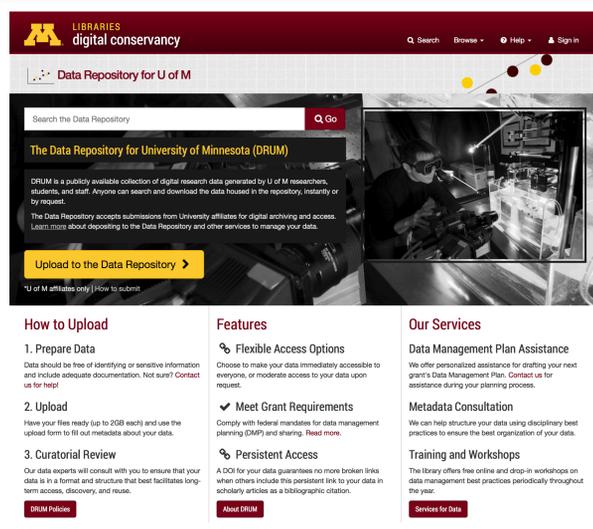


Problem

Funding agencies, publishers, and institutions are increasingly asking researchers to digitally preserve and publically share their digital research data. Yet, meeting those needs should not be the only consideration in the design and implementation of open repositories for data. **What do researchers expect out of this process? How can we design data repositories to best fit their research needs as well as the organization's?**

About DRUM



The screenshot shows the DRUM website interface. It includes a search bar, a navigation menu, and a main content area with sections for 'How to Upload', 'Features', and 'Our Services'. The 'How to Upload' section lists steps: 1. Prepare Data, 2. Upload, and 3. Curatorial Review. The 'Features' section highlights 'Flexible Access Options', 'Meet Grant Requirements', and 'Persistent Access'. The 'Our Services' section lists 'Data Management Plan Assistance', 'Metadata Consultation', and 'Training and Workshops'.

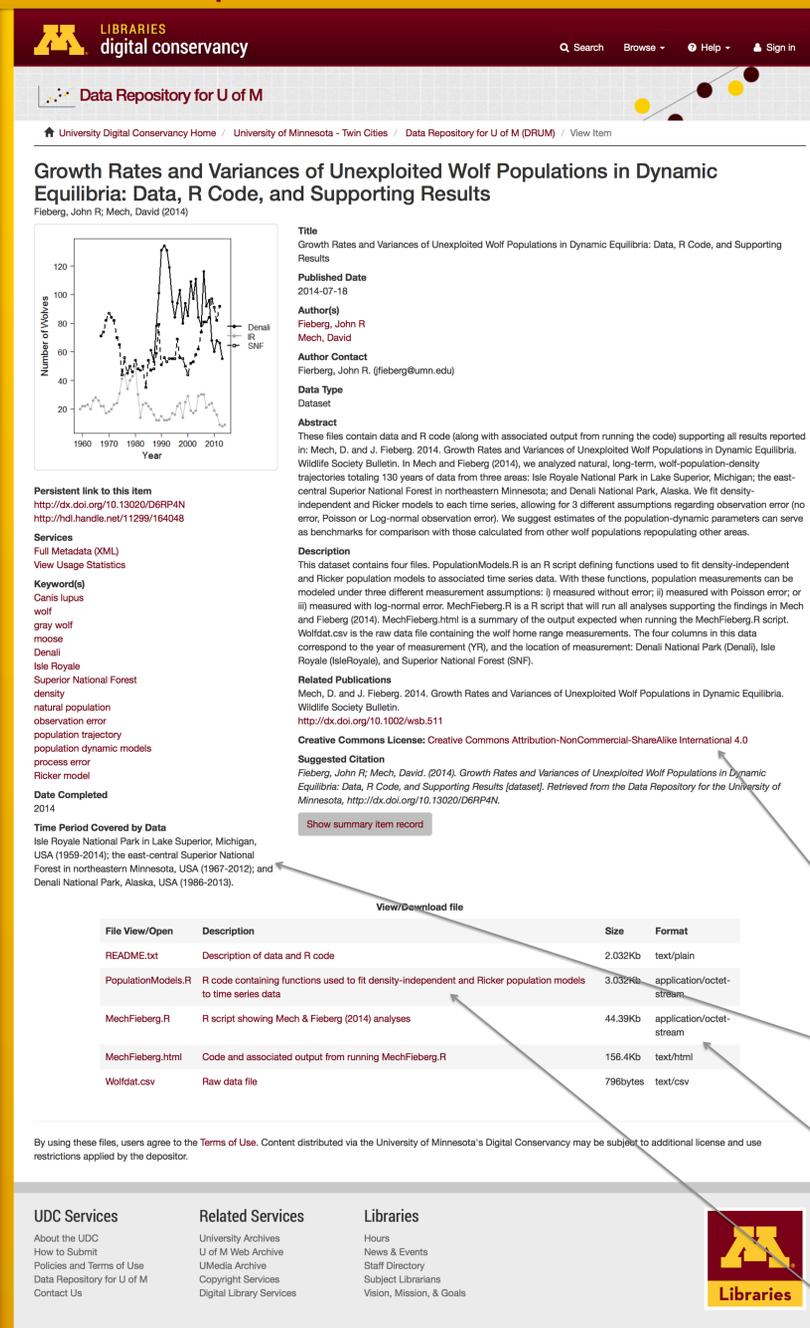
The Data Repository for the University of Minnesota (DRUM), is a Dspace-based repository launched¹ by the U of M Libraries in March 2015, and is a place for our researchers to self-deposit and publish their data for long-term access and future use. DRUM includes:

- **Curatorial review**
- **Metadata enhancement**
- **Persistent citations (DOIs)**
- **Documentation templates**
- **Dissemination services**
- **Digital preservation**
- **Staffed by a team of data curators in the library**

Before marketing our service to campus, we performed three usability tests with academic research faculty that revealed a handful of configuration and interface design changes.

1. Functional requirements, policies, and metadata mapping available as “Supporting Documentation for Implementing the Data Repository for the University of Minnesota (DRUM)” at <http://hdl.handle.net/11299/171761>.

Example Data Record in DRUM



The screenshot shows a data record page in DRUM. It features a line graph titled 'Growth Rates and Variances of Unexploited Wolf Populations in Dynamic Equilibria: Data, R Code, and Supporting Results'. The graph plots 'Number of Wolves' (y-axis, 0-120) against 'Year' (x-axis, 1960-2010). The data shows a significant peak around 1990. The record includes metadata such as 'Title', 'Published Date', 'Author(s)', 'Author Contact', 'Data Type', and 'Abstract'. A table at the bottom lists files for download, including 'README.txt', 'PopulationModels.R', 'MechFieberg.R', 'MechFieberg.html', and 'Wolfdat.csv'.

Methodology

In Dec 2014 – Jan 2015, three faculty members were interviewed in their campus office for 30 minutes. The sessions began with a general overview of DRUM services. This was followed by questions and activities designed to:

1. Elicit information about the research data they produce
2. Discuss the features critical for their adoption of DRUM
3. Learn how they would use data submitted/stored in DRUM
4. Learn how they might describe the service to their peers.

Participants were asked to complete one submission into the data repository using their own example data.

Results

Testers seemed eager and well-positioned to adopt DRUM. They “trust” in the libraries to keep things safe. Our submission process worked well, with some room for improvement.

Use-Cases Mentioned

- ✓ Satisfy NSF data sharing requirements
- ✓ Long-term storage for “archived” data
- ✓ Student use (better than problem sets)
- ✓ Ensure replicability of research (yet “risky”)
- ✓ Public access – “OA will soon be important”
- ✓ Indexing in search engines – get exposure
- ✓ DOI to get citations and track use
- ❑ Need to keep some stuff private (eg PII)
- ❑ Data should be “usable” over time
- ❑ Delegation of responsibility over time
- ❑ Need place for sensitive data
- ❑ “Life-time” embargos (up to 70-80 years)

Interface Issues

The DSpace submission form was customized for data¹ and tested very well by users. Yet:

- Consider a step-by-step guide at start
- Creative commons – need better guidance.
- Need better examples for geospatial and temporal fields (eg. Start/end date) or include description for each date entered
- Multiple file uploading is greatly desired.
- Data comes from a wide range of formats not pre-populated in the DSpace registry. Proactively expand registry as potential file types are identified.
- Individual file descriptions were much longer than expected.

Conclusion

Through usability testing of faculty-deposited research data into DRUM, our Dspace-based data repository, we not only uncovered several UX design challenges that we intend to address, but, we found that the intentions and desires of faculty to share their data pertain not only to funding requirements, but reflect fundamental values, including transparency and sharing of digital research data.