



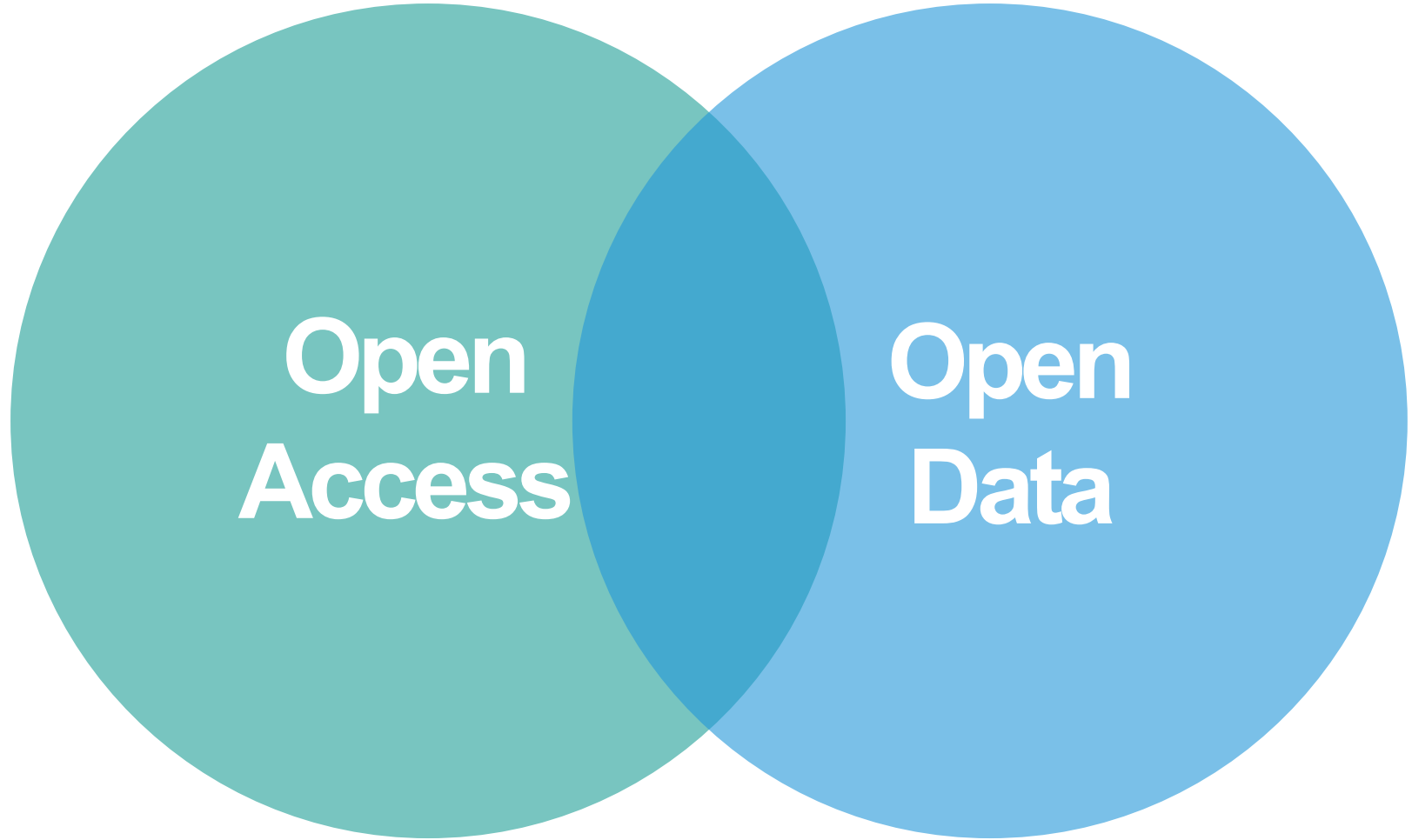
WHAT'S THE DEAL WITH DATA?

UNDERSTANDING RESEARCH DATA
MANAGEMENT & SUPPORT AT UVM

Elizabeth A. Berman



OPEN SCHOLARSHIP



**Open
Access**

**Open
Data**

FEDERAL FUNDING AGENCY REQUIREMENTS

2003

2011

*2013

2014

2015

2016

National Institute of Health (NIH)
National Science Foundation (NSF)
***Office of Science & Technology (OSTP)**
Department of Energy (DOE)
Agency for Healthcare Research and Quality (AHRQ)
Centers for Disease Control and Prevention (CDC)
Department of Defense (DOD)
Food and Drug Administration (FDA)
NASA
National Institute of Standards and Technology (NIST)
United States Geological Survey (USGS)
National Oceanic and Atmospheric Administration (NOAA)
United States Department of Agriculture (USDA)

DATA MANAGEMENT PLANNING

Data & metadata description

Security, ethics & intellectual property issues

Data access, sharing & re-use provisions

Short-term storage & management

Long-term storage, management & preservation

Personnel & infrastructure resources

RESEARCH AT UVM

“World-class excellence in disciplinary and multi-disciplinary research is a priority for UVM as one of the nation’s premier small research universities and a leader in creating and translating knowledge in service to the people of Vermont and the nation.”
– Office of the Vice President of Research



**FT
Faculty**



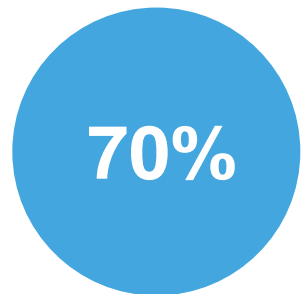
**PT
Faculty**



**Grants &
Contracts**



**External
Funding**



**Federal
Grants**

RESEARCH DESIGN

PHASE 1: Environmental Scan

- Data management tools & software
- Different models of service and support

PHASE 2: Mixed Methods Research

- How do faculty at UVM manage their research data? How do they document and describe data? Where do they store data? How do they provide access to or share their data?
- Are there any challenges or barriers UVM faculty face in effectively managing their research data?
- Is there a need or support for data management planning services on campus?

**PHASE
ONE**

**ENVIRONMENTAL
SCAN**

DATA MANAGEMENT SUPPORT



Data management

[Home](#)[Services](#) ▾[Make a plan](#) ▾[Store your data](#) ▾[Share your data](#) ▾

Services

We help MIT faculty and researchers manage, store, and share data they produce.

Assistance with creating data management plans

Many [research funders](#) have requirements for data sharing and [data management plans](#). We can help you to create these plans, assess the data management needs of your project, and help you to identify data management solutions.

Individual consultation

We are available to help you, your lab, or center understand your data management needs and recommend best practices for keeping your data usable, now and into the future.

Workshops

Our [workshops](#) teach you how to manage your data more efficiently and help you to share your data with others. [See a schedule of upcoming workshops](#).

Questions?

MIT users:

[Email
data-
management@mit.edu](mailto:data-management@mit.edu)

[Learn how we can help
you](#)

Visitors:

[See information for
visitors](#)

 Data Repository for U of M

Search the Data Repository

Q Go

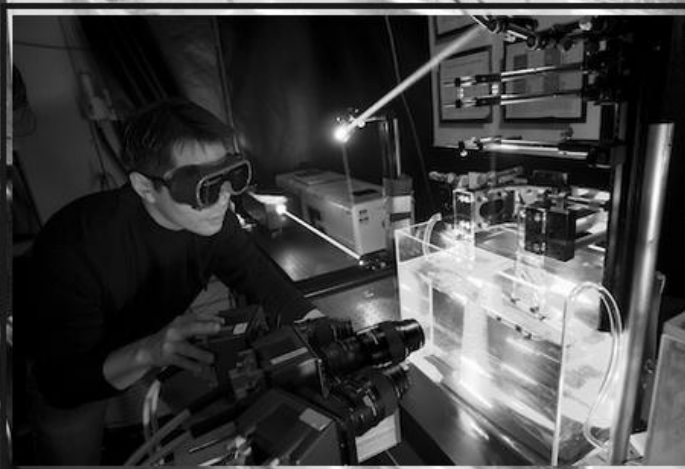
The Data Repository for University of Minnesota (DRUM)

DRUM is a publicly available collection of digital research data generated by U of M researchers, students, and staff. Anyone can search and download the data housed in the repository, instantly or by request.

The Data Repository accepts submissions from University affiliates for digital archiving and access. [Learn more](#) about depositing to the Data Repository and other services to manage your data.

[Upload to the Data Repository >](#)

*U of M affiliates only | [How to submit](#)



How to Upload

1. Prepare Data

Data should be free of identifying or sensitive information and include adequate documentation. Not sure? [Contact us for help!](#)

2. Upload

Have your files ready (up to 2GB each) and use the upload form to fill out metadata about your data.

3. Curatorial Review

Features

Flexible Access Options

Choose to make your data immediately accessible to everyone, or moderate access to your data upon request.

Meet Grant Requirements

Comply with federal mandates for data management planning (DMP) and sharing. [Read more.](#)

Persistent Access

Our Services

Data Management Plan Assistance

We offer personalized assistance for drafting your next grant's Data Management Plan. [Contact us](#) for assistance during your planning process.

Metadata Consultation

We can help structure your data using disciplinary best practices to ensure the best organization of your data.

Training and Workshops



Metadata Production and Consulting Services

Acquisitions & E-Resource Licensing Services

Automation

Cataloging & Metadata Services

Post-Cataloging Services

▼ [Library Technical Services](#)

- [Search LTS](#)
- [Procedures & Documentation](#)
- [Projects & Initiatives](#)
- [Resources & Tools](#)
- [Services](#)
- [Training](#)
- [Who We Are](#)
- ▶ [Archives](#)

Metadata is structured data that facilitates access, administration and preservation of resources.

Want help? [Contact us!](#)

We provide expert metadata advice to academic libraries, journal publishers, non-profit organizations, agencies and Cornell University units across multiple fields.

Services include:

Consultation

- Review project requirements and make recommendations
- Analyze existing metadata and recommend transformation strategies, when appropriate
- Educate and train metadata creators on best practices

Development

- Identify community metadata standards to best describe and serve resources
- Create data models that foster seamless access, interoperability and reuse
- Determine types of access and appropriate repositories that fit project needs
- Establish workflows for metadata creation or capture

Production

- Reformat metadata to meet project specifications
- Modify metadata to conform with community standards or project guidelines
- Provide quality control throughout project lifecycle

Guiding Principles:



Data and Visualization
Services Department

- [About Us](#)
- [Collections](#)
- [Guides](#)
- [News & Workshops](#)
- [Blog](#)

CONTACT US

askdata@duke.edu

Data Visualization Lab
(in the Edge)

@duke_data

Data Visualization

Using Data Analysis & Visualization Software

- Browse the [data visualization example gallery](#) and locate related tools
- View software available in the [Data and Visualization Services computer lab](#)
- Find help on specific software or topics:
 - Learn how to use [Tableau](#) for easy, interactive charts and maps
 - Learn how to use [OpenRefine](#) for data processing
 - Get tips for [text analysis projects](#)
 - View additional tutorials on the [Data and Visualization Services blog](#)
 - Compare various [mapping tools](#)

Getting Help with Visualization

- Meet with a [Data and Visualization Services Consultant](#)
- Attend a [Data and Visualization Services Workshop](#)
- Get tips on [designing effective charts, figures and posters](#)
- Visit the [Multimedia Project Studio](#) for graphic design help

Engaging with the Visualization Community at Duke

- Attend the [Visualization Friday Forum](#)
- View our [Flickr Visualization Gallery](#)
- Submit your project to our [Data Visualization Contest](#)
- Visit or propose a data visualization project for the [LINK MediaWalls](#)

WHAT IS DATA VISUALIZATION?

In a nutshell, data visualization is the term we use to describe all of the ways people transform data into visual representations. This could be a map, a bar chart, a timeline or an artistic rendering of data. For more definitions, examples and helpful data visualization tools, see our [Duke Data Visualization LibGuide](#).

Mapping and GIS

Mapping is a special subset of data visualization. Researchers use [Geographic Information System \(GIS\)](#) software to conduct complicated geographical data analyses and to develop high-quality maps. The [Data and Visualization Services](#) department includes [staff](#) with special training in GIS and mapping who have developed a series of [workshops](#) and [training guides](#) to help with various types of mapping projects.

Some of the tools we can introduce you to are:

- [ArcGIS](#) for professional GIS and mapping
- [Tableau](#) for easy, interactive maps
- [Online mapping tools](#):
 - [GeoCommons](#) for open analysis, interactive online mapping
 - [Google Earth](#) for 3D maps and animated tours
 - [Google Fusion Tables](#) for online maps based on spreadsheets



Contact Us

411 Chapel Drive
Durham, NC 27708
(919) 660-5870
Perkins Library Service Desk

Services for...

Faculty & Instructors	Alumni
Graduate Students	Donors
Undergraduate Students	Visitors
International Students	Patrons with Disabilities



Re-use & Attribution / Privacy
Support the Libraries



Think ahead. Plan ahead.

Discover the new, easy-to-use tool designed to build quality data management plans — for free

[Go to the DMPTool](#)



[Learn about the DMPTool »](#)

DISCOVER UC3

Explore our full suite of data services and tools

[Learn More](#)



RESOURCES & TRAINING

- » [Data management guides](#)
- » [Webinars](#)
- » [Slides and Marketing materials](#)

[View All](#)



UC BY THE NUMBERS

- » [862 DMPs created by UC researchers](#)
- » [980 users across UC](#)



UC CONTACTS

- » [Have a question?](#)
- » [Get local campus help](#)



RECENT DMP NEWS

- » [Get the latest information about data management and the DMPTool](#)

[View All](#)

**PHASE
TWO**

**MIXED METHODS
RESEARCH**

RESEARCH DESIGN: SEQUENTIAL MIXED METHODS



Target Population

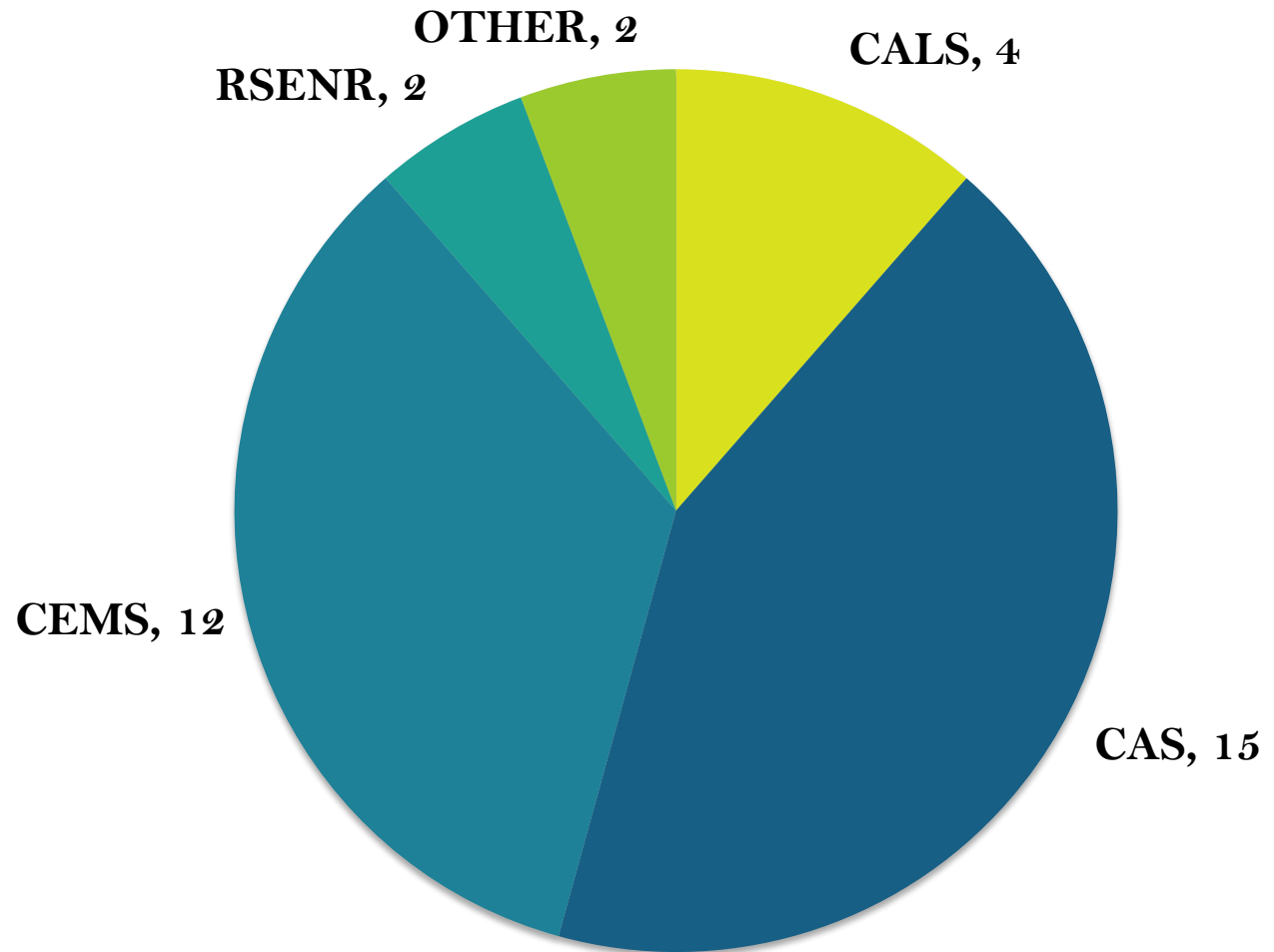
- University of Vermont faculty
- Received a NSF grant between January 1, 2011 – December 31, 2014
- Required to submit a data management plan (DMP)

Population = 49

Sample = 35

DOCUMENT ANALYSIS

- Biology (CALs)
- Plant Biology (CALs)
- Plant & Soil Science (CALs)
- Anthropology (CAS)
- Chemistry (CAS)
- Geology (CAS)
- Geography (CAS)
- Physics (CAS)
- Psychology (CAS)
- Mathematics & Statistics (CEMS)
- School of Engineering (CEMS)
- Rubenstein
- EPSCoR: Experimental Program to Stimulate Competitive Research (OTHER)



Data Management Plans Coding

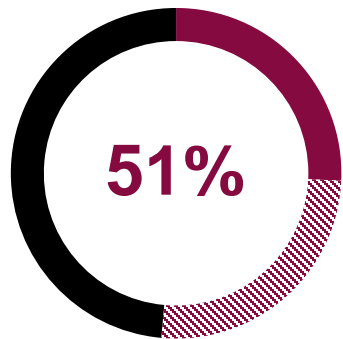
- What types of data will be produced? **DATA TYPE**
- What metadata standards do you need to follow for documentation?
METADATA
- What physical and/or cyber resources and facilities (including third party resources) will be used to store the data? **STORAGE**
- Do any considerations need to be made to protect sensitive information, including study participant confidentiality and intellectual property protection? **RESTRICTIONS**
- What policies do you need to follow with respect to data sharing and reuse?
SHARING
- How will you ensure archiving and preservation of the data you will produce? **PRESERVATION**

DOCUMENT ANALYSIS

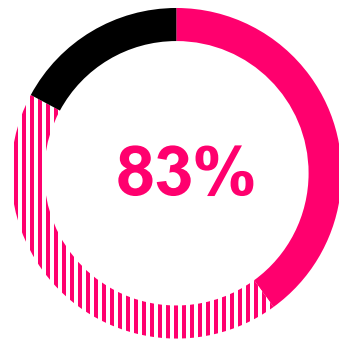


DOCUMENT ANALYSIS

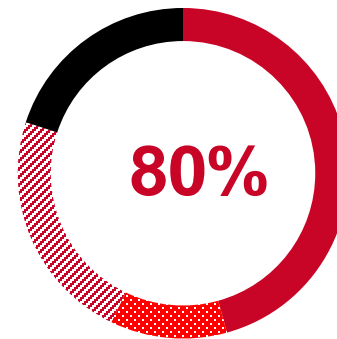
- 51% (n=18) addressed data description
- 28% (n=9) addressed specific metadata schema
 - Darwin Core, Water Markup Language (WaterML), Federal Geographic Data Committee Geospatial Metadata Standards, Systems Biology Markup Language (SBML), Ecological Metadata Language (EML)



**Metadata &
Documentation**



**Data
Storage &
Back-up**



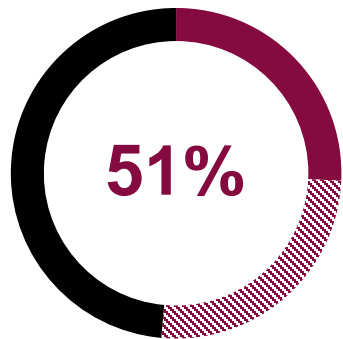
**Data
Sharing &
Re-Use**



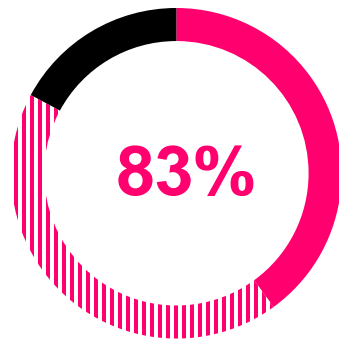
**Data
Preservation
& Archiving**

DOCUMENT ANALYSIS

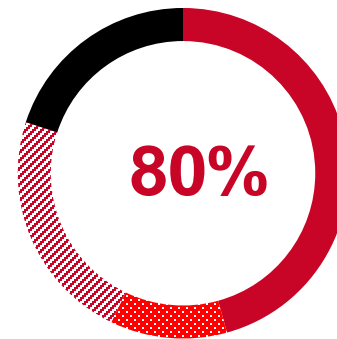
- 100% (n=35) addressed data preservation and access
- 83% (n=29) addressed storage
 - computer hard drive, external hard drive, UVM server, external server, third-party cloud storage (e.g. DropBox), USB drives
- 40% (n=14) addressed storage & back-up protocols



**Metadata &
Documentation**



**Data
Storage &
Back-up**



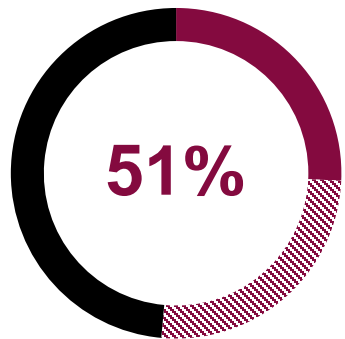
**Data
Sharing &
Re-Use**



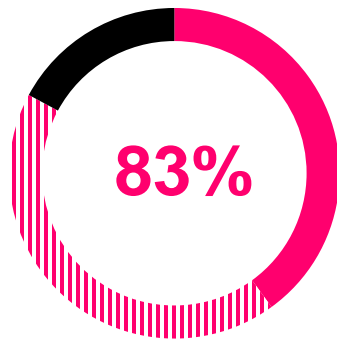
**Data
Preservation
& Archiving**

DOCUMENT ANALYSIS

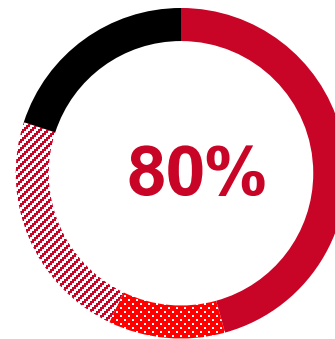
- 80% (n=28) addressed sharing data
- 20% (n=7) addressed restrictions
- 11% (n=4) addressed sharing via open-source/creative commons licenses
- 23% (n=8) addressed sharing via direct request



**Metadata &
Documentation**



**Data
Storage &
Back-up**



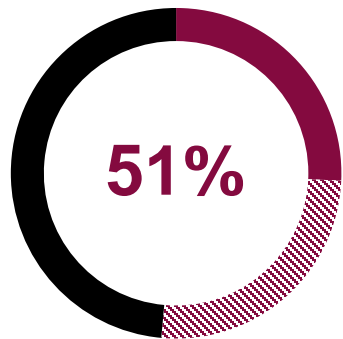
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Sharing &
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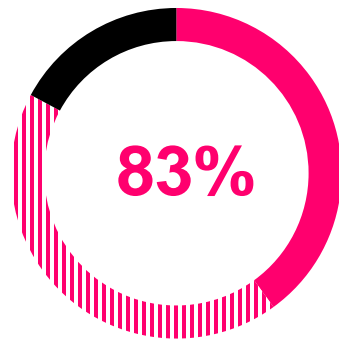
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Preservation
& Archiving**

DOCUMENT ANALYSIS

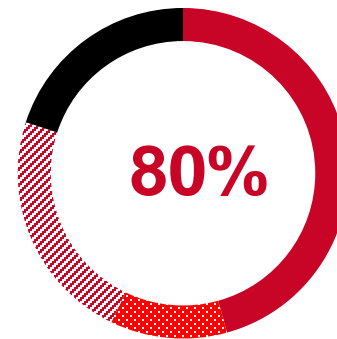
- 100% (n=35) addressed data preservation and access
- 49% (n=17) addressed preservation via repositories
 - publications (n=20); conferences & meetings (n=13); research group/project website (n=15); personal website (n=4); collaborative wiki space (n=1)



**Metadata &
Documentation**



**Data
Storage &
Back-up**



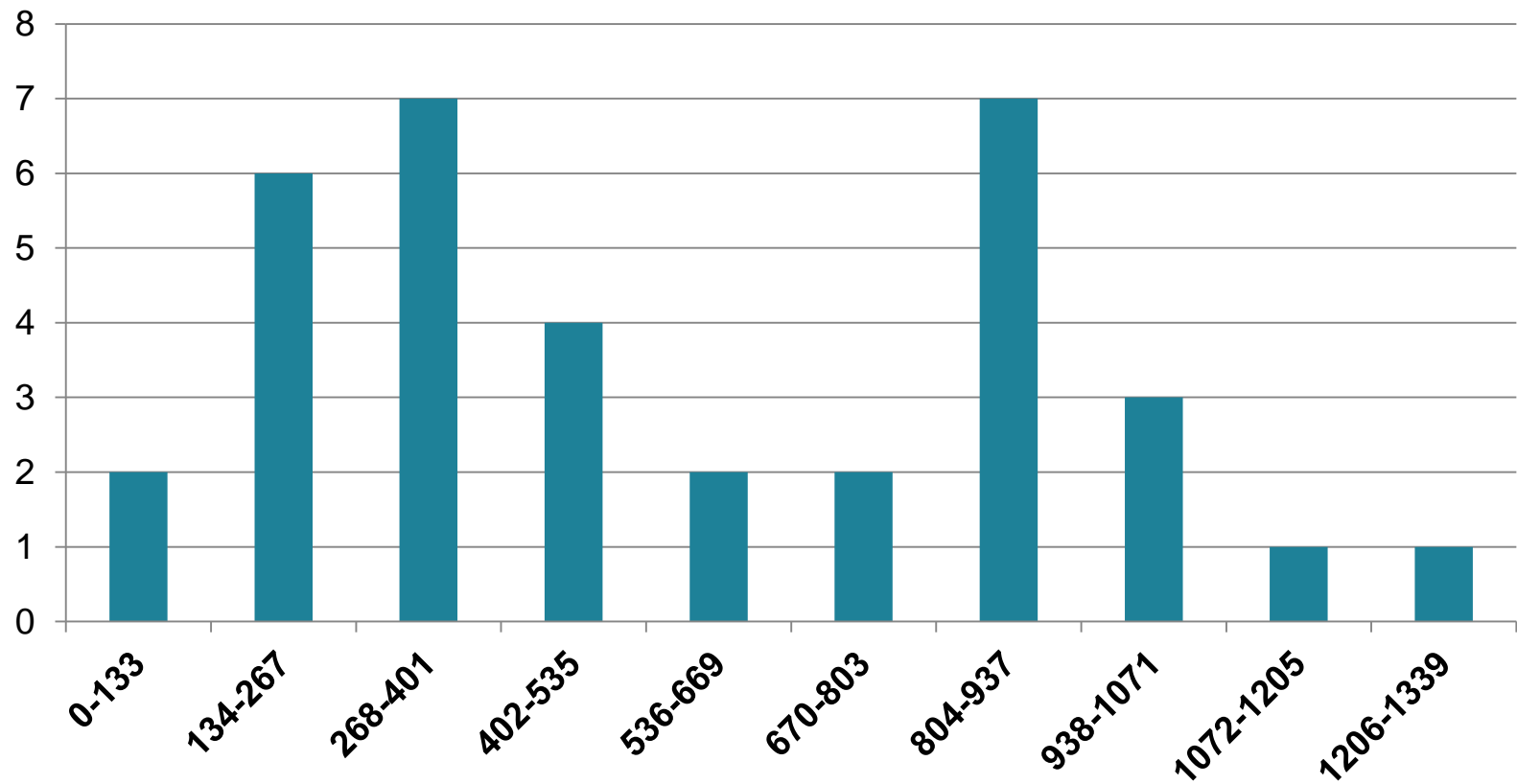
**Data
Sharing &
Re-Use**



**Data
Preservation
& Archiving**

DOCUMENT ANALYSIS

Number of Words in Data Management Plan



IN-DEPTH INTERVIEWS

Target Population

- University of Vermont faculty
- Received a NSF grant between January 1, 2011 – December 31, 2014
- Required to submit a data management plan (DMP)
- Purposeful sampling:
 - academic department
 - academic rank
 - gender

Population = 49

Sample = 6

IN-DEPTH INTERVIEWS

Pre-Interview Questionnaire

- Data types & formats
- Metadata & description
- Size of dataset
- Data storage & back-ups
- Lifespan of data
- Data sharing methods & restrictions

Semi-Structured Interview

- Data management guidance
- Data management challenges
- UVM support of data management

IN-DEPTH INTERVIEWS

Data Access, Data Sharing & Researcher Attitudes

- Data access vs. data sharing
- Infrastructure: subject repositories, general data repositories, institutional data repositories
- Education and outreach

Institutional Support & Collaboration

- Institutional policies
- Funding concerns
- Decentralized institutional model: misconceptions and misunderstandings about available infrastructure and services

FURTHER RESEARCH

- Broad survey of faculty data management practices.
- Better understand researchers' attitudes towards data management planning:
 - Do researchers use DMP for guidance during research projects?
- Data management planning as tool to engage with students
 - Intersection between student pedagogy, student learning, information literacy, and campus infrastructure?
- What is the capacity of UVM Libraries to provide data management services or support?