



# **Open Mic for Data!**

October 30, 2025







# Housekeeping

- This session is being **recorded**. Slides will be posted to BCoN website after the event.
- Each lightning talk presenter has a maximum of **5 minutes** (4 slides)
- Please **hold questions** for after the lightning talks
- You may use the **chat** feature to share comments, ask questions, and to introduce yourself.
- If you would like to speak, please use the **raise hand** function.
- Contact AIBS IT Support via chat if you are experiencing technical difficulties.



NSF Award: <u>2303588</u>

Spring Summer-Fall Spring Summer 2024 2025 2025

### **Training**

Team Science and Inclusive Science Workshops for the Steering Committee

#### **Listening Sessions**

Six virtual domain-focused sessions, each 2 hours long

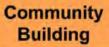
### Workshop

All-day virtual workshop to develop recommendations and roadmap

### **Synthesis**

Final report; Roadmap; Publication; Webinar describing Outcomes

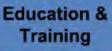




- Investing in human infrastructure
- Aligning data integration efforts

### Stocktaking & Gap Analysis

- Mapping data landscape
- Understand sociotechnical contexts

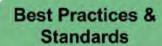


- Developing career pathways
- Supporting crossdisciplinary training

### BIOFAIR Data Network

### Technological Capacity Building

- Creation of flexible and extensible tools
- Community-driven innovation



- Mandating FAIR-aligned data publication
- Advancing interoperability frameworks



Scan to Listen to AIBS Podcast



**BIOFAIR** &

**DATA NETWORK** 

Scan to Read the BIOFAIR Report



# A Taxonomic Name is the Key to the Knowledge About a Specimen

**Donat Agosti** 

Plazi

email: agosti@plazi.org







### What's in a taxonomic name?



#### What is a taxonomic name?

- Identifier for a taxon
- Refers to one or multiple linked taxonomic concepts
- Enables comparing taxa-related data over space and time
- Is reproducible
  - original description provides the evidence, including holotype
  - provenance in the case of identification
- Part of the biodiversity knowledge graph

### Provenance of a taxonomic identification

Reproducible science!

### **Operational**

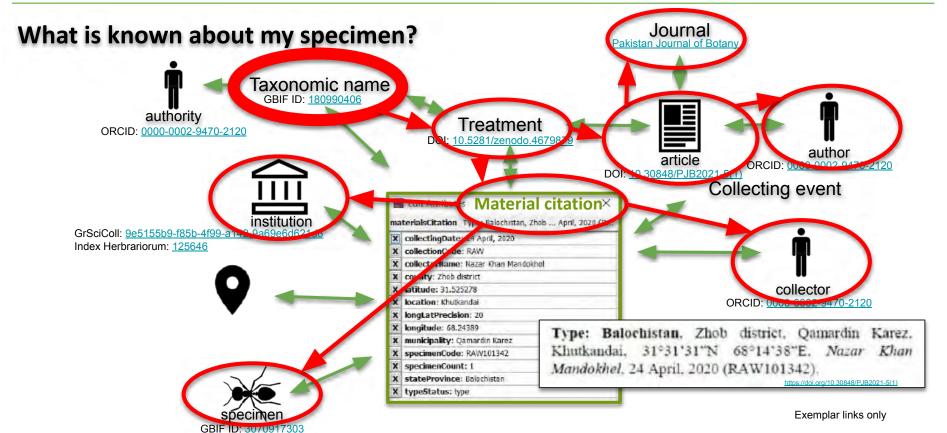
Saves an enormous amount of time

#### How to make taxonomic treatments FAIR?

Follow <u>Disentis Roadmap!</u>

### What's in a taxonomic name?

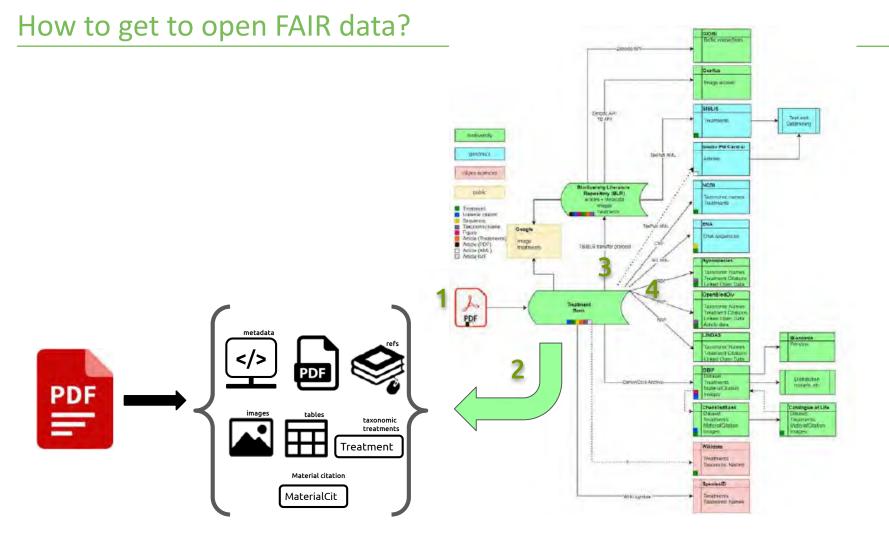




Imagine the possible applications enabling making use of this big data? Imagine the time saved if all these links are hyperlinks?









### Access to FAIR treatments: Infrastructures maintained or supplied by Plazi



	Articles	<u>Treatments</u>	<u>Figures</u>	<u>Tables</u>	Material Citations	Bibliographic references
TreatmentBank Treatment Bank	128,678	1,161,783	785,016	104,902	2,029,122	4,983,930 1,184,136 with doi
Biodiversity Literature Repository	102,956 processed 482K total	663,512	759K	23K	-	Biodiversity Literature Repository
GBIF	58,408	663,512	-	-	1,044,918	GBIF Global Biodiversity Information Facility
BiodiversityPMC	27,161	983,123	-	-		
ChecklistBank	58,833	612,549	-	-		



# Thank you!

Questions, answers, participation <a href="https://github.com/plazi/community">https://github.com/plazi/community</a>
Introduction to digitizing taxonomic literature with Plazi

DOI

**Donat Agosti** 

agosti@plazi.org

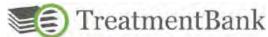














# **Exploring Wikibase as a Platform for the Sherwin Carlquist Extended Specimen Network**

**Jason Best** 

**Botanical Research Institute of Texas** 

email: jbest@brit.org









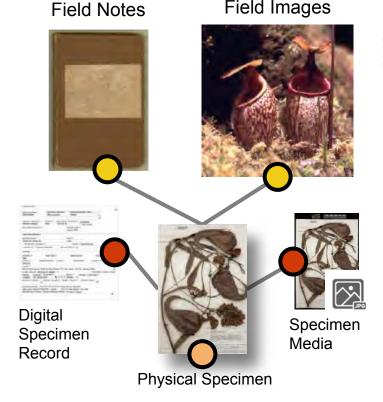
# **Exploring Wikibase as a Platform for the Sherwin Carlquist Extended Specimen Network**

### **Jason Best Botanical Research Institute** of Texas - jbest@brit.org **BCoN BIOFAIR 2025-10-30**





Thiers, B., Monfils, A., Zaspel, J., Ellwood, E. R., Bentley, A., Levan, K., ... Aime, M. C. (2019). Extending U.S. Biodiversity Collections to Promote Research and Education. Biodiversity Collections Network.





### Archival items at BRIT Digital records deposited in the Portal to Texas History

(PTH) at the University of North Texas

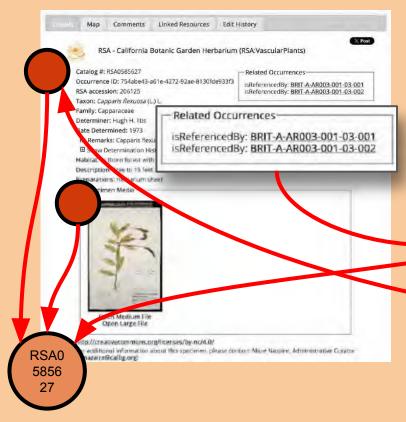


CCH2.org

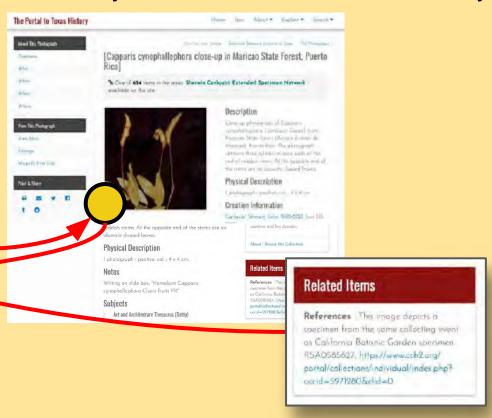
### **Biological items** at CalBG Digital records deposited in

### **Linking Elements of an ESN - for Humans**

### CCH2.org - Symbiota



### texashistory.unt.edu - Portal to Texas History



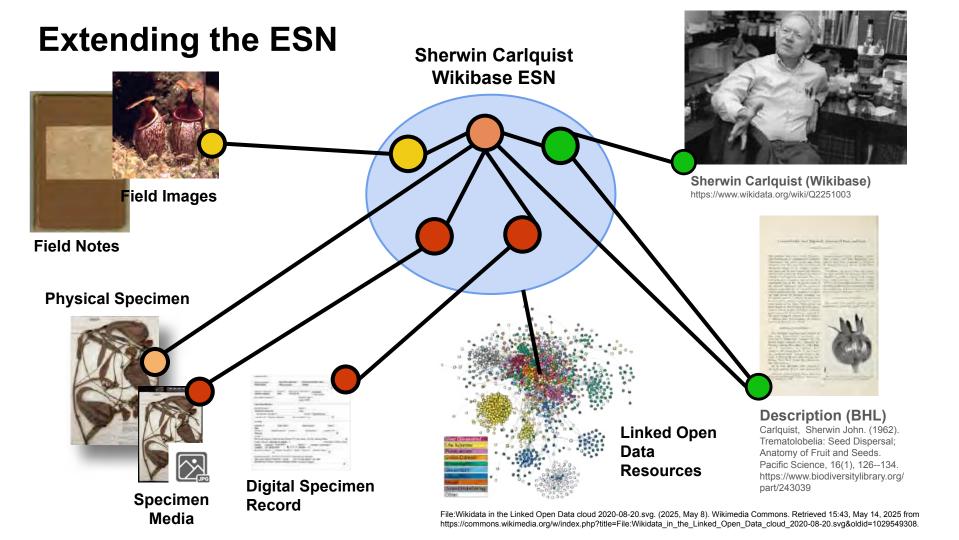
### **Sherwin Carlquist in the Wikiverse - for Machines**

https://en.wikipedia.org/wiki/Sherwin\_Carlquist



https://www.wikidata.org/wiki/Q2251003

instance of	human
date of birth	7 July 1930
date of death	1 December 2021
occupation	<u>botanist</u>
archives at	Botanical Research Institute of Texas
collection items at	California Botanic Garden
BHL creator ID	83802
Bionomia ID	Q2251003
etc	etc





# Building the Culture of Data Stewardship: An Ocean Data Case Study

### Rachael Blake

**Intertidal Agency** 

email: rachael@intertidal.agency







# **Intertidal**

Unlocking ocean data for global good

we work on the "people layer"



rachael@intertidal.agency



Data governance & stewardship encompasses the people, processes, policies, and standards around data, as well as the supporting technical infrastructure.

https://www.intertidalagency.org/



# Data stewardship



The actions involved in supporting, promoting, and guiding the use and reuse of data throughout the data lifecycle.

supports data integration and reuse, unlocking

- new ocean discoveries
- new innovative solutions
- long-term sustainability

# Everyone can be a data steward!



- ★ Plan for data management & publication
- ★ Document data (aka metadata)
- ★ Standardize data (for integration)
- ★ License data (e.g. Creative Commons licenses)
- ★ Discover and reuse data

Wherever you are on your data stewardship journey, we meet you there to help you build your skills

# Are you building community through training? Let's collaborate!





rachael@intertidal.agency

- Standardization
- Guidance
- Integration

- Workflows
- Methods
- Lessons

We've worked with <u>Creative</u>
<u>Commons</u> and <u>Openscapes</u>!

https://www.intertidalagency.org/



# **Eco-evolutionary Analyses of Global South Biodiversity Need Better Data**

### Israel Borokini

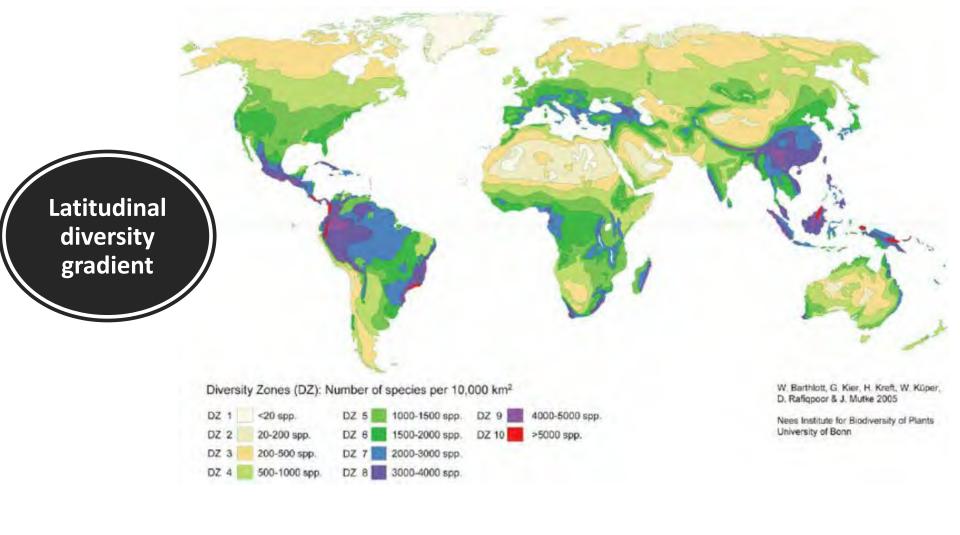
Montana State University, Bozeman

email: israel.borokini@montana.edu

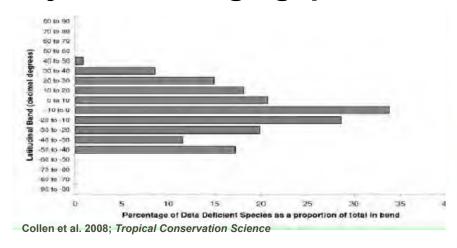


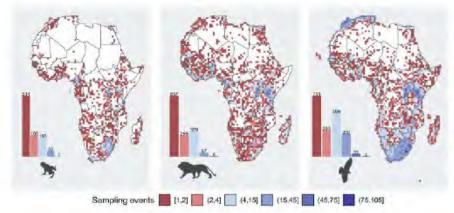


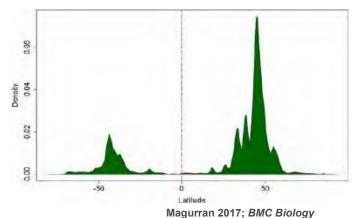


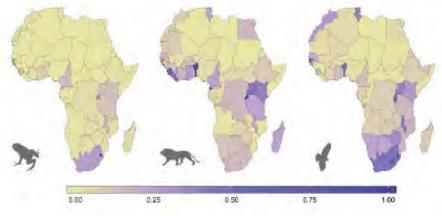


### Major knowledge gaps for biodiversity









Farooq et al. 2020; Systematic Biology

### Where is Global South biodiversity data?

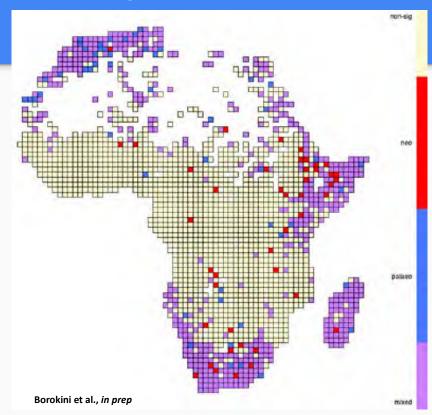
- 1. Global North museum and herbaria hold the most collections from Africa, Asia, and South America
  - Collected many centuries ago no georeferenced coordinates
  - Some have been digitized and more underway
    - TCN African plants digitization across 31 U.S. herbaria
- 2. Nature unknown due to poor funding for extensive fieldwork
- Piles of collected specimens in herbaria that are yet to be mounted, processed, and digitized





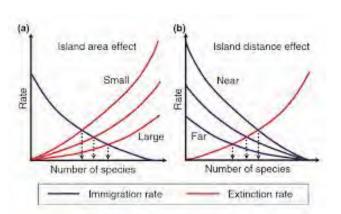
# Potentials for biodiversity data utility

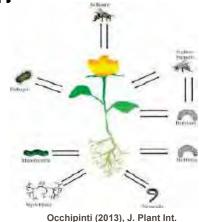
- Spatial phylogenetics identify centers of phylogenetic diversity and endemism in megadiverse regions
  - Conservation prioritization and gap analysis
- Train Global South early career scientists on bioinformatics
- Guide further sampling

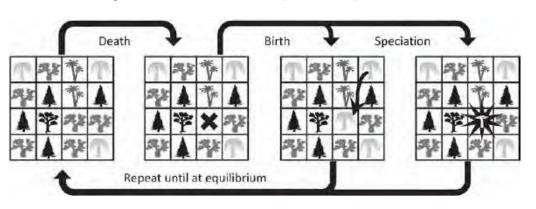


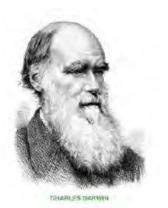
Global South contribution to ecology and evolution

- Theory of evolution (Darwin and Wallace)
- Theory of Island Biogeography (Wilson and MacArthur)
- The unified neutral theory of biodiversity and biogeography (Hubbell)
- Theory of co-evolution (Janzen)

















https://tbisrael.wixsite.com/website

- Department of Ecology, Montana State University, Bozeman, United **States**
- Email: israel.borokini@montana.edu





# The Use of Wikidata for Recording Identifiers for Collecting Expedition for Open Linked Data

**Robert Cubey** 

Royal Botanic Garden Edinburgh

email: rcubey@rbge.org.uk







# The use of Wikidata for recording identifiers for Collecting Expedition for Open Linked Data

Many collections contain material gathered or created during expeditions, including:

Naturalis - CC0

- Natural History collections: specimens and observations, field books
- · Ethnographic collections: objects, documentation
- · Archives: maps, drawings, field books, measurements
- Libraries: publications of species, travel journals



BHL

Special Collections of the University of Amsterdam, Public domain, via Wikimedia Commons



# Modelling Research Expeditions in Wikidata

## Working Group → Task Group

- ⇒ Our **informal working group** started in 2023 to explore how Wikidata is used to describe research expeditions.
- We created a WikiProject page.
- Propose a data model for research expeditions in Wikidata
  - discuss properties and edit items
- Create guidelines and best practices for describing research expeditions
- Proposed a new Task Group at TDWG 2023 (see abstract: <a href="https://doi.org/10.3897/biss.7.111427">https://doi.org/10.3897/biss.7.111427</a>
- New TDWG Task Group started officially early 2024

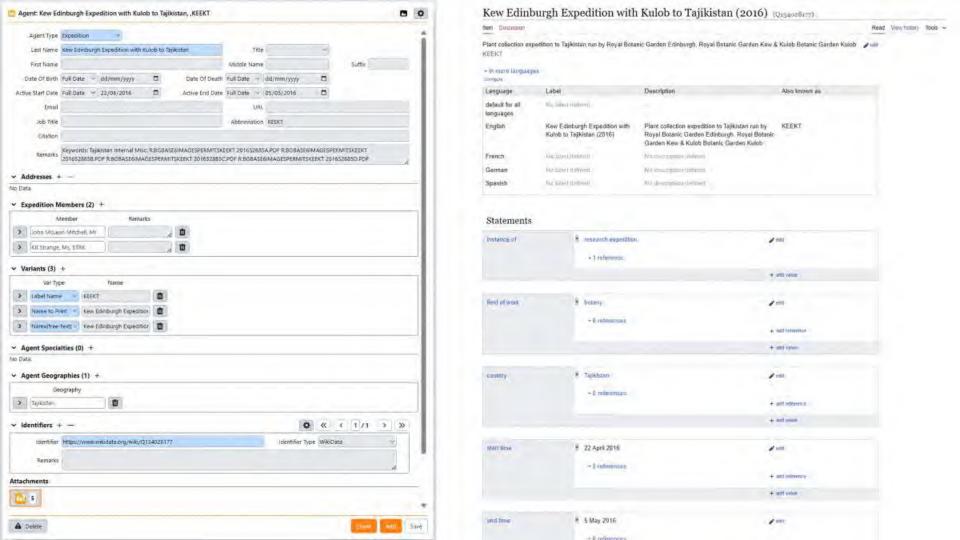


## Research expedition schema



property ID	property label	example expedition
P31	instance of	Q4558719
P15	route map	Q2305
P242	locator map image	Q113493980
P18	image	Q2305
P155	follows	Q233260
P156	followed by	Q919430
P1705	native label	Q1586167
P1813	short name	Q918793
P495	country of origin	Q122705442
P17	country	Q2305
P276	location	Q122705442
P1427	start point	Q119129
P2825	via	Q119129
P1444	destination point	Q119129
P937	work location	Q101428109
P580	start time	Q2305
P582	end time	Q2328
P3712	has goal	Q1586167
P101	field of work	Q4558719
P4791	commanded by	Q2305
P1037	director / manager	Q8414

P710	participant	Q2305
P1876	vessel	Q2305
P2283	uses	Q122705442
P138	named after	Q176653
P793	significant event	Q176653
P3342	significant person	Q1688349
P1132	number of participants	Q1162294
P1120	number of deaths	Q261538
P664	organizer	Q98118933
P859	sponsor	Q261538
P8324	funder	Q1586167
P1416	affiliation	Q67436630
P11146	collection items at	Q1586167
P485	archives at	Q1586167
P1299	depicted by	Q2670112
P1343	described by source	Q1383393
P973	described at URL	Q1586167
P1534	end cause	Q20948837
P5008	on focus list of Wikimedia Project	Q1586167
P373	Commons Category	Q60609222



## Visualisation of Wikidata expeditions





# HARRIMAN ALASKA EXPEDITION

American research expedition to explore Alaska and Siberia undertaken in 1899

Start Exploring





Harriman Alaska Expedition Q1586167



# **ZooMu Network Data Updates**

### Amanda Mazza

**Duke University Lemur Center** 

email: amanda.mazza@duke.edu







# ZooMu Zoo Museum Network

**Data Updates** 

Amanda Mazza, M.P.H.-Duke Lemur Center

Contact: amanda.mazza@duke.edu





Integrating Zoos and Natural History Museums to Enhance Capacity for Biological Collections Research















### The Duke Lemur Center

#### lemur.duke.edu

The **Duke Lemur Center** (DLC) founded in 1966 in Durham, NC, is a world leader in the study, care, and protection of lemurs—Earth's most threatened group of mammals. With more than 200 animals across 13 species, the DLC houses the world's most diverse population of lemurs outside their native Madagascar. The DLC strives to advance science, scholarship, and biological conservation through non-invasive research, community-based conservation, and public outreach and education.

The **DLC Museum of Natural History** (DLCMNH) examines primate extinction and evolution over time and houses more than 35,000 fossils, including extinct giant lemurs and one of the world's largest and most important collections of early anthropoid primates. The **DLCMNH** also houses the **DLC** osteology collection which includes the lemur's life history.



#### **Database Management @DLC**



- Husbandry records
- Veterinary records



- Biobank data
- Researcher data
- Observational records



- Fossil records
- · Osteology records
- · Animal diet records
- Animal training records



- Photo archive
- Natural History catalog



- Fossil microCT scans
- Frozen cadaver scans
- Osteology scans



#### What is ZooMu?



NSF-funded Research Coordination Network Cross-Institutional Network Connecting

**Biodiversity Collections** 









**Zoos & Aquariums** 

Natural History Museums

Living Collection



Preserved Collection

Birth

Death

00

Long-lasting & transdisciplinary network between complementary biological collections and broadening access to collection data & materials



#### **TWG: Cyber-Infrastructure**

Brought together experts from zoos, museums, collection systems, and biodiversity informaticists.

- Address key challenges in data sharing, interoperability, and long-term accessibility.
- Align data standards.
- Improve institutional collaboration.
- Increase the discoverability and usability of biological data.

#### Key outcomes

- Established a Cl working group.
- Pilot initiatives to test collaborative solutions identifying standardized identifiers to improve cross-institutional data tracking.
- Leverage platforms like GBIF for broader data integration.
- Create webinars for institutional training.



ZooM



### Macrostrat as an Integration Point for Biological and Geochemical Data

#### **Shanan Peters**

University of Wisconsin-Madison

email: peters@geology.wisc.edu







### Macrostrat as an integration

# point for biological & geochemical data

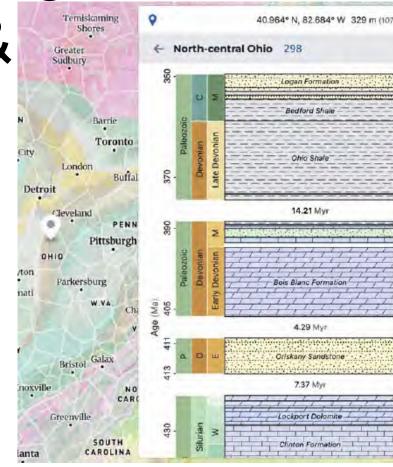
Shanan Peters & Daven Quinn University of Wisconsin-Madison macrostrat.org, rockd.org

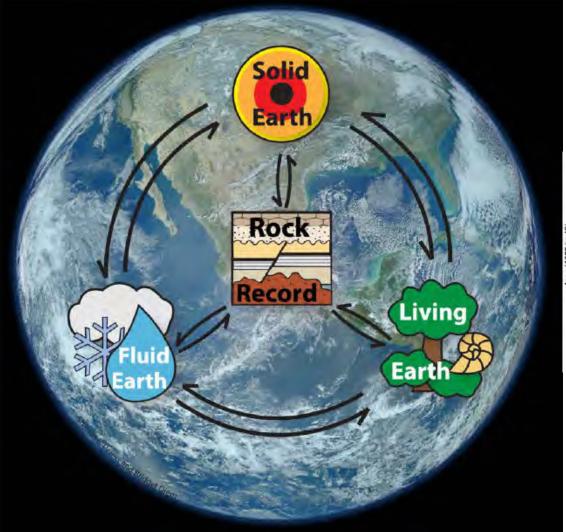


### Macrostrat

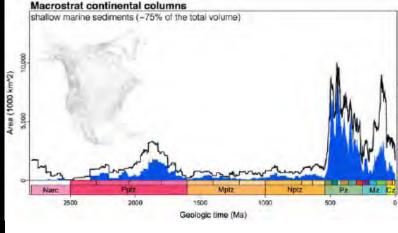
The data system for the crust

A geospatial relational database of geologic maps and geologic columns, with great, open API hooks.





Quantifying the lithological and spatiotemporal properties of the crust tells us much about the evolution of the Earth-life system



The way we do this carries with it major informatics advantages: stratigraphy is a very "natural join" for many different things.

#### Permian fossils in a Colorado U. museum drawer

https://www.colorado.edu/cumuseum/2020/10/14/permian-era-fossils

Natural History Museum of Los Angeles County, D. Durmis CC BY-NC-SA https://theconversation.com/digitizing-the-vast-dark-data-in-museum-fossil-collections-102833

Table 2

Results of TOC and Rock-Eval pyrolysis data on core and cuttings samples from wells in the western Sirte Basin. TOC: Total organic carbon, wt %;  $S_1$ : Free hydrocarbon content, mg HC/g rock;  $S_2$ : Remaining hydrocarbon generative potential, mg HC/g rock;  $S_3$ : Carbon dioxide yield, mg CO<sub>2</sub>/g rock; HI: Hydrogen index =  $S_2 \times 100$ /TOC, mg HC/g TOC; OI: Oxygen index =  $S_3 \times 100$ /TOC, mg CO<sub>2</sub>/g TOC;  $T_{max}$ : Temperature at maximum of  $S_2$  peak; PI: Production index =  $S_1$ /( $S_1$ + $S_2$ ).

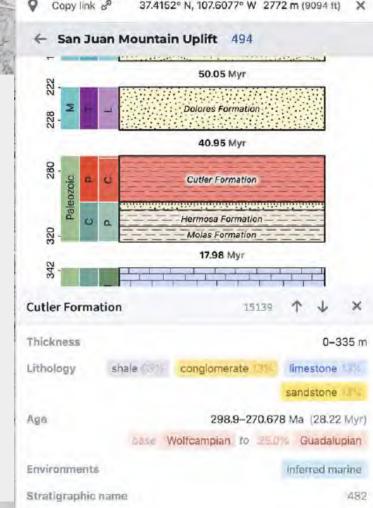
Well name	Formation	Sample type	Depth (m)	TOC (wt%)	S <sub>1</sub> (mg/g)	S <sub>2</sub> (mg/g)	S <sub>3</sub> (mg/g)	T <sub>max</sub> (°C)	HI (mg HC/g TOC)	OI (mg CO <sub>2</sub> /g TOC)	S <sub>1</sub> /TOC	PI	S <sub>1</sub> +S <sub>2</sub> (mg/g)
AA1.3	Kalash	Core	2720	0.31	-	-	(e)	-	-	-	~	90	-
AA1.4	Kalash	Core	2723	0.41	-	-		-	The second second	-	-	-	-
AAL5	Kalash	Core	2725	0.38	-	-	-	-	-	-	2	-	-
AA1.6	Kalash	Core	2730	0.29	-	-	G-	-	-	The common of th	÷	-	-
FFF1.1	Kalash	Core	2372	0.58	0.21	1.11	0.76	437	191	130.58	36.08	0.15	1.32
FFF1.2	Kalash	Core	2374	0.37	-	-	-	-	-	-	-	-	-
FFF1.3	Kalash	Core	2375	0.42	-	-	-	-	-	-	×	-	*
FFF1.5	Kalash	Core	2375	0.63	0.16	1.29	0.7	439	204.43	110.93	25.35	0.11	1.45
FFF1.6	Kalash	Core	2377	0.33	-	-	-	-	-	-	-	-	
FFF1.7	Kalash	Core	2378	0.19	_	-	-	-	-	-	~	-	-
FFF1.8	Kalash.	Core	2379	0.31	-	-	OH:	-	le-	-	÷	~	-
FFF1.9	Kalash	Core	2380	2.04	0.33	6.95	1.01	440	341.17	49,50	16.17	0.04	7.29
FFF1.10	Kalash	Core	2382	0.47	0.26	1.07	1.12	437	226.69	237.28	55.08	0.19	1.33
QQQ1.1	Sirte	Cuttings	2431-2432	0.57	0.08	0.47	0.56	435	82.89	98.76	14.10	0.14	0.55
GG1.4	Sirte	Cuttings	2658-2661	1.01	0.35	1.22	0.99	435	120.79	98.01	34.65	0.22	1.57
GG1.5	Sirte	Cuttings	2667-2670	1.01	0.30	1.22	1.26	438	122.24	126.25	30.06	0.19	1.52
GG1.7	Sirte	Cuttings	2676-2679	1.70	0.60	2.04	1.04	447	120.00	61.17	35.29	0.22	2.64
GG1.8	Sirte	Cuttings	2719-2721	1.28	0.54	1.4	1.22	436	109.37	95.31	42.18	0.27	1.94
GG1.9	Sirte	Cuttings	2728-2731	1.39	0.57	1.63	1.06	439	117.26	76.25	41.00	0.25	202
GG1.10	Sirte	Cuttings	2746-2749	1.20	0.51	1.66	0.84	437	138.33	70.00	42.50	0.23	2.17
GG1.11	Sirte	Cuttings	2761-2764	1.04	0.32	0.92	1.00	432	88.46	96.15	30.76	0.25	1.24
GG1.12	Sirte	Cuttings	2780-2783	0.89	0.31	0.74	0.99	433	82.95	110.98	34.75	0.29	1.05

Geochemical measurements in scientific publication (Atfy et al. 2017)

https://www.sciencedirect.com/science/article/pii/S0920410516308889

Science (and society as a whole) has had a rather "extractive" relationship with stratigraphy.

- Comprehensive starting point for coverage of surface and subsurface over all <u>N.Am</u>, deep sea (eODP), other regions + infrastructure for more!
- System to handle nomenclature and complexities
- Explicit linkages between geologic map spatial control and geologic column age control
- Continuous time age model that allows for precise age estimates (in Myr) for anything from stratigraphy at any scale of resolution
- APIs to automatically retrieve geological context for any arbitrary location/name/age
- Active (very straightforward) linking with Paleobiology Database and Sedimentary Geochemistry and Paleoenviron. Project (SGP)





## Community Science Can Bring Together Natural History Collections and Historical Survey Data

**Randy Singer** 

**Augusta University** 

email: rsinger@augusta.edu







#### Randy Singer

"Community science can bring together natural

history collections and historical survey data"

#### **Fast Facts:**

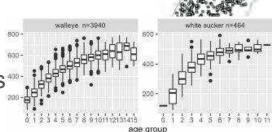
140,000 Objects Processed

3,200 Volunteers

450,000 Data Points

#### **Workflow:**

Cards -> Zooniverse ->
Transcribers -> Data -> Us
-> IFR/Collections



MUSEUN



Email: rsinger@augusta.edu

@randchovy



#### Angling for Data on Michigan Fishes

Early DEPARTMENT OF GENERALITIES TO BE TO	LAKE 108		104	STITUTE POR PISHERIE	meser a mese	CASE SHAMEST
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#### FAIRy: Upstream, Cross-Repo Submission-Readiness Checks (GEO/Zenodo) Jennifer Slotnick

**Datadabra** 

Email: hello@datadabra.com







### **FAIRy by Datadabra**

A local-first validator, fixer and packager for research datasets to cut down bounced submissions and back-and-forth

Goal: portable 'BIOFAIR-ready' preflight you can run locally before handing data to any repository

Seeking pilot collaborators across genomics ↔ environmental data

#### What FAIRy Already Does

 $Fix \rightarrow re$ -run —> tells you what cleared

```
=== FAIRy Preflight ===
Rulepack:
                 GEO-SEQ-BULK@0.1.0
FAIRy version:
                 0.1.0
Run at (UTC):
                 2025-10-29T05:57:07.345059+00:00
FAIL findings:
WARN findings:
                  0
submission_ready: False
Report JSON:
                 out/report.json
Example finding:
 [FAIL] GEO.BIO.CONTEXT_MISSING @ row 1
   why: Each sample needs biological source info (tissue / cell_line / cell_type).
   fix: Provide at least one of tissue, cell_line, or cell_type for each row.
Resolved since last run:
  CORE.DATE.INVALID_IS08601
  CORE.ID.UNMATCHED_SAMPLE
```

- Runs locally (offline)
- PASS/FAIL/WARN with why and how to fix
- Write JSON and Markdown report with timestamp, rulepack version you can share
- On re-run highlights what cleared (fast feedback loop)

Outputs a shareable, data-free readiness sheet (PASS / WARN / FAIL + how to fix) you can hand to a PI or curator . A candidate handoff artifact for a future BIOFAIR node."

#### Why this matters for an integrated data network

- Metadata is messy (weird encodings, inconsistent IDs, non-ISO dates)
- Submissions bounce; curators say "please fix," leading to multi-day loops
- There's no portable, local preflight before handoff to curators

This is a standards and training gap: submitters don't get consistent guidance up front and curators have to triage

#### Looking for collaborators (BIOFAIR pilot)

Pilot partners wanted: any domain. We'll capture 5–7 must-have fields, automate locally and report aggregate gaps back to the BIOFAIR community

#### Scan the QR if you're even a little curious!

- Tell me your name / org /
- data type
  Add "pilot partner" if
  you're open to testing a
  tiny rulepack
- I'll follow up



Jennifer Slotnick FAIRy / Datadabra hello@datadabra.com 🜐 datadabra.com/biofair linkedin.com/in/ienniferslotnick/

Long-term hope: compare pilots and find the pieces that travel across domains. Start of a BIOFAIR-ready preflight.



# Integrating Ancient Environmental DNA with the Neotoma Paleoecology Database Jack Williams

University of Wisconsin-Madison

Email: jwwilliams1@wisc.edu







### Integrating ancient environmental DNA (aeDNA) with the Neotoma





#### **Paleoecology Database**

John (Jack) Williams
Simon Goring
Jonathan Nelson
University of Wisconsin-Madison

#### Trisha Spanbauer

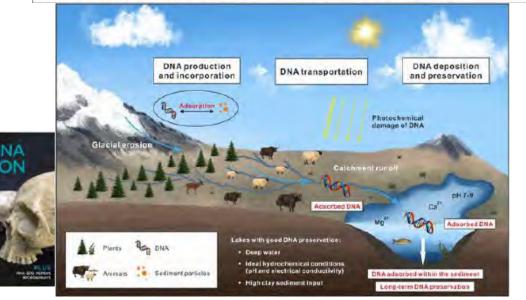
University of Toledo & University of Kentucky

#### **Amy Myrbo**

**Amiable Consulting** 

...and many others

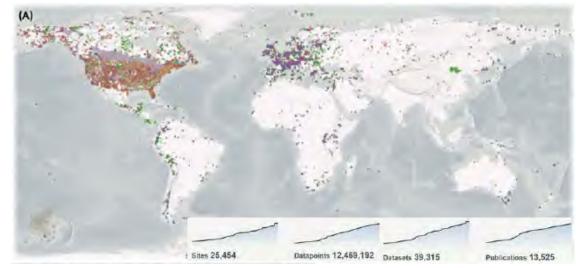




#### What is Neotoma?

- Global Coverage
- Paleoecological data, used to study species responses to past environmental change
- Curated by human expertsHigh-Value Data
- Supports a wide variety of data types
- Data organized into
   Constituent Databases,
   each with its own Data
   Stewards and contributors

Mission: Support global-change research and education via open, ethical, community-curated data and services for paleoecological and paleoenvironmental data



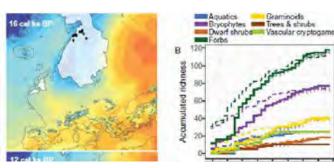


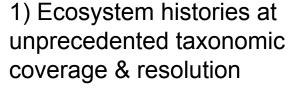


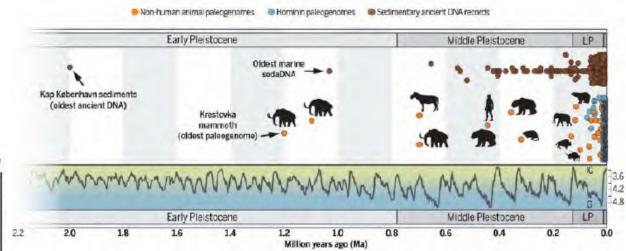


+ Ostracodes, Amoebae, Charcoal, 14C dates, and many more

# Why aeDNA is exciting

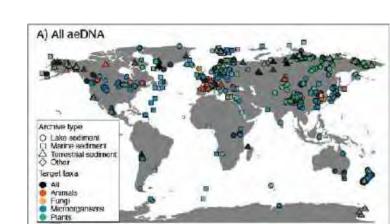






2) Steadily increasing temporal extent

3) Rapidly growing site network, >800 sites worldwide, doubled in 2 years



#### **Current Work**

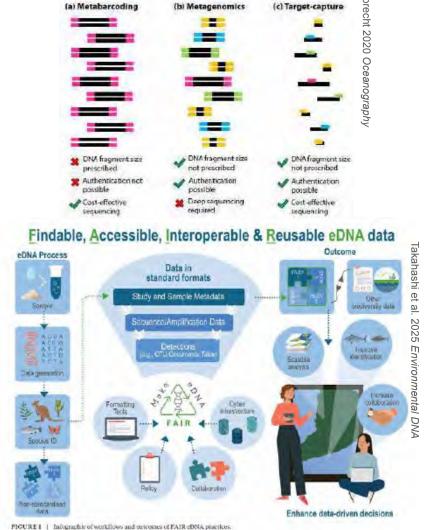
Joint working group of aeDNA experts and Neotoma developers

Focus on metabarcoding data

Cross-walking Neotoma data schema with FAIRe standard (Takahashi et al. 2025)

Spring 2025: begin uploads of aeDNA metabarcoding data into Neotoma

Suggestions & connections welcome!



#### **Discussion**

BIOFAIR &
DATA NETWORK

Questions for speakers?

New ideas for projects?

Potential ideas for collaboration?

#### **THANKS!**





David Kunkel



Brooke Long-Fox Phoenix Bioinformatics



Cameron Pittman
Denver Museum of Nature &
Science



Julia Portmann Yale University



Denver Botanic Gardens



Jyotsna Pandey AIBS & NSCA



https://sortee.org/collaborations/

https://bcon.aibs.org/

Contact us at bcon@aibs.org