AgBioData RCN

Education Working Group

2024 AgBioData Community Workshop
April 29-30 and May 1, 2024

Education WG Membership

Erin Antognoli	USDA National Agricultural Library
Leyla Cabugos	California Polytechnic State University, San Luis Obispo
Chao Cai	Purdue University
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Megan O'Donnell	Iowa State University, University Library
Leonore Reiser	Phoenix Bioinformatics
Meg Staton	University of Tennessee, Knoxville

Educational WG Goals

Mission:

Create an educational curriculum that teaches FAIR data principles within the context of GGB agricultural research

- Purpose, structure, and uses of GGB databases
- FAIR (data) and TRUST (systems) principles
- How to use and access data in GGB databases
- How to find, use, and make FAIR data
- How GGB databases advance scientific knowledge and global progress

Why is this work important?

- **Skill Development**
  - Complex science, systems, and data
- **Recruitment**
  - Researchers, curators, and educators
- **Community values**
  - Ethical, scientific, and technological
- **Policy awareness**
  - Changing practices and expectations
- **Sustainability**
  - Quality is worth the cost
- **Good practice**
  - Good data, better science

NSF

Year 2 - Refining our Purpose

- How FAIR data principles are related to databases is not well covered in current education
- FAIR data is a uniting principal for GGB databases, but the methods to achieve it are often hidden to users
  - FAIR principles apply to both data and **data systems**
  - System design and rigor are pathways to achieving FAIR
  - Users must be literate in science, data, and technology systems to see the connection

Year 2 - Refining our Purpose

- Our introductory lessons surface the methods and motivations for FAIR data within GGB databases and serve as a base for further instruction and learning

Findable
- Described
- **Indexed**
- **PIDs**

Accessible
- Locatable
- **Metadata**

Interoperable
- **Metadata**
- **Ontologies**

Reuseable
- Described
- **Licenses**
- **Context**

GGB Strengths
- Systems
- Standards

Year 2 - Refining our Purpose

Audience:

- Basic materials for high school students
- Introductory materials for undergraduate
- Deeper readings and activities for graduate students

Design principles:

- What and Why
  conceptual and applied
- Relevant
  useful and important
- Easy to use
  open access and multimodal
- Adaptable
  customizable and remixable

Core curriculum: basic concepts

1. What is a biological digital repository?
2. FAIR and databases
3. Bio-databases: types of data, finding and obtaining data
4. Creating and sharing trustworthy data
5. Submitting data to a database
6. How to use your library resources
7. Databases for agriculture

Core curriculum: scaffolding

1. What is a biological digital repository?
2. FAIR and databases
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5. Submitting data to a database
6. How to use your library resources
7. Databases for agriculture

Learning pathway

- Oh, that's what they do
- Standards are important!
- I can use this
- This is valuable
- I can get help
- This work has impact

Deliverables

- **Core curriculum:** finalized
- **Slides and lesson plans:** completed
- **Recorded lectures:** partially complete
- **White paper:** finalizing text
- **Virtual Workshop at Plant Biology 2024:** upcoming
- **Publication of teaching materials:** upcoming
  - Lesson plans, slides, activities, and recorded lectures
  - Will link into white paper which provides broad overview and historical framing.

Building off the core

- More lessons have been identified for potential development
  - Introduction to ontologies
  - Database technology (basic and advanced)
  - How to… (database/organism/method specific)
- **New volunteers** are needed to make them happen
- AgBioData members can link to, remix, and reuse the materials to educate their users

Recommendations for AgBioData

- Create a centralized, open access, sustainable repository for WG outcomes (Zenodo?)
- Recruit new WG members from
  - Livestock community (most of us are plant people/librarians)
  - Professional groups
  - Beyond NA and R1 universities
  - Educators to adapt/improve materials for their audience

Recommendations to AgBioData Members

- Each member is responsible for providing instructions for users
  - The curricula can help
- Ensure you are communicating not just FAIR data principles, but also **TRUST principals** (lesson 4)

Lin, Dawei, Jonathan Crabtree, Ingrid Dillo, Robert R. Downs, Rorie Edmunds, David Giaretta, Marisa De Giusti, et al. 2020. "The TRUST Principles for Digital Repositories." *Scientific Data* 7 (1): 144. https://doi.org/10.1038/s41597-020-0486-7.

FAIR requires TRUST

- TRUST emphasises what GGB databases contribute to the community
- Vital for FAIR data and government requirements

Transparency	Tell people what you have and what you do.
Responsibility	Run a reliable and legal service that ensures data isn't damaged.
User Focus	Create and maintain your system and services to meet user needs.
Sustainability	Build systems and services that last.
Technology	Provide safe systems using stable technology

Thank you!