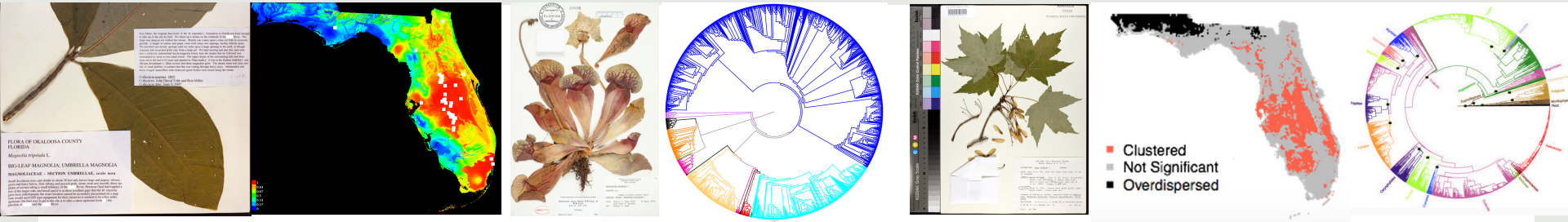


Using Biodiversity Specimen-Based Data to Study Global Change

Goals of the Workshop

Pamela S. Soltis

Collections: The Library of Life

1600 natural history collections in the US

1-2 billion specimens in the US

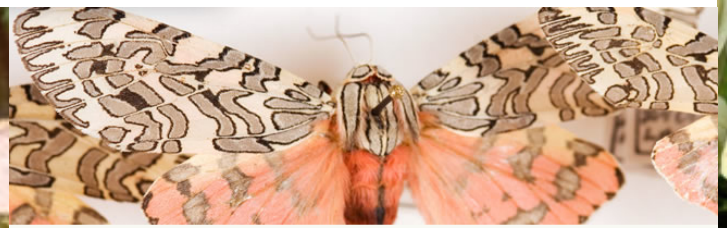
3-4 billion specimens worldwide

Label Data

- Scientific name – including authority
- Date
- Collector
- Location – state, county, specific site, GPS coordinates
- Associated species
- Notes

What Can We Do with Specimen Data?

- Monitor shifts in biodiversity through time
- Track invasive species
- Ecological Niche Modeling, climate change
- Track phenological shifts
- Integrate with evolutionary history
- Past movements and climate change
- Landscape genetics

Limitations

- Gaps in data – are they real?
  - What are they? Spatial? Temporal? Taxonomic?
  - How do we evaluate and accommodate them?
- Data quality
  - Accuracy – identification, locality, etc.
  - Unevenness
- Access
- Lack of well-established analytical pipelines
- Inadequate skills for management, manipulation, analysis of big data

Goals of the Workshop

- Explore ways in which specimen data can be used in studies of global change
- Introduce the types of digitized data coming online in iDigBio
- Identify the gaps and limitations in both specimen data and environmental data
- Moving forward: how do we harness the value of specimen data…
  - for studies of global change?
  - for reducing the effects of global change?

Overview of the Workshop

- Intro – iDigBio
- Global Change Studies using specimen data
- Digitized Data – what? Reports from TCNs
- Discussions – break-out groups on specific topics
- Moving forward – new collaborations? paper?

Overview of the Workshop

- **Intro – iDigBio: toward solving the access problem**
- Global Change Studies using specimen data
- Digitized Data – what? Reports from TCNs
- Discussions – break-out groups on specific topics
- Moving forward – new collaborations? paper?

iDigBio
Integrated Digitized Biocollections

www.idigbio.org

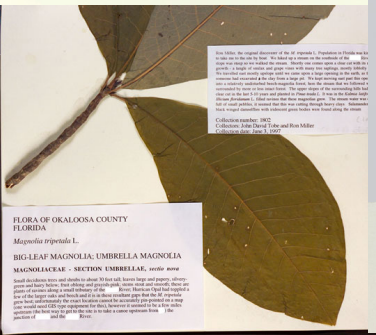
National Coordinating Center For Digitization of Biodiversity Collections

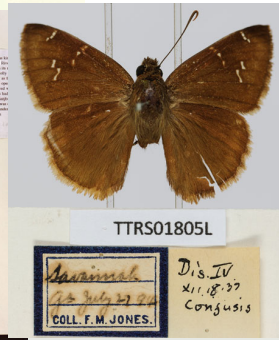
Ingest, serve, integrate data:

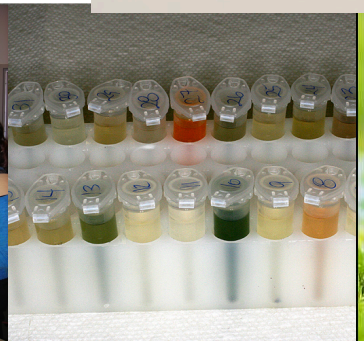
Localities

Dates

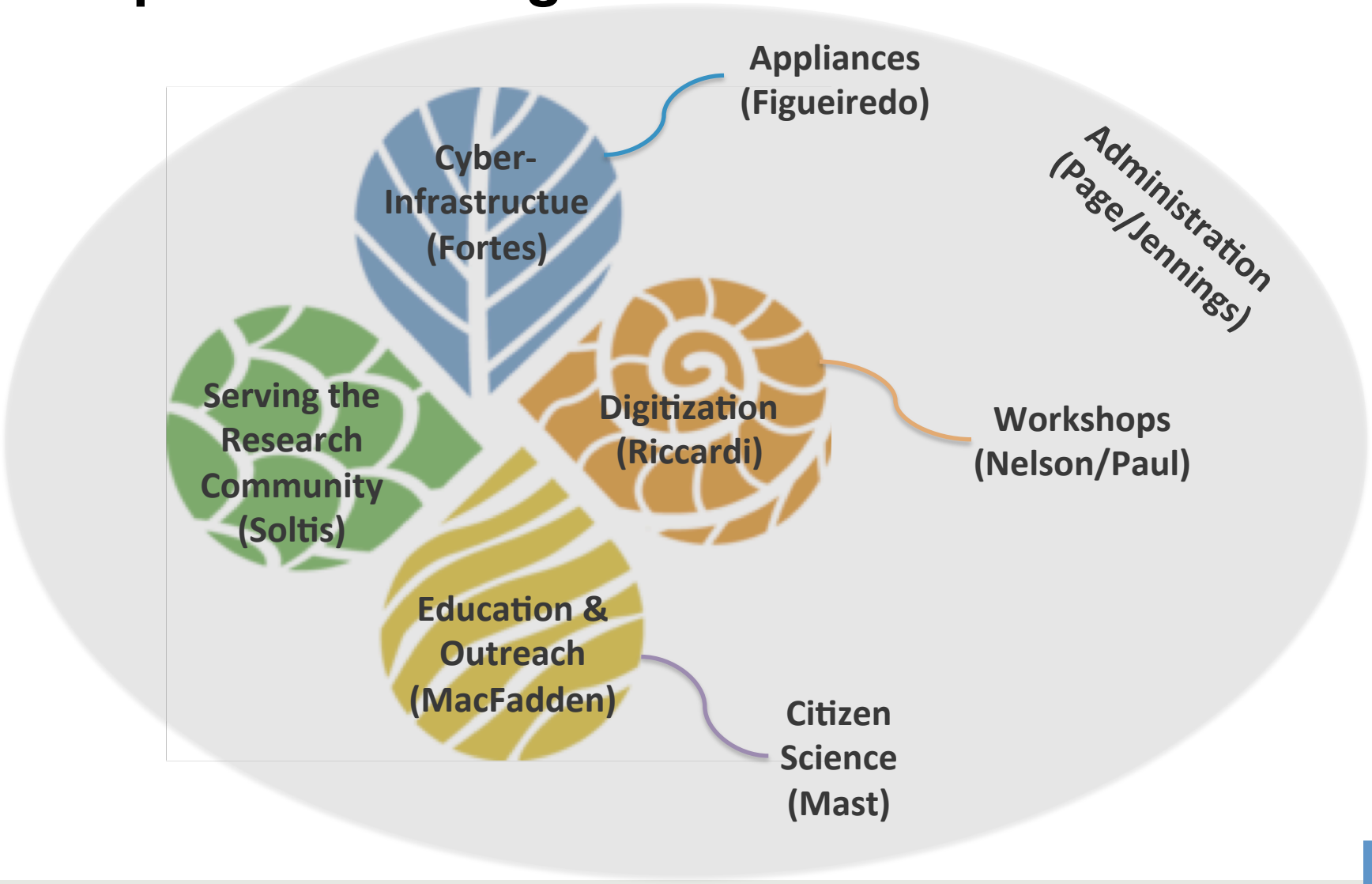
Images





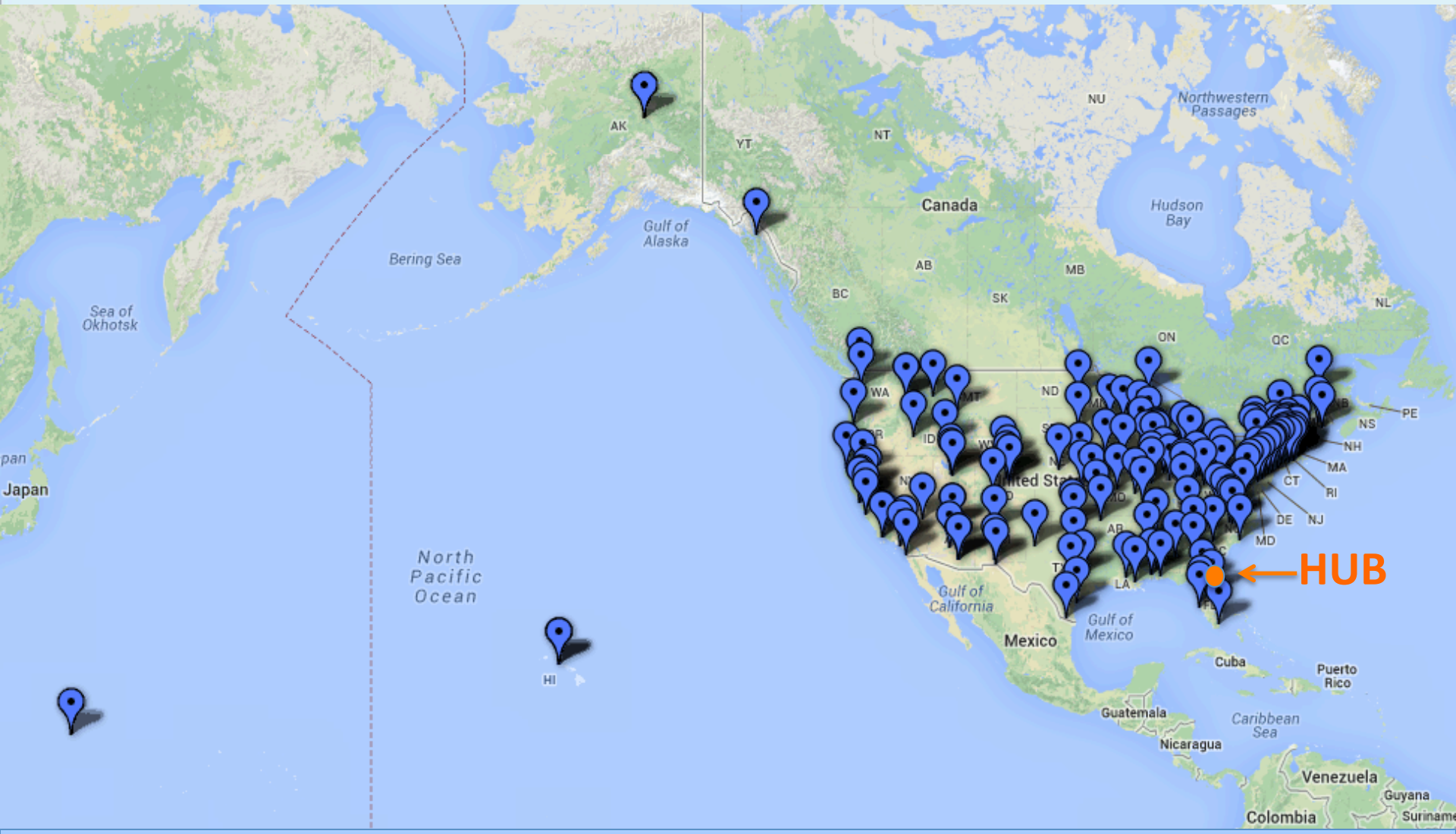


Components of iDigBio



iDigBio
Integrated Digitized Biocollections
National Resource for Advancing Digitization of Biological Collections

NATIONAL HUB, THEMATIC COLLECTION NETWORKS, AND COLLABORATORS



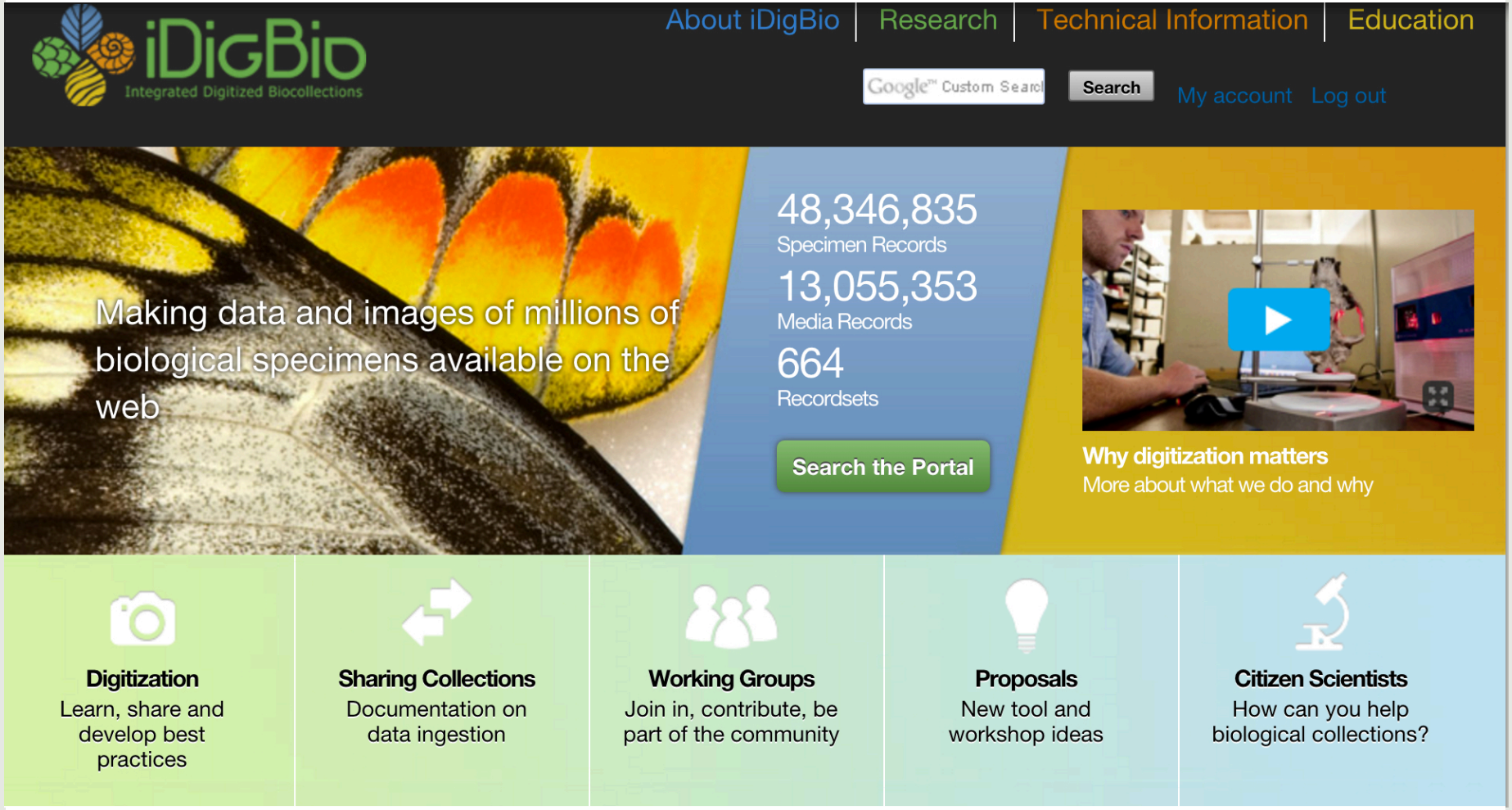
15 TCNS and collaborating institutions: ~250 institutions in 50 states

Topics of Networks

- Flowering time and climate change in New England
- Use of bryophytes and lichens as indicators of climate change across North America
- Invasive species of the Great Lakes region
- Plants, insect herbivores, parasitoids
- Flora of the SE US and response to climate change
- Response of paleo marine communities to environmental change

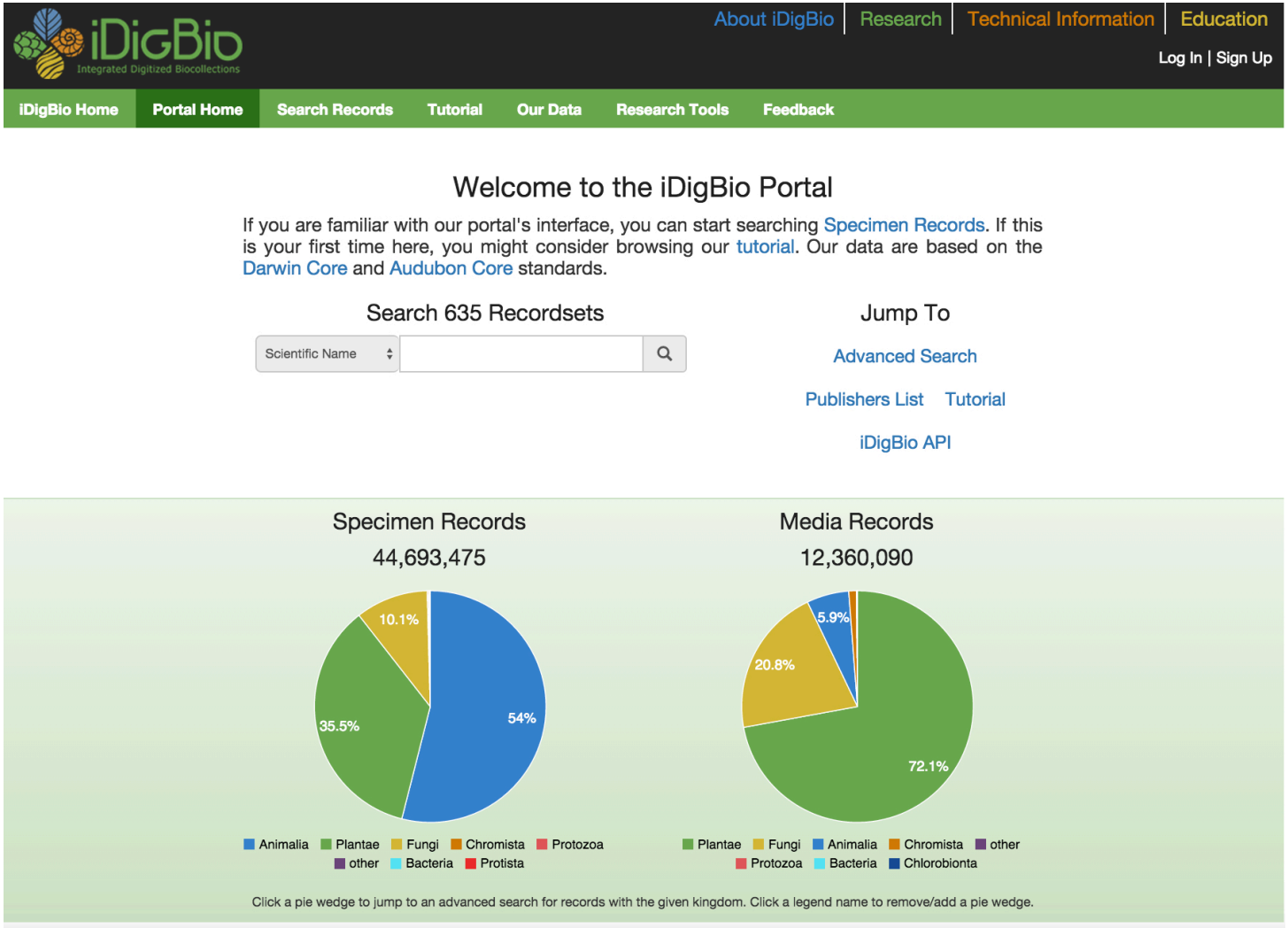
15 TCNS and collaborating institutions: ~250 institutions in 50 states

iDigBio Homepage



www.idigbio.org

iDigBio Specimen Portal



Overview of the Workshop

- Intro – iDigBio
- Global Change Studies using specimen data
- Digitized Data – what? Reports from TCNs
- **Discussions – break-out groups on specific topics**
- Moving forward – new collaborations? paper?

Topics to be Discussed

1. What questions related to global change can be addressed with data in iDigBio (and other aggregators)?
2. How do we deal with irregularities and unevenness of data for addressing these questions?
3. What analytical and computational issues limit the use of these data?
4. What are the sources of environmental data (climate, soil, hydrology, land use) for the past, present, and future, and what are their limitations?
5. What tools need to be developed to facilitate this research?
6. What resources should iDigBio include to facilitate specimen-based research on global change?

Moving Forward

- Identify areas for future research
- Identify gaps/limitations in data and propose solutions
- Identify tools/resources needed
- Establish working groups
- Develop collaborations
- Outline a paper

Thank you!

www.idigbio.org

psoltis@flmnh.ufl.edu

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 a grant from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program (Cooperative Agreement EF-1115210). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. All images used with permission or are free from copyright.