eResearch—What is it?

What is the Library’s role?
Perspectives
eResearch

Definition:

Research using digital technology (e.g. computing, networks, digital data) in fields including science, social science, and the humanities
List three interesting findings that surfaced as a result of your teams’ pre-work.

Finding 1: Strategies require integrated approaches by central administration (Provost, Library, IT, VCR, and colleges, research centers);

Finding 2: Broad range of ongoing data stewardship activities: Data storage; data curation; requirements gathering and analysis;

Finding 3: Research cyberinfrastructure support is uneven across campus and disciplines.
Library eResearch Task Force

• Identify ways to strengthen the library’s connection to the research life cycle;
• Define key collaborations for e-research support, at Illinois, across the University, and externally;
• December 31, 2012
Action plan
Professional Development & Training

- Send representatives to data-related meetings and conferences
  - IDCC, IASSIST, NISO
- Promote and participate in data professional development available locally
  - ERRT, Savvy Researcher, I-CHASS
- Partner with UIC, Northwestern, UC to bring an external speaker to Chicago and Urbana for one-day data management training sessions
User Education & Training

• Savvy Researcher Workshops
  – Intro to Data Management
  – Using ICPSR for Social Science Data
  – GIS 101 & GIS 102
  – Visualizing Your Data

• Scholarly Commons
  – Data consultation hours & open lab
Data management & curation
Active Data Curation and Support

• Curation is the active use of data. It is a lifecycle process, part of the workflow process.
• There are domain dependent, discipline specific curation needs
• Many ideas and projects:
  – Connecting data with publications;
  – Providing descriptive metadata support;
  – Providing research support tools/services;
  – Trusted digital repositories.
Physical Science & Engineering: Grainger Library Roles

• Libraries are creating preservation systems, Trusted Digital Repositories.
• Connecting data to literature in the knowledge creation process with tools and services:
  – GrIPs (Group Information Profiles)
    • Institute for Condensed Matter Theory
    • Center for the Physics of the Living Cell
    • Beckman Advanced Scientific Visualization Laboratory
    • Quantum Information Research Group
    • Geology Department
Grainger Library Roles

• Connecting international projects with data:
  – I2CNER: International Institute for Carbon Neutral Energy Research (Kyushu University, Japan; UIUC; Sandia Lab; DoE)

• NSF Data Management Plan support.
## Department of Geology Information Resources

### Faculty/Researcher Publications

<table>
<thead>
<tr>
<th>Steve Altaner</th>
<th>Craig Lundstrom</th>
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<tr>
<td>Allison Anders</td>
<td>Steve Marshall</td>
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<td>Jay Ross</td>
<td>Gary Parker</td>
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<td>Jim Best</td>
<td>Xiaodong Song</td>
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<td>Craig Bethke</td>
<td>Chu-Yung Chen</td>
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<td>Bruce Fouke</td>
<td>Tom Johnson</td>
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<td>Susan Kieffer</td>
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### Key Journals

- Chemical Geology
- Earth and Planetary Science Letters
- Earth Surface Processes and Landforms
- Environmental Sci & Tech
- Geology
- Geophysical Research Letters
- Journal of Geophysical Research
- Nature (choose "Nature" in list)
- Nature Geoscience

### Find Journal

- **Title Words:**
  - [Look for Journal](#)

### Locate Full-Text of Articles and Papers

- **Journal Title or ISSN:**
  - [Enter](#)

- **DOI of Article Explanation:**
  - [Enter](#)

- **Specific Information (if known):**
  - **Not needed if DOI entered**
    - **First Author's Last Name:**
      - [Enter](#)
    - **Article Title Words:**
      - [Enter](#)
    - **Volume:**
      - [Enter](#)
    - **Issue:**
      - [Enter](#)
    - **Starting Page:**
      - [Enter](#)

### Frequent Searches for Articles, Papers, and Books

- Search for **Sedimentary petrology** in articles, conferences, books.
- Search for **paleoclimate cligenesis** in articles, conferences, books.
- Search for **silicate melts and the magma ocean** in articles, conferences, books.
- Search for **calcium carbonate and travertine** in articles, conferences, books.
- Search for **Geomicrobiology** in articles, conferences, books.
- Search for **Pn tomography and the crust** in articles, conferences, books.
- Search for **Hydrogeology** in articles, conferences, books.

### Search for Articles, Papers, and Books

- **Search for:**
  - [Look for Articles](#)
What Data should be Curated?

• We have interviewed science/engineering faculty.
• Used the Purdue profiles.
• One key question: what data should be saved and curated.
• Key issue for NSF: the differences between raw data and processed data.
• Examples:
  – Atmospheric Sciences (experimental)
  – Biophysics (simulation data).
Atmospheric Science: Experimental Data

• Five levels and two data streams:
  – Level 1: raw voltages from an instrument
  – Level 2: calibrated data derived from raw voltages
  – Level 3: image products displaying the data
  – Level 4: derived parameters, statistics, etc. from calibrated data
  – Level 5: analysis of Level 4 data that winds up in papers, publications, etc.

• Two other necessary data streams: ancillary instrument information and metadata.
Biophysics: Simulation Data

- Modeling of interactions of atomic level molecular data. All software based & developed by group.
- Three levels:
  - Level 1: raw data from simulation runs: positions and velocities of particles;
  - Level 2: various raw data extracts of subsets of the runs of particles data.
  - Level 3: visualization files (movie, images); analysis products generated from the visualization data for publication data.
- Also need input parameters (the starting coordinates, the version of the software, etc.)
Projects

• Link research publications with stored data in directories at researcher site.
• Develop useful tools to assist in the research project – focus may be on grad students.
• Develop services that federate (bring together via searches across multiple projects) digital content – such as images across campus labs and researchers.
Personal archiving
Support for Tools Used to Manipulate and Analyze Data

http://www.library.illinois.edu/sc/
Track Big Data Programs, Proposals, etc.

- March 29, 2012 White House press release:
  >$200 million from 6 departments/agencies
    - Improve the tools and techniques needed to **access**, **organize**, and glean discoveries from huge volumes of digital data
    - Advance state-of-the-art core technologies needed to **collect**, **store**, **preserve**, manage, analyze, and **share** huge quantities of data

- Opportunities
  - Funding for Library initiatives
  - Partnerships
  - Development of new services /promotion of existing services
eResearch & the campus
Origin

“Data management and curation services will be an inevitable expense … for a portion of our annual $278M sponsored research, but these costs can be significantly reduced if we plan now to develop coordinated university-wide services to confront this issue… Expect improvements to be in compliance, quality of curation, policies, and access rather than in cost savings.”

Stewarding Excellence, IT@Illinois, 2010

http://oc.illinois.edu/budget/it_project_team_report.pdf
Campus Data Stewardship Program

“Data curation and stewardship cannot be provided by a single campus entity but rather should be built and operated by a strong partnership of relevant campus units and built on infrastructure and systems that have served the university well throughout its history...University Librarian ... lead a group to study this subject area and to produce an action plan.”

Stewarding Excellence, IT@Illinois, next steps letter from Chancellor & Provost, 2010

http://oc.illinois.edu/budget/SEIT_Next_Steps2.pdf
Campus Data Stewardship Committee

- University Library
- Office of the CIO
- Office of the Vice Chancellor for Research
- NCSA
- Graduate School of Library & Information Science
- Graduate College
Raising Awareness

Presentations and workshops focused on researchers and research support:

– Opening symposium--campus-wide (Sept. 2011)
– Research and IT administrators (Sept. 2011)
– Institutional assets (Oct. 2011)
– Discipline-based workshops (March-April 2012)

http://blogs.cites.illinois.edu/datasteward/events-2/
eResearch Task Force
Members

• Susan Braxton, Prairie Research Institute, Liaison to Reference Services Committee;
• Tom Habing, Library IT
• Karen Hogenboom, Social Sciences and GIS, Liaison to Data Services Cttee.
• Chris Prom, University Archives, Special Collections
• Mary Schlembach, Engineering and Physical Sciences
• Sarah Shreeves, Scholarly Commons / RRSS, Liaison to Scholarly Communications Cttee., Data Services Cttee.
• Caroline Szylowicz, Rare Book & Manuscript Library
• Sarah Williams, Life Sciences, Data Services Cttee.
• Chair: Beth Sandore Namachchivaya
Questions?

http://www.library.illinois.edu/committee/eresearch_task_force/eresearch_task_force_charge.html