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Research Data Management and Sharing

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Research Data Management

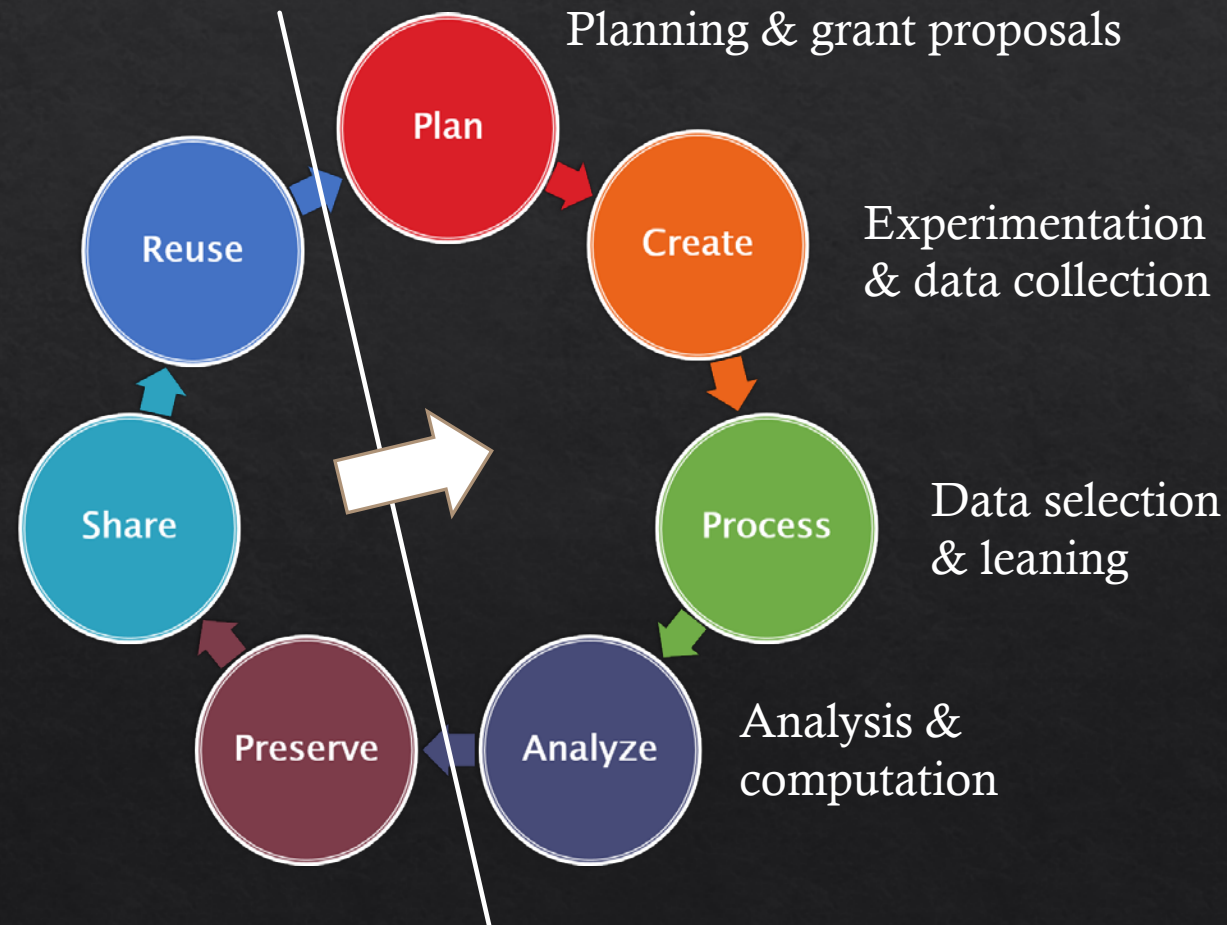
Christie Peters – christie.peters@uky.edu

Head, Science & Engineering Library and eScience Initiatives

Research Data Lifecycle



Your research is only part of the picture

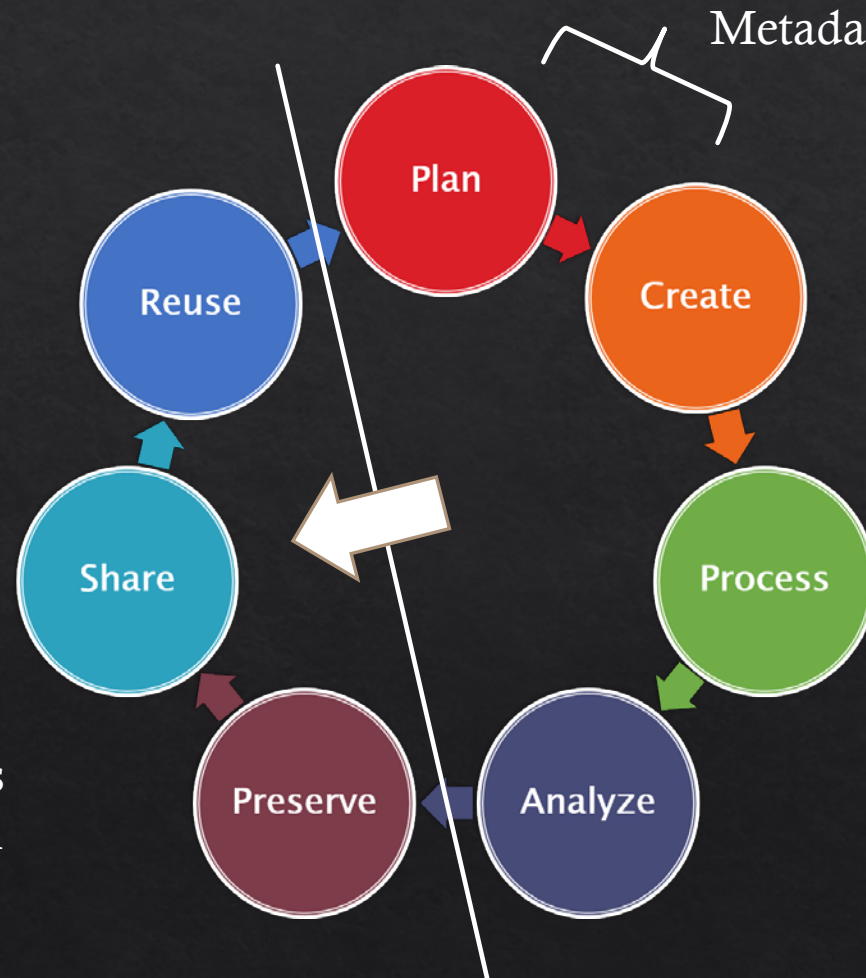


Begin with the end in sight

Data Management Plans (DMP)

NSF Biological Sciences

- Data & Materials Produced
- Standards, Formats, & Metadata
- Roles & Responsibilities
- Dissemination Methods
- Policies for Data Sharing & Access
- Archiving, Storage, & Preservation



Properties in an example Darwin Core record

- | | | |
|------------------------|---------------------------------|----------------------------|
| • occurrenceID | • fieldNumber | • georeferencedDate |
| • modified | • eventRemarks | • georeferenceSources |
| • rights | • higherGeography | • georeferenceRemarks |
| • institutionCode | • continent | • identifiedBy |
| • collectionCode | • waterBody | • dateIdentified |
| • datasetName | • islandGroup | • typeStatus |
| • basisOfRecord | • island | • scientificName |
| • dynamicProperty | • country | • kingdom |
| • catalogNumber | • stateProvince | • phylum |
| • recordedBy | • county | • class |
| • sex | • locality | • order |
| • preparations | • minimumDepthInMeters | • family |
| • otherCatalogNumbers | • maximumDepthInMeters | • genus |
| • associatedMedia | • locationRemarks | • specificEpithet |
| • associatedReferences | • decimalLatitude | • infraspecificEpithet |
| • associatedSequences | • decimalLongitude | • scientificNameAuthorship |
| • eventDate | • geodeticDatum | |
| • year | • coordinateUncertaintyInMeters | |
| • month | • georeferencedBy | |
| • day | | |

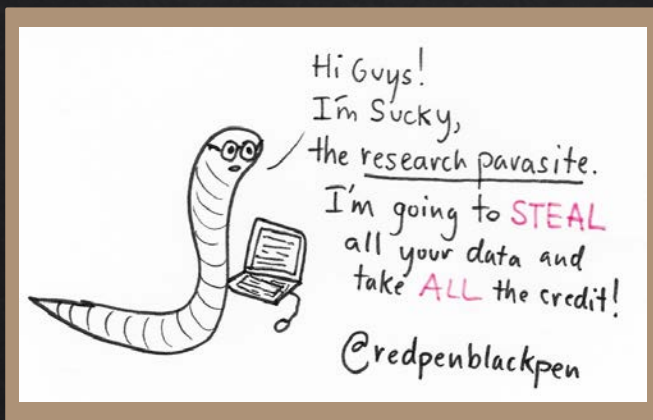
<https://www.slideshare.net/rlwalls2008/using-the-biological-collections-ontology-to-advance-biodiversity-science>

Data Sharing & Reuse



Advantages of Data Sharing

- Funding agency requirement
- Promotes new research
- Verification
- Different interpretations
- Reduces cost of replication
- Research efficiency
- Safeguards against misconduct
- Training through replication



Data Preservation

Tips for Data Preservation

- Appropriate metadata
- Format migration
- Storage media failure
- Storage media obsolescence
- Data integrity
- Budget

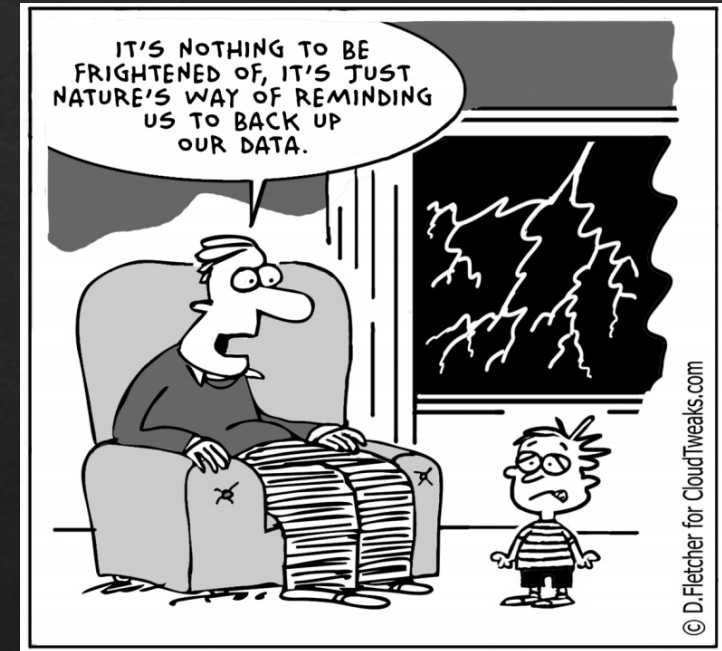
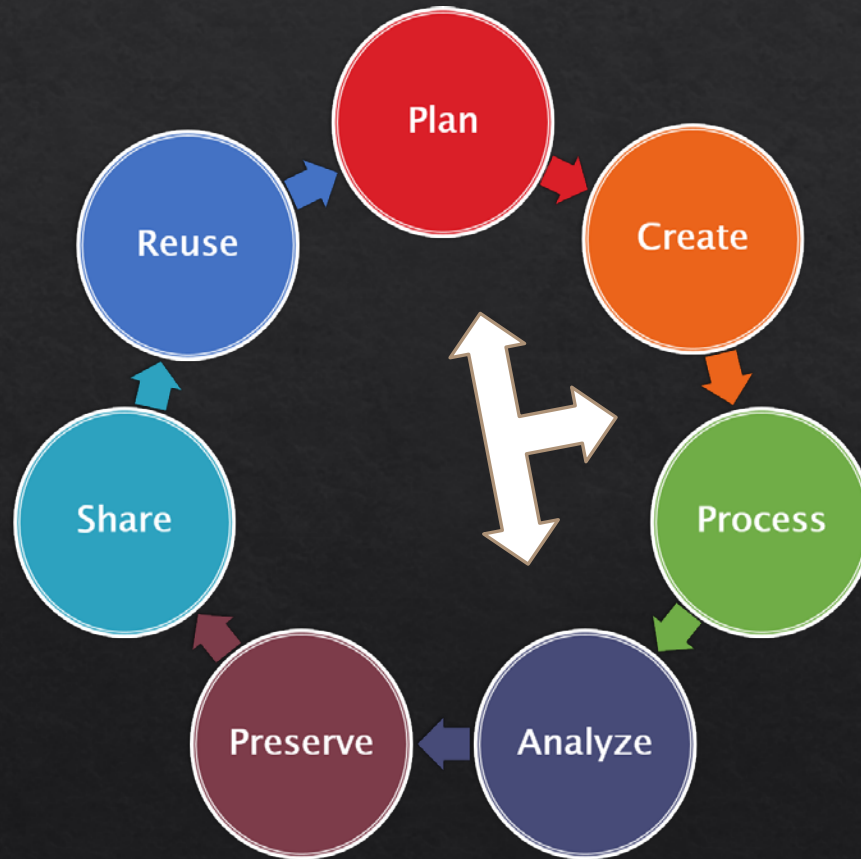


Archiving & Preservation
≠
Backup & Short-Term Storage

Storage & Backup

Tips for Data Storage & Backup

- Determine your options
 - Campus/Dept. IT
 - Cloud storage
 - Local backups
- 3-2-1 Rule
- Security



Data Management Plans



Resources at the University of Kentucky



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Research Data Management @ UK

A UK Libraries Research Guide

The screenshot shows the University of Kentucky Libraries Research Guides website. The header includes the University of Kentucky Libraries logo and the title "Research Guides". The breadcrumb trail is "UKY / Research Guides / Research Data Management @ UK / Getting Started". The main title is "Research Data Management @ UK: Getting Started" with a search box. Below the title is a navigation menu with tabs: "Getting Started", "Data Management Support @ UK", "Grant Requirements", "Data Types & Metadata", "Data Repositories", and "Data Sharing & Re-use". The "Getting Started" tab is active, showing a welcome message and a circular diagram of data management processes. The "Data Management Planning Tool" section is also visible, featuring a "Get Started" button and a description of the tool. A "Subject Guide" section on the right includes a photo of Christie Peters, an "Email Me" button, and contact information.

UNIVERSITY OF KENTUCKY Libraries

Research Guides

UKY / Research Guides / Research Data Management @ UK / Getting Started

Research Data Management @ UK: Getting Started

Resources and information to help you get started with data management, data preservation, and data sharing

Getting Started | Data Management Support @ UK | Grant Requirements | Data Types & Metadata | Data Repositories | Data Sharing & Re-use

Getting Started with Research Data Management

Welcome to the UK Libraries Data Management Research Guide! This guide provides advice, resources, and contact information for people who can help you with all of your research data management needs.

If you need help creating a data management plan, assessing the data management needs of a particular project, or identifying solutions for data management and archiving, please email: Researchdata@L.SV.UKY.EDU

```
graph TD; A[Project & Data Management Planning] --> B[Data Collection & Assurance]; B --> C[Data Analysis]; C --> D[Data Preservation & Archiving]; D --> E[Publication & Data Sharing]; E --> F[Data Reuse]; F --> A; G[Data Security] --- B; H[Storage & Backup] --- C;
```

Data Management Planning Tool

When creating your data management plan, we recommend using DMPTool. It is a free service which will guide you through including the required elements in a data management plan providing detail for different granting agencies.

Data Management Planning Tool
Create, review, and share data management plans that meet institutional and funder requirements. [Get Started](#)

DMPTool offers ready-to-use templates to create data management plans for specific funding agencies. This tool provides step-by-step instructions and guidance for creating your data management plan for NSF, NIH, NEH, NOAA, GBMF and IMLS.

To get started, follow the link above, click "log in," select the University of Kentucky as your institution, and log in using your link blue username and password.

Public DMPs are plans created using the DMPTool and shared publicly by their owners. They are not vetted for quality, completeness, or adherence to funder guidelines. You may find it useful to browse through these guides and see how other researchers have responded to some of the questions.

Subject Guide

Christie Peters

[Email Me](#)

Contact:
859-218-4841

Subjects:
[Earth and Environmental Sciences](#)

http://libguides.uky.edu/research_data

Resources at Iowa State University



Megan O'Donnell
Scholarly Communications Librarian
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Harrison Inefuku
Digital Scholarship & Initiatives, Co-Lead
Scholarly Publishing Services Librarian
hinefuku@iastate.edu

Research Data Sharing and Reuse

Adrian K. Ho

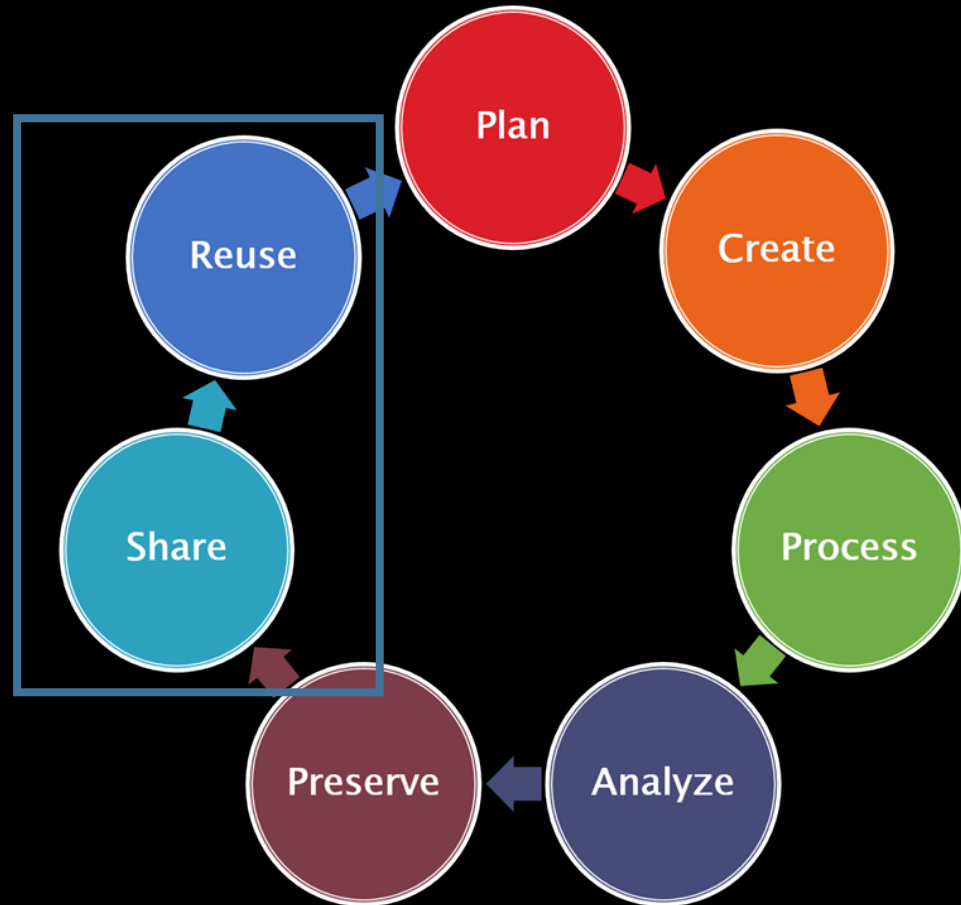
University of Kentucky Libraries

CAMTech IAB Meeting

Lexington, KY

May 23, 2017

Actions Involved in Research Data Management



Reasons for Sharing Research Data

- Avoiding loss of research data
- Maximizing benefits through reuse of data for scholarship and innovation
- Addressing reproducibility issue
- Funding agencies' requirements
- Journals' requirements
- Norm in certain research communities

Benefits of Sharing Research Data

- Possible offer for collaboration from other researchers
- More citations of the associated article(s)
- Citations of shared data
- Better chance to gain access to other researchers' data

When and What to Share

- Sharing data around the publication time of the associated article
- Data that supports the publication
- In a format most useful to other researchers
- Codes for computational research
- Exemption for sensitive data or data tied to patentable inventions

Preparation for Research Data Sharing

- Quality control of data
- Documentation about data and research process
- Related information

How and Where to Share

- Publishing data as the supplementary file(s) of the associated article
- Publishing an article in a data journal
- Deposit of data in an online repository

Decision on Data Repository

Criteria Recommended by MIT Libraries

- Scope
- Metadata and indexing
- Deposit policies and workflow
- Review procedures
- Access policies and procedures
- Tracking and citation
- Preservation features

Institutional Repository at UK

<http://uknowledge.uky.edu/>

The screenshot displays the UKnowledge website interface. At the top, the University of Kentucky logo and the 'UKnowledge' title are prominent, accompanied by a circular image of a campus building. A navigation bar includes links for HOME, ABOUT, FAQ, and MY ACCOUNT. The left sidebar contains a search section with a search box and a dropdown menu set to 'in this repository', followed by an 'Advanced Search' link and an 'RSS' notification option. Below this are four main categories: BROWSE (with sub-links for Collections, Disciplines, and Authors), AUTHOR CORNER (with sub-links for Author Rights/Copyright, Author FAQ, and Submit Research), and LINKS. The main content area features a 'Browse Research and Scholarship' section with a 'Follow' button and a grid of links to various research types: Colleges, Departments, or Centers; Journals and Peer-Reviewed Series; Theses and Dissertations; Conferences and Events; Image Galleries; University Press of Kentucky; UKnowledge Researcher Profiles; and Featured Collections. A 'University of Kentucky Expert Gallery' link is also present. A 'Reader from:' section shows the user's location as Taegu, Daegu-gwangyeoksi, Korea, Republic Of, with a slider for 'State Child Welfare Policy: Causes and Consequences' by Dana D. Connelly. At the bottom, there is a world map with location markers and a 'UK Libraries' logo with the text 'Sponsored by the University of Kentucky Libraries'.

Institutional Repository at Iowa State

<http://lib.dr.iastate.edu/>

The screenshot shows the homepage of the Iowa State University Digital Repository. The header is red with the text "IOWA STATE UNIVERSITY Digital Repository". Below the header is a navigation bar with links for HOME, REPOSITORY, PRESS, ABOUT, FAQ, and MY ACCOUNT. The main content area is divided into three columns. The left column contains a search box, a "Browse" section with links to Collections, Disciplines, Authors, and Profiles, and an "Author Corner" section with links to Author FAQ, Submit Research, Profiles, and How to Cite. The middle column features a large image of a woman examining corn plants, followed by a "DISCOVER KNOWLEDGE" section with a "Follow" button and a list of links: Iowa State University Digital Repository, Iowa State University Digital Press, Iowa State University Theses and Dissertations, and Selected Works Profiles. The right column contains a paragraph of text describing the repository's mission and contact information. At the bottom, there is a "Reader from:" section with a location indicator for Hong Kong and a "Framing China:" section with a link to a news article.

IOWA STATE UNIVERSITY
Digital Repository

HOME | REPOSITORY | PRESS | ABOUT | FAQ | MY ACCOUNT

Search
Enter search terms:

in this repository
Advanced Search
Notify me via email or [RSS](#)

Browse
[Collections](#)
[Disciplines](#)
[Authors](#)
[Profiles](#)

Author Corner
[Author FAQ](#)
[Submit Research](#)
[Profiles](#)
[How to Cite](#)

This repository is part of the Iowa Research Commons

Managed by:
IOWA STATE UNIVERSITY
Digital Scholarship and Initiatives

Sponsored by:
IOWA STATE UNIVERSITY
University Library

IOWA STATE UNIVERSITY
Office of the Vice President for Research

ISSN 2572-679X

DISCOVER KNOWLEDGE

[Iowa State University Digital Repository](#)
Research and scholarship by Iowa State's faculty, students and staff.

[Iowa State University Digital Press](#)
Journals and conference proceedings published and/or hosted by the Iowa State University Library.

[Iowa State University Theses and Dissertations](#)

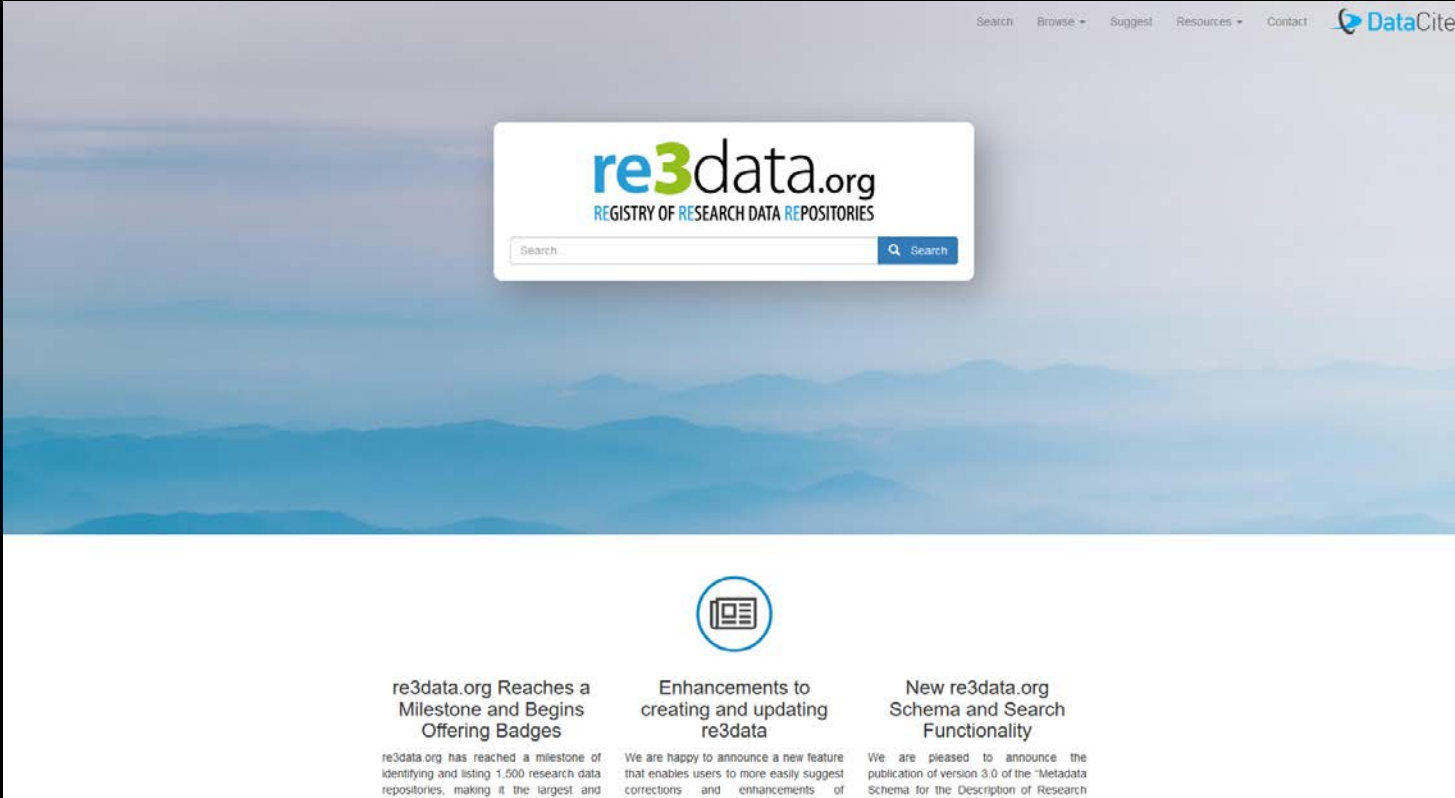
[Selected Works Profiles](#)
Research profiles of Iowa State's faculty, students and staff.

[Expert Gallery](#)

Reader from: Hong Kong, Hong Kong (Sar), Hong Kong
Framing China: how U.S. media reported eight U.S. state visits by top Chinese leaders
Yao Chang
[Retrospective: Theses and Dissertations](#)

Registry of Research Data Repositories


<http://www.re3data.org/>



Search Browse Suggest Resources Contact DataCite

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES

Search Search



re3data.org Reaches a Milestone and Begins Offering Badges
re3data.org has reached a milestone of identifying and listing 1,500 research data repositories, making it the largest and

Enhancements to creating and updating re3data
We are happy to announce a new feature that enables users to more easily suggest corrections and enhancements of

New re3data.org Schema and Search Functionality
We are pleased to announce the publication of version 3.0 of the "Metadata Schema for the Description of Research

Open Access Directory: Data Repositories

http://oad.simmons.edu/oadwiki/Data_repositories

The screenshot shows the 'Data repositories' page on the Open Access Directory (OAD) website. The page is structured as follows:

- Page Header:** Includes 'Page Discussion', 'Read', 'View source', 'View history', and a search bar.
- Section Header:** 'Data repositories' with the OAD logo and the text 'This list is part of the Open Access Directory'.
- Introduction:** A list of bullet points explaining the purpose of the directory and providing instructions for users.
- Archaeology:** A section listing repositories such as 'Archaeology Data Service' and 'Open Context'.
- Astronomy:** A section listing repositories like 'Astronomical Data Archives Center' and 'National Space Science Data Center'.
- Biology:** A section listing repositories such as 'The Arabidopsis Information Resource' and 'The Cell: An Image Library'.
- Contents (hide):** A table of contents listing 15 categories from Archaeology to Social sciences.
- Navigation Sidebar:** Located on the left, it includes links for 'Contribute content', 'About OAD', 'Tools', and 'What links here'.

Required Information for Data Deposit

- Creator name (with ORCID identifier)
- Dataset title
- Publisher
- Publication year
- Resource type
- Identifier (usually provided by publisher)

Recommended Information for Data Deposit

If applicable

- Description
- Subject(s)
- Contributor(s)
- Additional date(s)
- Related identifier(s)
- Geographic location

Rights and Licensing for Reuse

Creative Commons Licenses

- CC0 tool (no rights reserved)
- Attribution (CC BY) license
- Other licenses with specific restrictions


Open Data Commons licenses

- Public Domain Dedication and License
- Attribution License

Record of Shared Research Data

Ergot and Loline Alkaloid Concentrations in Endophyte-Infected Tall Fescue Tillers

[Rebecca L. McCulley](#), *University of Kentucky* [Follow](#)

Researcher ORCID Identifier
 <http://orcid.org/0000-0002-2393-0599>

Dataset Creation Date
6-2009

Release Date
2-2017

Publisher
University of Kentucky Libraries

Description
Approximately 40 tall fescue tillers were randomly collected and frozen from each of the 20 treatment plots.

Tillers were cut at 7.6 cm above ground level and tested for the presence of the Epichloe endophyte using an enzyme-linked immunosorbent assay.

Tillers from each plot were sorted into 'infected' vs 'uninfected' groups, lyophilized, and ground through a 1mm screen using a Cyclotec 1093 mill.

Ground material from the endophyte infected tillers was analyzed for ergot and loline alkaloids in the lab of Lowell Bush at the University of Kentucky, Plant and Soil Sciences Dept.

For details on alkaloid analyses see: McCulley et al. Oct. 2014. *Frontiers in Chemistry*, Volume 2, Article 88 (www.frontiersin.org – doi: 10.3389/fchem.2014.00088)

Digital Object Identifier (DOI)
<https://doi.org/10.13023/K2RP48>

Rights
© 2017 Rebecca L. McCulley

This dataset is distributed under the terms of the [Creative Commons Attribution 4.0 International License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided that the dataset creator and source are credited and that changes (if any) are clearly indicated.

Supporting Information
Details about the experiment are on the first tab of the downloadable file.

File Format
Excel file

File Size
26 KB

Spatial Coverage
NCCC plots, University of Kentucky, Spindler Research Farm

[Download](#)

[Additional files available below](#)

Included in
[Plant Sciences Commons](#)
[Soil Science Commons](#)

SHARE
[f](#) [t](#) [in](#) [G+](#) [e](#) [+](#)

Relevant Resources

Briney, K. (2015). *Data Management for Researchers: Organize, Maintain and Share Your Data for Research Success*. Exeter, UK: Pelagic Publishing.

Data Sharing Requirements by Federal Agency

<http://researchsharing.sparcopen.org/data>

Research Funder Data Sharing Policies

<https://sparcopen.org/our-work/research-data-sharing-policy-initiative/funder-policies/>

Relevant Resources

Data Repository Comparison Chart (from MIT Libraries)

<http://libraries.mit.edu/repository-comparison>

UKnowledge (institutional repository at University of Kentucky)

<http://uknowledge.uky.edu/>

Iowa State University Digital Repository

<http://lib.dr.iastate.edu/>

Relevant Resources

Registry of Research Data Repositories (re3data)

<http://www.re3data.org/>

Open Access Directory: Data Repositories

http://oad.simmons.edu/oadwiki/Data_repositories

CC0 Tool

<https://creativecommons.org/share-your-work/public-domain/cc0/>

Relevant Resources

Creative Commons Licenses

<https://creativecommons.org/share-your-work/licensing-types-examples/licensing-examples/>

Open Data Commons Public Domain Dedication and License

<https://opendatacommons.org/licenses/pddl/>

Open Data Commons Attribution License

<https://opendatacommons.org/licenses/by/>