

Ethical Open Science for Past Global Change Research

**Building technical and social capacity in data systems
and practitioners in support of ethical open science
practices such as the CARE and FAIR principles**

Jessica Blois – UC Merced
Jack Williams – UW Madison
Simon Goring – UW Madison
Andrea Thomer – University of Arizona
Meghan Balk – U. Oslo/U. Arizona
Leigh Lieberman – Princeton
Kitty Emery – University of Florida
Michelle LeFebvre – University of Florida
Suzanne Pilaar Birch – University of Georgia

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NSF-2226373
NSF-2226370



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Proximate Challenges & Goals

- **Data interoperability** — large differences among data resources in their degree of adoption (or knowledge) of common data standards
- **Data resource growth and complexity** — many researchers are unsure of how or where to best contribute their data, how to best access data from existing resources, or how to implement best practices
- **Inequities** — many scientific practices, including primary data curation, carry legacies of past and present colonialism and lead to inequities in data access, data distribution, and data governance

AIM 1

Improve
Interoperability
&
Reproducibility

AIM 2

Enable FAIR
Data Curation
& Stewardship

AIM 3

Support Equity
& Improve
Access

EOS RCN Projects



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EOS RCN Projects: Community Building & Reflection

- **Annual Symposia**
- **Ethical OS self-reflection survey**
- **Webinar Series**
- **Reading Group**



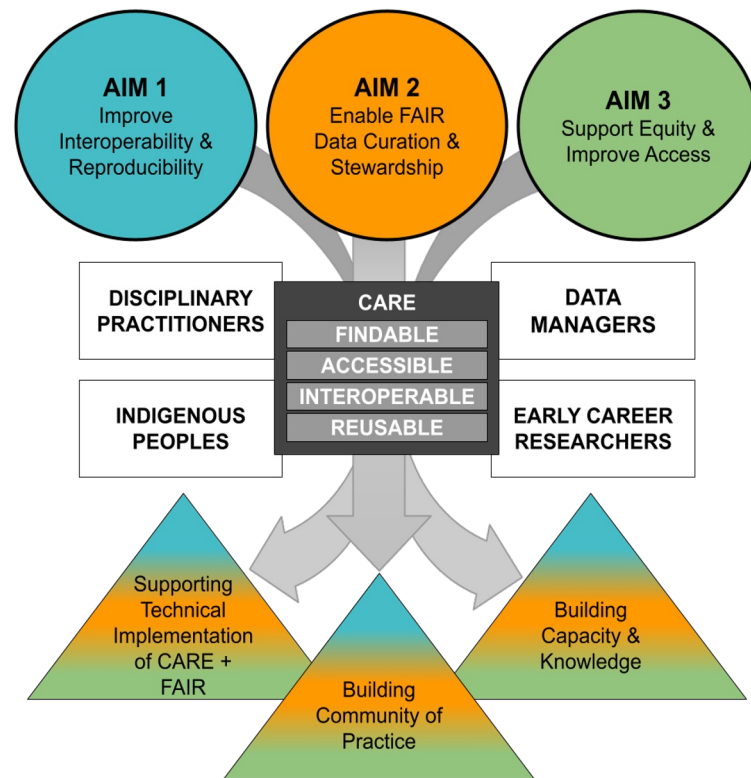
Year 1 Symposium @ Biosphere2

Presentations and panels

- FAIR - Introduction to data resources and scope of interoperability issues
- CARE - Introduction to CARE principles and scope of CARE issues
- Begin to form pathways for RCN participant structure and centering Indigenous participation

Roundtable Discussions

1. Technical capacity and linked open data
2. CAREful data curation and data sharing
3. Authority to Control / Governance
4. Data Repositories as Works in Progress
5. Collective Benefit
6. Pathways for New Collaboration



2024 Webinar Series

Sign up on the “News and Event” link on our website!



March 26, 2024: Dr. Pedro Monarrez (University of California, Los Angeles)

How the past creates the present: reviewing the foundational roles of colonialism and systemic racism and their modern manifestations in paleontology



May 21, 2024: Corrie Roe, Ashley Rojas, Emily Santhanam (Local Contexts)

Local Contexts: Tools to Support Indigenous Data Sovereignty and Cultural Authority



June 11, 2024: Dr. Genevieve Reid (Florida International University)

Talk Title: TBA

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Practitioner & Organizational Reflection Survey

Part 1: Questions about Ethical Open Science

- How do you and your CCDR define EOS?
- How are these definitions informed by FAIR? How are they informed by CARE?

Part 2: Questions about The FAIR Principles

- What parts of FAIR do you and your CCDR practice? What parts do you not? Why?
- What do you and your CCDR need to further engage and/or improve your engagement with FAIR?

Part 3: Questions about Ethics & The CARE Principles

- What parts of CARE do you and your CCDR practice? What parts do you not? Why?
- What do you and your CCDR need to further engage and/or improve your engagement with CARE?

Part 4: Complements & Tensions

- Are there points for you and your CCDR where EOS, FAIR, and CARE currently complement and support one another? Are there points where there are currently tensions?
- What changes would you need to make for EOS, FAIR, and CARE to become part of a single, holistic practice for you and your CCDR? What is the relationship between those changes and your personal and organizational boundaries?

EOS RCN Projects: Repositories Governance



➤ **Case studies: Neotoma, Open Context, Florida Museum**

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Repository Governance Case Study: Overview

- **Goals:**
 - Develop repository-level case studies to develop concrete, practicable steps towards advancing Ethical Open Science, CARE, and FAIR best practices
 - Share the methods developed and advances gained with other interested repositories.
- **Case Study Resources/Repositories:**
 - Open Context (Digital/Archaeology),
 - Neotoma Paleoecology Database (Digital/Paleoecology),
 - Florida Museum (Museum – physical and digital)
- **Next-Circle Resources/Repositories:**
 - EOS RCN Partners (FUTRES, iSamples, Linked Earth, NOAA-NCEI-Paleoclimatology, Paleobiology Database, VertNet)
 - FAIROS RCNs

Repository Governance Case Study: Process and Timeline

Year 1: July 2023 – Launch		
All Hands Meeting: Discuss Concepts, Organize		
Year 1: Fall 2023 – Reflect		
All Case Studies: Guided Self-Reflection and Discussion		
Year 2: Spring / Summer 2024 – Initial Action		
<i>Open Context</i> : Data Audits, Special Session at Center for American Archaeology, then Revise Policy/Process for Data Intake	<i>Neotoma</i> : Data Audits, Neotoma Community Survey, then Revise Data Use Policy, Draft Statement of Values	<i>FM</i> : Participate and Observe
Year 2: July 2024 – Reconnect		
All Hands Meeting: Report out, plan next steps, invite other repositories to participate		
Year 2: Fall 2024 – Deepen and Broaden		
<i>Open Context</i> : Shift from Reflection and Policy to Technical Implementation	<i>Neotoma</i> : Shift from Reflection and Policy to Technical Implementation	<i>FM</i> : Begin Intra-Institutional Advocacy
Launch guided self-reflections for other interested groups		

EOS RCN Projects: Improving Interoperability



- **Mapping the Interoperability Landscape**
- **Case Study: Linking data across repositories**
- Neotoma constituent database landing pages

Mapping the Quaternary Informatics Landscape

Goal: To map the current Quaternary informatics landscape, evaluate current interoperability efforts, and recommend best practices moving forward

Phase I (in progress): content analysis and semi-structured interviews

- Analysis of Quaternary data resources' structure, documentation, metadata schemas
 - What are the power dynamics embodied and enforced by these repositories and standards?
 - Discern cultural underpinnings of systems of nomenclature, usage of geographic terminology and maps
- Semi-structured interviews with data resource users and repository managers
 - What are the needs, vision, and challenges for interoperability?
 - Protocol in review with University of Arizona Institutional Review Board; April 2024 start

Phase II (Fall 2024, separate IRB): meet with Indigenous community members

- Talk through configuration and content of databases, receive questions, feedback, and desires for these systems
 - Connection building with Indigenous Tribes and/or First Nations, Spring & Summer 2024
 - What are dealbreakers for openness? Can interoperability facilitate points of consultation? Other concerns?

Interoperability exploration and case study across ZAN, Neotoma, and Open Context



Goal: focus on expanding FAIR data curation protocols from the ZooArchNet (ZAN) project to:

1. propagate/link legacy museum-curated zooarchaeological data across various CCDRs
 2. align with CARE guidelines and descendant community priorities
- We have completed an inventory/assessment of Florida Museum “connections” or records (zooarchaeological data records, publication references, repository references) in Neotoma
 - “Ground truthing” to understand the history of such records and their relationship to current Florida Museum physical holdings and/or accession record data (e.g., data but no specimen)

Broad finding 1: There are many different types of record occurrences spanning specimen repositories (the FM) and open access databases, and some with gaps in historical provenance (e.g., physical location(s), ownership, permission to manage, etc.) through time

Broad finding 2: This type of fundamental data inventory across repositories and data aggregators is essential if interoperability is to be realized

EOS RCN Projects: Outreach and Education



- **ECR Projects: Doing Ethical Open Science Across Disparate Data Types**
- FAIR/CARE educational materials
- Data repository decision tree

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Doing Ethical Open Science Across Disparate Data Types

Goal: To understand the pathways and barriers data *users* experience in incorporating a CARE perspective in research that uses ‘big data’

Year 2 Symposium

- Focus group of data users, particularly ECRs:
 - to understand the needs given their fields (paleontology, archaeology, anthropology, biology) to conduct EOS
 - to understand how they have navigated EOS using ‘big data’ previously
 - to understand how folks engage with data not collected in an ethical way
- Draft a paper discussing these findings
 - discuss potential solutions

Interaction with Interoperability Group

- determine what cultural context is missing from different databases

EOS RCN Projects

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- Case studies: Neotoma, Open Context, Florida Museum



- Mapping the Interoperability Landscape
- Case Study: Linking data across repositories
- Neotoma constituent database landing pages

- ECR Projects: Doing Ethical Open Science Across Disparate Data Types
- FAIR/CARE educational materials
- Data repository decision tree

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Questions?

PI & Leadership Team:

Jessica Blois (UC Merced)
jblois@ucmerced.edu

Jack Williams (U. Wisconsin)

Simon Goring (U. Wisconsin)

Andrea Thomer (U. Arizona)

Meghan Balk (U. Oslo/U. Arizona)

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Michelle LeFebvre (U. Florida)

Kitty Emery (U. Florida)

Suzie Pilaar Birch (U. Georgia)

Nick Hoffman (UC Merced)

Natalie Raia (U. Arizona)

Jen Green (U. Florida)

Nicole Fuller (U. Florida)

Melissa Cradic (Open Context)

Eric Kansa (Open Context)

Advisory Committee

Tonya Connor (U. North Dakota)

Edward Davis (U. Oregon)

Carrie Morrill (NOAA)

Ricardo Punzalan (U. Michigan)

Mark Uhen (George Mason)

