# iDigBio: A Network Partner for Specimen-Based Research and Data

Integrated Digitized Biocollections

www.idigbio.org

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

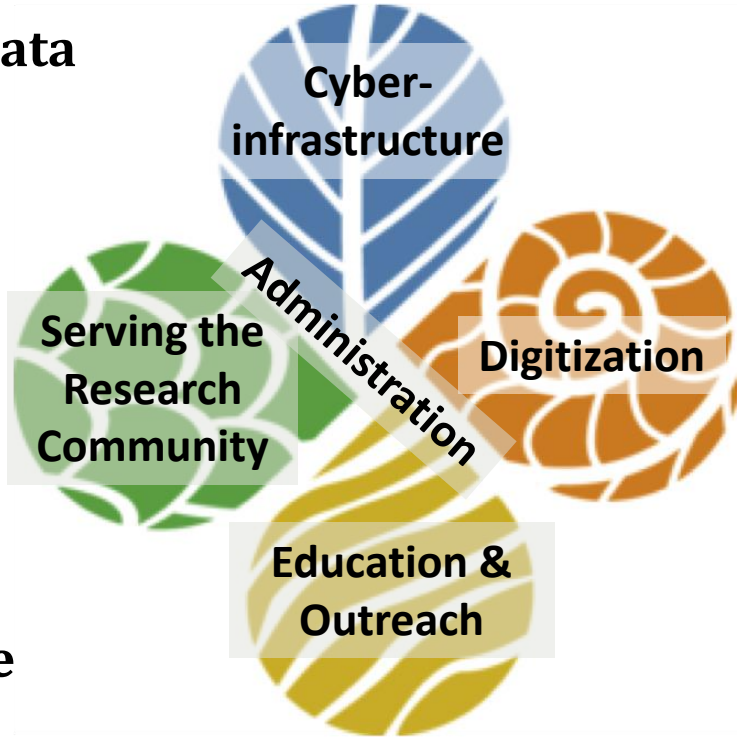
# Who are we?

- Coordinating center for the national effort to digitize non-federal U.S. natural history collections
  - Based at the University of Florida and Florida State University
- Central resource for NSF's Advancing Digitization of Biodiversity Collections (ADBC) program
  - 10 year, $100 million nationwide effort
  - National network of institutions organized by theme to focus research, drive digitization efforts, & build community
    - Thematic Collection Networks (TCNs)
    - Partners to Existing Networks (PENs)

***"To advance scientific knowledge by improving access to digitized information in vouchered scientific collections across the US."***

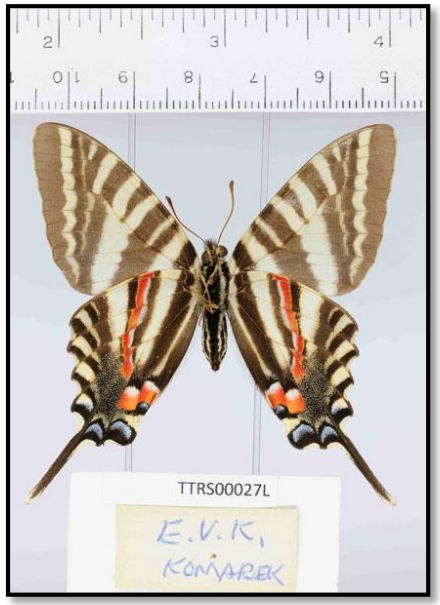
# What do we do?

- **Enable digitization of biodiversity collections data**
  - Develop efficient & effective standards & workflows
  - Workforce education & training
- **Provide portal access to biodiversity data in a cloud computing environment**
  - Respond to cyberinfrastructure needs
  - Enable access & discoverability
- **Facilitate use of biodiversity data to address key environmental and economic challenges**
  - Researchers, educators, general public, policy-makers, …
- **Plan for long-term sustainability of the national digitization network & effort**
  - Expand participation: partners, data sources, public, …
  - Proliferate and broaden uses of biodiversity data



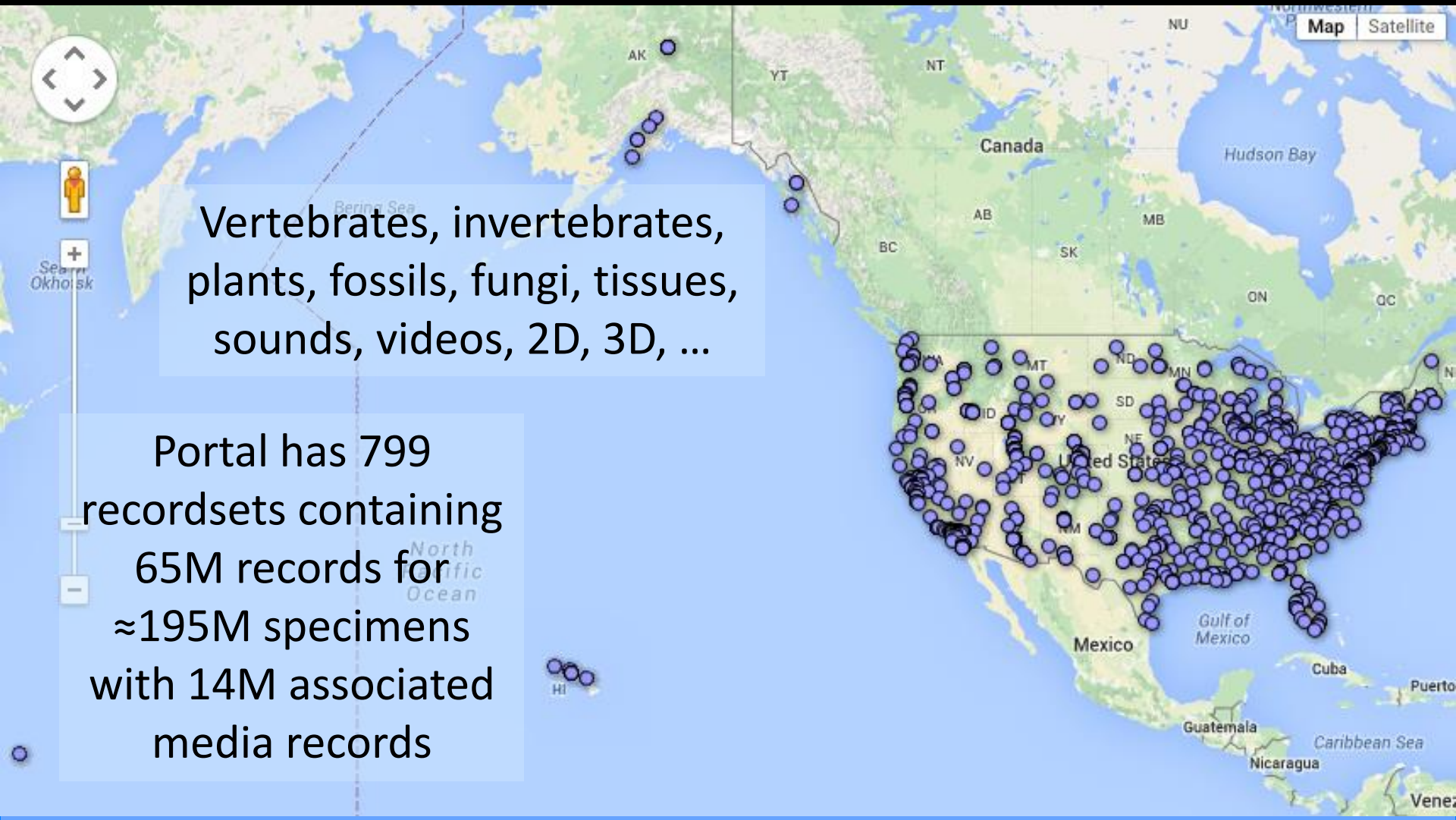
# Why are we doing it?

Estimates suggest there are between
**500 million and 1 billion**
biological and paleobiological specimens
in the United States and potentially
**3-4 billion worldwide.**
Many are digitized, but most are not.
**An untapped trove of information!**


# National Network of the Advancing Digitization of Biodiversity Collections Program

iDigBio
Integrated Digitized Biocollections




Vertebrates, invertebrates, plants, fossils, fungi, tissues, sounds, videos, 2D, 3D, …

Portal has 799 recordsets containing 65M records for ≈195M specimens with 14M associated media records

**500+ collections in 275+ institutions in 50 states (18 TCNs + 17 PENs)**

# How do we do it? Collaboration!

# Where are we headed?

- More recordsets from "all" providers
- Improve data access & discoverability
- Highlight, promote, & facilitate broad and diverse uses of biodiversity data
- Promote/improve data quality & standards
- Develop sustainability strategies
- Facilitate public participation/crowdsourcing


# Before we get too far… Enjoy your alphabet soup…

| Acronym | Meaning |
|---|---|
| iDigBio | Integrated Digitized Biocollections |
| NSF | National Science Foundation |
| ADBC | Advancing Digitization of Biodiversity Collections |
| TCN | Thematic Collection Network |
| PEN | Partner to Existing Network |
| CSBR | Collections in Support of Biological Research |
| IMLS | Institute for Museum and Library Services |
| GBIF | Global Biodiversity Information Facility |
| BCoN | Biodiversity Collections Network |
| GRBio | Global Registry of Biodiversity Repositories |
| DwC | Darwin Core |
| IPT | Integrated Publishing Toolkit |
| API | Application Programming Interface |

www.idigbio.org/wiki/index.php/Glossary_of_Terms

# www.idigbio.org/portal

## Welcome to the iDigBio Portal

If you are familiar with our portal's interface, you can start searching Specimen Records. If this is your first time here, you might consider browsing our tutorial. Our data are based on the Darwin Core and Audubon Core standards.

### Search 799 Recordsets

Scientific N

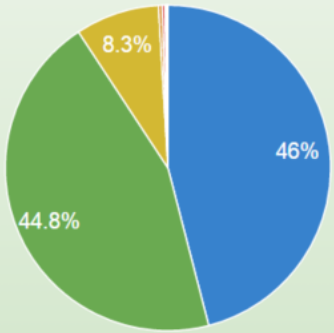
### Jump To

Advanced Search  Publishers List

Tutorial  iDigBio API

### Specimen Records

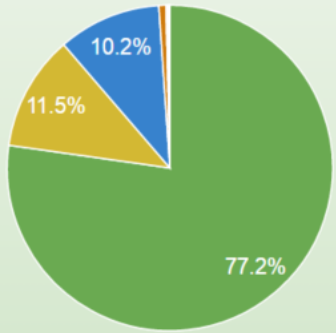
64,835,381




Animalia  Plantae  Fungi  Chromista
Protozoa  Viruses  other  Bacteria  Protista
Incertae sedis

### Media Records

14,585,363




Plantae  Fungi  Animalia  Chromista
Protozoa  other  Bacteria  Viruses
Incertae sedis

Click a pie wedge to jump to an advanced search for records with the given kingdom. Click a legend name to remove/add a pie wedge.

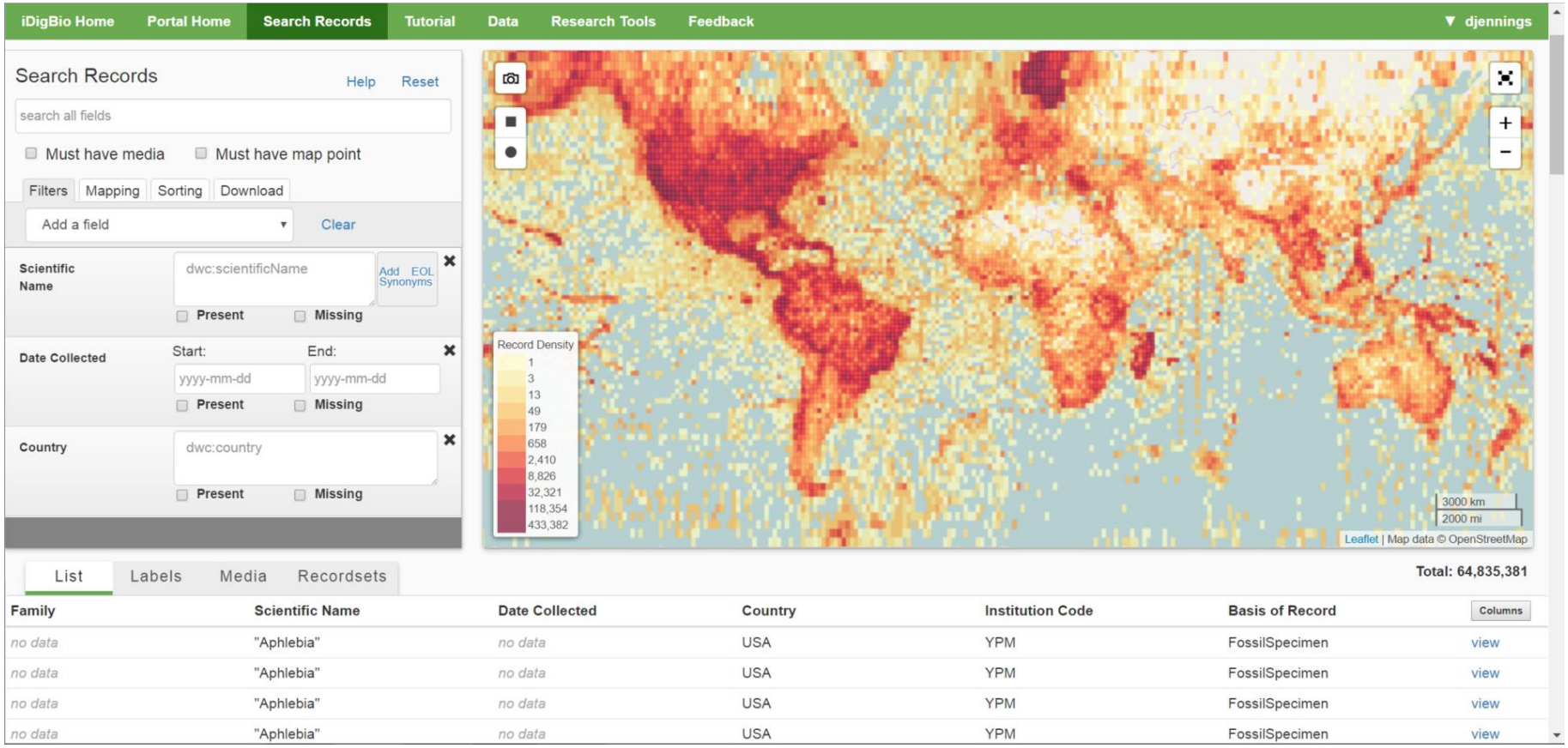
Biodiversity Information Standards

TDWG

Darwin Core

Audubon Core

# Search across all data, all/individual fields, customize, use autocompletion, synonyms, ...



# View search results as table, pseudolabels, or images

List | Labels | Media | Recordsets

Total: 237,084

| Family | Scientific Name | Institution Code | Collection Code | Date Collected | Collected By | Country | Locality | Occurrence ID | Catalog Number | Columns |
|---|---|---|---|---|---|---|---|---|---|---|
| Pinaceae | Abies amabilis | UAM | Plant specimens (A... | 1993-07-08 | Collector(s): John D... | United States | W side of Nakat Inle... | http://arctos.databa... | 9979 | view |
| Pinaceae | Abies amabilis | UAM | Plant specimens (A... | 1993-07-08 | Collector(s): John D... | United States | Just I., mouth of Fill... | http://arctos.databa... | 10032 | view |
| Pinaceae | Abies amabilis | UAM | Plant specimens (A... | 1997-07-09 | Collector(s): Mary C... | United States | Alexander Archipela... | http://arctos.databa... | 19196 | view |
| Pinaceae | Abies amabilis | UAM | Plant specimens (A... | 1997-08-26 | Collector(s): Phyllis ... | United States | Thorne Arm, Revilla... | http://arctos.databa... | 144097 | view |
| Pinaceae | Abies amabilis | UAM | Plant specimens (A... | 2013-07-15 | Collector(s): K. Sma... | United States | S of Pt. Baker, E of ... | http://arctos.databa... | 250713 | view |
| Pinaceae | Abies lasiocarpa (H... | MO | MO | 1879-07-19 | John Muir | United States | Head of Navigation ... | urn:catalog:MO:Tro... | 100327950 | view |

List | Labels | Media | Recordsets

*Acalypta elegans* — Tingidae

United States, Alaska, Kanuti NWR
**Lat:** 66°22' 15" **Lon:** -152°1' 16"
UAM, Insect specimens, 164024, Collector(s): Derek S. Sikes

*Animalia, Arthropoda, Insecta, Hemiptera* 2010-06-21

*Acanthocinus pusillus* — Cerambycidae

United States, Alaska, Fairbanks, Creamer's Field
**Lat:** 64°52' 6" **Lon:** -147°44' 12"
UAM, Insect specimens, 95967, Collector(s): Luke Werner

*Animalia, Arthropoda, Insecta, Coleoptera* 1991-09-25

*Acartophthalmus nigrinus* — Acartophthalmidae

United States, Alaska, Etolin Is.
**Lat:** 56°8' 33" **Lon:** -132°20' 7"
UAM, Insect specimens, 234152, Collector(s): Derek S. Sikes

*Animalia, Arthropoda, Insecta, Diptera* 2011-07-21/2011-07-22

List | Labels | Media | Recordsets

***Acalypta elegans*** UAM, Insect specimens

***Abietinella abietina*** MICH

***Mammuthus*** UAM, Earth Science

***Acer glabrum subsp. douglasii*** UAM, Plant specimens (ALA)

***Actitis macularia*** MVZ, Bird eggs/nests

# Results mapped/rendered and downloadable

Search Records

Help Reset

search all fields

Must have media  Must have map point

Filters | Mapping | Sorting | Download

**Current Search**

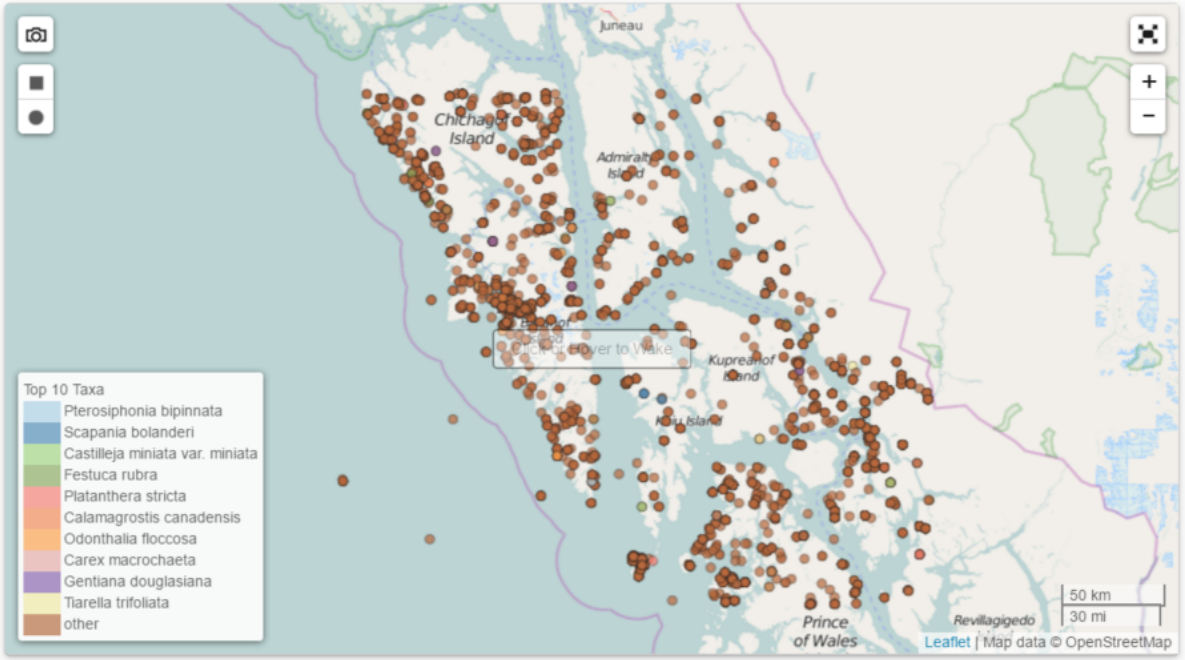
Kingdom = plantae. Bounds are NW lat = 58.0022767

**Download CSV** - Build time: 0 hrs 0 mins 10 secs

Email sajames@flmnh.ufl.edu

**Downloads**

| Search | Status |
|---|---|
| Kingdom = plantae. Bounds are NW la... | Click To Download |




List | Labels | Media | Recordsets

Total: 5,348

| Family | Scientific Name | Institution Code | Collection Code | Date Collected | Collected By | Country | Locality | Occurrence ID | Catalog Number | Columns |
|---|---|---|---|---|---|---|---|---|---|---|
| Pinaceae | Abies amabilis | UAM | Plant specimens ... | 2013-07-15 | Collector(s): K. S... | United States | S of Pt. Baker, E ... | http://arctos.data... | 250713 | view |
| Pinaceae | Abies lasiocarpa | UAM | Plant specimens ... | 1993-07-20 | Collector(s): Mich... | United States | Prince of Wales I... | http://arctos.data... | 8705 | view |
| Pinaceae | Abies lasiocarpa | UAM | Plant specimens ... | 1993-07-21 | Collector(s): Mich... | United States | Prince of Wales I... | http://arctos.data... | 8733 | view |
| Pinaceae | Abies lasiocarpa | UAM | Plant specimens ... | 2012-08-30 | Collector(s): Kare... | United States | Tracy Arm, Sawy... | http://arctos.data... | 250750 | view |
| Aceraceae | Acer glabrum su... | UAM | Plant specimens ... | 1961-05-08 | Collector(s): Elbe... | United States | Alexander Archip... | http://arctos.data... | 42221 | view |
| Aceraceae | Acer glabrum su... | UAM | Plant specimens ... | 1979-07-19 | Collector(s): Lind... | United States | Alexander Archip... | http://arctos.data... | 42222 | view |
| Aceraceae | Acer glabrum su... | UAM | Plant specimens ... | 1979-08-29 | Collector(s): Mar... | United States | Alexander Archip... | http://arctos.data... | 42779 | view |

# Specimen record page with summary, details, flags, associated media, georeference, provider, …

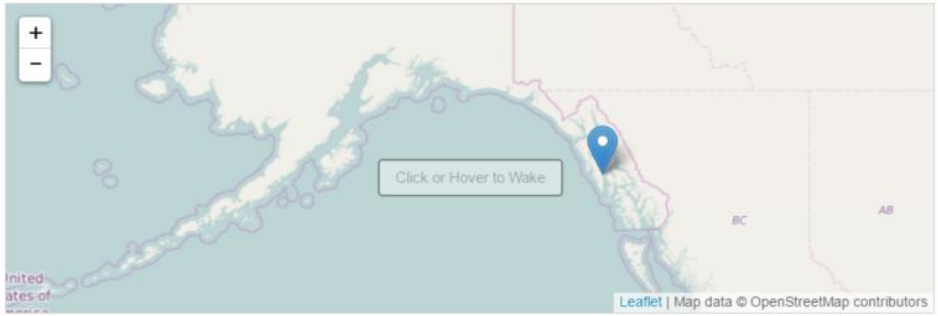
## Specimen Record

Plantae > Pteridophyta > Polypodiopsida > Polypodiales > Pteridaceae

### *Adiantum aleuticum*

From UAM Herbarium (ALA), Vascular Plant Collection (Arctos)

| | | | |
|---|---|---|---|
| Continent | North America | Institution Code | UAM |
| Country | United States | | |
| State/Province | Alaska | Collection Code | Plant Specimens (ALA) |
| Locality | E Side Of Island, Ne Entrance Of Red Bluff Bay | Catalog Number | 244018 |
| Latitude | 56.8512 | Collected By | Collector(s): Mary C. Stensvold, Michael E. Shephard |
| Longitude | -134.7091 | Date Collected | 2000-08-17 |




### Media


Data Flags Raw

### Taxonomy

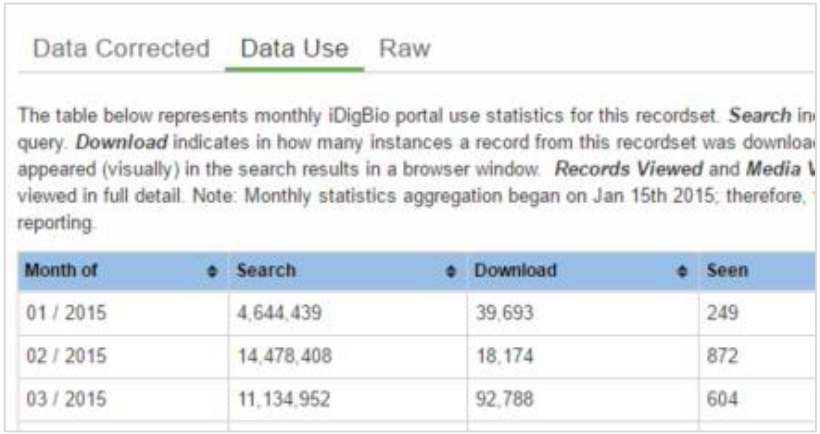
| | |
|---|---|
| Scientific Name | Adiantum aleuticum |
| Higher Classfication | ; Filicopsida; Polypodiales; Pteridaceae; (Ruprecht) Paris |
| Kingdom | plantae |
| Phylum | pteridophyta |
| Class | Filicopsida |
| Order | Polypodiales |
| Family | Pteridaceae |
| Genus | Adiantum |
| Specific Epithet | aleuticum |
| Nomenclatural Code | ICBN |

Data Flags Raw

| Type | Description |
|---|---|
| geopoint_datum_error | Geographic Coordinate has Invalid Geodetic Datum. |
| idigbio_isocountrycode_added | iDigBio ISO 3166-1 alpha-3 Country Code Added. |
| dwc_phylum_added | Darwin Core Phylum Added. |
| dwc_class_replaced | Darwin Core Class Corrected. |
| dwc_kingdom_added | Darwin Core Kingdom Added. |

# Advantages of sharing data with iDigBio

- Quality
- Continual improvement
- Attribution/metrics
- Discoverability
- Depth/breadth



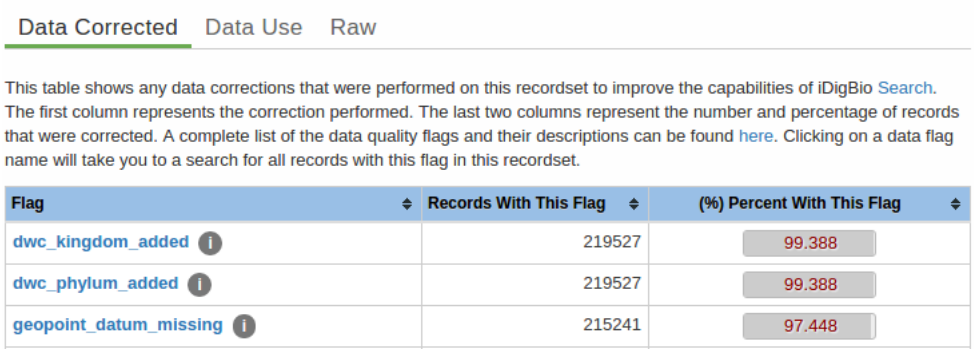
Data Corrected | Data Use | Raw

The table below represents monthly iDigBio portal use statistics for this recordset. ***Search*** in query. ***Download*** indicates in how many instances a record from this recordset was downloa appeared (visually) in the search results in a browser window. ***Records Viewed*** and ***Media V*** viewed in full detail. Note: Monthly statistics aggregation began on Jan 15th 2015; therefore, reporting.

| Month of | Search | Download | Seen |
|---|---|---|---|
| 01 / 2015 | 4,644,439 | 39,693 | 249 |
| 02 / 2015 | 14,478,408 | 18,174 | 872 |
| 03 / 2015 | 11,134,952 | 92,788 | 604 |

Data | Flags | Raw

| Type | Description |
|---|---|
| geopoint_datum_missing | Geographic Coordinate Missing |
| dwc_phylum_added | Darwin Core Phylum Added. |
| dwc_continent_added | Darwin Core Continent Added. |
| dwc_country_replaced | Darwin Core Country Corrected. |
| idigbio_isocountrycode_added | iDigBio ISO 3166-1 alpha-3 Cou |
| dwc_kingdom_added | Darwin Core Kingdom Added. |



Data Corrected | Data Use | Raw

This table shows any data corrections that were performed on this recordset to improve the capabilities of iDigBio Search. The first column represents the correction performed. The last two columns represent the number and percentage of records that were corrected. A complete list of the data quality flags and their descriptions can be found here. Clicking on a data flag name will take you to a search for all records with this flag in this recordset.

| Flag | Records With This Flag | (%) Percent With This Flag |
|---|---|---|
| dwc_kingdom_added | 219527 | 99.388 |
| dwc_phylum_added | 219527 | 99.388 |
| geopoint_datum_missing | 215241 | 97.448 |

# Monthly Spotlight on Biodiversity

- www.idigbio.org/tags/biodiversity-spotlight
  - Natural history info, current research, & links to specimens in iDigBio
  - Tips & tricks for using the iDigBio portal and search API

- Madagascar
  - February 2016
  - Portal Corner: using the portal search interface

- Graygreen Reindeer Moss (*Cladonia rangiferina*)
  - January 2016
  - Coding Corner: using R and iDigBio Search API

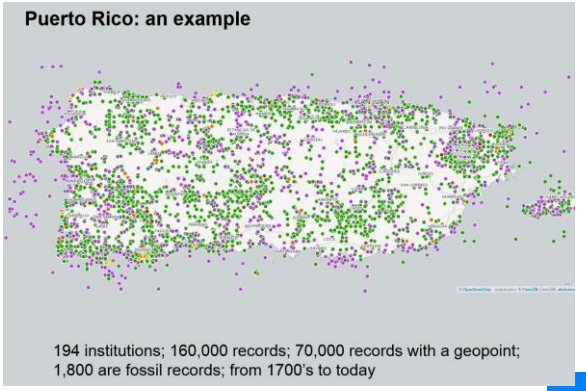
- Fathead Minnow (*Pimephales promelas*)
  - May 2016
  - Coding Corner: using R and iDigBio Search API

# Monthly Spotlight on Research

- www.idigbio.org/tags/research-spotlight
  - Use of iDigBio data in research projects
  - Importance of vouchered specimen collections & data for research
  - Ways that collections data can be used in research projects
  - Positive outcomes of data use, such as policy or conservation actions

- Preserving historic bee specimens to protect future bee biodiversity (Aug 2016)
  - Bee conservation, decline, and shifts in community species composition in relation to environmental disturbances

- Playing with biological specimen data in iDigBio – limitations and solutions for research (May 2016)
  - iDigBio Data Quality Flags to assist with cleaning data
  - iDigBio Working Groups as a mechanism for community



iDigBio
Integrated Digitized Biocollections

SCIENTIFIC REPORTS

OPEN

**Macrodinychus mites as parasitoids of invasive ants: an overlooked parasitic association**

Received: 30 January 2016

Jean-Paul Lachaud[1,2], Hans Klompen[3] & Gabriela Pérez-Lachaud[1]

**Beetles (Coleoptera) of Peru: A Survey of the Families. Erotylidae Latreille, 1802**

Author(s): Joseph V. McHugh and Caroline S. Chaboo

Source: Journal of the Kansas Entomological Society, 88(2):274-282.

Mesoamerican Herpetology

www.mesoamericanherpetology.com

OPEN ACCESS

Eagle Mountain PUBLISHING, LC

www.eaglemountainpublishing.com

**The herpetofauna of Nayarit, Mexico: composition, distribution, and conservation status**

Guillermo A. Woolrich-Piña[1], Paulino Ponce-Campos[2], Jesús Loc-Barragán[3], Juan Pablo Ramírez-Silva[3], Vicente Mata-Silva[4], Jerry D. Johnson[4], Eli García-Padilla[5], [illegible] David Wilson[6]

**Taxonomic and Behavioral Composition of an Island Fauna: A Survey of Bees (Hymenoptera: Apoidea: Anthophila) on Martha's Vineyard, Massachusetts**

Author(s): Paul Z. Goldstein and John S. Ascher

Source: Proceedings of the Entomological Society of Washington, 118(1):37-92.

Deck et al. Standards in Genomic Sciences (2015) 10:25

DOI 10.1186/s40793-015-0014-0

MEETING REPORT

SIGS Standards in Genomic Sciences

Open Access

**Meeting report: Identifying practical applications of ontologies for biodiversity informatics**

John Deck[1*], Robert Guralnick[2], Ramona Walls[3], Stanley Blum[4], Melissa Haendel[5], Andréa Matsunaga[6] and John Wieczorek[7]

*Zootaxa* 4127 (3): 471–492

http://www.mapress.com/j/zt/

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http://zoobank.org/urn:lsid:zoobank.org:pub:6F20F72E-AB2E-44BD-AA73-04F739D42E06

**Revised diagnosis of the genus *Gonorhynchus* McClelland (Teleostei: Cyprinidae: Labeonini) with redescription of *G. latius* (Hamilton) and revalidation of *G. wattanah* (Sykes)**

PATRICK J. CICCOTTO & LAWRENCE M. PAGE

Biodiversity Data Journal 4: e10356

doi: 10.3897/BDJ.4.e10356

Editorial

**Species Conservation Profiles compliant with the IUCN Red List of Threatened Species**

Pedro Cardoso[‡,§], Pavel Stoev[|,¶], Teodor Georgiev[¶], Viktor Senderov[#,¶], Lyubomir Penev[#,¶]

Palaeontologia Electronica

http://palaeo-electronica.org

**The Digital Atlas of Ancient Life: delivering information on paleontology and biogeography via the web**

Jonathan R. Hendricks, Alycia L. Stigall, and Bruce S. Lieberman

***Scholtzicoris linnavuorii*, new genus and new species of Myrtaceae-Feeding plant bug from Western Australia (Hemiptera: Heteroptera: Miridae: Phylinae: Semiini: Exocarpocorina)**

Author(s): Randall T. Schuh

Source: Entomologica Americana, 122(1):156-163.

Research

New Phytologist

**Patterns of abiotic niche shifts in allopolyploids relative to their progenitors**

D. Blaine Marchant[1,2], Douglas E. Soltis[1,2,3] and Pamela S. Soltis[2,3]

**Methods in Ecology and Evolution**

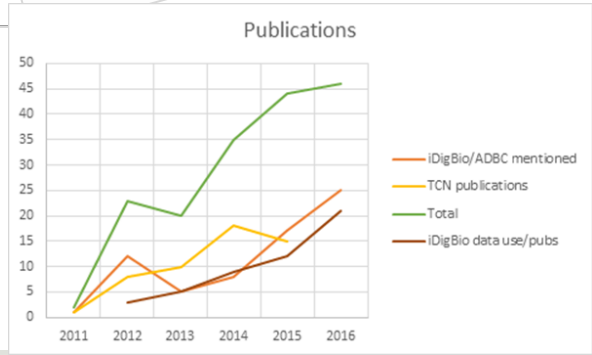
*Methods in Ecology and Evolution* 2015, 6, 1044–1054

doi: 10.1111/2041-210X.12375

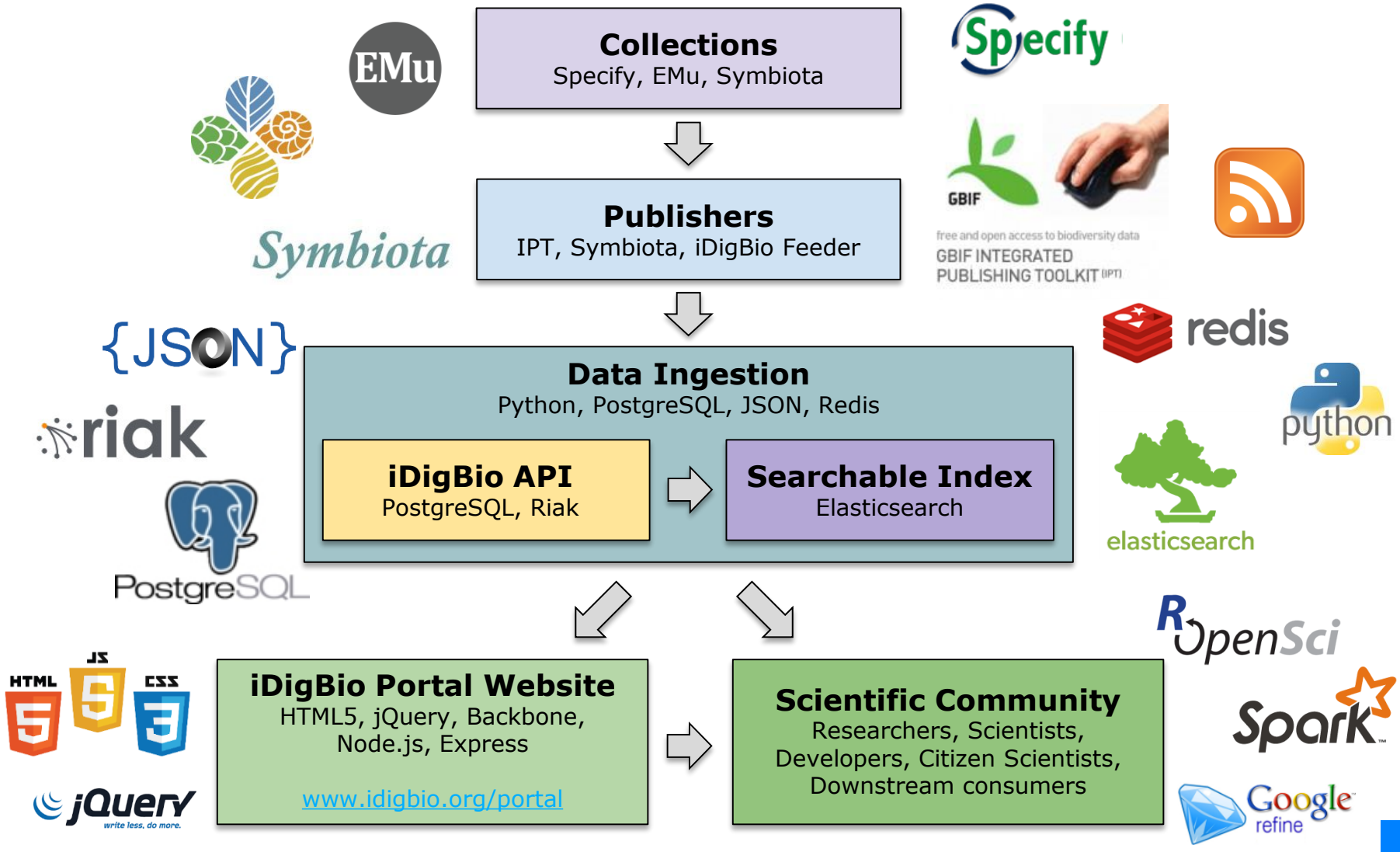
British Ecological Society

**The effect of repeated, lethal sampling on wild bee abundance and diversity**

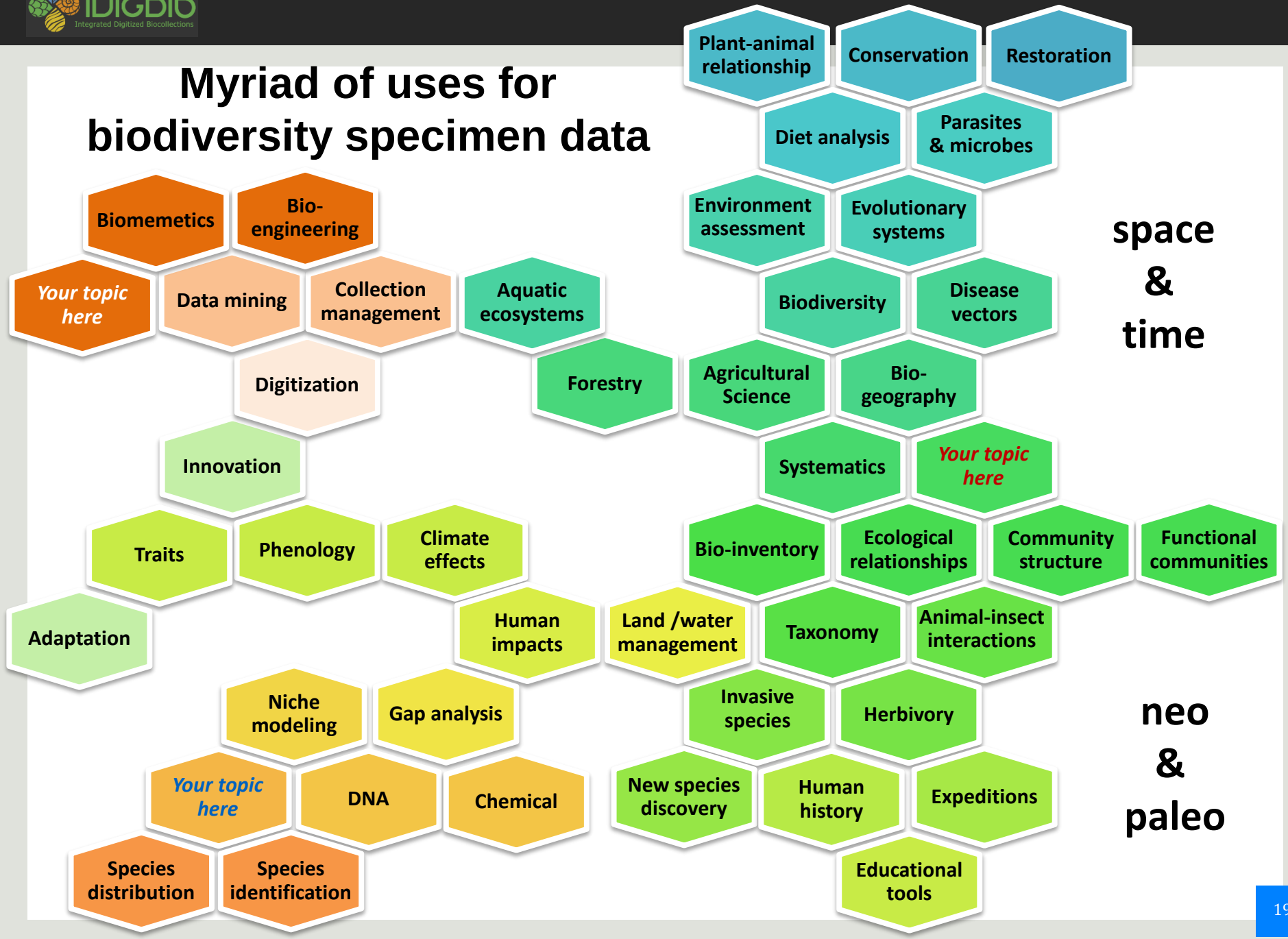
Zachariah J. Gezon[1,2*], Eli S. Wyman[3], John S. Ascher[4], David W. Inouye[2,5] and Rebecca E. Irwin[1,2]



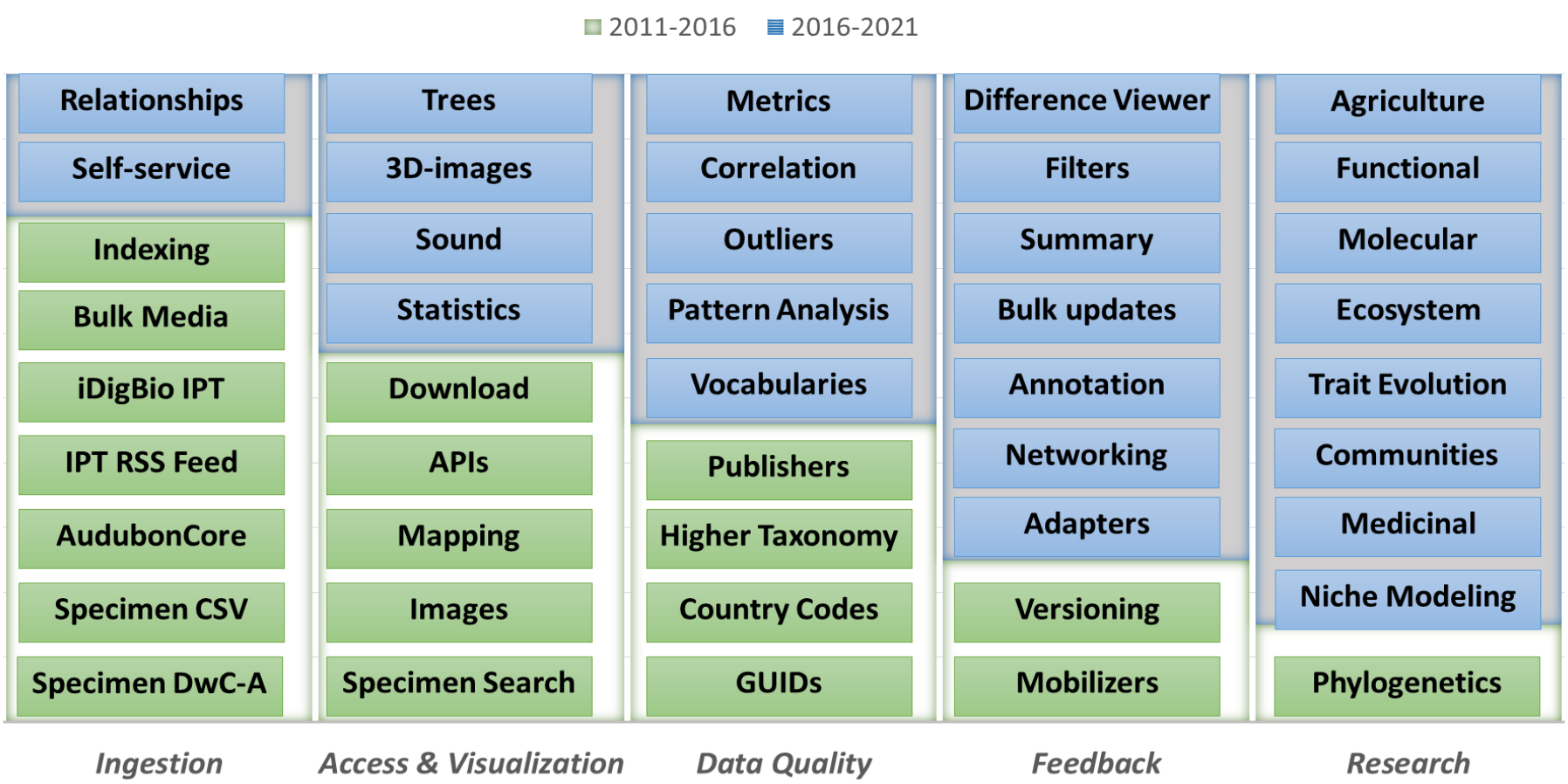
# iDigBio Data Flow



# Myriad of uses for biodiversity specimen data



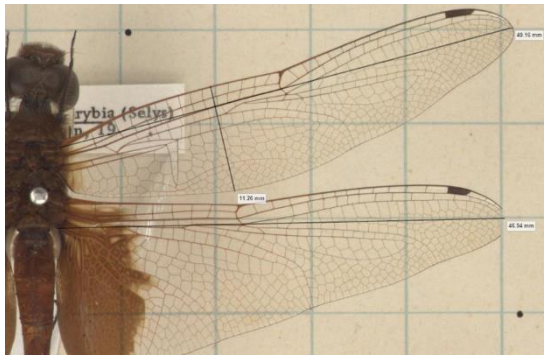
# iDigBio ACTIVITIES SUPPORTED BY CYBERINFRASTRUCTURE

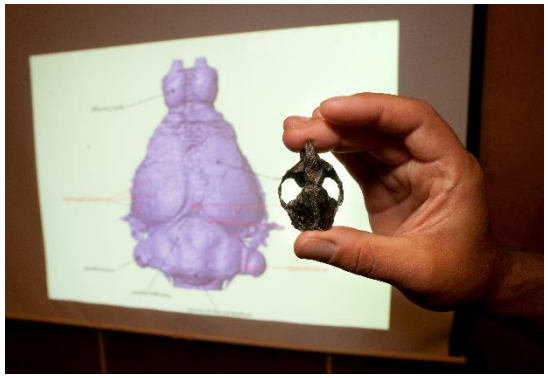


# We want you to engage with us!

- iDigBio has access to data and the means to quickly answer questions about it

- Lots of opportunity for collaboration and potential funding:
  - Using the data we already have
    - (e.g., niche modeling)
  - Mining the data we have to discover the things we don't know we have
    - (e.g., extract measurements/characteristics from images or 3D models)
  - Gathering the data we don't have ("dark data")
    - (e.g., SCNet, TCN proposal)
  - Enhancing and enriching the data
    - (e.g., field notes, data linking)





# Get involved!!


**idigbio.org/wiki**

facebook.com/iDigBio

twitter.com/iDigBio

vimeo.com/iDigBio

idigbio.org/rss-feed.xml

idigbio.org/events-calendar/export.ics

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