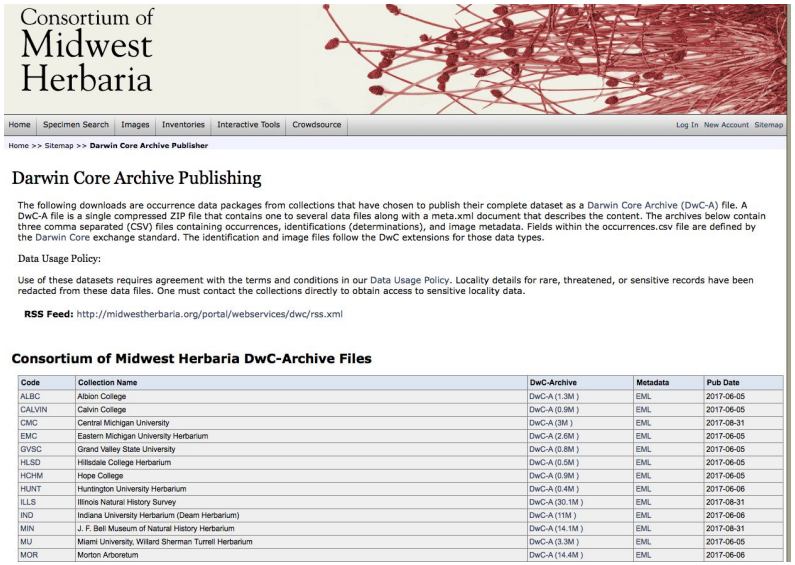
** that is reproducible and automated*

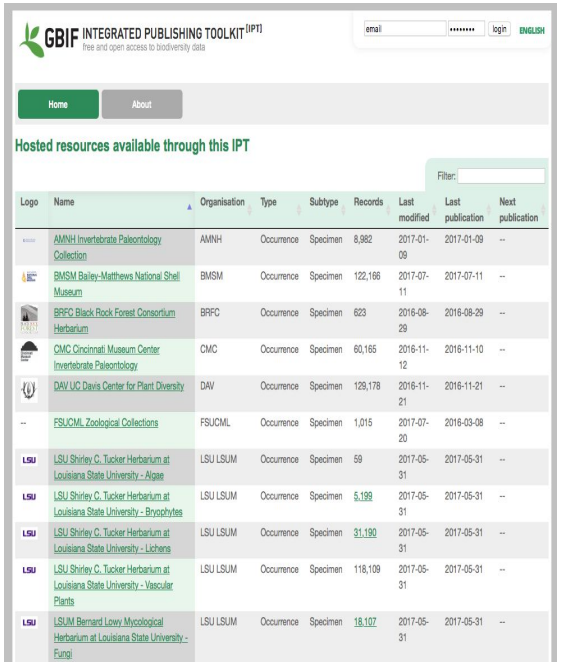




Data publishing – where to begin

- Email data@idigbio.org
  "I'm ready"
- Review your data and publishing options together



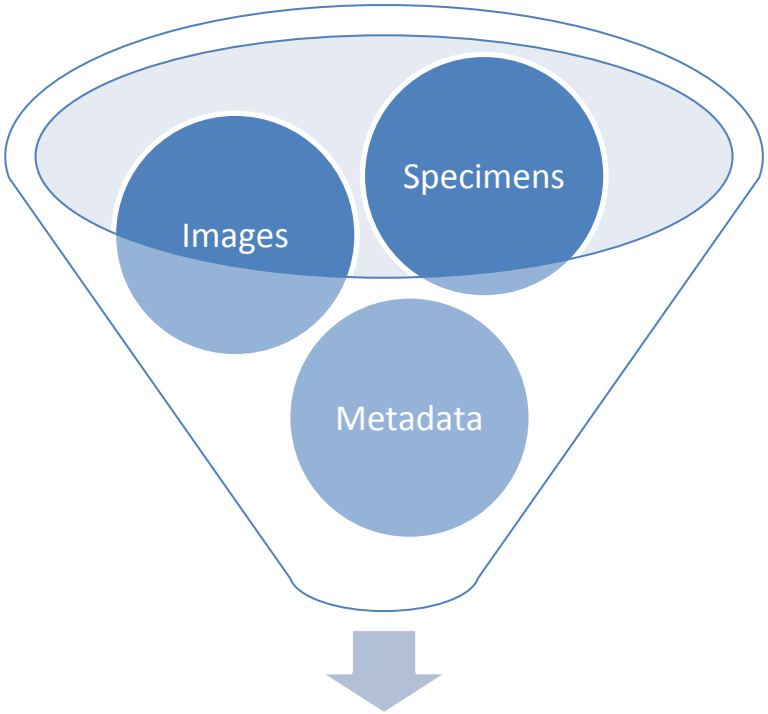


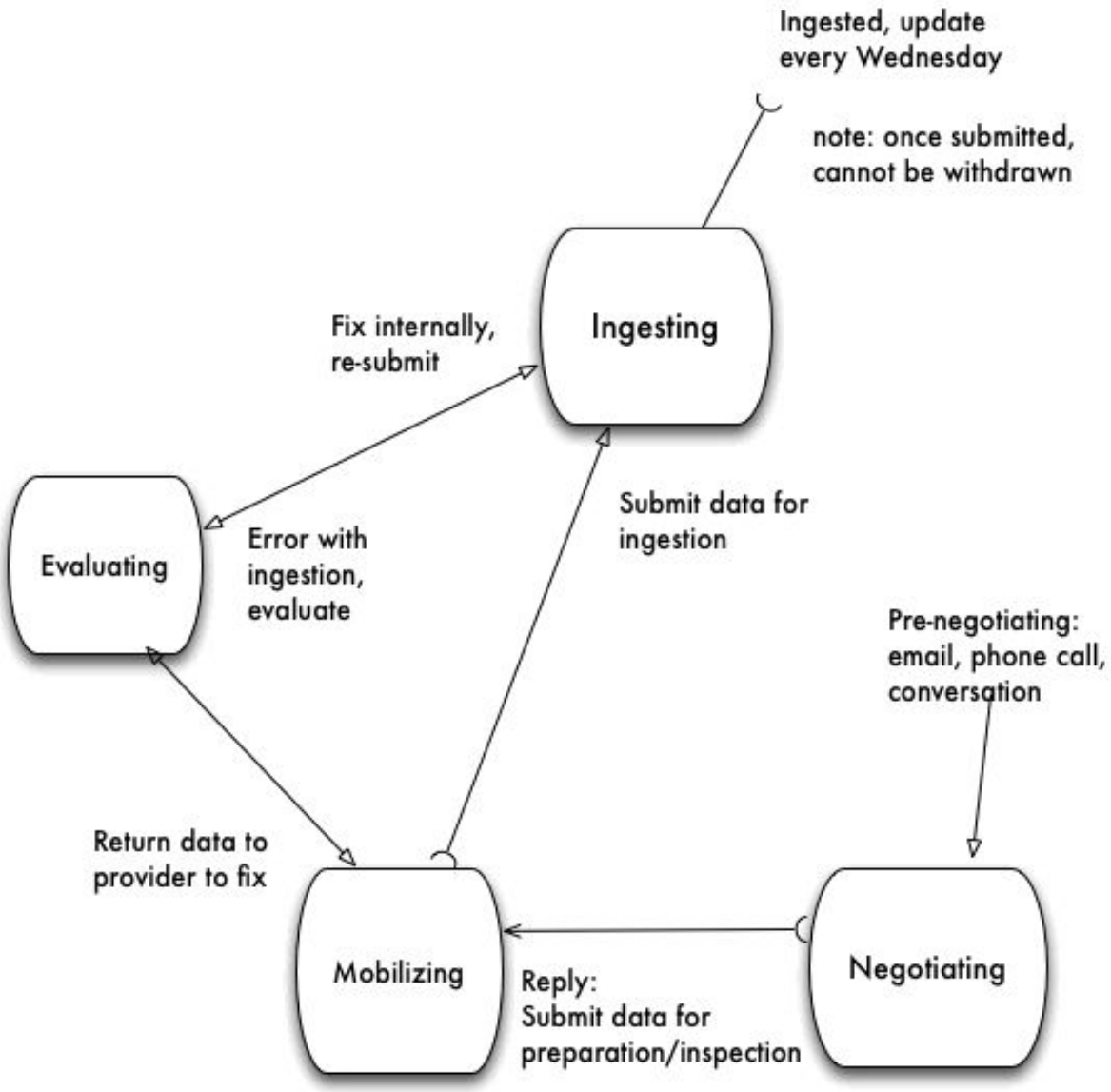
Ingestion Queue

- https://www.idigbio.org/wiki/index.php/Data_Ingestion_Report

Milestones:

- Negotiating
- Mobilizing
- Ingesting
- Evaluating




Ingested, update every Wednesday
note: once submitted, cannot be withdrawn
Ingesting
Fix internally, re-submit
Evaluating
Error with ingestion, evaluate
Submit data for ingestion
Pre-negotiating: email, phone call, conversation
Return data to provider to fix
Mobilizing
Reply: Submit data for preparation/inspection
Negotiating

DATASET INFO: info about the provider (metadata)

Document your dataset metadata with your provider information:

- responsible parties (name, address, email, role)
- institution name, institution code, collection code, logo
- URL to the collection at your institution
- descriptive paragraph about the institution, collection, and the dataset

DATASET INFO: rights

- Use Creative Commons standards:
  - CC0 for data (not copyrightable)



  - CC BY for media (at least)



IDENTIFIERS

Every specimen and media record needs an identifier. [Robust and persistent]

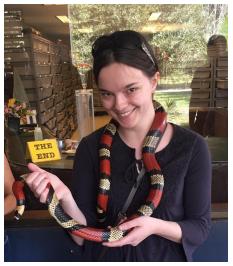
We like UUIDs with a prefix:

urn:uuid:2d5d3a8f-7a18-4825-a129-4a32b4ae58b8

Contact us!



Alnycea Blackwell “Allie”
Project Assistant
ablackwell@floridamuseum.ufl.edu



Cat Chapman
Biodiversity Informatics Coordinator
cchapman@floridamuseum.ufl.edu



David Jennings
Project Manager
djennings@flmnh.ufl.edu



Deborah Paul “Debbie”
Digitization/Training Manager
dpaul@fsu.edu



Erica Krimmel
Digitization Resources Coordinator
ekrimmel@fsu.edu



Gil Nelson
Project Director
gnelson@floridamuseum.ufl.edu



Jillian Goodwin
Conference Manager
jgoodwin@floridamuseum.ufl.edu



Molly Phillips
Education, Outreach, Diversity, & Inclusion Coordinator
mphillips@flmnh.ufl.edu



Ronald Canepa
System Administrator and Programmer
rcanepa@acis.ufl.edu



Nicholas Rejack
System Administrator / Programmer III
nrejack@acis.ufl.edu



Chris Wilson
System Administrator / Programmer III
wilsotc@acis.ufl.edu



Libby Ellwood
Global Communications Manager
ellwoodlibby@gmail.com

Thank you!

www.idigbio.org

facebook.com/iDigBio

twitter.com/iDigBio

vimeo.com/idigbio

idigbio.org/rss-feed.xml

webcal://www.idigbio.org/events-calendar/export.ics

iDigBio is funded by grants from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program [DBI-1115210 (2011-2018) and DBI-1547229 (2016-2021)]. 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. *© 2011-2019 iDigBio*