Supporting Data Use in Undergraduate Student Research:

From Teaching Basic Data Literacy to Incorporating Data Documentation into Empirical Research Projects

Aaron Albertson, *Social Sciences Research & Instruction Librarian, Data Support Lead - Macalester College*

Beth Hillemann, *Social Sciences Research & Instruction Librarian - Macalester College*

Ron Joslin, *Science, Mathematics and Computer Science Research & Instruction Librarian - Macalester College*

Supporting Data at a Liberal Arts College

➔ History and context
➔ Our influences
➔ Our approaches
➔ Future plans

Data Explosion

- Data explosion:
  Increase of data use
  in undergraduate research.

- Across all disciplines
  and subject areas
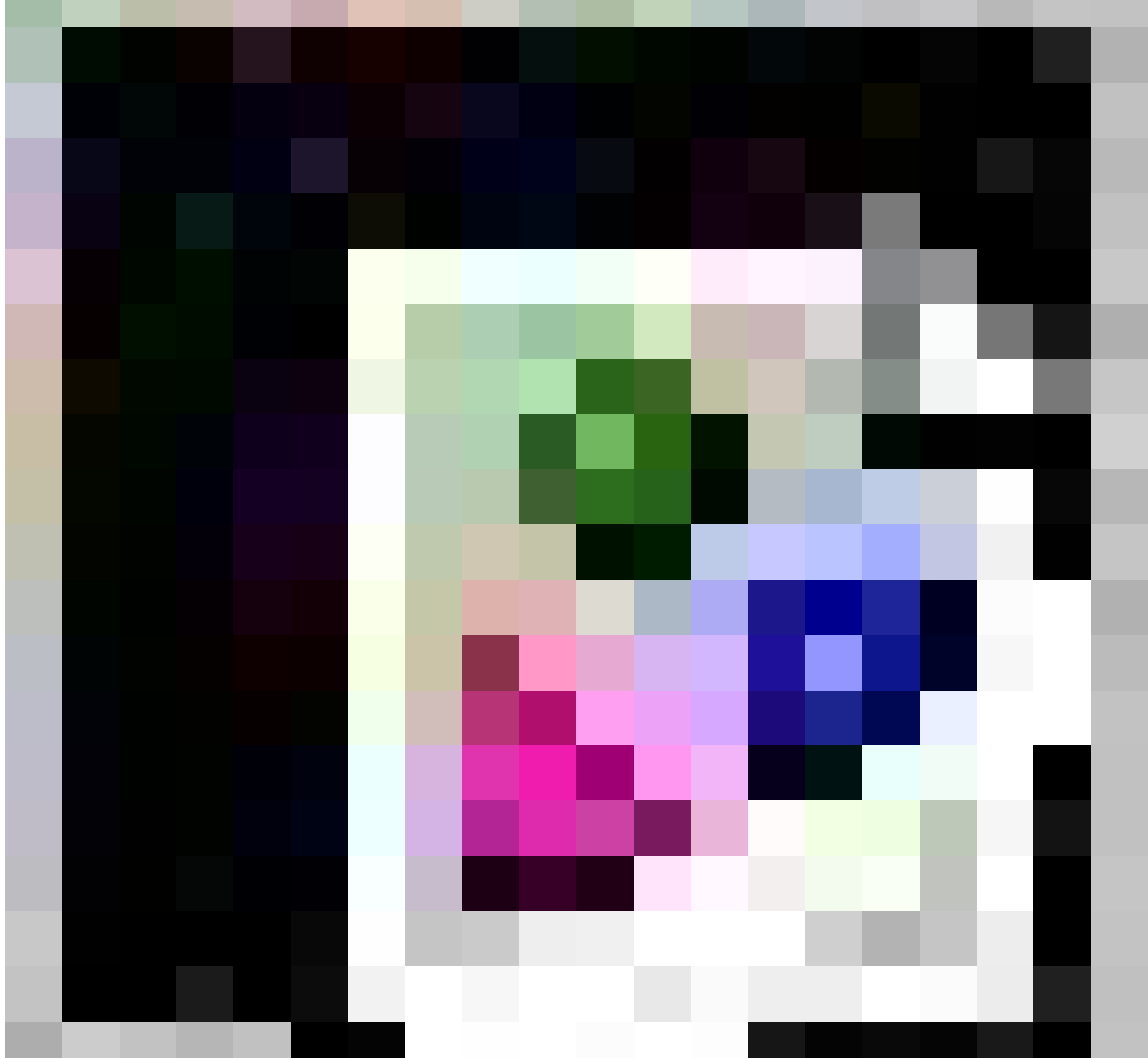
Data Research at Mac

- About Mac: highly selective liberal arts college w/ 2000 students
- No one librarian wears 'data hat'
- From 'Q courses' to Data Science minor
  - Across disciplines new emphasis on data
- Data support: from finding to data management
  - Ambitious students
- Traditional support
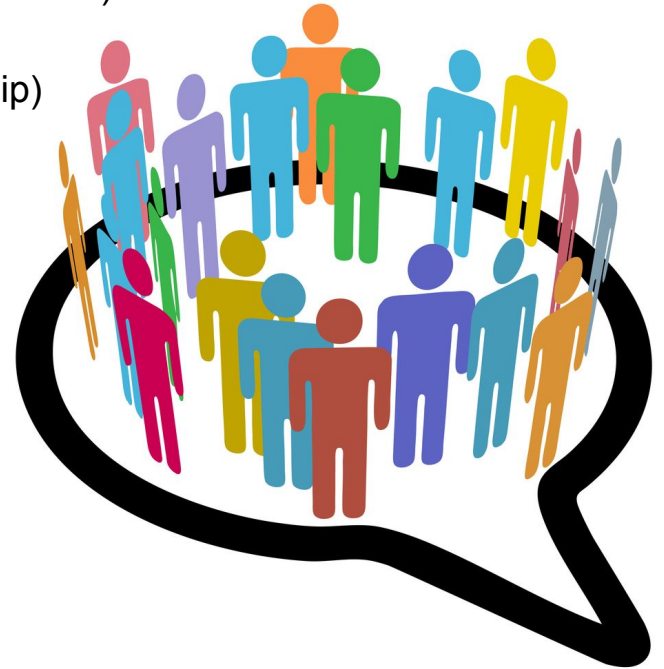 - Course-integrated, consultations

Influences

- ## Internal demands:
  - Increasing data integration into the curriculum (Hughes Grant)
  - Increasing faculty research needs
    (grant requirements, more awareness, digital scholarship)

- ## Staff development - learning more
  - conferences/ webinars/ workshops
  - Curricular projects: e.g. NECDMC
  - Project TIER

What we are doing to meet on-campus data needs

Finding a Place for Data to Live on Campus

Digital Commons, our institutional repository

Connecting with Grants Office

Providing faculty support for data mgmt planning

Data-focused Instruction Sessions

Course-integrated sessions, workshops, consultations

Data Modules

Online data best-practices resource

We'll be focusing on these support efforts in this presentation.

Supporting Data In Undergraduate Research:

Instruction & Consultations

Instruction sessions

Going beyond just finding data.

- ○ Data-focused course integrated instruction
- ○ Honors student sessions
- ○ Summer science workshops

Data consultations

Identifying needs, finding data, proper citation,
data management best practices

Hands-On Data Activity From Summer Science Workshop

HANDS-ON ACTIVITY

You will be doing research on water quality at Macalester's Ordway Nature Study Area. You have received the first file of raw data (January 2013) related to weather and water quality that has been collected by sensors/equipment located at Ordway, and you expect to receive up to 24 additional data files similar to this one. Using information from the library's data planning checklist provided below, start planning for your use of this data in your research.

Using the data planning checklist, think through and record the steps that you would take when planning for your research data.

1. CREATE GOOGLE DOCUMENT. Title the document 'Session 3: Data'
2. SHARE THE DOCUMENT WITH: joslin@macalester.edu
3. LIST YOUR NAME(S) AT THE TOP OF DOC

Please respond to the following data planning questions on the Google doc that you created.

1. The first data file you received is a Microsoft Excel file. What file format will you use while working on your research? Once the project is completed and you will be archiving the data, what file format might you use?

2. You received a file named "datafile.xls" and it contains the Ordway weather and quality data for January 2013. You expect to receive up to 23 additional files. What naming convention will you develop for the data files used in your research?

3. Since you obtained your data from ... consider when using this ...

4. Wh... ...other sources, what other factors might you need to ...arch?

...arch? ...at your data is safe from loss? Where will the data ... use by other Macalester students working on a ...

...a file provided, what type of documentation and/or metadata... to ensure usability of the data into the future?

Supporting Data In Undergraduate Research:

Creating Online Modules

- Library & ITS Committee
- Interactive and flexible
- Expanding beyond Social Sciences
- 'Macalesterize': Connect to our resources and services
- Identify topics to cover:
  - Module #1: Data Management Overview
  - Module #2: Finding & Collecting
  - Module #3: Sharing & Using
  - Module #4: Intellectual Property & Ethics
  - Module #5: Protecting & Storing
  - Module #6: Metadata
  - Module #7: Organizing
  - Module #8: Preserving & Archiving
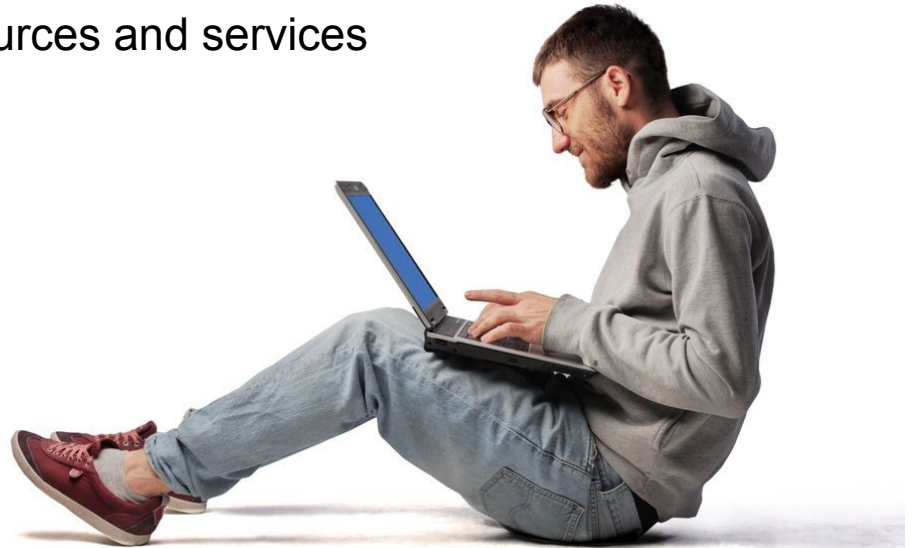
Learning Objectives

Examples:

- "Students will cite sources of data and document processes of collecting data in order to communicate the origins of their data."
- "Students will identify, locate, or create data appropriate to the question being addressed."
- "Students will articulate the importance of preserving original data in order to recreate the study."

Choosing A Platform

- Looked at variety of products
- Chose Google Slides

The modules in action:
Introduction to Statistical Modeling

Students were asked to go through our 'Finding Data' module and then complete a Google doc-based exercise answering questions about where they might find the needed data for their specific research project.

A librarian then gave feedback on their responses via the Google doc as well as suggesting possible other data sources they may want to check out.

The Move
to LibGuides

- Rethinking our Platform
- Why LibGuides?
  - Staff access / edit
  - Ability to share content between modules
  - It's platform students and faculty are familiar
- Process of creation
- How's it going?
- Take a look at the modules

Future Plans:
"Data Modules 2.0"

- Develop discipline-specific scenarios
- Add a glossary
- Create additional exercises for faculty

More Future Plans

- Course integration in the Fall
- Data Modules Assessment Plan
    - Survey students for usefulness of modules
    - Assess final projects for data practices using rubric

You can find our data modules at
http://libguides.macalester.edu/data1
if you'd like to follow the progress of our work.

Sources we mentioned in our presentation:

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

The TIER Protocol (Teaching Integrity in Empirical Research) provides guidance to students conducting quantitative research to help ensure that their work is transparent and reproducible.

New England Collaborative Data Management Curriculum (NECDMC)

< http://library.umassmed.edu/necdmc/index >

An instructional tool for teaching data management best practices to undergraduates, graduate students, and researchers in the health sciences, sciences, and engineering disciplines.

Thanks for attending our session!

QUESTIONS?

Contact us:

Aaron Albertson
albertson@macalester.edu

Beth Hillemann
hillemann@macalester.edu

Ron Joslin
joslin@macalester.edu