iDigBio
Integrated Digitized Biocollections

Using Digitized Data in Scientific Research *using and reusing biodiversity data*

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Florida Museum of Natural History
University of Florida

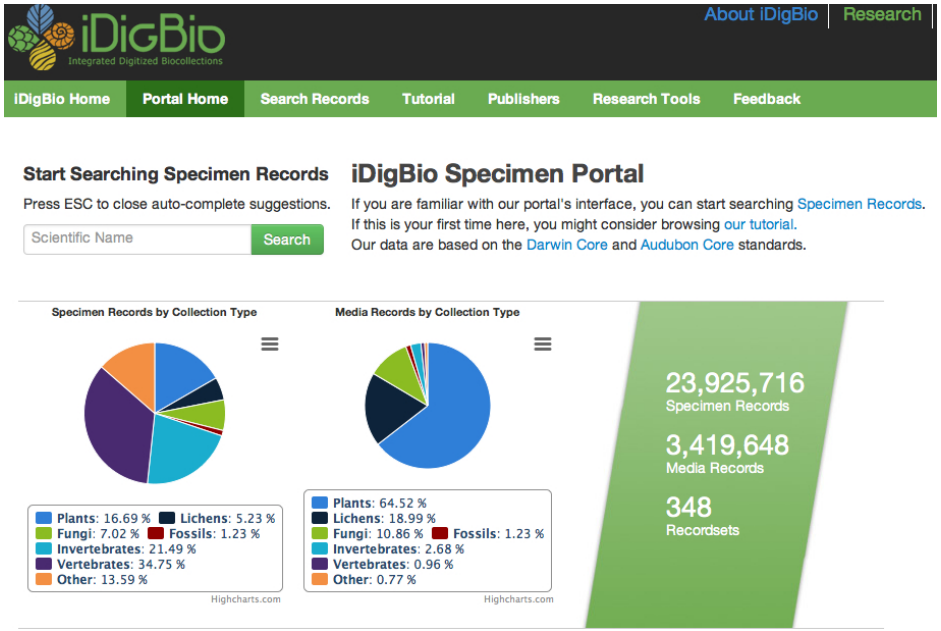
iDigBio is funded by a grant from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program (Cooperative Agreement EF-1115210). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect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

Collections: The Library of Life

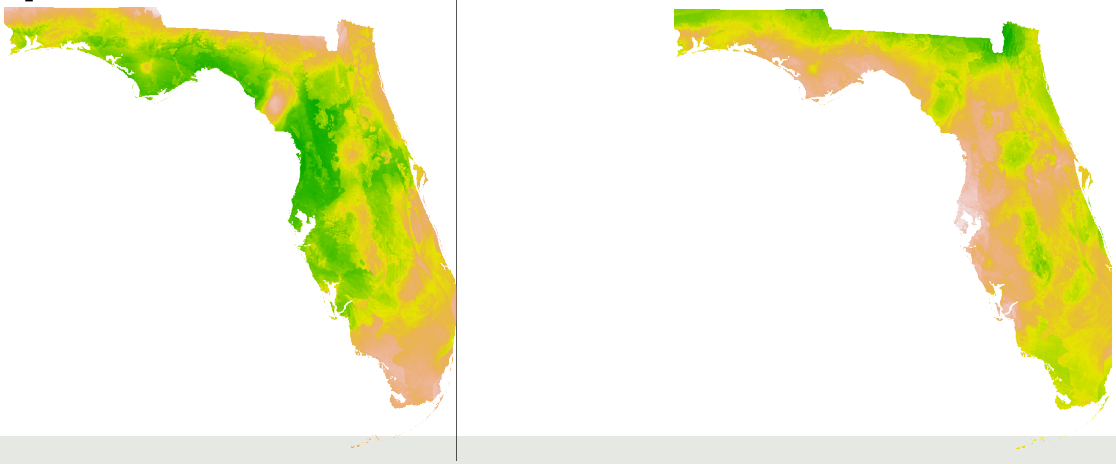
>1600 natural history collections
in the US alone
1-2 billion specimens
in the US
3-4 billion specimens
worldwide

Research @ iDigBio

- Data portal

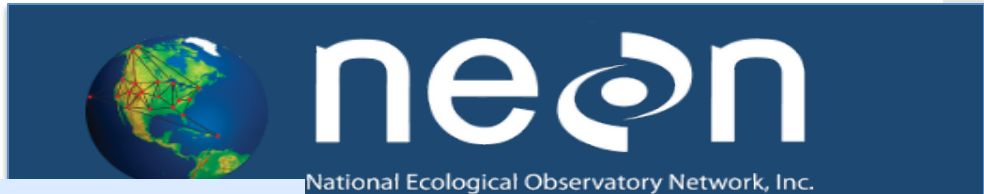


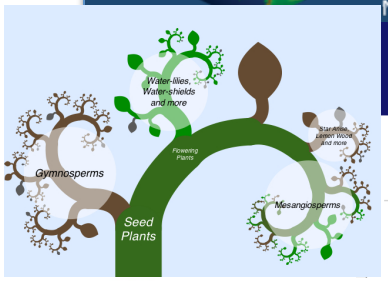
- Computational workflows and environment

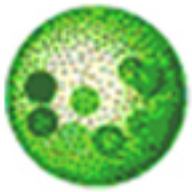


Linking Collections to…

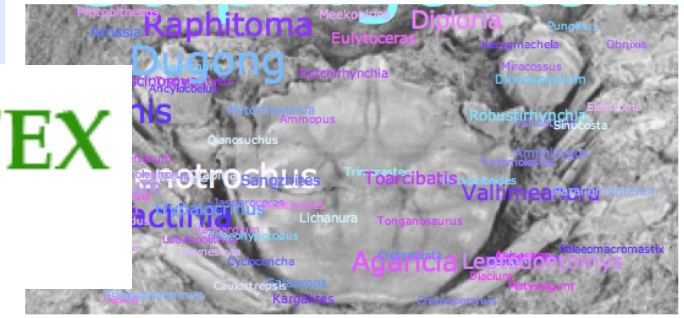
- Phylogenies
- Ecology
- Paleontology
- Living Collections
- Other Repositories

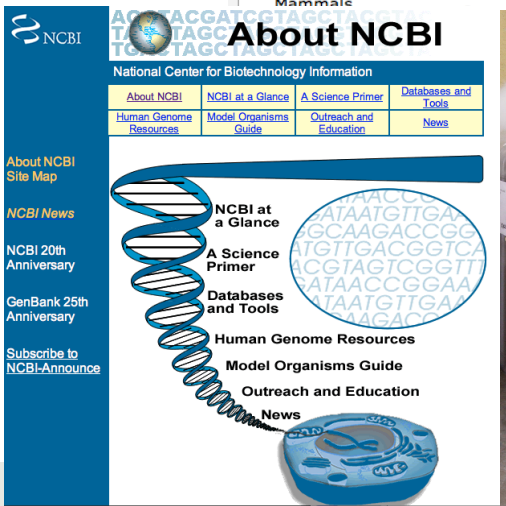




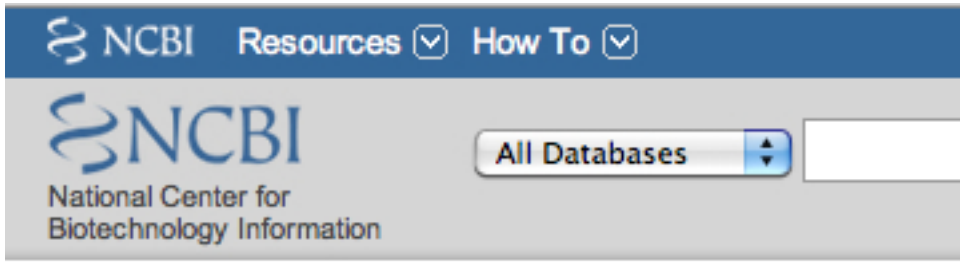


UTEX





Linking to GenBank



Welcome to NCBI

The National Center for Biotechnology Information advances science and health by providing access to biomedical and genomic information.

About the NCBI | Mission | Organization | Research | NCBI News

- **Examples of the /specimen_voucher information:**

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/specimen_voucher="personal:Dan Janzen:99-SRNP-2003"
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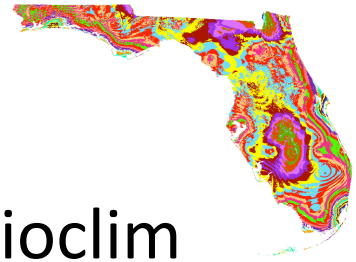
Ecological Niche Modeling: locality information

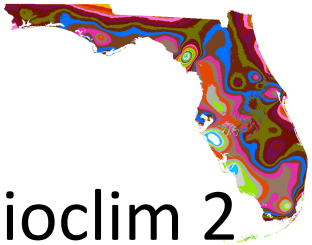
GEOLocate 29.65, -82.32

number,dwc:preparations,dwc:identificationVerificationStatus,idigbio:subfamily,idigbio:preparationCount,fcc:pickedBy,dwc:eventRemarks,dwc:VerbatimEventDate,dwc:associatedReferences,idigbio:endangeredStatus,dwc:locationAccordingTo,dwc:georeferenceSources,dwc:associatedSequences,dwc:formation,dwc:higherClassification,dwc:catalogNumber,dwc:verbatimSRS,dwc:higherGeography,dwc:individualCount,dwc:decimalLongitude,dwc:datasetName,dwc:month,dwc:georeferencedBy,dwc:eventTime,dwc:identificationQualifier,idigbio:

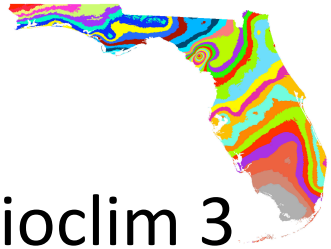
Ecological Niche Modeling: Environmental Layers



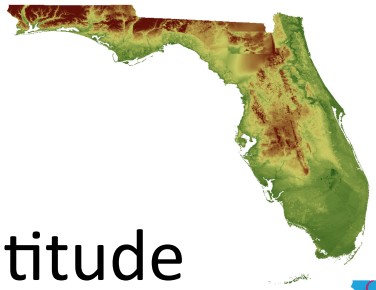
Bioclim 1



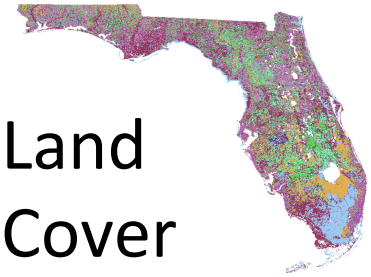
Bioclim 2



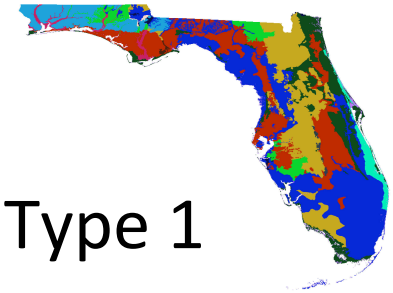
Bioclim 3



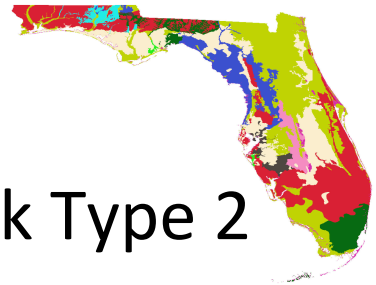
Altitude



Land Cover



Rock Type 1

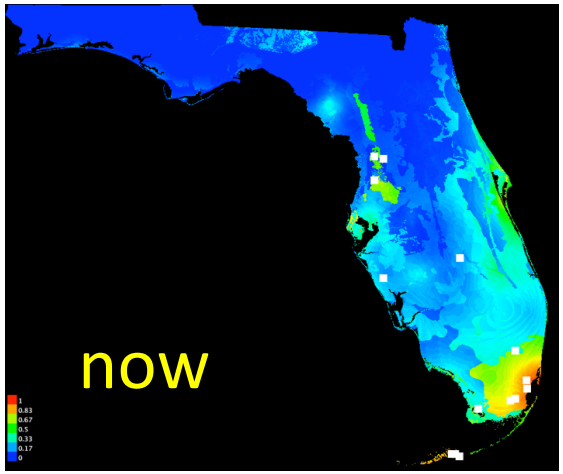


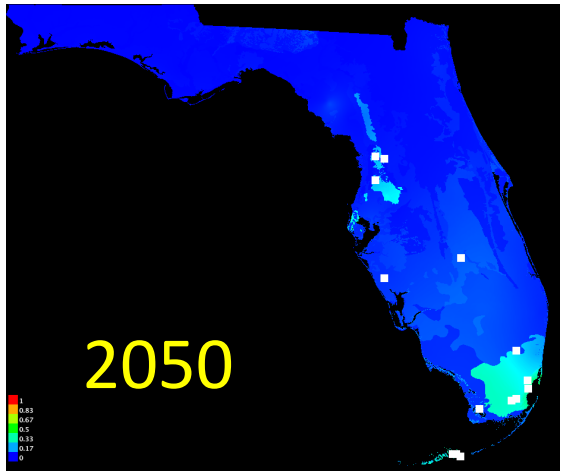
Rock Type 2

C. Germain-Aubrey et al.

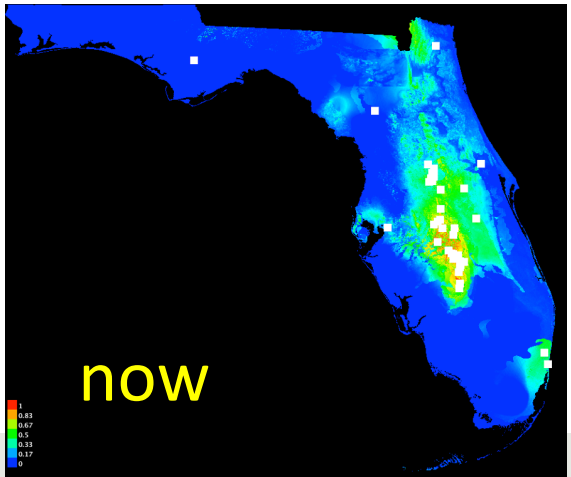
Responses to Climate Change: Winners & Losers

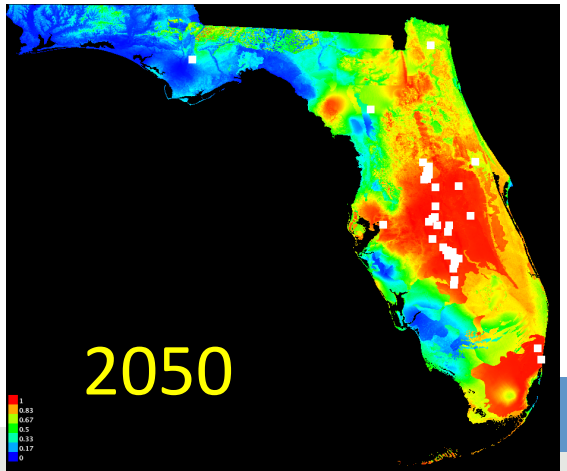
Abildgaardia ovata (flatspike sedge)





Prunus geniculata (scrub plum)

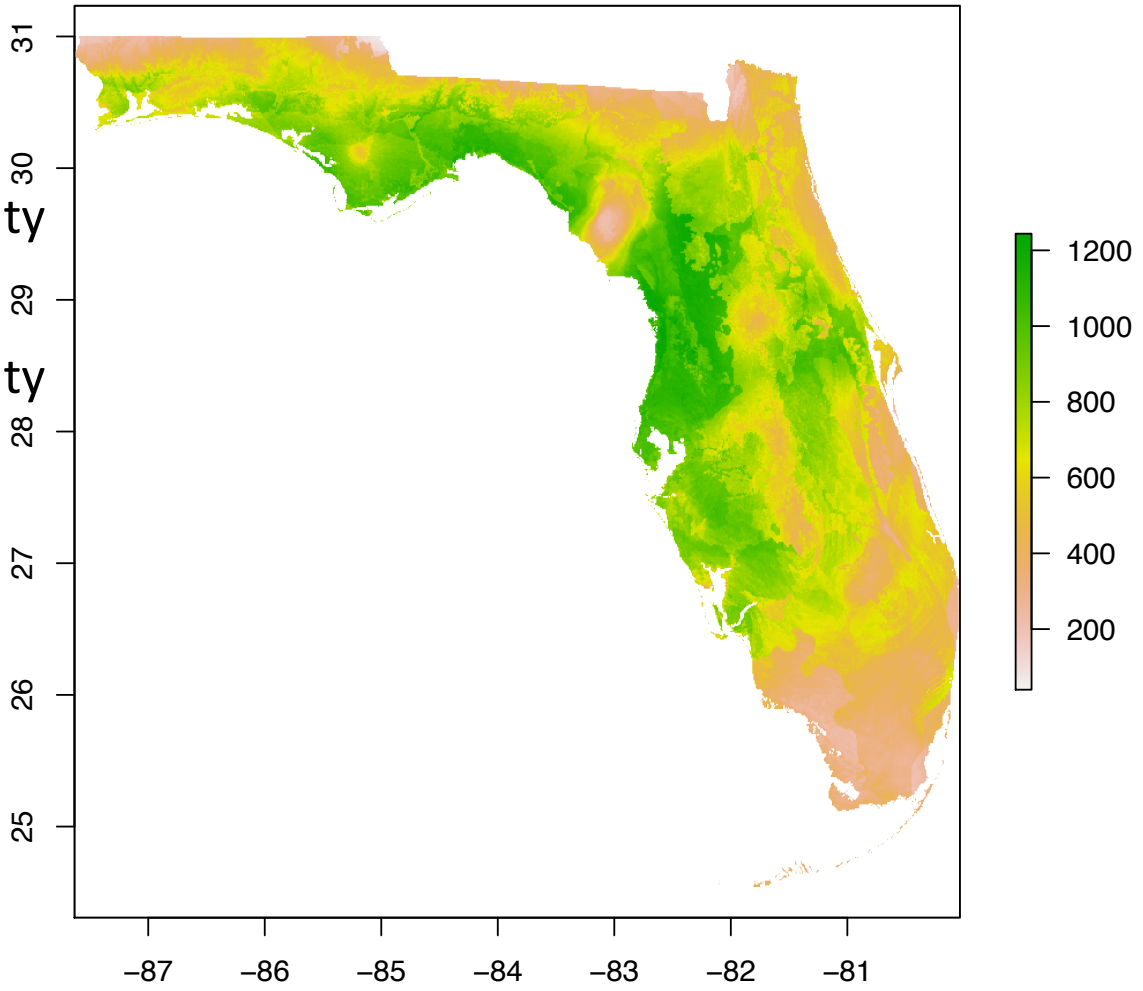




Florida plant diversity heat map: now

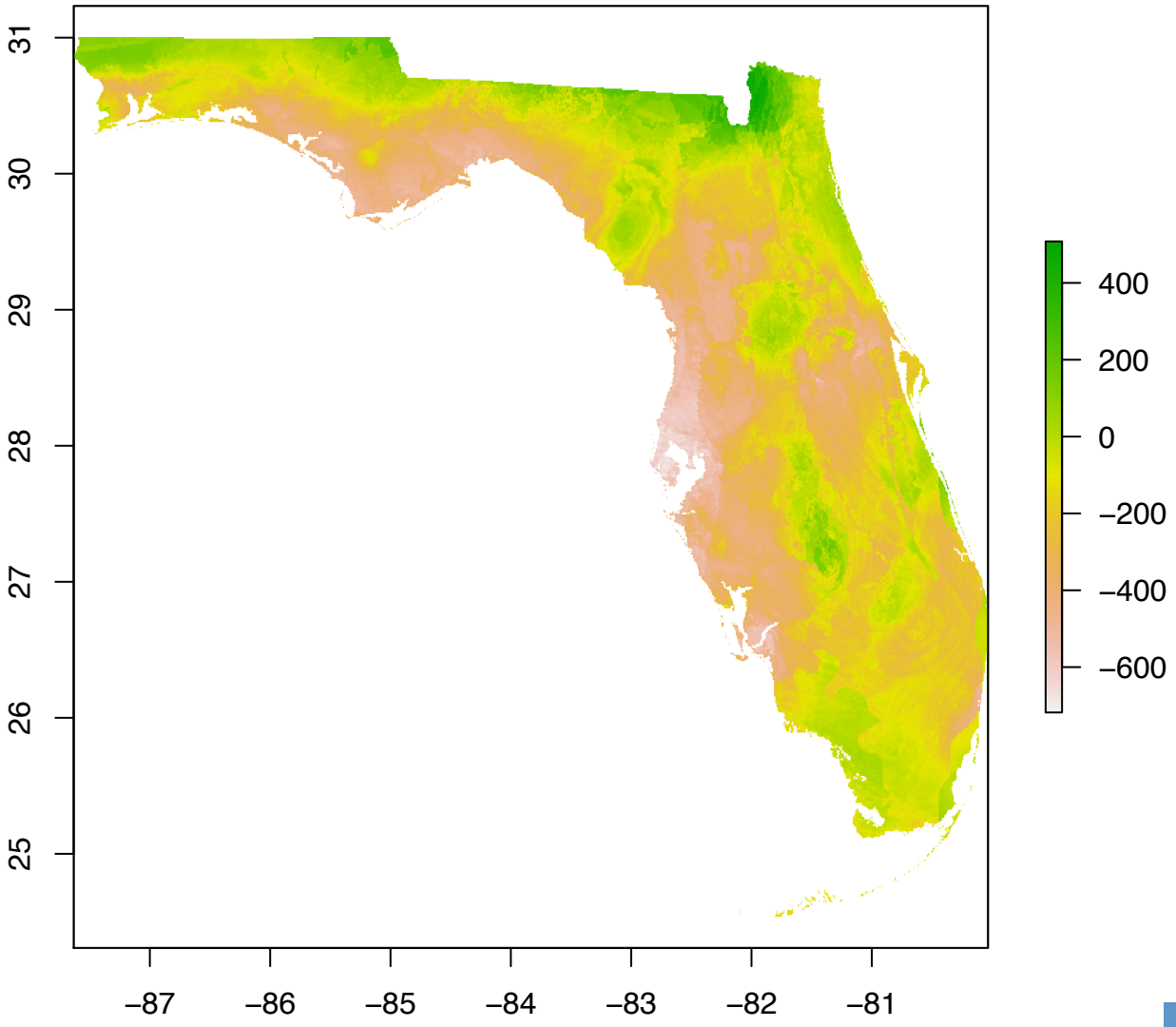
High species diversity

Low species diversity



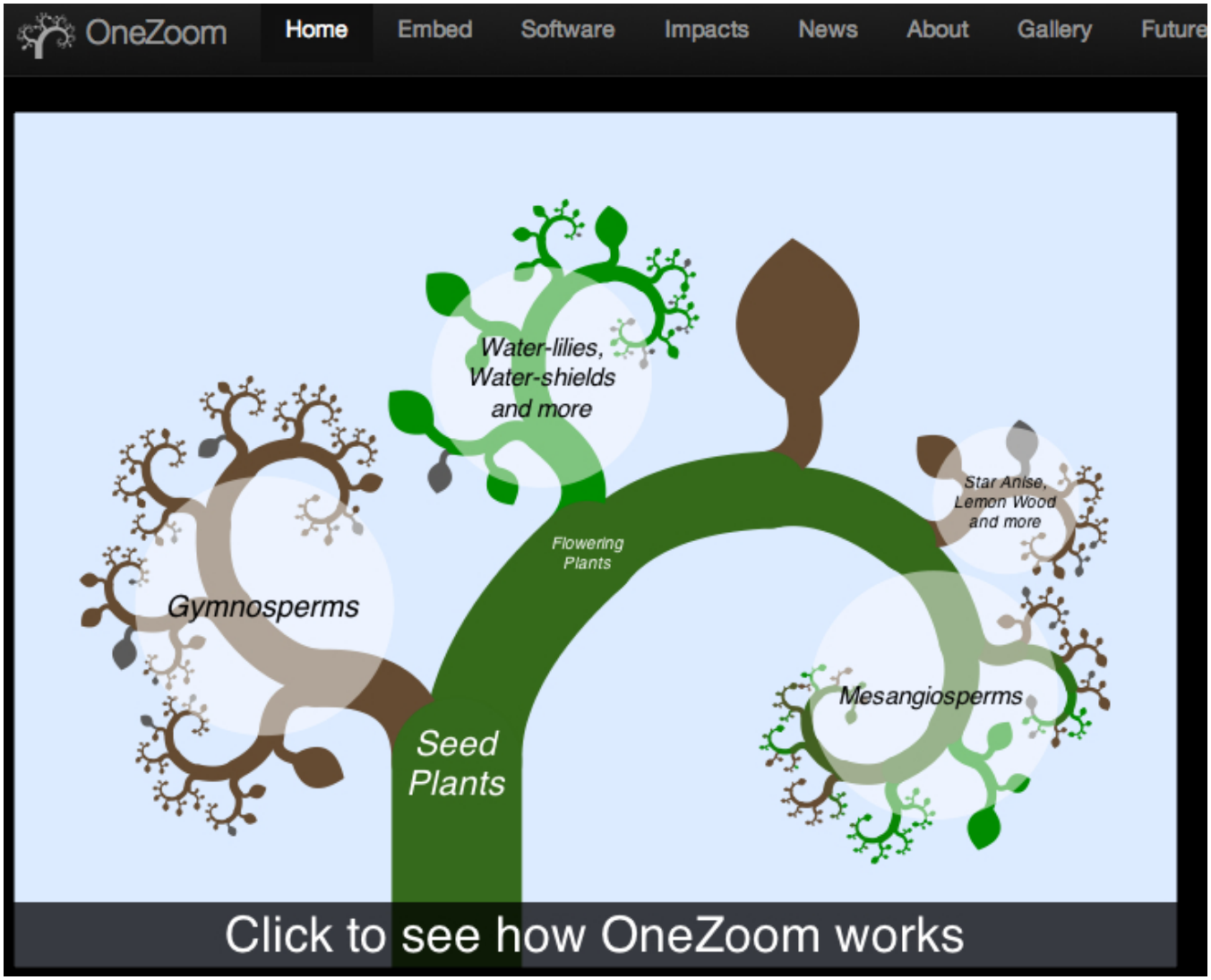
Between now and 2050…

- Panhandle species moving NORTH!
- Peninsula species moving SOUTH!



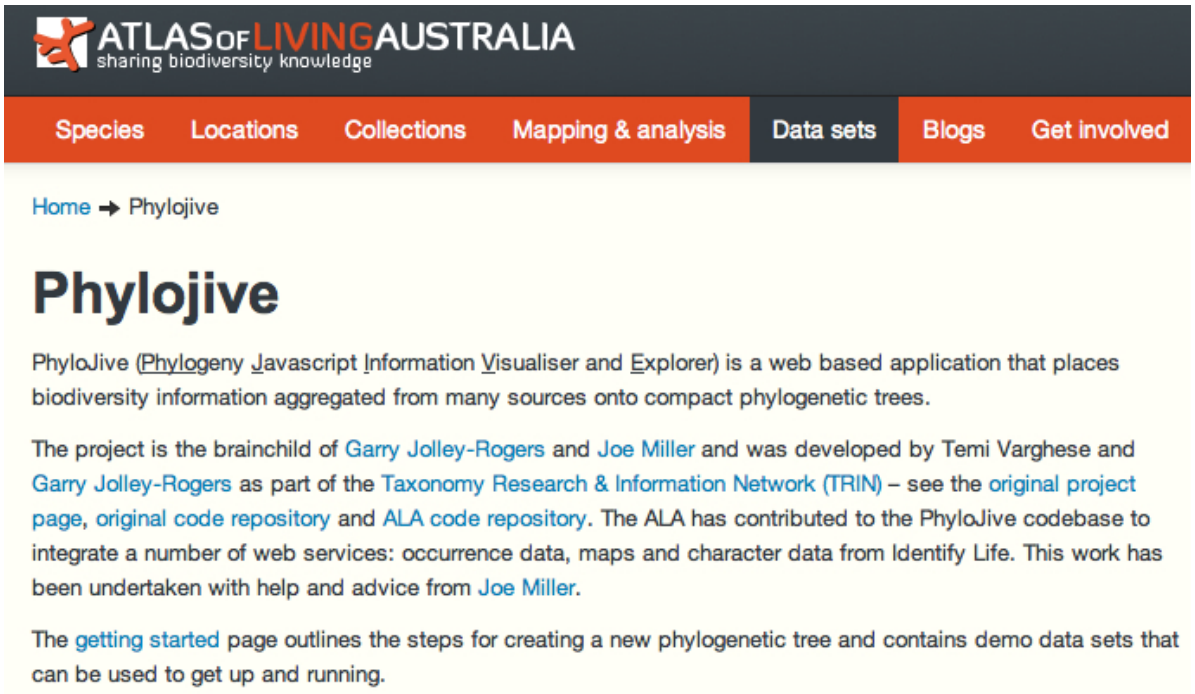
spp 2050 - #spp now

Linking to Phylogeny



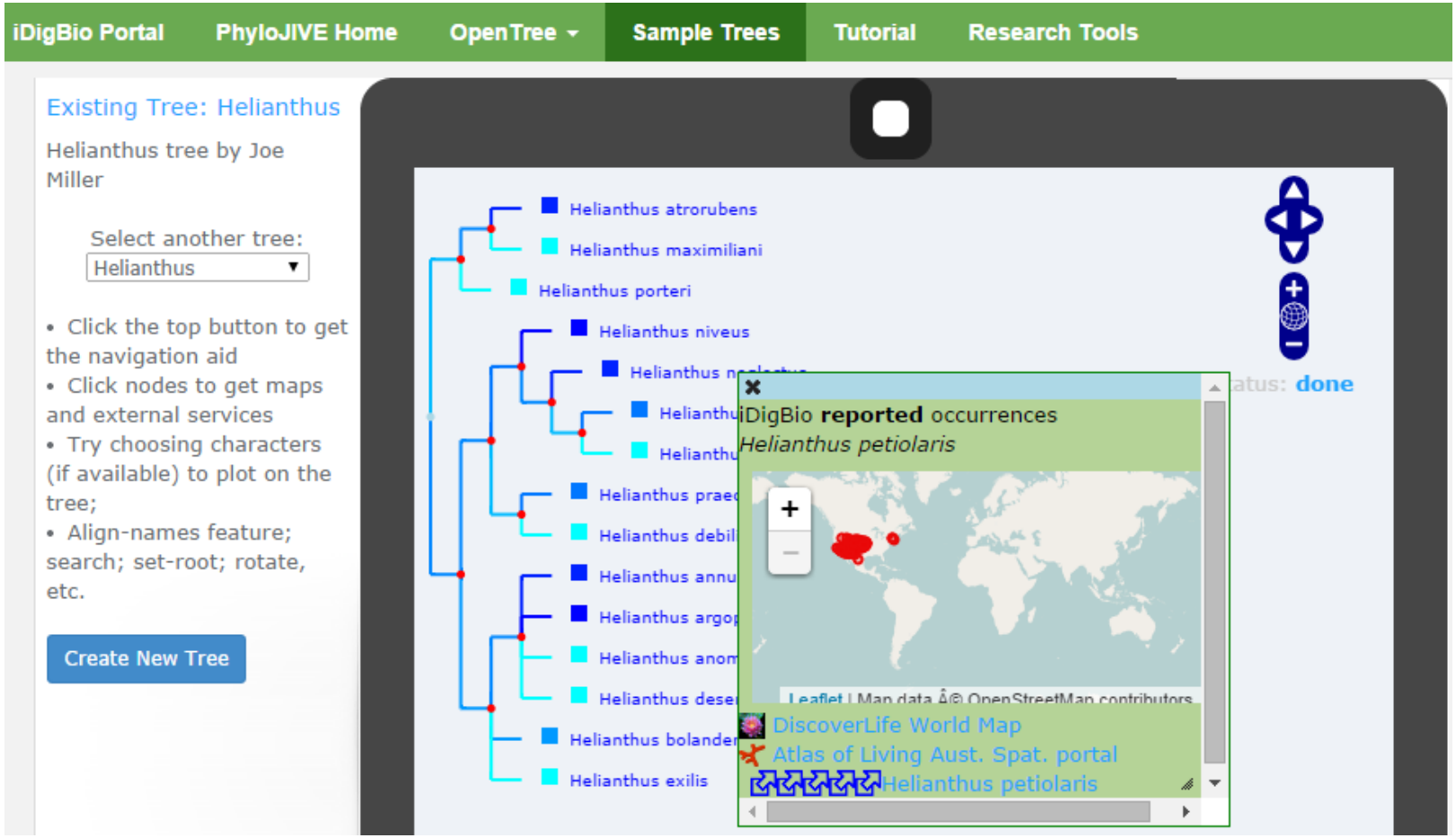
PhyloJIVE

Links biodiversity data to trees
Joe Miller & Garry Jolley-Rogers
phylojive.ala.org.au/



A. buxifolia
Source: Australian Plant Image Index
Image by: Macdonald, C.

PhyloJIVE instance in iDigBio

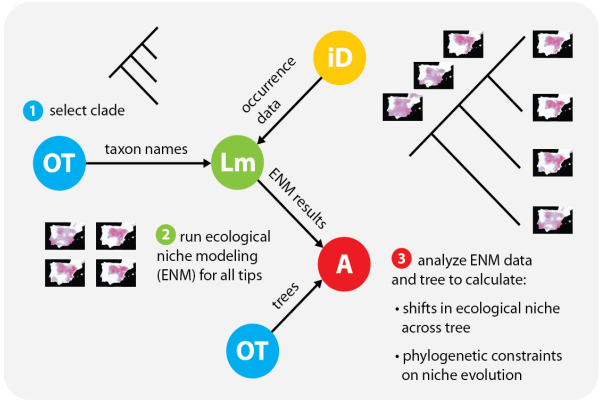


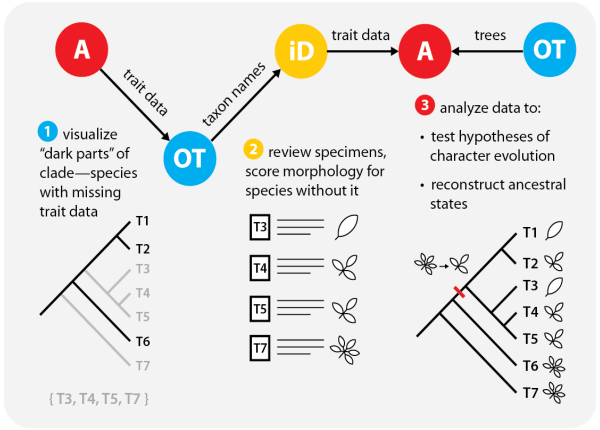
- Developed by Garry Jolley-Rogers, Joe Miller, and Temi Varghese
- Integrates biodiversity data with phylogeny
- http://phylojive.acis.ufl.edu/

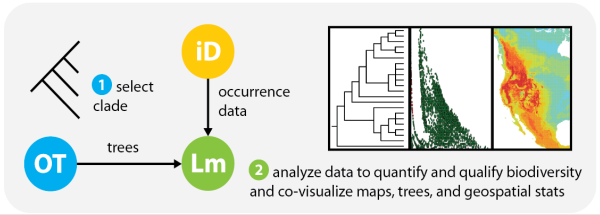
A. Matsunaga

Connecting Trees, Specimens, Tools

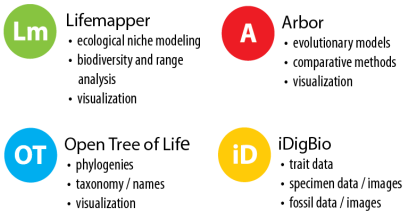
EXAMPLE WORKFLOWS:

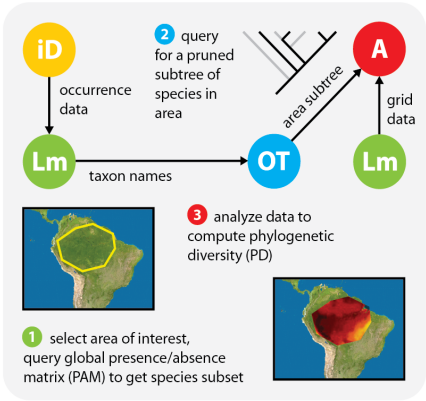


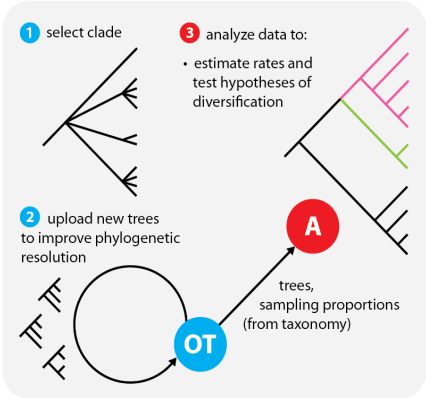




RESOURCES:







Connecting Trees, Specimens, Tools

iDigBio
Integrated Digitized Biocollections

BIEN

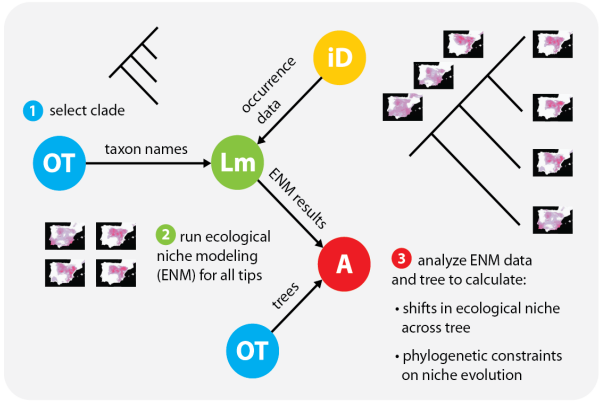
OPEN
Tree of Life
A community-assembled ToL

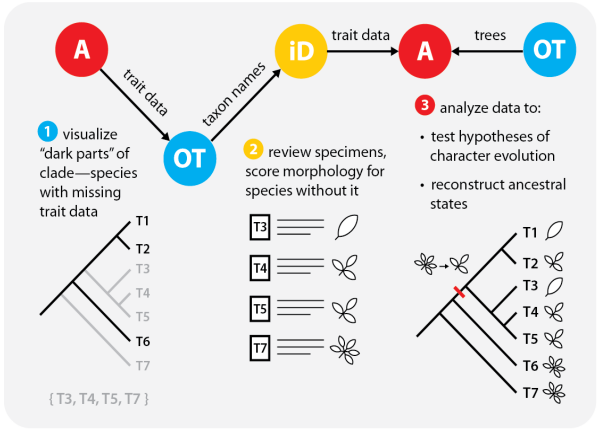
Lifemapper

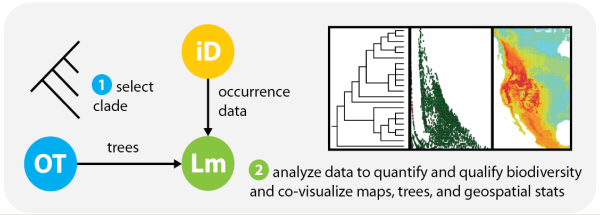
ARBOR
revolutionary workflows

Connecting Trees, Specimens, Tools

EXAMPLE WORKFLOWS:







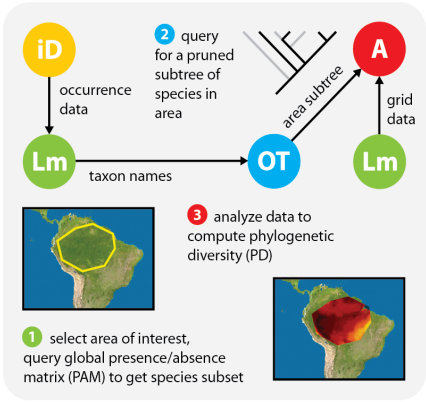
RESOURCES:

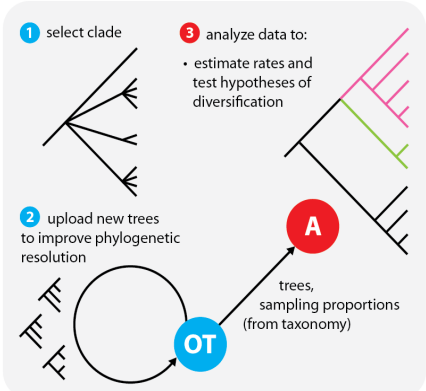
Lm Lifemapper
- ecological niche modeling
- biodiversity and range analysis
- visualization

A Arbor
- evolutionary models
- comparative methods
- visualization

OT Open Tree of Life
- phylogenies
- taxonomy / names
- visualization

iD iDigBio
- trait data
- specimen data / images
- fossil data / images





Connecting Trees, Specimens, Tools

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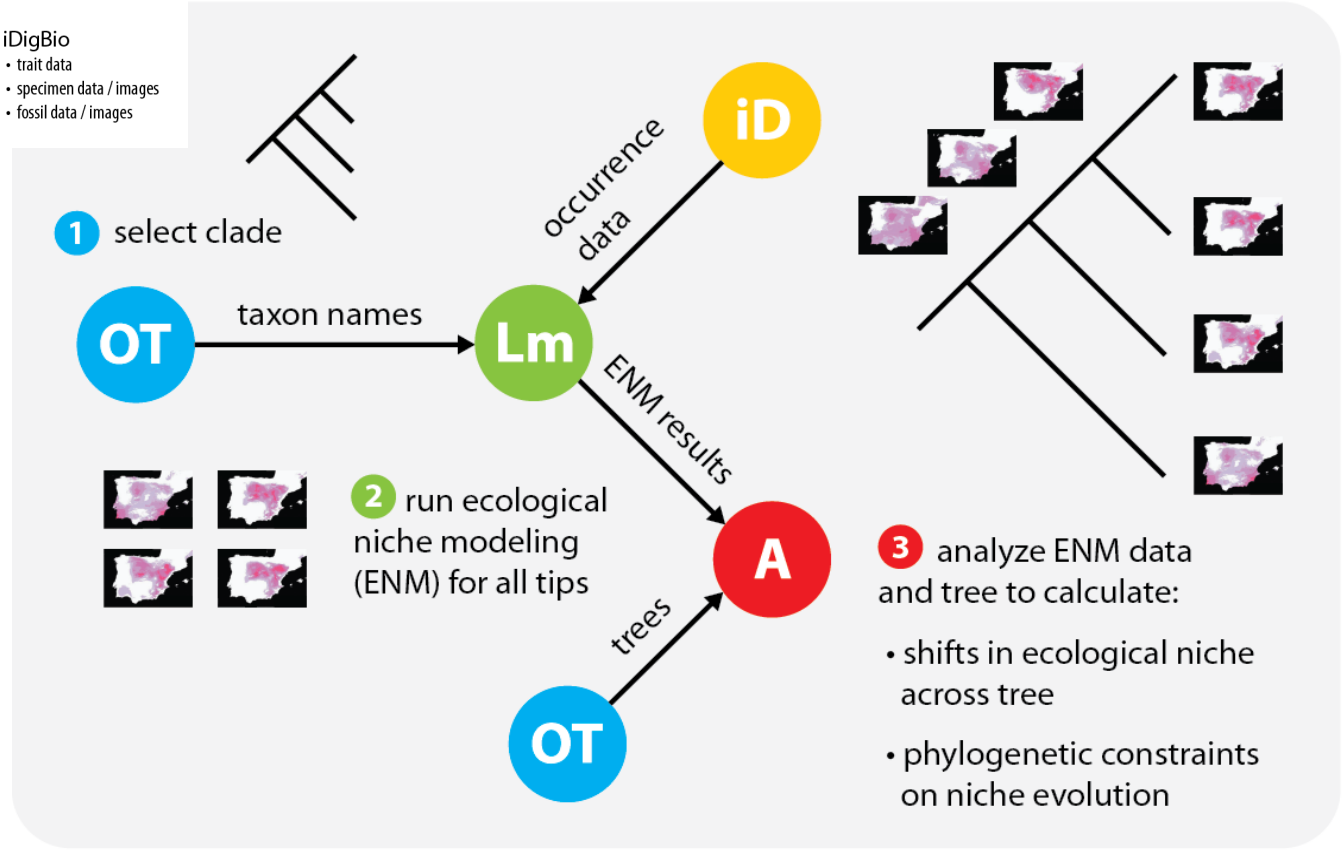
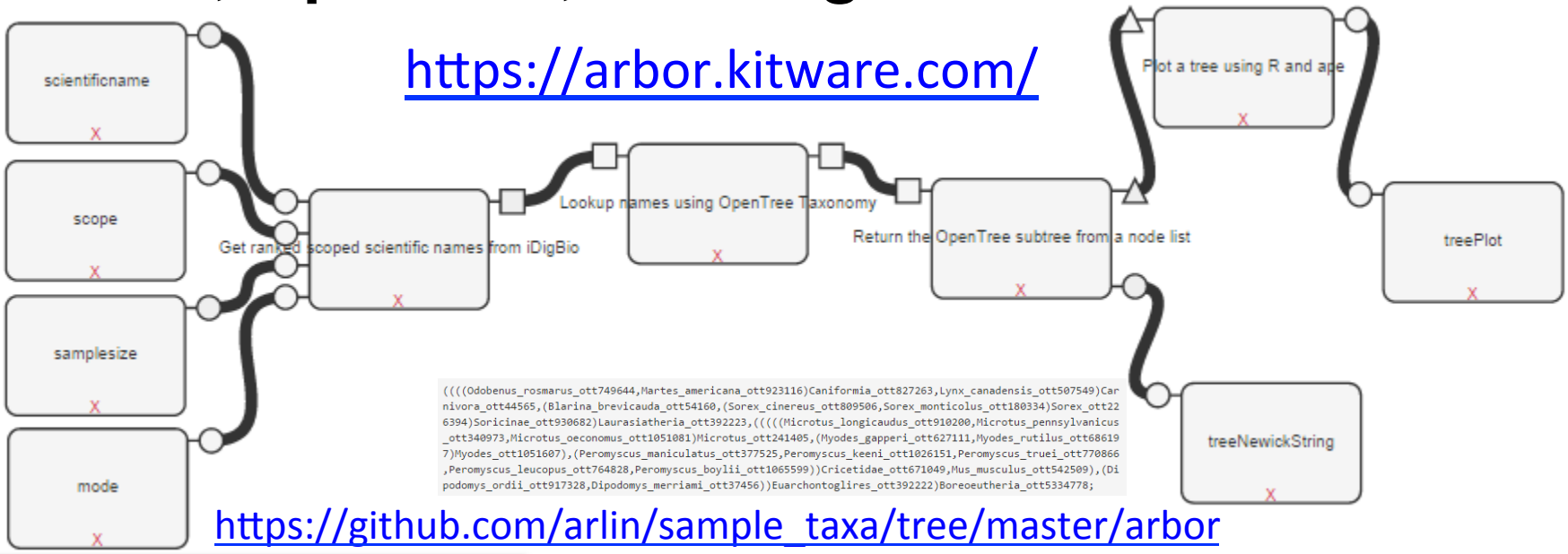
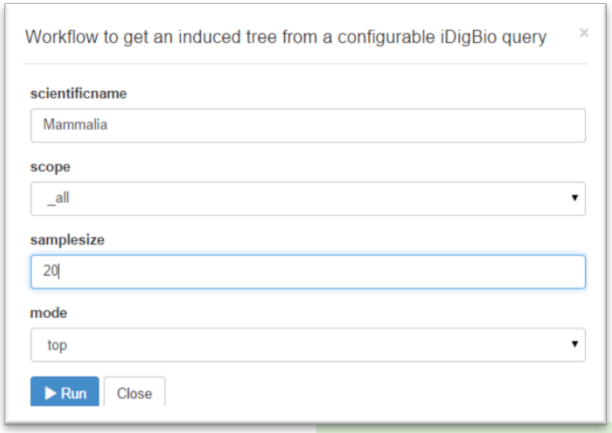


Arbor, OpenTree, and iDigBio

https://arbor.kitware.com/



https://github.com/arlin/sample_taxa/tree/master/arbor

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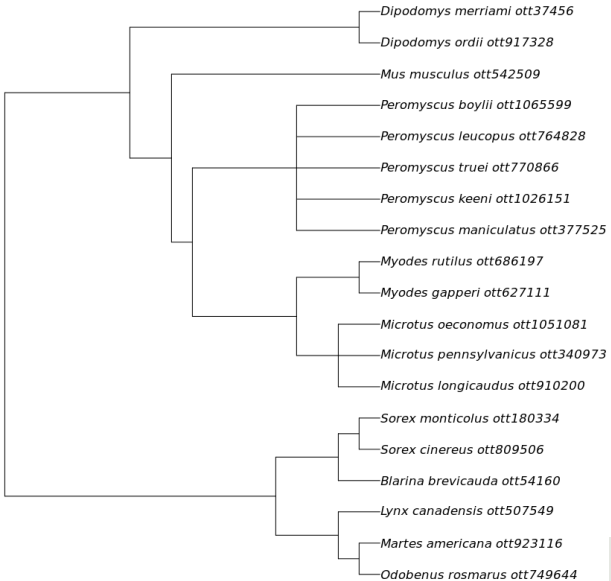
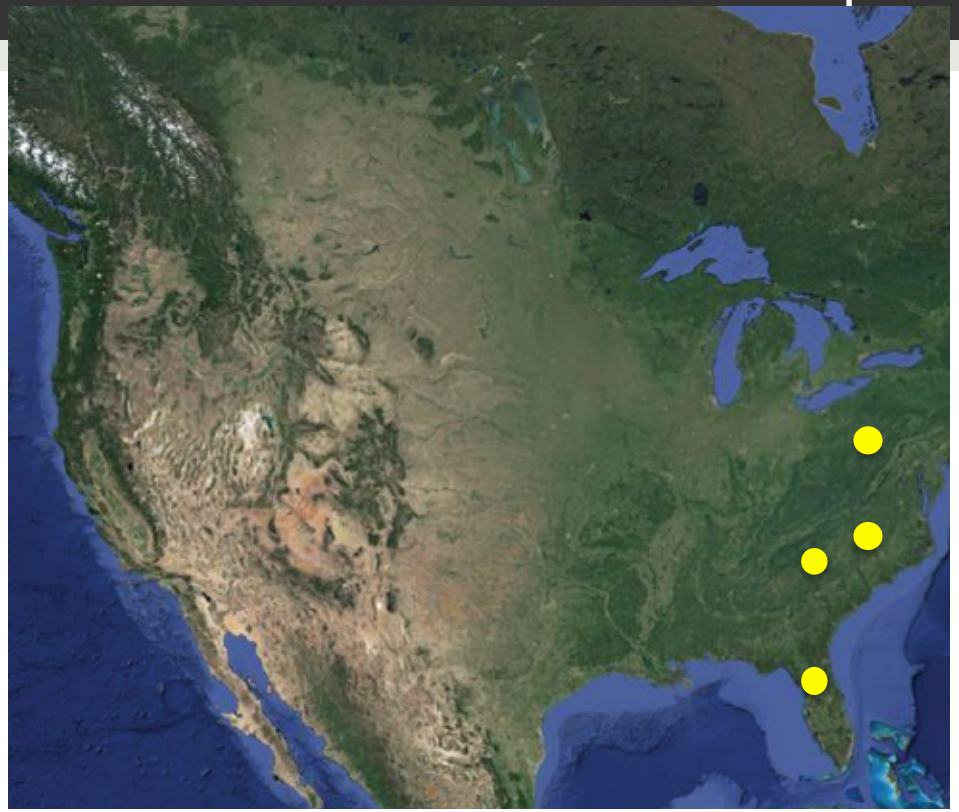
Success! Produced the following outputs:

- Workflow to get an induced tree from a configurable iDigBio query treeNewickString [string]
- Workflow to get an induced tree from a configurable iDigBio query treePlot [image]



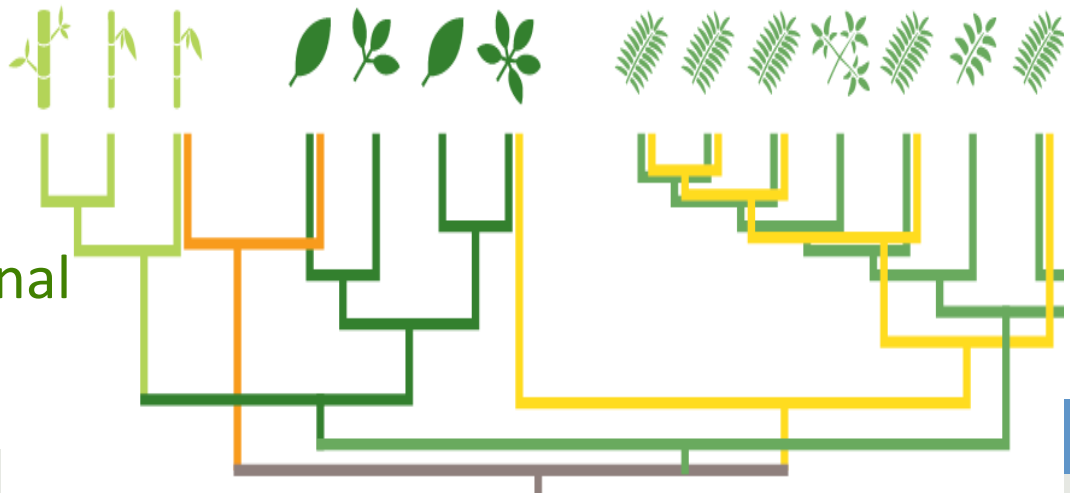
A. Matsunaga

PhotosyntheticPathway
Respiration LeafArea NfixationCapacity
SLA RegenerationCapacity PlantLifespan
WoodDensity GrowthForm
PhenologyType LeafN
LeafP LeafLongevity PhotosyntheticCapacity
MaxPlantHeight SeedMass



Connecting ecology to specimens

Correlation of plant functional traits



Many Uses for Specimen Data

- Connections to other resources, e.g. GenBank
- Ecological Niche Modeling
- Integration with phylogeny, e.g. PhyloJIVE
- Complex integration of phylogeny, specimens, ENM, other heterogeneous data
- Images as sources of traits for ecological studies
- Others???

- Research Applications Working Group

Thank you!

www.idigbio.org

psoltis@flmnh.ufl.edu

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idigbio.org/rss-feed.xml

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

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