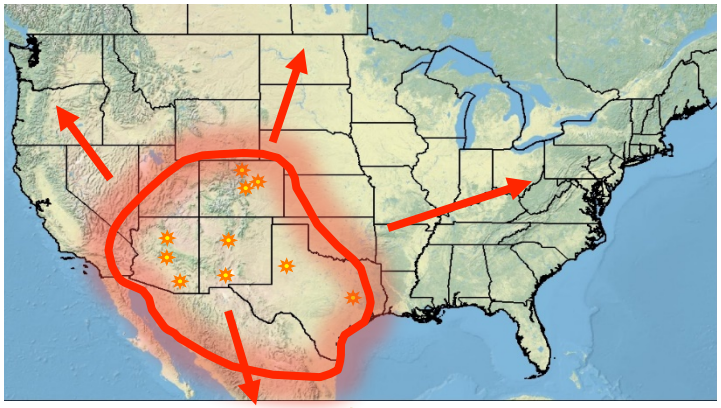
SCAN

Symbiota Collections of Arthropods Network

Symbiota Collections of Arthropods Network (SCAN)

A Data Portal Built to Visualize, Manipulate, and Export Species Occurrences

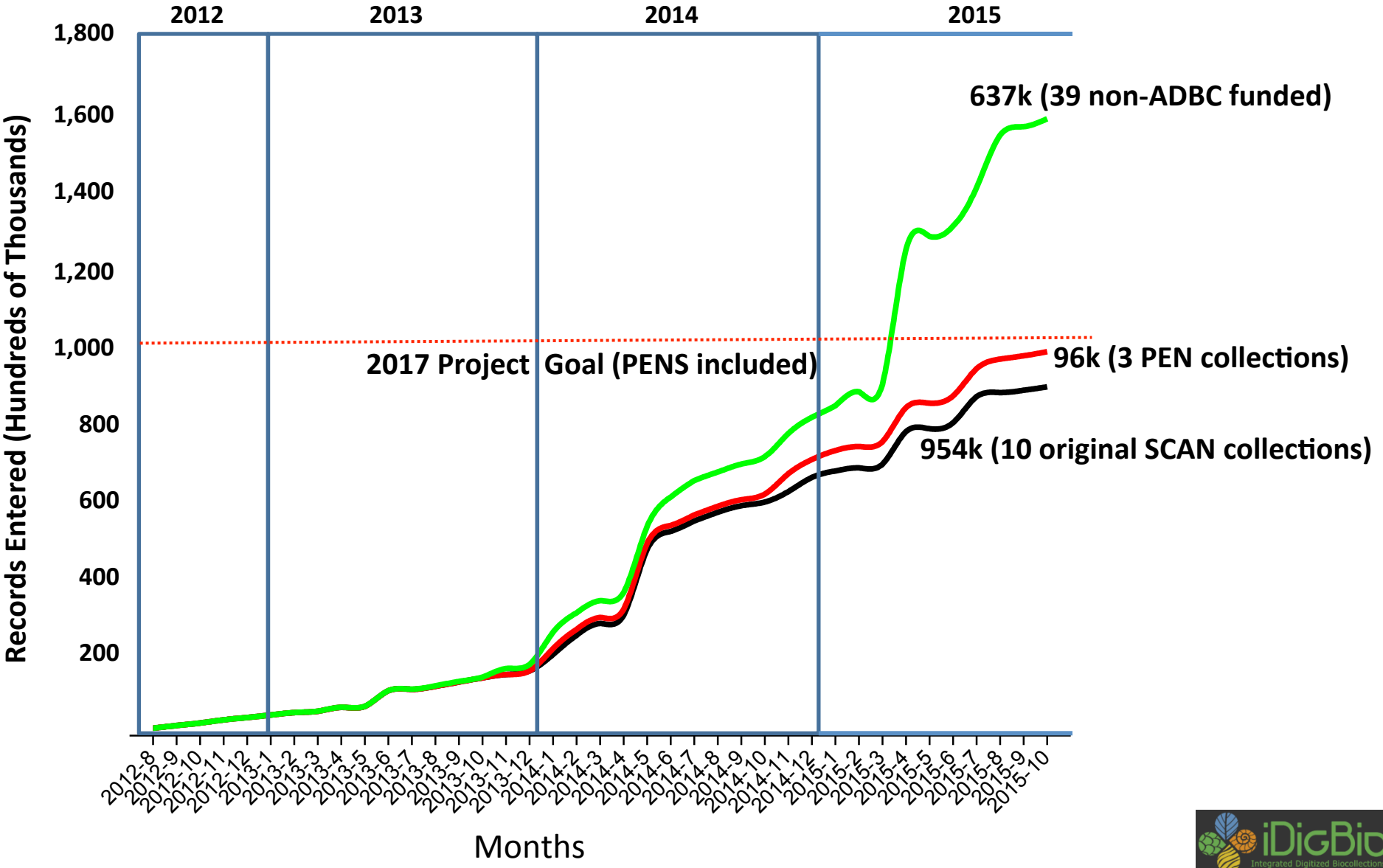


Symbiota Promoting Bio-Collaboration

This project made possible by National Science Foundation Award EF 1207371

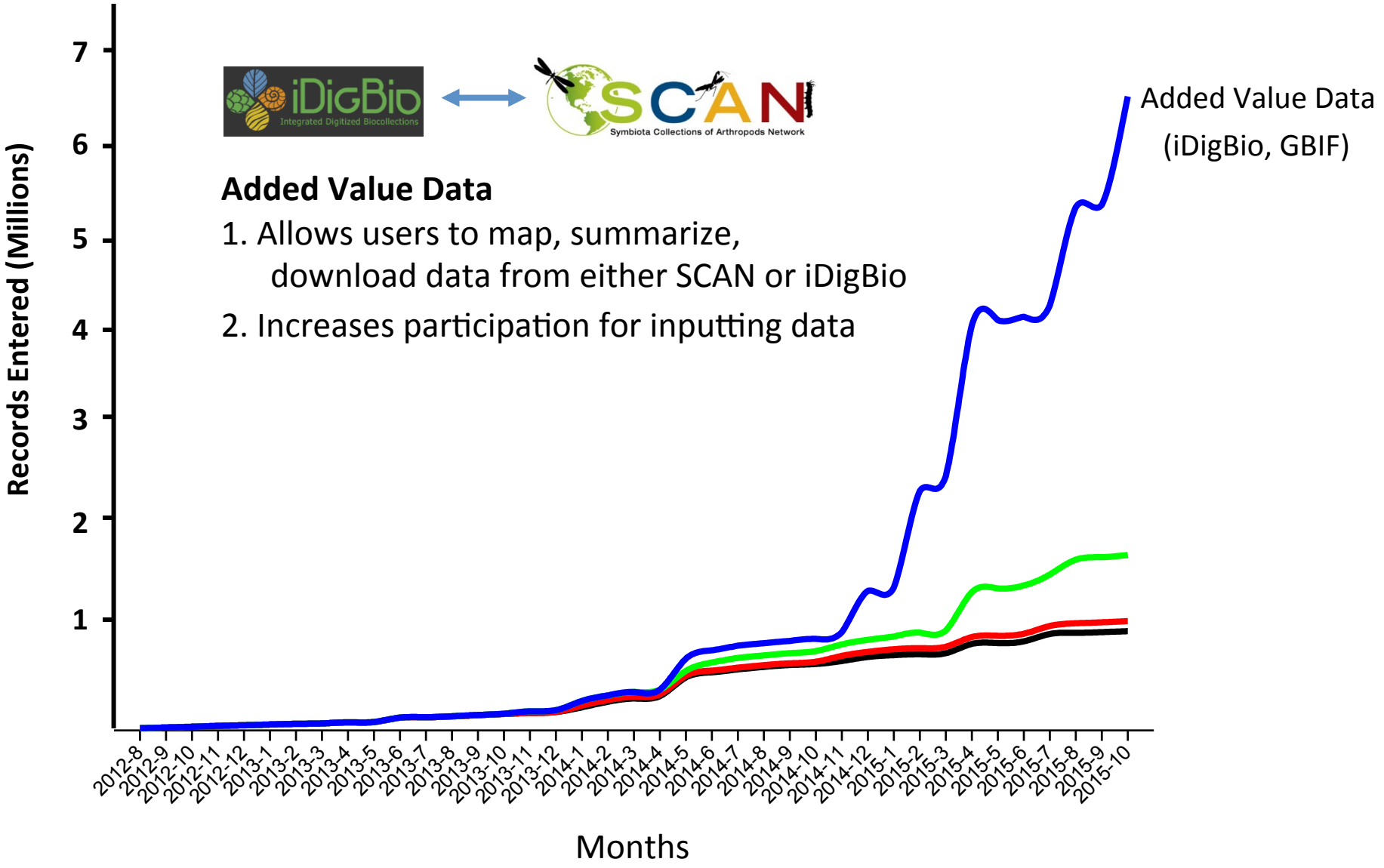
iDigBio Integrated Digitized Biocollections

Broader Impact Digitizing: 1.68 million



Towards a Complete Arthropod Portal

6,250,725 specimen records served



Challenges Using Digitized Arthropod Data for Global Change Research

- Achieving critical mass: 250 million specimens in North American collections, but <10 million digitized (~4%)
- 62% of specimens in North American collections identified to species
- 10% of North American arthropod species have “enough” occurrence data (n=30). Arthropods comprise ~65% of described species, only 15% of climate impact studies
- Most data providers do not actively conduct global change research
- No collaborative repository extensively used for vetted research-ready data

Strategy to Promote Global Change Research

- “If you build it they will come”
- Identify and promote research groups

Digitized Data for Arthropod Research:

- **SCAN Focus on North America – United States > Canada > Mexico**
- **5-25 thousand species can be modeled today!** (10 to 30 records per species)
- **Key Ground-Dwelling Groups with data**

		North America				
	Estimated	Occurrence	Number & Percentage of Species			
	NA species	Records	w/ >10 records		w/ >30 records	
Ants (Formicidae)	1,000	134,348	600	60%	412	41%
Ground Beetles (Carabidae)*	2,000	372,311	1,211	61%	861	43%
Darkling Beetles (Tenebrionidae)	850	66,208	425	50%	239	28%
Grasshoppers (Acrididae)	550	109,742	258	47%	196	36%
Spiders (Araneae) *	3,000	99,478	994	33%	566	19%
Other Groups						
Scarab beetles (Scarabaeidae)	1,100	210,000	623	57%	450	41%
Bees (Apoideae)*	4,000	576,000	1,800	45%	1,200	30%
Butterflies & Moths (Lepidoptera)*	15,000	254,000	3,000	20%	1,900	13%
Plant Bugs (Miridae)*	1,600	236,000	1,200	75%	700	44%

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928-523-2381
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The Campaign for NAU

RESOURCES

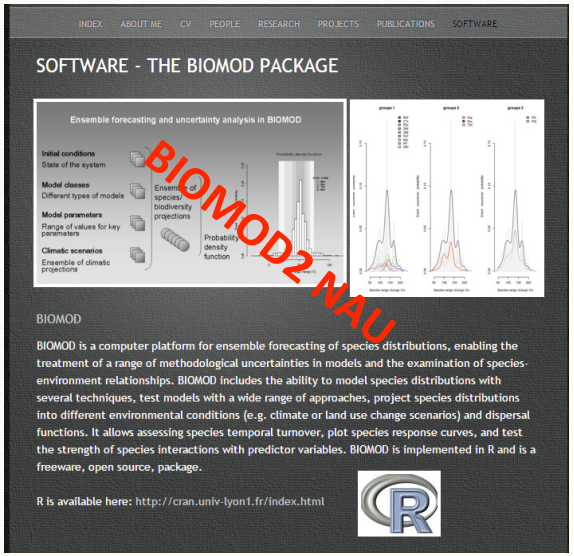
Here you can find a compilation of resources related to ecology and evolutionary biology, including R code and relevant data sources. This is by no means a comprehensive list of resources or techniques and represents the biases of the BRAIN Lab personnel, but should get you on the right track. Click on any of the headings below to find resources on that topic.

Species Distribution Modeling

Modeling species distributions is a rapidly expanding area of research with applications in ecology, evolution and conservation biology. Operationally, species distribution models (aka climate envelope models) typically seek to estimate the set of environmental conditions that best describe a species' realized niche. A variety of tools exist for extracting species occurrence records, relating them to environmental layers, generating/testing models and projecting them spatially.

SPECIES DISTRIBUTION MODELING: STEP-BY-STEP

Step 1: Occurrences & Presence-Absence Data
Step 2: Spatial Projections
Step 3: Environmental Data (Predictor Variables)
Step 4: Data Cleaning & Formatting
Step 5: Extent Selection
Step 6: Model Algorithms & Other Decisions
Step 7: Model Evaluation
Step 8: Geographic Projection
Step 9: Range Maps
Step 10: Migration
Step 11: Niche Overlap Tests



Goals: Final Year and Beyond

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1. Create “research-ready” data (i.e., >30 records per species) for 1,000s of target taxa

2. Achieve 90% identification of specimens digitized to species within five years of project end (ground-dwelling taxa).

3. Promote research groups.