DATA INTEGRITY: ACQUISITION, MANAGEMENT, SHARING, AND OWNERSHIP

RESPONSIBLE CONDUCT OF RESEARCH

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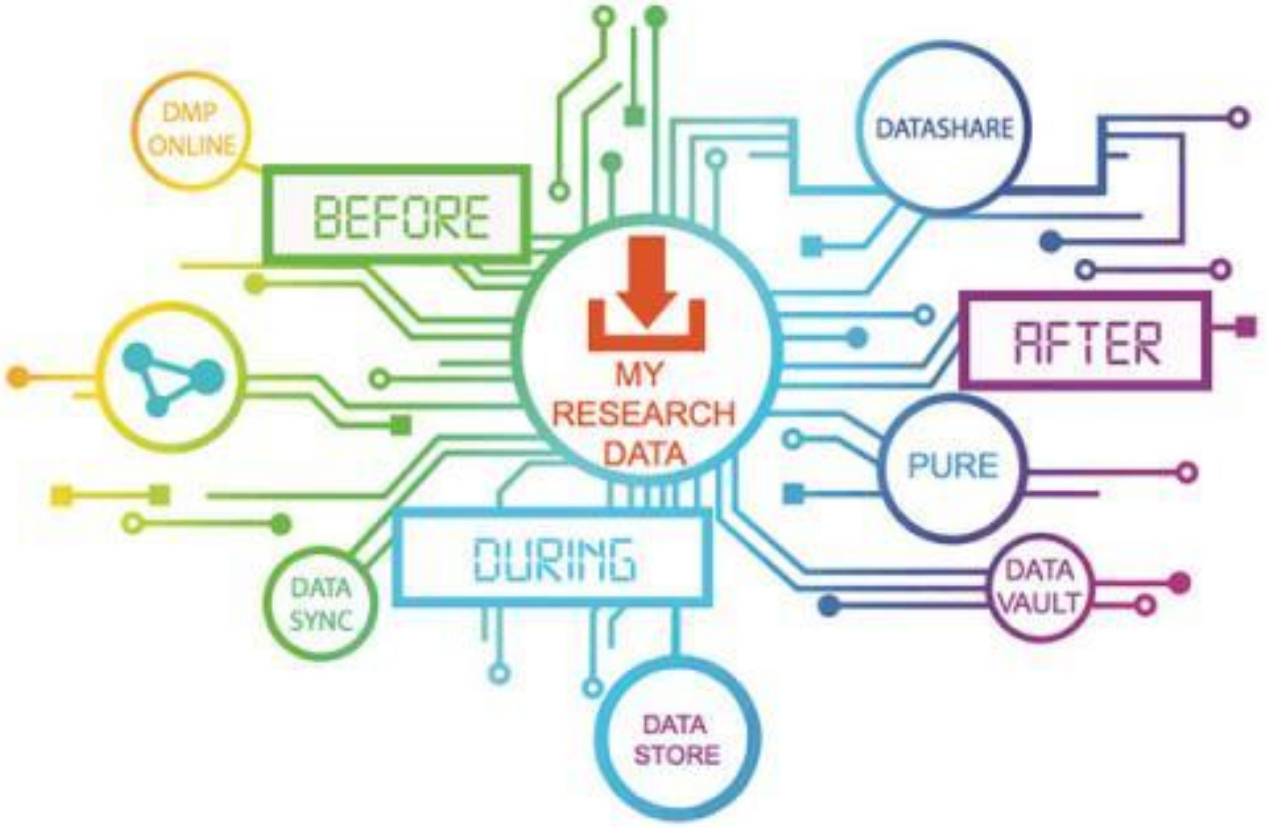
Warm Up Questions

1. Have you ever been asked to share your data with your team members or a journal publisher?
2. Have you ever submitted a data management plan to a funding agency?
3. Have you ever used a research data repository to publish or share your data?

Goals for Today

- Understand the research data life cycle
- Know DMPTool to create a quality DMP
- Recognize the importance of Research Data Management (RDM)
- Know good practices and available resources of RDM at TXST

What do we mean when we talk about research data?



What data do you use and create?

Research Data is recorded, factual material commonly accepted in the scientific community as necessary to validate research findings. (Awasthi & Tripathi, 2019)

Numeric data
Spreadsheets
Binary files
Code

PDFs
Image files
Audio files
Physical specimens
Archival materials
Geospatial data

Or something else

Research Scenario

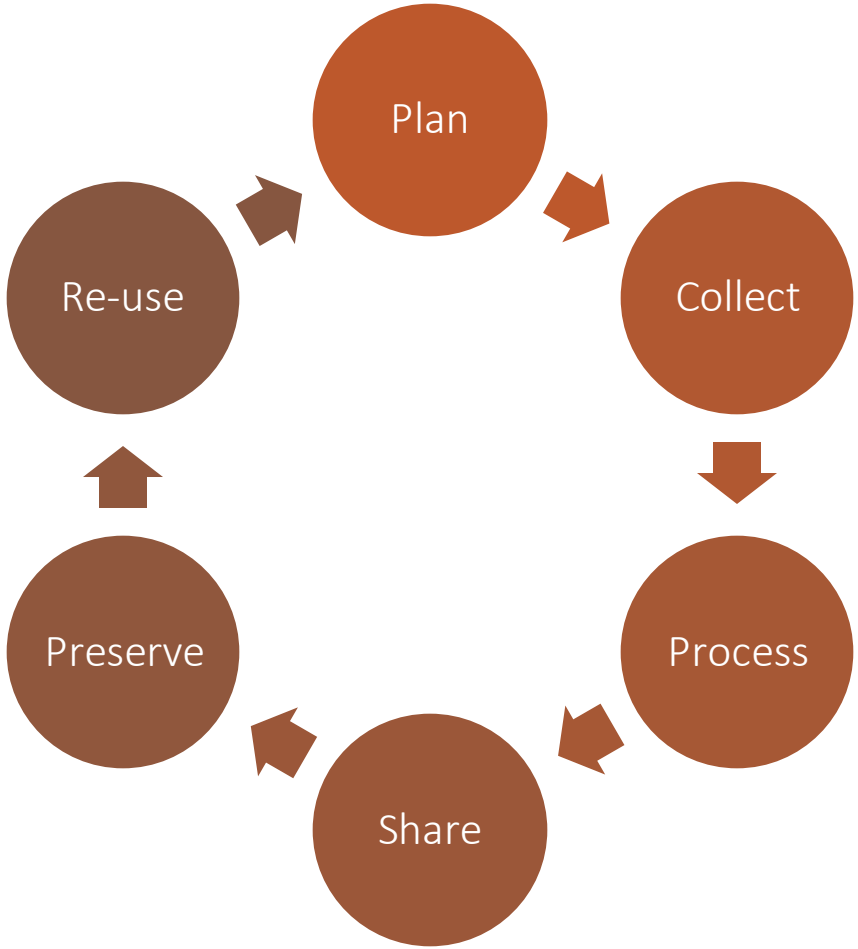
You published a study on a high-prestige journal. This study has been cited widely by others who have built upon your findings. However, three years later another researcher said, after several replications he could not get the similar results as found by your study and he has accused you of having falsified the data.

What is research data management?

Research Data Management (RDM) is the organization, management, publication, and preservation of the products of research.

Mandate	Facilitate	Reuse	Impact
Meet requirements and expectations set by funding agencies, publishers and domain associations	Ensure that your data is complete, documented, and accessible to you and to future researchers	Encourage the discovery and reuse of your data to further discoveries in your field of research	Receive credit for your data and increase its impact and visibility

Beneficial to you and your research in a long run!



Research Data Lifecycle

Start With a Data Managment Plan (DMP)

- Funder requirements
- Institutional policy
- Mitigate error and loss
- Avoiding unforeseen costs
- Be able to return the data
- Getting a handle on the complexity of data

Basic Elements of a DMP

Simply a 1-2 page summary explaining how you are planning to manage the data gathered in the course of your research project.

1. What are you creating / generating?
2. How is it securely handled during the project?
3. How is access and data integrity maintained long term?
4. Additional Details: Roles and responsibilities, systems used, documentation, security

NSF general DMP guidelines

- The **TYPES** of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project;
- The **STANDARDS** to be used for data and metadata format and content;
- Policies for **ACCESS** and **SHARING** including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;
- Policies and provisions for **RE-USE**, re-distribution, and the production of derivatives; and
- Plans for **ARCHIVING** data, samples, and other research products, and for preservation of access to them.

Based on NSF general DMP guidelines

Always consult the specific data management requirements for your funding agency to write your DMP.

Planning and Writing Resources

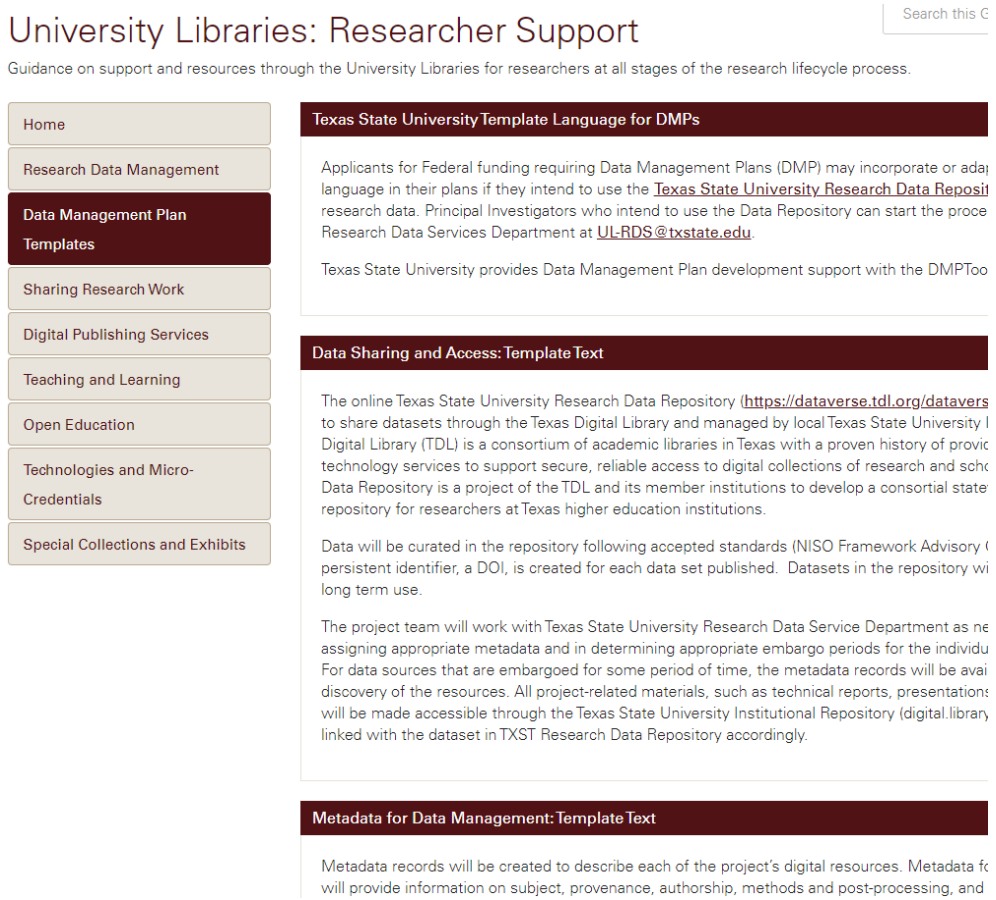
- Data Management Plan
- DMPTool
- Sample text & templates
- Login with TXST Email
- https://dmptool.org/

Templates for TXST Researchers

Template Text: Data Sharing and Access

Template Text: Metadata for Data Management

https://guides.library.txstate.edu/research-data/DMP



FILE NAMING STRATEGIES

DATA STORAGE

DATA PRESERVING / PUBLISHING

Good Practices in RDM

SAR_090320.doc

What does this mean?

- Survey Analysis Results?
- Survey of Agriculture Research?
- Sam A. Rodriguez, a researcher?
- September 03, 2020?
- March 09, 2020?
- March 20, 2009?

File Naming

Two main criteria: **Context & Consistency**

Good File Naming Practices

- Use descriptive file names
- Use a standard date system
- Use leading zeros
- Use basic characters and avoid (/ , # ?)
- Version files
- Be consistent

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- ❖ Date (YYYY-MM-DD)
- ❖ Project name/Grant #
- ❖ Type of data
- ❖ Location/site/spatial coordinates
- ❖ Researcher info
- ❖ Version

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SAR_090320.doc ?

in YYYY-MM-DD format (2023-09-19)

Sort, with standard dates

2023-03-16_Code_descriptions.docx
2023-05-24_Code_descriptions.docx
2023-11-03_Code_descriptions.docx

Sort, without standard dates

11-3-23_Code_descriptions.docx
3-16-23_Code_descriptions.docx
5-24-2023_Code_descriptions.docx

Good File Naming Practices

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Sort, with a leading zero

Test01_RDM assessment.xlsx
Test02_RDM assessment.xlsx
Test03_RDM assessment.xlsx
…
Test10_RDM assessment.xlsx
Test11_RDM assessment.xlsx

Sort, without a leading zero

Test1_RDM assessment.xlsx
Test10_RDM assessment.xlsx
Test11_RDM assessment.xlsx
…
Test2_RDM assessment.xlsx
Test3_RDM assessment.xlsx

Good File Naming Practices

- Use descriptive file names
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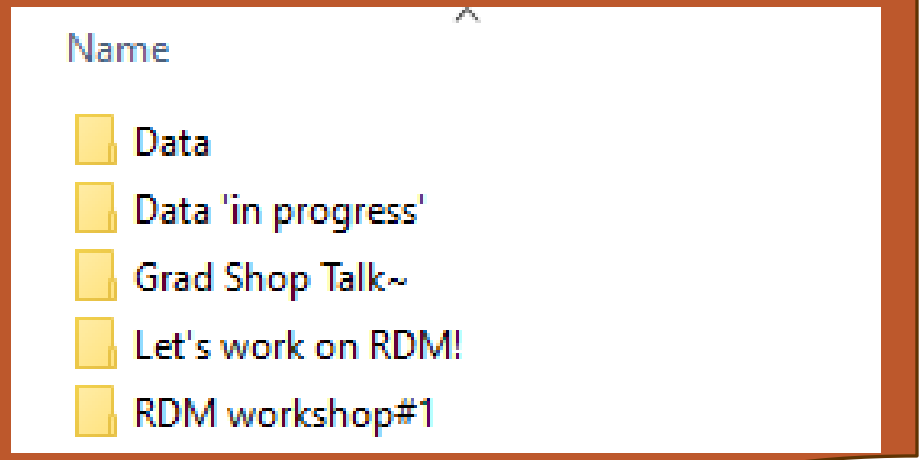
- **Use_as delimiters**
  - **Data_v01**
- **Avoid Special Characters**



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❖ **Using consecutive numbering for major version changes**

Code_descriptions_**20230919_v01**.docx

❖ **Using decimals for minor changes**

Code_descriptions_**20230919_v01.1**.docx

Good File Naming Practices

- Use descriptive file names
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- Be consistent

❖ **Consistency with Spaces**

Data_projectname**v03**.docx

Data_**project name v01**.docx

Data_**projectname_v02**.docx

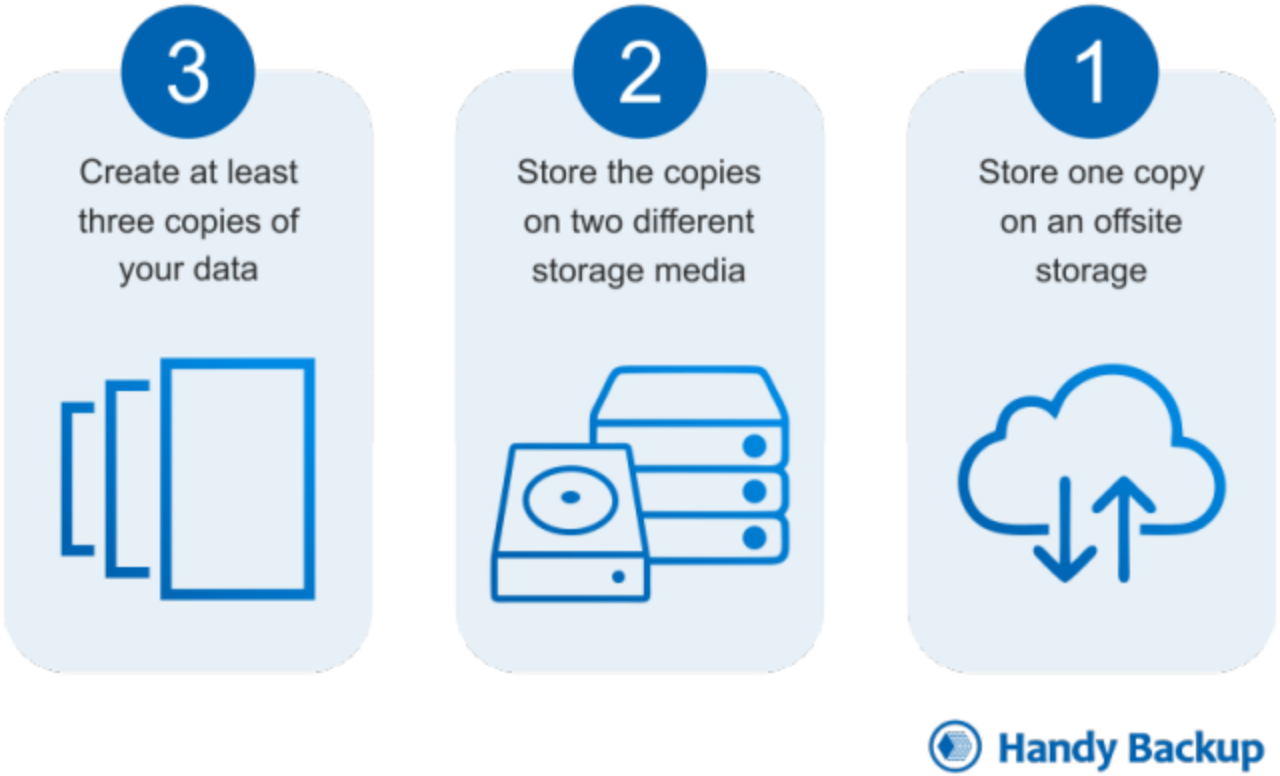
Data Documentation: README File

README files are plain text documents that sit at the top level of project folders and describe the purpose of the project, contact details, and organization of files.

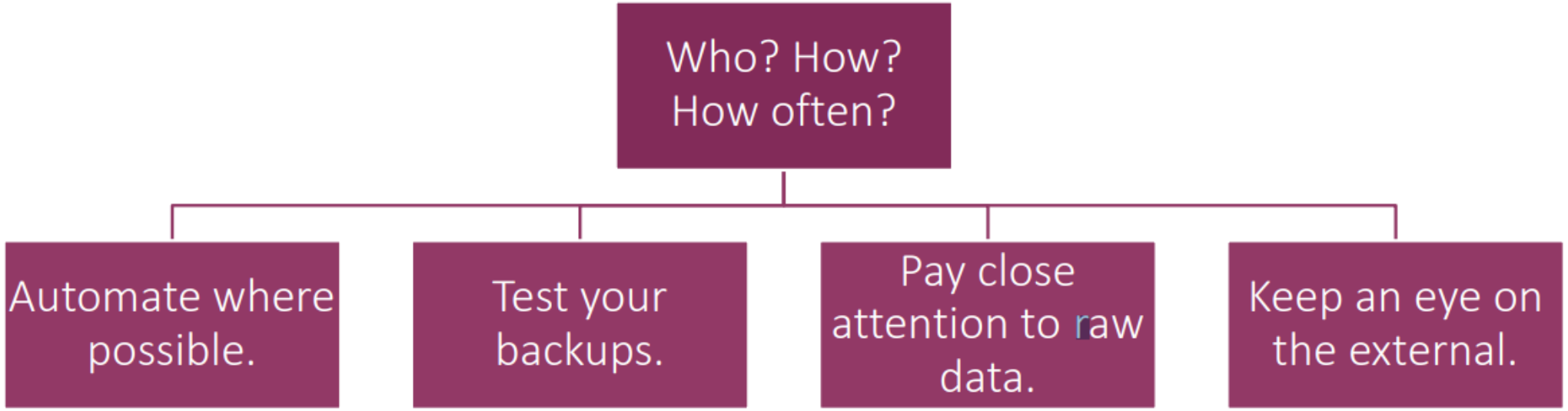
A standard document detailing information about the documents:

- Title of dataset
- Name/institution/contact information for
- Principal Investigator (or person responsible for collecting the data)
- File name structure and the description of the attributes used to name the files.
- Descriptions of every folder, file, format, data collection method, instruments, etc.
- Codes: Provide a complete list of any codes/abbreviations used.
- Dates/Locations of data collection
- Funding information
- People involved

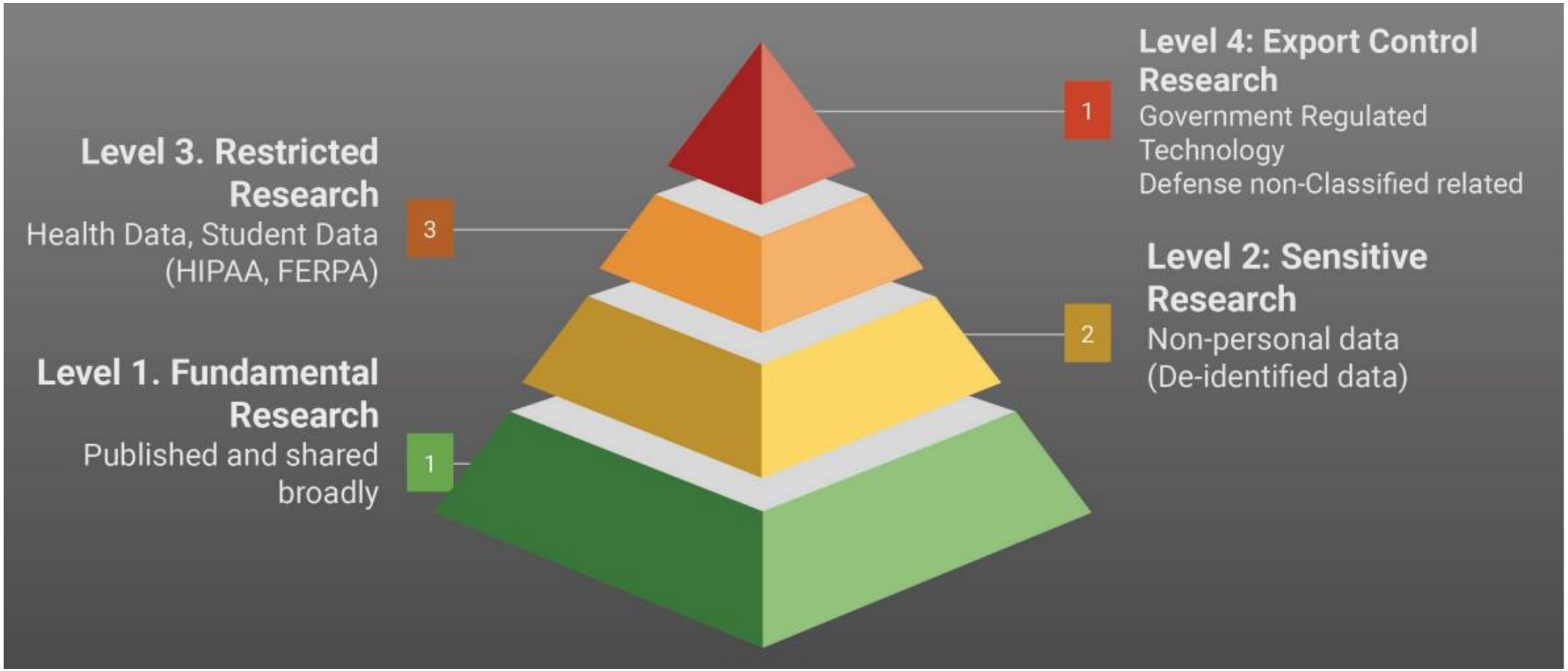
Data Storage and Backup **3-2-1 Rule**



Consideration for back-up



Security Measures: Know Your Data



TXST Data Classifications

	Confidential Information	Sensitive Information	Public Information
Level of Sensitivity	High	Moderate	Low
Legal Requirements	Protection of data is required by law (e.g., TPIA, FERPA, and HIPAA data) or contractual agreements.	Often considered "public" in the sense it is releasable under the Texas Public Information Act, some assurance is required so release of information is both controlled and lawful.	Public information by its very nature is designed to be shared broadly, without restriction, at the complete discretion of the owner.
Disclosure Risk	Confidential information presents the most serious risk of harm if improperly disclosed.	Unauthorized disclosure of Sensitive information could adversely impact the University, individuals or affiliates.	From the perspective of confidentiality, public information may be disclosed or published by any person at any time.
Examples of Information	• Social Security numbers • Credit card info • Personal health info • Student records • Crime victim info • Library transactions • Court sealed records • Access control credentials	• Performance appraisals • Employee DOB • Employee email addresses • Donor information • Voicemail records • Email contents • Unpublished research	•Job posting • Service offerings • Published research • Directory information • Degree programs • General information about university products and services

Data Archiving/Publishing

TXST Dataverse Repository

A research data management system

Add, share, publish, and manage your data

Find datasets from across Texas institutional Dataverse collections.

https://dataverse.tdl.org/

Texas Data Repository

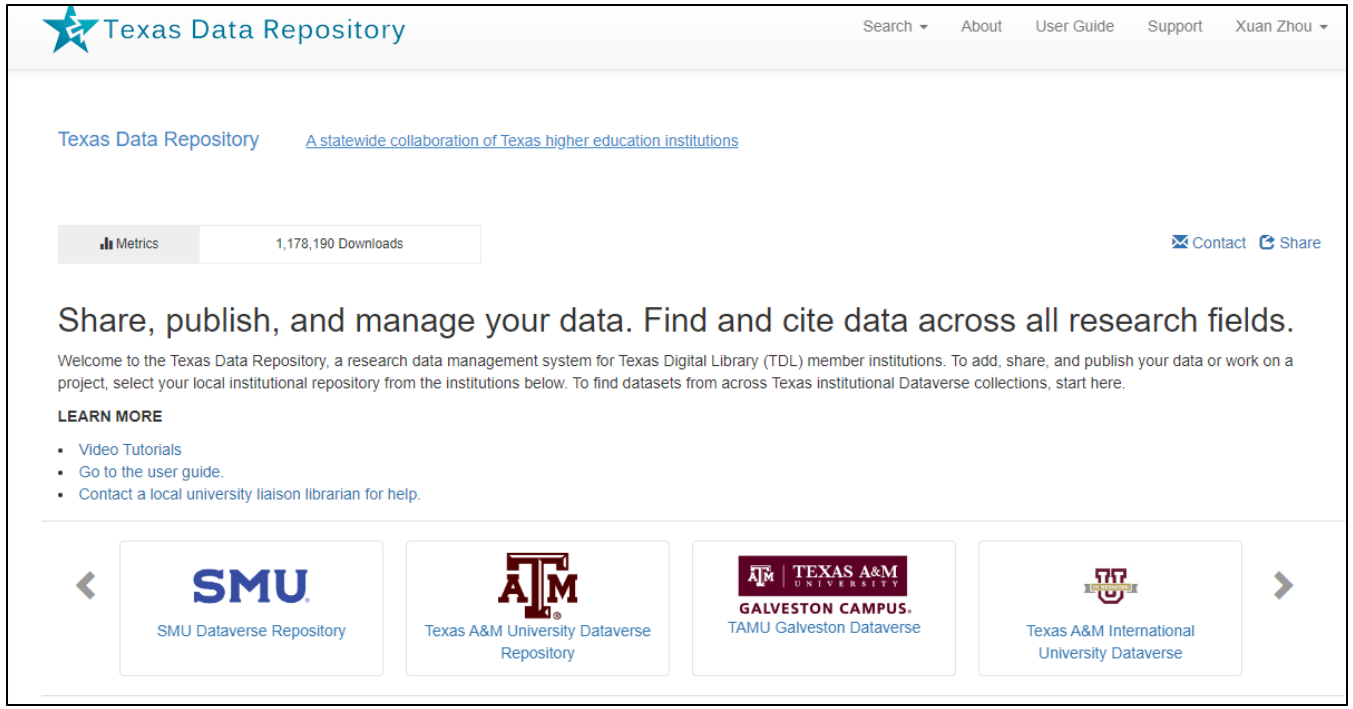
TXST Dataverse Repository is Appropriate for:

- **Data in any file type**
- **Data from any field of research**
- **Static or evolving datasets**
- **Data without confidential or sensitive information.**
- **Individual file up to 4GB (Small- Medium size)**
- **Large file: consult RDM/ IT service department**

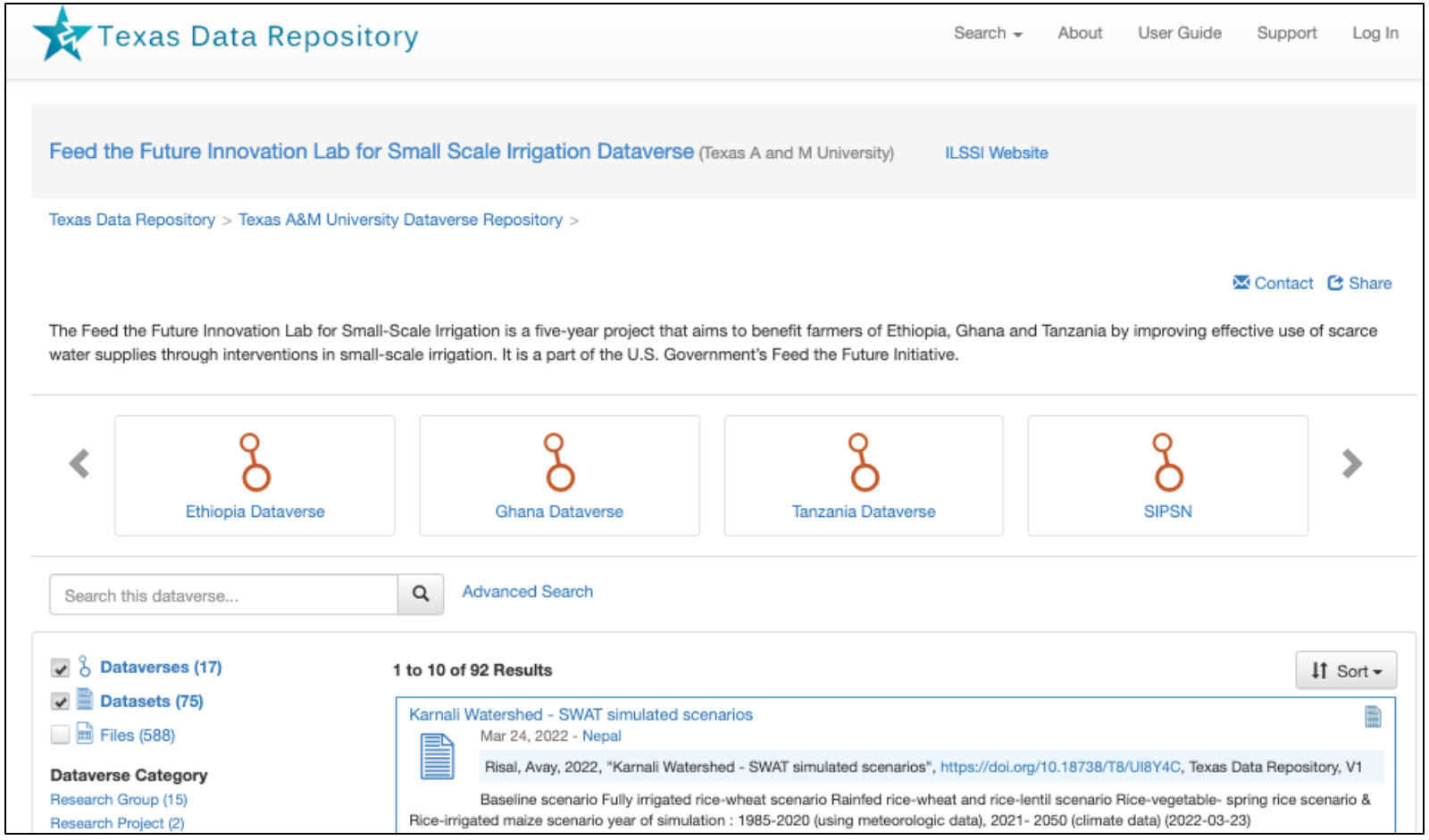
Why TXST Dataverse Repository?

- Provides a platform for archiving and publishing the data developed or used in support of research at Texas State University
- An open access data repository for researchers affiliated with TXST
- Served by RDM service team: help with DMP and preparing data to deposit
- University libraries offer advice on appropriate file formats, metadata, and licensing options
- Provide consultation services or training workshops for users to upload and manage their own data collections

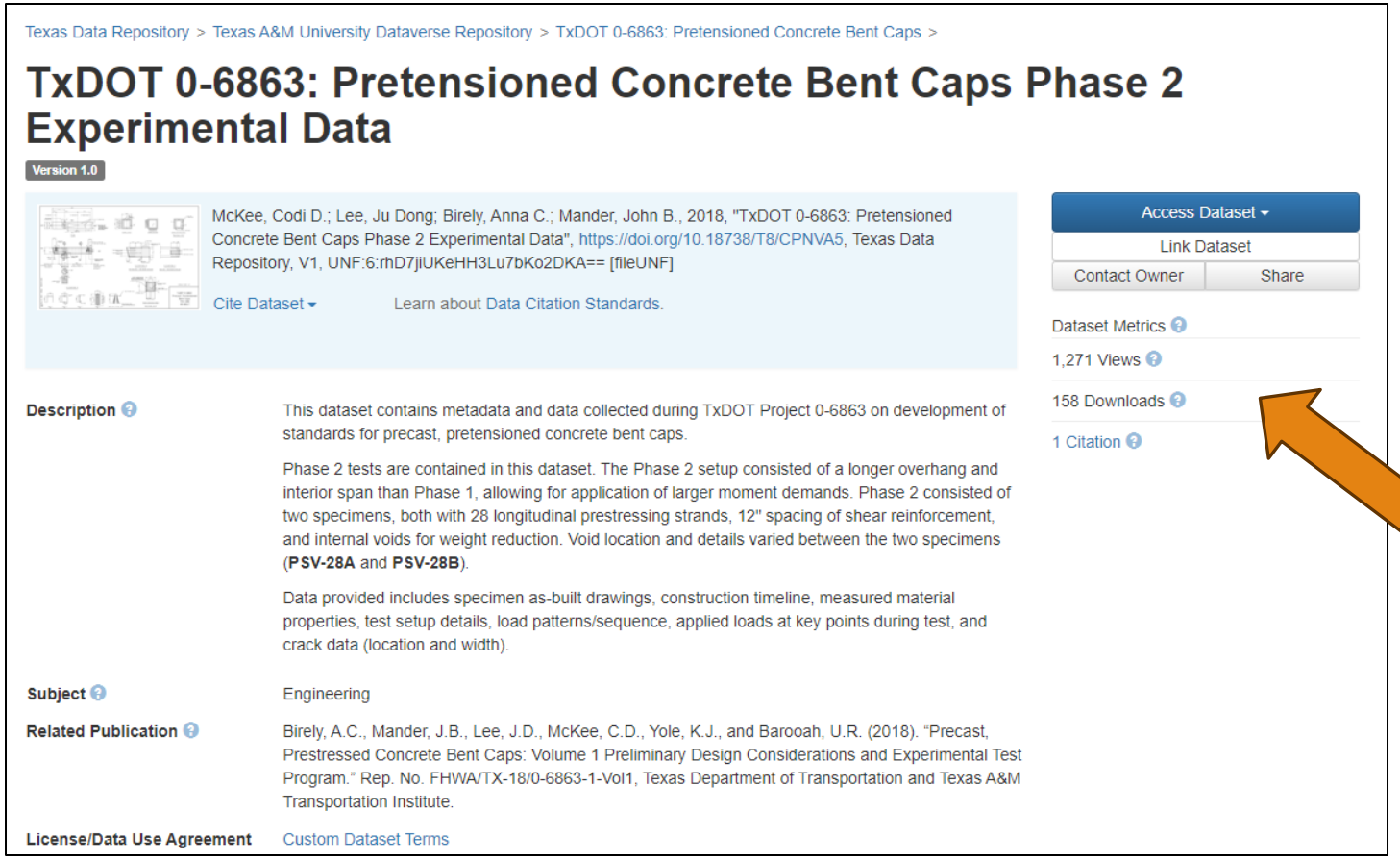
Find Open Data



Facilitate Collaboration



Increase scholar impact



Texas Data Repository > Texas A&M University Dataverse Repository > TxDOT 0-6863: Pretensioned Concrete Bent Caps >

TxDOT 0-6863: Pretensioned Concrete Bent Caps Phase 2 Experimental Data

Version 1.0

McKee, Codi D.; Lee, Ju Dong; Birely, Anna C.; Mander, John B., 2018, "TxDOT 0-6863: Pretensioned Concrete Bent Caps Phase 2 Experimental Data", https://doi.org/10.18738/T8/CPNVA5, Texas Data Repository, V1, UNF:6:rhD7jiUKeHH3Lu7bKo2DKA== [fileUNF]

Cite Dataset Learn about Data Citation Standards.

Access Dataset
Link Dataset
Contact Owner | Share

Dataset Metrics
1,271 Views
158 Downloads
1 Citation

Description This dataset contains metadata and data collected during TxDOT Project 0-6863 on development of standards for precast, pretensioned concrete bent caps.

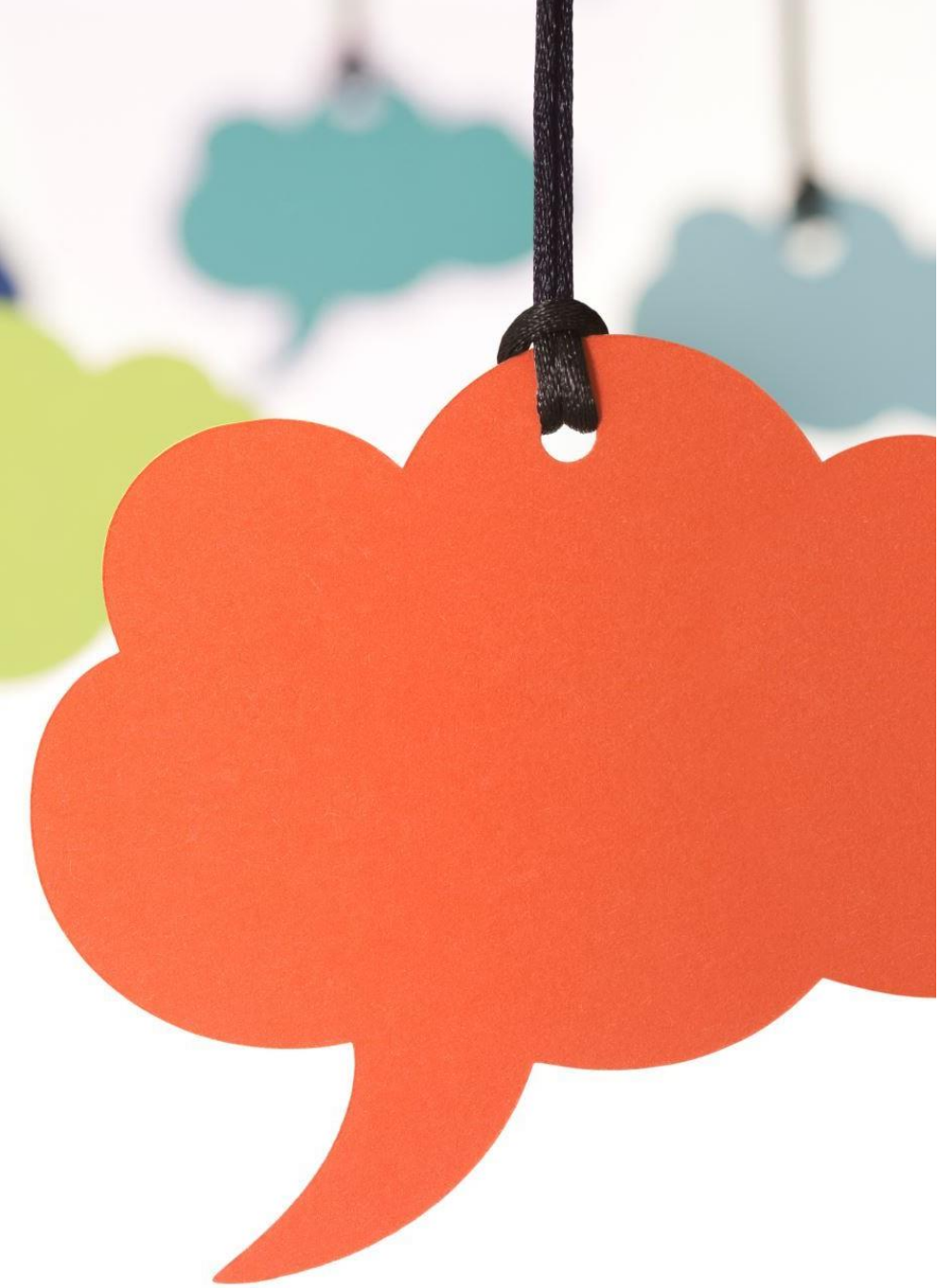
Phase 2 tests are contained in this dataset. The Phase 2 setup consisted of a longer overhang and interior span than Phase 1, allowing for application of larger moment demands. Phase 2 consisted of two specimens, both with 28 longitudinal prestressing strands, 12" spacing of shear reinforcement, and internal voids for weight reduction. Void location and details varied between the two specimens (**PSV-28A** and **PSV-28B**).

Data provided includes specimen as-built drawings, construction timeline, measured material properties, test setup details, load patterns/sequence, applied loads at key points during test, and crack data (location and width).

Subject Engineering

Related Publication Birely, A.C., Mander, J.B., Lee, J.D., McKee, C.D., Yole, K.J., and Barooah, U.R. (2018). "Precast, Prestressed Concrete Bent Caps: Volume 1 Preliminary Design Considerations and Experimental Test Program." Rep. No. FHWA/TX-18/0-6863-1-Vol1, Texas Department of Transportation and Texas A&M Transportation Institute.

License/Data Use Agreement Custom Dataset Terms



Final Tips and Reminders

- Know your data
- Decide which data you want to share
- Choose file formats that last
- Remember the documentation
- Consider ownership and privacy
- **Make a Plan!**

Thank you!

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Research Data Services

Texas State University Libraries

https://www.library.txstate.edu/

Love Data Week (February 2024)

The Carpentries Workshop

Software Carpentry (R for Reproducible Scientific Analysis)

Our more introductory R lesson. In addition to our **standard content**, this workshop covers data analysis and visualisation in R, focusing on working with tabular data and other core data structures, using conditionals and loops, writing custom functions, and creating publication-quality graphics. As our more introductory R offering, this workshop also introduces learners to RStudio and strategies for getting help. This workshop is appropriate for learners with no previous programming experience. For audiences with some experience with R or other programming languages, we recommend our **Programming with R** lesson.

Software Carpentry (Programming with R)

Our more advanced R lesson. In addition to our **standard content**, this workshop covers data analysis and visualisation in R focusing on working with core data structures, using conditionals and loops, writing custom functions, and running R programs from the command line. This is the more advanced of our two R offerings for Software Carpentry and is appropriate for learners with some previous programming experience, in R or other languages. For audiences with no previous programming experience, we recommend our **R for Reproducible Scientific Analysis** lesson.

THE CARPENTRIES

SUPPLEMENTAL INFO & ACTIVITIES

Who owns the data?

It may depend on who sponsors the research.

As employees of the university, you are working for hire for the university, which, in most cases, owns the rights to the data. In federally sponsored research, the university owns the data but allows the principal investigator on the grant to be the steward of the data. The PI takes responsibility for the collection, recording, storage, retention, and disposal of data.