



## **Implementation of the CoreTrustSeal**

The CoreTrustSeal board hereby confirms that the Trusted Digital repository Scholars' Mine complies with the guidelines version 2017-2019 set by the CoreTrustSeal Board.

The afore-mentioned repository has therefore acquired the CoreTrustSeal of 2016 on April 3, 2018.

The Trusted Digital repository is allowed to place an image of the CoreTrustSeal logo corresponding to the guidelines version date on their website. This image must link to this file which is hosted on the CoreTrustSeal website.

Yours sincerely,

The CoreTrustSeal Board

## Assessment Information

Guidelines Version: 2017-2019 | November 10, 2016  
Guidelines Information Booklet: [CTS Requirements 2017-2019](#)  
All Guidelines Documentation: [Documentation](#)

Repository: Scholars' Mine  
Seal Acquiry Date: Apr. 03, 2018

For the latest version of the awarded CoreTrustSeal for this repository: <https://www.coretrustseal.org/why-certification/certified-repositories/>

Previously Acquired Seals: None

This repository is owned by: **Missouri University of Science and Technology**

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# Assessment

## 0. Context

### Applicant Entry

#### *Self-assessment statement:*

Institution Repository: Scholars' Mine is the institutional repository for the Missouri University of Science and Technology (Missouri S&T). Scholars' Mine provides digital access to scholarly and cultural resources created by the university community. This includes faculty papers, research data, departmental publications, conference proceedings, graduate student works, and other scholarly material as well as campus cultural and historical works.

Additional information about Scholars' Mine is available here: <http://libguides.mst.edu/scholarsmine>. Scholars' Mine can be accessed here: <http://scholarsmine.mst.edu/>

The designated community for Scholars' Mine primarily focuses on digital access to scholarly and cultural resources created by the faculty, students and staff of the Missouri University of Science and Technology. Scholars' Mine serves a large and diverse global community of researchers and scholars. Statistics relating to how the global community utilizes Scholars' Mine can be found here: <http://libguides.mst.edu/scholarsmine/statistics>.

Scholars' Mine is a mediated repository with enhanced curation. All submitted material is reviewed prior to acceptance. The review includes copyright clearance, enhancement and augmentation of metadata, and testing of compatibility and readability of all files. Ongoing curation of some file types is performed to ensure future preservation, access, and readability. More complete information on supported file types and preservation practices can be found here: <http://libguides.mst.edu/scholarsmine/policies>.

Scholars' Mine utilizes two outsourced partners: The first contract is with Berkeley Electronic Press (bepress™) which is an annual renewable contract covering the use of Digital Commons™, the Expert Gallery Suite™, consultive services and publishing services. Digital Commons™ is a suite of tools and services enabling the management, display and publication of scholarship to the web. As a hosted platform Digital Commons™ is optimized for all major search engines and allows our institution to focus on success rather than technology.

The Expert Gallery Suite™ is a research announcement tool which allows scholars and researchers to maximize the readership and impact of their work. The Expert Gallery Suite™ enables the institution to create for its researchers and scholars search engine optimized webpages featuring their scholarly work. The Expert Gallery Suite™ also enables colleagues to follow their work and is a valuable tool for feeding and growing content for the repository by providing an incentive for faculty participation. Additionally, Digital Commons publishing services provide a publishing infrastructure for the creation and publication of digital journals including adding journals to major indexes and databases, registering DOIs, and preserving articles in CLOCKSS and Portico.

Consulting services which include both technical assistance with software and general advice to assist in setup, site maintenance, software operation, customization and design are also provided by bepress. Scholars' Mine is responsible for the uploading all content and metadata using web forms or batch facilities. Bepress does not claim any copyright to content we upload and will return to us all uploaded content at our request or at the termination of our contract.

As a condition of contract acceptance bepress was evaluated by our campus IT Department to determine if they conform to our institutional standards for network security; availability; authentication, authorization, and password security; application security; and cryptography/encryption. Bepress meets or exceeds these standards. See Safeguarding Your Content with Digital Commons at [https://www.bepress.com/reference\\_guide\\_dc/safeguarding-content-digital-commons/](https://www.bepress.com/reference_guide_dc/safeguarding-content-digital-commons/) for additional information.

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The second contract is with Amazon. In order to utilize the bepress Archive service Missouri S&T maintains a contract with Amazon for an Amazon S3 account. The Amazon S3 account is managed through our campus IT Department who contracts the service through DLT (<http://www.dlt.com>). Utilizing Amazon S3 and the bepress archive service provides a mirrored cloud server which adds an additional level of secured infrastructure to safeguard content. This mirrored service acts as an archive and is instantaneously updated any time changes are made in Digital Commons™ and the Expert Gallery Suite™. The archive's contents are organized in a file/folder hierarchy mirroring the structure of the repository and includes automatic checksums and data integrity checks.

The mirrored content in our Amazon S3 account acts as an additional level of security to ensure safe storage. Amazon S3 is designed to provide 99.999999999% durability of objects over a given year and is designed to sustain the concurrent loss of data in two facilities. Additional information and details about Amazon S3 is available at: <https://aws.amazon.com/s3/faqs/>.

- Additional information about bepress can be found here: <https://www.bepress.com/>
- Additional information about DigitalCommons™ can be found here: <https://www.bepress.com/products/digital-commons/>
- Additional information about Expert Gallery Suite™ can be found here: <https://www.bepress.com/products/expert-gallery-suite/>
- Additional general information on Amazon S3 can be found here: <https://aws.amazon.com/s3/>

Scholars' Mine has a significant global impact with a heavy global user base. Some important highlights include:

- In the last two years Scholars' Mine has had over one million content downloads.
- Usage statistics can be found here: <http://libguides.mst.edu/scholarsmine/statistics>.

Top Educational Organizations outside of the University of Missouri System utilizing Scholars' Mine (based on content downloads):

- Research Center of Theoretical Physics & Mathematics (IPM)
- Taiwan Academic Network
- Massachusetts Organization of Educational Collaboratives
- Universiti Teknologi Malaysia
- Indian Institute of Technology Kharagpur India
- Imperial College London
- University of Illinois
- Danmarks Tekniske Universitet
- Texas A&M
- NTU

Top Research and Technology Institutions utilizing Scholars' Mine (based on content downloads):

- United Technologies Research Center
- Commissariat a L'energie Atomique
- PE Bozhko Oleksandr Mykolajovych
- National Institute of Technology Surathkal
- Motilal Nehru National Institute of Technology (Mnnit) Allahbad

Top Commercial Organizations utilizing Scholars' Mine (based on content downloads):

- The Boeing Company
- Intel Corporation
- Golder Associates Inc.
- AutoEverSystems Corp.
- Jacobs Engineering Group Inc.

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Top Governmental Agencies utilizing Scholars' Mine (based on content downloads):

- Fundaco Para a Ciencia e a Tecnologia I.P.
- NASA
- KISTI
- China Science & Technology Network
- Los Alamos National Laboratory

Top Military Agencies utilizing Scholars' Mine (based on content downloads):

- Headquarters USAISC
- Navy Network Information Center
- 754th Electronic Systems Group
- Department of Defense Network Information Center
- Australian Defense Organization

Top organizations who access/link to Scholars' Mine content:

- International Society for Soil Mechanics and Geotechnical Engineering
- The Networked Digital Library of Theses and Dissertations
- Steel Market Development Institute
- Academy of Geo-Professionals
- Association for Information Systems
- Cold-Formed Steel Engineers Institute
- Structural Engineering Forum of India
- The International Information Center for Geotechnical Engineers
- OCLC WorldCat
- Engineering Conferences International
- American Iron and Steel Institute
- Association for Computing Machinery

Other institutions of note who access/link to Scholars' Mine Content:

- Purdue University
- University of Wollongong (Australia)
- Cal Poly San Luis Obispo
- University of Massachusetts Amherst
- Penn State
- Rochester Institute of Technology
- University of Pennsylvania
- University of Iowa
- Syracuse University
- University of Connecticut
- University of Kentucky
- South Cross University (Australia)
- Stanford University
- Michigan Tech
- Edith Cowan University (Australia)

Scholars' Mine houses the technology library of the Center for Cold-Formed Steel Structures and hosts the proceedings of the International Specialty Conference on Cold-Formed Steel Structures. This library provides access to research collections sponsored by the American Iron and Steel Institute, Rack Manufacturing Institute, Steel Deck Institute, and other similar national and international organizations. Leading researchers, engineers, manufacturers, and educators who have engaged in research, design, manufacture, and the use of cold-formed steel members participate in the conference.

Scholars' Mine also hosts the proceedings of the International Conference on Case Histories in Geotechnical Engineering and the International Conferences on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics. These two conference proceedings share knowledge gained from geotechnical engineering projects such as dams, bridges, etc. around the world. The knowledge is utilized to train future engineers. Information from these conference proceedings are among the most heavily used in the repository. It is important to note that prior to making these proceedings open access they existed in limited print and behind paid access portals only. Making

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these proceedings available in an open access forum has had a significant impact on usage in developing nations.

Scholars' Mine is a participant in the Digital Commons Network which brings together freely accessible scholarly research from hundreds of universities and colleges worldwide.

## **Reviewer Entry**

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 1. Mission/Scope

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

## Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

In support of scholarship and research Scholars' Mine, the institutional repository of the Missouri University of Science and Technology (Missouri S&T), will:

- Contribute to the advancement of knowledge and the betterment of society by acquiring, organizing, preserving, and providing global access to the research and cultural resources of Missouri S&T.
- Support cross-disciplinary collaboration and the multidisciplinary and organizational needs of Missouri S&T by building active communities of researchers and scholars and integrating Scholars' Mine into the research and educational endeavors of the campus.
- Support the professional development and research endeavors of our faculty and students by providing a rich and interactive environment where their research and academic achievements can be developed and made easily accessible to scholars and researchers worldwide.
- Create global visibility for Missouri S&T by highlighting the institution's research endeavors and culture.

Our mission is stated in the "About" section of Scholars' Mine (<http://scholarsmine.mst.edu/about.html>) and in our library guide to Scholars' Mine (<http://libguides.mst.edu/scholarsmine>). Additionally the mission statement is included in promotional materials, both digitally and in print.

Scholars' Mine is directly incorporated in the university's strategic plan. Lever 2.4.13 of the university's strategic plan states: "Continue development of Scholars' Mine designed for increasing internal and external communication and globally promoting the intellectual work of the campus." To meet this strategic initiative of the university, Curtis Laws Wilson Library is responsible for the management and development of Scholars' Mine. The Library has directly incorporated Scholars' Mine into the library's strategic plan. Lever 5 of the library strategic plan states: "Explore opportunities to feature and develop Scholars' Mine."

As part of the strategic initiative of the university, Scholars' Mine receives secured financial support through a general budget allocation to the library and is broadly supported by the Office of the Chancellor, Office of the Provost, Office of Graduate Studies, and Office of Sponsored Programs.

The mission statement and all current policies and guidelines have been approved by the Scholars' Mine Advisory Council, which is the official governing body for the institutional repository.

- Additional information about the university's strategic plan can be found here: <http://strategicplan.mst.edu/>
- Additional information about the library's strategic plan can be found here: <http://library.mst.edu/strategicplan/>

## Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

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## 2. Licenses

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

Scholars' Mine is legally considered a part of the University of Missouri. Therefore all legal agreements are with the University of Missouri Board of Curators. Scholars' Mine maintains files on all applicable licenses and legal agreements.

A click-through agreement to a non-exclusive distribution license is part of the online submission process for student theses and dissertations and some student and faculty publications. A signed license agreement is required for all manual submissions from authors or other parties. Submitters can also utilize Creative Commons licensing to further define access and reuse. All submissions are reviewed by qualified library staff prior to acceptance. Library staff also harvest existing publications and other creative output of our faculty and staff utilizing a variety of methods. Harvested materials are placed in Scholars' Mine in accordance with current policy and applicable laws.

Our Non-exclusive distribution license can be found at: [http://scholarsmine.mst.edu/scpro\\_guidelines/3/](http://scholarsmine.mst.edu/scpro_guidelines/3/).

All campus communities and groups wishing to publish journals or house unique collections of content in Scholars' Mine are required to agree to a Memorandum of Understanding (MoU) which outlines the rights and responsibilities of all parties involved. The MoU is a negotiated document designed to better meet the needs of specific communities and must be in place before content is placed in Scholars' Mine.

Conditions of use are clearly defined in the digital object's descriptive metadata. This includes copyright and usage licensing. Various levels of access control can be employed to control or restrict access. Access levels include full public access, campus only access, and restricted to a subscriber list or domain. Additional access control can be accomplished through embargoing content for a defined period of time.

Reported instances of noncompliance with the conditions of access or use are investigated, then reported to the content owner and appropriate actions taken.

Additional information about licensing, access and use can be found here:

- All policies: <http://libguides.mst.edu/scholarsmine/policies>
- All Guidelines: <http://libguides.mst.edu/scholarsmine/guidelines>

### Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

### 3. Continuity of access

#### *Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

#### *Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

#### *Self-assessment statement:*

Scholars' Mine serves as the Missouri S&T institutional data repository by providing resources and services to promote the management, dissemination and preservation of research data sets generated by researchers affiliated with Missouri S&T or in association with Missouri S&T researchers. The Curtis Laws Wilson Library is responsible for preserving and providing access to research data in Scholars' Mine. The Library is committed to preserving and maintaining access to research data for a minimum period of ten years after it is published in Scholars' Mine. Longer-term preservation is subject to:

- the defined priority level of the data holding,
- requests for longer preservation period extensions by the researcher,
- the Library's selection criteria and archival appraisal for long-term retention, and
- budget approval for staffing and related resources needed to accomplish this goal.

Curtis Laws Wilson Library is committed to the following classes of research data sets with associated preservation priorities and commitment levels:

- Priority 1: Data Sets associated with Publications. Extensive effort will be made to ensure preservation of data sets associated with journal publications or other scholarly publications for a period of 10 years or in perpetuity if requested by the researcher, or for as long as the data sets meet the Library's collection development policies and practices, or is superseded in the future by an acceptable data repository.
- Priority 2: Stand-Alone Data Publications. Reasonable steps will be taken to preserve stand-alone data publications in accordance with best practices and collection development policies.
- Priority 3: Data Sets with High Research/Teaching Value. Reasonable steps will be taken to preserve data sets that are identified by faculty, subject specialist librarians or archivists as having high value for meeting the research and teaching needs of Missouri S&T or within the broader research community.
- Priority 4: Other Data Files and Materials. No preservation steps will be taken for ephemeral materials deemed to be of little or no long-term value to the comprehensiveness of the collection. Working files of particular significance to Missouri S&T's teaching and research needs, or within the greater research community, may be preserved on a select basis as appropriate.

As an institution of higher learning Missouri S&T supports scholarship, teaching, and learning. Curtis Laws Wilson Library is responsible for identifying, acquiring, and preserving scholarly resources for as long as they are needed to support the activities of the University. Scholars' Mine's mandate for the digital preservation of and access to, research data sets and other intellectual works of our faculty, students and staff is drawn from responsibilities outlined above and specifically defined in:

- Lever 2.4.13 of Missouri S&T's strategic plan which states: "Continue development of Scholars' Mine designed for increasing internal and external communication and globally promoting the intellectual work of the campus."
- Lever 5 of the library strategic plan which states: "Explore opportunities to feature and develop Scholars' Mine."

Funding for Scholars' Mine is considered a long-term priority for the University and is secured through general budget allocations. In the unlikely event of a cessation of operations, research data sets housed in Scholars' Mine

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will be dealt with as follows:

1. The library will work toward finding an alternative data repository.
  2. If no alternative data repository is available the research data sets will be returned to the researcher or appropriate campus unit.
- See Digital Preservation Policy: [http://scholarsmine.mst.edu/scpro\\_guidelines/5/](http://scholarsmine.mst.edu/scpro_guidelines/5/)
  - See Research Data Management Policy: [http://scholarsmine.mst.edu/scpro\\_guidelines/6/](http://scholarsmine.mst.edu/scpro_guidelines/6/)
  - All policies: <http://libguides.mst.edu/scholarsmine/policies>
  - All Guidelines: <http://libguides.mst.edu/scholarsmine/guidelines>

## **Reviewer Entry**

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 4. Confidentiality/Ethics

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

It is the responsibility of the researcher to conduct research in compliance with any applicable disciplinary norms and be in compliance with the University of Missouri's Collected Rules and Regulations (see: [https://www.umsystem.edu/ums/rules/collected\\_rules/research](https://www.umsystem.edu/ums/rules/collected_rules/research)). Researchers submitting data to Scholars' Mine are required to acknowledge that they are in compliance and to provide an assessment of any disclosure risk.

Scholars' Mine operates in compliance with the laws of the United States and the state of Missouri which address confidentiality, privacy, and protection of research participants. Relevant federal laws include:

- Protection of Human Subject (45 CFR 46)
- The Family Education Rights and Privacy Act (FERPA)
- The Health Insurance Portability and Accountability Act (HIPAA)

Scholars' Mine requires copies of all relevant documentation proving compliance with these laws from depositors.

The researcher is required to provide an assessment of the data's disclosure risk. Data with a high disclosure risk may be rejected and returned to the researcher with advice on how to lower the risk. Additionally, access to data with high disclosure risks can be secured through access control measures.

Scholars' Mine offers four levels of access to data:

1. open-access,
2. access restricted to defined IP addresses or domains,
3. access restricted to specific users requiring login authentication, and
4. on-site access only under secure conditions.

Depositors are required to provide a disclosure risk assessment which is evaluated by trained library staff prior to acceptance. Appropriate access levels are assigned to accepted data sets in consultation with the depositor. Some data sets with high disclosure risks may not be accepted and will be returned to the depositor with advice on how to bring the data into compliance with disciplinary and ethical norms. Administration of data with disclosure is restricted by login to authorized administrators.

- See our Research Data Confidentiality Policy: [http://scholarsmine.mst.edu/scpro\\_guidelines/9/](http://scholarsmine.mst.edu/scpro_guidelines/9/)
- All policies: <http://libguides.mst.edu/scholarsmine/policies>
- All Guidelines: <http://libguides.mst.edu/scholarsmine/guidelines>

### Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 5. Organizational infrastructure

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

Scholars' Mine is the institutional repository for the Missouri University of Science and Technology (Missouri S&T) and provides digital access to the scholarly and cultural resources created by the university community. Missouri S&T is a public institution founded in 1870 and is widely recognized as one of the nation's best universities for engineering, sciences, computer science, and technology. Missouri S&T has received the following rankings:

- A top 100 U.S. university (QS World University Rankings, 2017)
- Top teacher education program for secondary education in Missouri, as determined by the National Council on Teacher Quality (September 2015).
- No. 2 value-added public university, according to the Brookings Institute (April 2015).
- No. 2 best value among public colleges as determined by Kiplinger's "salary yardstick." (Kiplinger's Best College Values, December 2016).
- No. 3 engineering college, according to College Factual/USAToday (USAToday, August 2016).
- No. 8 university in the nation for annual return on investment, according to PayScale.com (April 2017).
- No. 3 public university for online graduate computer information technology programs and 6th overall (U.S. News and World Report, January 2017).
- No. 12 public university for online graduate engineering programs and 16th overall (U.S. News and World Report, January 2017).
- No. 15 for career services in Princeton Review's "Colleges That Pay You Back" (February 2015).
- No. 15 "smartest public college" in the U.S. (Business Insider, September 2015).

Scholars' Mine operates as a discrete unit within the Curtis Laws Wilson Library and is directly incorporated in the university strategic plan. Lever 2.4.13 of the university strategic plan states: "Continue development of Scholars' Mine designed for increasing internal and external communication and globally promoting the intellectual work of the campus." To meet this strategic initiative of the university, Curtis Laws Wilson Library is responsible for the management and development of Scholars' Mine. The Library has directly incorporated Scholars' Mine into the library strategic plan. Lever 5 of the library strategic plan states: "Explore opportunities to feature and develop Scholars' Mine." As a strategic initiative of the university, Scholars' Mine is perceived and designed as a permanent repository for scholarly resources.

As part of the strategic initiative of the university, Scholars' Mine receives secured financial support through a general budget allocation to the library and is broadly supported by the Office of the Chancellor, Office of the Provost, Office of Graduate Studies, and Office of Sponsored Programs.

Scholars' Mine receives a general budget allocation for:

- Contractual services for hosting, server space, and support from Berkley Electronic Press (bepress™) and Amazon
- Salaries and benefits for the Scholarly Communications Librarian and support staff, including student employees
- Equipment including computers and other digitization devices
- Professional development and training

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- Computer and software support, and onsite server space through our campus IT department
- Supplies and other miscellaneous expenses

Training for all repository processes is standardized and provided to all new employees. Refresher training is provided as needed on a periodic basis. Professional development opportunities are provided and are part of the expectations for advancement and job performance. Certifications and affiliations are maintained as appropriate to the mission of the repository and job responsibilities. The University sponsors DC-HUG (Digital Commons – Heartland User Group) and an annual IR Day to provide professional development opportunities regionally.

Scholars' Mine has dedicated staffing of 3.5 FTE (Full-time Equivalent). Staffing consists of:

- Scholarly Communications Librarian – Responsible for management and oversight of all operations including governance, policy, and compliance. This position also provides consultation and advice to faculty on a variety of topics including copyright and research data management. Additionally this position evaluates repository content for acceptance and performs compliance and quality reviews as well as locates new content for inclusion in the repository. (1 FTE).
- Repository Coordinator – Coordinates and oversees daily operations and performs compliance and quality reviews. This position also locates new content for inclusion in the repository. (1 FTE).
- Digitization Specialists – Student employees providing digitization and digital editing services as well as assisting in the location of new content for inclusion in the repository. (1.5 FTE).

Scholars' Mine directly draws upon support from other Curtis Laws Wilson Library staff (4 FTE). This includes:

- Metadata Services Librarian – Provides consultation, support, and guidance in the design, implementation, and usage of supporting metadata (1 FTE).
- Archivist – Provides consultation in collection development, preservation, and data management (1 FTE).
- Library Information Specialists – Provides metadata creation, cataloging, entry, and review as well as locating new content for inclusion in the repository. (2 FTE).
- See Organization Chart: [http://scholarsmine.mst.edu/scpro\\_guidelines/10/](http://scholarsmine.mst.edu/scpro_guidelines/10/)

## Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 6. Expert guidance

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

## Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

Scholars' Mine is governed by an advisory board. The advisory board meets on a periodic basis or communicates via email to provide advice and recommendations on strategy, policy, technology, and content. The advisory board also advises on changes in policy and strategy. The advisory board consists of campus stakeholders and includes representatives from:

- Curtis Laws Wilson Library
- Office of Information Technology
- Office of the Vice Provost of Academic Support
- Office of Sponsored Programs
- Office of Graduate Studies
- Faculty Senate Library and Learning Resources Committee
- Campus Academic Departments
- Campus Research Centers, Labs and Units
- Student Life

Additional advice including scientific advice is obtained as needed from subject specialists within our faculty, or externally through a variety of means including meetings, email, etc. Additionally, the Scholarly Communications Librarian and other Scholars' Mine staff attend conferences and maintain ongoing professional consultative relationships on our campus and within the University of Missouri System, and at state, nationally, and international levels.

User feedback, on-going conversations and consultations are accomplished through a variety of channels both formal and informal:

- Formal meetings with the advisory board, external advisors or other parties
- As needed email exchanges with the advisory board, external advisors or other parties
- Workshops and discussion groups both in person and online
- Formal surveys
- Impromptu single-question surveys
- Online feedback forms and email
- Conversation
- Encounters at conferences and other forums
- Annual Conference and Repository Day hosted at Missouri S&T (beginning Fall 2017)
- See: <http://libguides.mst.edu/scholarsmine/contact>

## Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 7. Data integrity and authenticity

### *Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### **Applicant Entry**

#### *Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

#### *Self-assessment statement:*

Scholars' Mine is a hosted, cloud-based solution provided by Berkeley Electronic Press (bepress™). Bepress™ provides real-time redundancy that runs continuously. Additionally, all uploaded data files are stored in triplicate in a redundant storage cluster, as well as backed up off-site utilizing Amazon Glacier. Glacier performs regular, systematic data integrity checks and utilizes automatic self-healing.

Additionally, we participate in bepress™ Archive, a preservation program that pushes online repository content to Missouri S&T's Amazon S3 account. Per Amazon, "Amazon S3 uses a combination of Content-MD5 checksums and cyclic redundancy checks (CRCs) to detect data corruption. Amazon S3 performs these checksums on data at rest and repairs any corruption using redundant data. In addition, the service calculates checksums on all network traffic to detect corruption of data packets when storing or retrieving data" (<https://aws.amazon.com/s3/faqs/>.)

Additionally, Scholars' Mine maintains local file storage provided by our campus IT Department. This local storage houses local working files used to prepare content for the repository and an off-line archive (dark archive) of repository content. The campus utilizes Microsoft Enterprise Server Technology, RAID technology, and Microsoft Data Protection Manager, which provides progressive intelligent file checking and backup services.

Scholars' Mine is a mediated repository. All submissions are reviewed by qualified library staff prior to acceptance. This review includes the status of the dataset and metadata. Typically, we accept completed data sets and this status is noted in the descriptive metadata. In circumstances where the data is not complete, for example if research is in progress, we will note this status and provide additional information in the descriptive metadata.

Scholars' Mine also offers data management services to our faculty researchers. A component of this service is advice on creating and maintaining quality metadata. The intent of this service is to ensure completeness of the metadata before it is accepted into the repository. Regardless, metadata is reviewed before acceptance and the researcher is advised if changes are required or recommended. If circumstances warrant, a "readme" file is prepared to provide additional information to users regarding the metadata.

- See Guidelines for Metadata Review: [http://scholarsmine.mst.edu/scpro\\_guidelines/11/](http://scholarsmine.mst.edu/scpro_guidelines/11/)
- All policies and guidelines: <http://libguides.mst.edu/scholarsmine/policies> or [http://scholarsmine.mst.edu/scpro\\_guidelines/](http://scholarsmine.mst.edu/scpro_guidelines/)

Desired changes to published data and metadata can be completed only by an authenticated and authorized repository administrator via an administrative interface. Previous versions of data and metadata are recorded and maintained by the system with the time and date of the change, a description of the reason for the change, and the identity of the administrator making the change.

Version control is utilized. Only authenticated administrators may replace a published dataset with another. In that event, the earlier version is neither overwritten nor deleted. Instead the earlier version is retained within the system for reference and comparative purposes. A version history can be maintained in the metadata if requested by the depositor.

Scholars' Mine supports a wide range of international and community standards, including but not limited to OAI-PMH, ETD-MS, U.S. Federal Government Section 508 Guidelines, guidelines of the W3C Web Content Accessibility Guidelines, and guidelines for inclusion in community initiatives such as OpenAIRE, SHARE, RIAN, NDLTD, DPLA, Library Archives Canada, Portico, and CLOCKSS.

Once published, data changes are not made without a request or consent from the researchers. In the event the data is changed, the earlier version is neither overwritten nor deleted. Instead the earlier version is retained within the

system for reference and comparative purposes.

All changes are recorded and maintained within the repository, and changes to the backups are also tracked via checksums standard to Amazon S3. Audit trails are available via the administrative interface. Earlier versions of both data and metadata are neither overwritten nor deleted. Instead the earlier versions are retained within the system for reference purposes.

Each discrete entry in the repository consists of descriptive metadata and an unlimited number of associated files of any file type. Each discrete entry is assigned a unique URI which never changes and acts as a permanent link. Associated datasets within the repository are crosslinked to each other utilizing the discrete URI. Additionally, datasets can be crosslinked to any information accessible via a URI. Campus-based research entities such as research labs or centers can have a community presence in the repository and all their related research is presented together as a single searchable collection. Also, each researcher can have a discrete presence with all their related research and associated research data presented together as a single discrete searchable collection.

Essential properties does not have a standardized definition. If there are multiple versions of the same file, the researcher, in consultation with a repository administrator, decides which version of a file to present to visitors. Versioning is also enabled in Amazon S3. Earlier versions are retained within the system for reference and comparative purposes.

Scholars' Mine is a mediated repository, focused on the research output of the campus community. The identity of each depositor is known and verified prior to the acceptance of any content. Library staff maintain authority control of all campus employees and students. Depositors are verified against these files during all phases of the lifecycle of the data.

## **Reviewer Entry**

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 8. Appraisal

### *Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

## Applicant Entry

### *Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

### *Self-assessment statement:*

The collection development policy of Scholars' Mine focuses on collecting the intellectual output of the faculty, staff, departments and units of Missouri S&T. This includes research data. To be considered for inclusion in Scholars' Mine, research data and publications must be produced by a member of the University community or in association with the University community.

- See Institutional Repository Collection Development Policy: [http://scholarsmine.mst.edu/scpro\\_guidelines/12/](http://scholarsmine.mst.edu/scpro_guidelines/12/)

Scholars' Mine employs validation and content checks as follows:

- Researcher validation – The identity of the researcher is verified utilizing authority control procedures.

Level of digitization – Determination of the appropriate level of digitization is done in conjunction with the researcher.

- Level A – data, metadata, and documentation are fully digitized and anonymized
- Level B – data, metadata, and documentation are digitized at least to the level of scanned images and anonymized
- Level C – data, metadata, and documentation are in a non-digital format and anonymized. Level C data is converted to Level B or Level A after consultation with the researcher.
- Anonymization and confidentiality check – Non-anonymized data or data breaching confidentiality is rejected. Recommendations to bring the data into compliance are given to the researcher.
- Metadata check – The descriptive metadata must be comprehensible and clearly describe the dataset and its use. Enhancements to the metadata may be recommended to the researcher to more clearly describe the dataset and aid the user in interpreting the data. Additional recommendations may be made to include notes and other information in a bookmarked PDF user guide or 'Readme file.'
- Data dimension checks (Qualitative data) – Not done at this time; however the researcher is encouraged to perform this check
- Data validity checks (Qualitative data) – Not done at this time; however the researcher is encouraged to perform this check

Scholars' Mine is a mediated repository. All metadata is reviewed by trained library staff in consultation with the researcher prior to uploading the dataset to the repository. Enhancements to the metadata may be made in consultation with the researcher to more clearly describe the dataset and to aid the user in interpreting the data.

- See Guidelines - Metadata Review for Research Data: [http://scholarsmine.mst.edu/scpro\\_guidelines/11/](http://scholarsmine.mst.edu/scpro_guidelines/11/)

Scholars' Mine is a mediated repository. All metadata is reviewed by trained library staff in consultation with the researcher prior to uploading the dataset to the repository. Enhancements to the metadata may be made in consultation with the researcher to more clearly describe the dataset and to aid the user in interpreting the data. If the researcher is unwilling to make recommended changes or enhancements the data sets are rejected.

- See Guidelines – File Format Recommendations: [http://scholarsmine.mst.edu/scpro\\_guidelines/13/](http://scholarsmine.mst.edu/scpro_guidelines/13/)

Scholars' Mine is a mediated repository. All datasets are reviewed by trained library staff in consultation with the researcher prior to uploading the dataset to the repository. File format issues are resolved prior to uploading content or during the review.

- See Workflow – Research Data Processing Workflow: [http://scholarsmine.mst.edu/scpro\\_guidelines/4/](http://scholarsmine.mst.edu/scpro_guidelines/4/)

If the data is in a specialized or non-preferred format which cannot be converted to a more commonly accepted format, the metadata will be enhanced to include a description of how to best utilize the provided file format. This would include instructions on how to obtain any required specialized programs or applications. Additional disclaimers may also be added to the metadata if required.

## **Reviewer Entry**

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 9. Documented storage procedures

### *Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

## Applicant Entry

### *Statement of Compliance:*

3. In progress: We are in the implementation phase.

### *Self-assessment statement:*

Public-facing policies, guidelines, workflows, and best practices are accessible directly from the repository at: <http://libguides.mst.edu/scholarsmine>. Documentation on internal processes and procedures related to storage are maintained in a private wiki accessible only by authorized personnel. Maintenance of these policies and procedures is performed by authorized administrators. Procedures are reviewed every three years, or more frequently if needed.

All access to storage servers is secured through authenticated user logins with appropriate assigned levels of access through campus IT and/or service providers. Access levels are determined by the Scholarly Communications Librarian in consultation with the Repository Management Team and the Repository Advisory Board if necessary.

Automated content submission is also controlled via authenticated user logins. All automated submissions are mediated by login authenticated library staff prior to being made accessible to the public. Manual submissions can be made via email or in person and are also mediated by login authenticated library staff.

Public access to data is controlled by an assigned access level. The levels of access are:

1. Open Access (available to all)
2. On Campus Access (available only to designated campus IP addresses)
3. Restricted Access (available only to designated IP addresses, email domains, email addresses, or specified user logins)
4. Special Permission (access must be authorized by a designated party and data must be viewed in a controlled and supervised setting)

Digital resources must be stored and maintained in a manner that is consistent with accepted best practices in the digital preservation community. This includes both technical infrastructure (hardware, software, network access, data backup, facilities, maintenance, etc.) and ongoing preservation management activities. Best practice in digital preservation requires duplicating digital objects in both local systems and geographically removed systems. Campus IT and contracted service providers supply redundant local and geographically remote storage. The Library is investigating other methods of storing data off site, such as in a private LOCKSS network, the HathiTrust, the Internet Archive, or another collaborative group. See: [http://scholarsmine.mst.edu/scpro\\_guidelines/11/](http://scholarsmine.mst.edu/scpro_guidelines/11/).

1. Repository databases have real-time redundancy that runs continuously, and full nightly backups are kept of the entire database.
2. Storage servers for production files have full hardware redundancy. It is protocol to create hourly and daily snapshots, and offsite backups of production file systems. In this case, 'offsite' means offsite from the service provider's co-location facility. Production files are mirrored every half hour, databases every 2 hours. A second copy of offsite backups is sent to Amazon S3. (Amazon S3 data is redundantly stored across multiple Amazon facilities and multiple devices in each Amazon facility.)
3. All uploaded files are stored in triplicate in a redundant storage cluster, as well as backed up offsite to a third-party cloud service, Amazon Glacier, that specializes in data archiving and backup. Glacier performs regular, systematic data integrity checks and is built to be automatically self-healing.
4. Copies of the repository are also pushed to Missouri S&T's Amazon S3 account. New content and revisions to existing content are pushed automatically to S3.

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5. Pre-production files and other source materials are maintained on storage servers provided by campus IT. These servers have real-time redundancy that runs continuously, and full nightly rotating backups are kept of the entire database. A second copy of these materials is maintained in Google Drive.

- See: <http://libguides.mst.edu/scholarsmine/backupstrategy>

All production servers are maintained at a high availability co-location facility with multiple backbone connections and backup generators, or in redundant Amazon Web Services availability zones. We maintain failover web, database, and storage servers to continue to serve content in case of failures. In the event of a natural disaster or other catastrophe, the repository and its data can be restored from the backups.

- See: <http://libguides.mst.edu/scholarsmine/backupstrategy>

Current data backup and recovery strategies were informed by the OAIS reference model, current best practices in the institutional repository and digital preservation communities, and an informal risk analysis conducted by the Repository Management Team in consultation with our campus IT department and other service providers.

A formal risk management analysis is being considered and will be undertaken in the future.

Upon ingestion into Amazon S3, copies are compared for evidence of degradation. Repairs are introduced, if necessary, and administrators receive notifications. Amazon S3 provides a highly durable storage infrastructure designed for primary data storage. Objects are redundantly stored on multiple devices across multiple facilities in an Amazon S3 region. To help better ensure data durability, Amazon S3 copy operations synchronously store data across multiple facilities. Once the objects are stored, Amazon S3 maintains their durability by quickly detecting and repairing any lost redundancy. Additionally, Amazon S3 also regularly verifies the integrity of data stored using checksums. If Amazon S3 detects data corruption, it is repaired using redundant data. In addition, Amazon S3 calculates checksums on all network traffic to detect corruption of data packets when storing or retrieving data. If evidence of degradation is detected, repairs are introduced, if necessary, and administrators receive notifications. This is the responsibility of our service providers and is addressed in their contractual obligation to the University.

## Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 10. Preservation plan

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

A digital preservation plan is in place and can be found at: [http://scholarsmine.mst.edu/scpro\\_guidelines/5/](http://scholarsmine.mst.edu/scpro_guidelines/5/). All public-facing policies and guidelines for digital preservation are accessible directly from the repository at: <http://libguides.mst.edu/scholarsmine/policies>. Documentation on internal processes and procedures related to preservation are maintained in a private wiki accessible only by authorized personnel. Review of these policies and procedures is performed by authorized administrators. Procedures are reviewed annually.

Preservation levels are clearly defined in our Policies and Guidelines.

- See Policy - Digital Preservation: [http://scholarsmine.mst.edu/scpro\\_guidelines/5/](http://scholarsmine.mst.edu/scpro_guidelines/5/)
- See Guidelines - File Format Support: [http://scholarsmine.mst.edu/scpro\\_guidelines/13/](http://scholarsmine.mst.edu/scpro_guidelines/13/)

All depositors must agree to a Non-exclusive Distribution License. This license grants The Curators of the University of Missouri on behalf of the Missouri University of Science and Technology (Missouri S&T) and Curtis Laws Wilson Library the right to distribute scholarly works online and to migrate these works to new formats in the future if necessary. No transfer of copyright will occur as a result of this license.

- See Non-exclusive Distribution License: [http://scholarsmine.mst.edu/scpro\\_guidelines/3/](http://scholarsmine.mst.edu/scpro_guidelines/3/).

Scholars' Mine is a mediated repository. As such transfers of custody are discussed and reviewed with the depositor prior to the acceptance of content by the repository.

The Non-exclusive Distribution License grants the repository the right to copy, transform and store items, as well as provide access to them.

- See Non-exclusive Distribution License: [http://scholarsmine.mst.edu/scpro\\_guidelines/3/](http://scholarsmine.mst.edu/scpro_guidelines/3/).

Actions relevant to preservation including custody transfer, submission standards, and archival standards are clearly specified in policies, licensing, and submission documentation. See: <http://libguides.mst.edu/scholarsmine/policies>. Additionally, these actions are discussed with depositors prior to the acceptance of content by the repository.

Measures are in place to ensure that all actions relevant to preservation are taken. These measures include periodic training, documented procedures, ingestion process reviews, and periodic procedural reviews.

### Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 11. Data quality

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

Data and associated metadata deposited in Scholars' Mine is in direct association with the research and research publications of members of our campus community. Such data is in support of active research projects and research that has already been accepted for publication or data published in standalone data publications. Additionally, research projects generating data for deposit in Scholars' Mine may be approved and funded by grants from respected and recognized agencies such as the Department of Transportation, the National Science Foundation, and others. These agencies require a data management plan which provides for an acceptable level of data and metadata quality. Also, the Scholarly Communications Librarian and other library staff are actively involved in advising and assisting researchers with data management prior to data submission. This provides an acceptable baseline for data and metadata quality. Further, data submissions are reviewed by a team of trained library staff prior to acceptance, to ensure an acceptable level of quality for the descriptive metadata and any associated data schemas and file structures. Any issues will be resolved in consultation with the researcher, and other subject experts if necessary prior to acceptance.

Scholars' Mine offers data management services to our campus researchers. A component of this service is advice on creating and maintaining quality metadata, as well as best practices in data management. The intent of this service is to ensure completeness and quality of the metadata before it is accepted into the repository.

- See Guidelines – Metadata Review at: [http://scholarsmine.mst.edu/scpro\\_guidelines/11/](http://scholarsmine.mst.edu/scpro_guidelines/11/)

Scholars' Mine is a mediated repository. All submissions are reviewed by qualified library staff prior to acceptance. This review may include the use of metadata review tools if they are available for the schema. Currently, there is no automated assessment of metadata adherence to relevant schemas.

The ability for users to comment on, and/or rate data and metadata is an option in Scholars' Mine which can be turned on at the request of the researcher. General feedback and comment forms are also available in Scholars' Mine. Additionally, Scholars' Mine provides for general feedback and comments as well as conducting periodic surveys as part of the library's assessment efforts.

- See: Contact Us at <http://libguides.mst.edu/scholarsmine/contact>

Citations to related works or links to citation indices can be provided in the descriptive data or in attached files. Additionally, data and associated research are cross-linked in the repository. A recommended citation to the data and associated research is also provided.

### Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 12. Workflows

### *Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

## Applicant Entry

### *Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

### *Self-assessment statement:*

The Research Data Processing Workflow can be found at: <http://libguides.mst.edu/scholarsmine/workflows>. Documentation on workflows and processes are maintained in a private wiki accessible only by authorized personnel. Maintenance of these processes is performed by authorized administrators. Processes are reviewed every three years, or more frequently if needed.

The Scholarly Communications Librarian is responsible for communications with campus researchers and research centers and labs who are our only data depositors. This communication occurs in several forms including:

- Data management workshops
- Departmental meetings
- Office of Sponsored Programs events
- One-on-one consultations
- Email
- Phone
- Flyers and other promotional materials

The Scholarly Communications Librarian is often directly involved throughout the research process by:

- Assisting in writing data management plans for grant applications
- Advising on metadata creation
- Advising on documentation
- Other advice where needed or requested

Additionally, the Scholarly Communications Librarian maintains web-based resources and guides which are available to our campus community:

- About Scholars' Mine: <http://libguides.mst.edu/scholarsmine>
- Guide to Research Data management: <http://libguides.mst.edu/data>

During the ingestion process, continual contact with the researcher is maintained by both the Scholarly Communications Librarian and Library staff. The primary points at which this contact may occur are:

- Deposit Review
- Quality Review
- Final Review

After publication of the data the Scholarly Communications Librarian will follow up with the researcher to ensure satisfaction. The researcher will also receive monthly reports of activity relating to published data which includes download and readership counts and other activity.

Communication with users of data is done primarily through information contained in the descriptive metadata and supplemental files provided with the data as well as online resources and guides (see above). Additionally, optional feedback forms can be made available to users as well as comment forms, surveys, email and other online forms of communications. Our comments and questions form can be found at:

[http://scholarsmine.mst.edu/comments\\_questions.html](http://scholarsmine.mst.edu/comments_questions.html)

Scholars' Mine operates in compliance with the laws of the United States and the state of Missouri which address confidentiality, privacy and protection of research participants. Relevant federal laws include:

- Protection of Human Subjects (45 CFR 46)
- The Family Education Rights and Privacy Act (FERPA)

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- The Health Insurance Portability and Accountability Act (HIPAA)

It is the responsibility of the researcher to conduct research in compliance with any applicable disciplinary norms and be in compliance with the University of Missouri's Collected Rules and Regulations (see: [https://www.umsystem.edu/ums/rules/collected\\_rules/research](https://www.umsystem.edu/ums/rules/collected_rules/research)). Researchers submitting data to Scholars' Mine are required to acknowledge that they are in compliance and to provide an assessment of any disclosure risk. Data with a high disclosure risk may be rejected and returned to the researcher with advice on how to lower the risk. Additionally, access to data with high disclosure risks can be secured through access control measures.

Prior to depositing research data the researcher would have been advised about privacy issues and provided assistance and advice on properly anonymizing the data. (see: Research Data Confidentiality and Ethics Policy at: [http://scholarsmine.mst.edu/scpro\\_guidelines/9/](http://scholarsmine.mst.edu/scpro_guidelines/9/)) Once submitted the data is reviewed, along with the researcher-provided risk assessment, by the Scholarly Communications Librarian. Acceptance decisions relating to privacy are made at this point. Outcomes include:

- Acceptance as-is
- Return to the researcher for revisions
- Rejection

An access level is also assigned at this point. Scholars' Mine offers four levels of access to data: (1) open-access, (2) access restricted to defined IP addresses or domains, (3) access restricted to specific users requiring login authentication, and (4) on-site access only under secure conditions.

All staff receive appropriate training in relation to handling sensitive data so there is minimal impact on workflow. However, materials receiving an access level of 4 are handled by the Scholarly Communications Librarian only.

The following qualitative and quantitative checks are performed:

- Researcher validation – The identity of the researcher is verified utilizing authority control procedures.
- Level of digitization – Determination of the appropriate level of digitization is done in conjunction with the researcher.
  - Level A – data, metadata, and documentation are fully digitized and anonymized.
  - Level B – data, metadata, and documentation are digitized at least to the level of scanned images and anonymized.
  - Level C – data, metadata, and documentation are in a non-digital format and anonymized. Level C data is converted to Level B or Level A after consultation with the researcher.
- Anonymization and confidentiality check – Non-anonymized data or data breaching confidentiality is returned to the researcher for editing/correction.
- Metadata check – The descriptive metadata must be comprehensible and clearly describe the dataset and its use. Enhancements to the metadata may be recommended to the researcher to more clearly describe the dataset and aid the user in interpreting the data. Additional recommendations may be made to include notes and other information in a bookmarked PDF user guide or 'Readme' file. (See Metadata Review Guidelines at: [http://scholarsmine.mst.edu/scpro\\_guidelines/11/](http://scholarsmine.mst.edu/scpro_guidelines/11/))

These checks are not performed:

- Data dimension checks (Qualitative data) – the researcher is encouraged to do this check.
- Data validity checks (Qualitative data) – the researcher is encouraged to do this check.

Appraisal and selection of data for acceptance into Scholars' Mine is done in accordance with our Collection Development Policy and our Digital Preservation Policy. (See Institutional Repository Collection Development Policy at: [http://scholarsmine.mst.edu/scpro\\_guidelines/12/](http://scholarsmine.mst.edu/scpro_guidelines/12/) and the Digital Preservation Policy at:

[http://scholarsmine.mst.edu/scpro\\_guidelines/5/](http://scholarsmine.mst.edu/scpro_guidelines/5/)) Data must be in association with research performed by members of our campus research community.

Data that does not fall within our mission/collection profiles is rejected. Advice may be given to the researcher concerning an appropriate alternative repository.

As a STEM campus we accept multiple types of data including:

- Observational data: data captured in real-time. Examples: Sensor data, telemetry, survey data, sample data, neuroimages.E
- Experimental data: data generated from lab experimentation and equipment. Examples: gene sequences, chromatograms, toroid magnetic field data.

- Simulation data: data generated from test models. Examples: climate models, economic models.
- Derived or compiled data: data that is reproducible. Examples: text and data mining, compiled databases, 3D models, data gathered from public documents.

Data will be in a variety of schemas and file formats. Our staff is well trained and our workflows general enough and flexible enough to handle such variety. Our hosting platform can accommodate a wide variety of metadata schemas and is customizable. Subject specialists and additional resources and assistance are readily available on our campus if needed. Additionally, we do not expect a high volume of submissions. Nor, do we expect a significant impact on our existing workflows.

Prior to depositing research data the researcher would have been advised regarding acceptable schemas and file formats to avoid the need for data transformation. In circumstances where the researcher is unable to transform the data to an appropriate schema Scholars' Mine may accept the data and perform the transformation with the researcher's permission and participation. This decision would be made during the deposit review. Transformation of the data would occur during the data production and documentation steps in the workflow.

The decision to perform data transformation on items in the repository due to format/schema obsolescence is made by the Scholars' Mine Management Team in consultation with the Scholarly Communications Librarian. A workflow and project plan would then be created to accomplish the transformation and the researcher notified and consulted.

Workflows are reviewed at least every three years, and more frequently if required by the Scholars' Mine Management Team. Any changes are discussed and then implemented through the creation of a project plan.

If a change in workflow is required for a specific data submission due to some unique characteristic or requirement, the workflow would be reviewed and adjusted for the specific submission by the Scholars' Mine Management Team. Such changes would be discovered during the deposit review.

## **Reviewer Entry**

*Accept or send back to applicant for modification:*

Accept

*Comments:*

### 13. Data discovery and identification

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

#### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

The repository offers full-featured search facilities including:

Designed to be searched with internet search engines.

- Service provider works closely with specialized search engines such as Google Scholar™ to ensure widespread and accurate coverage of content.
- Sitemap XML files are automatically generated, providing a road map for search engines to find all the repository content. When new content is posted, Google is automatically notified, further increasing the rate at which new content gets discovered.

- Page titles are structured to be unique across the repository as well as informative—using terms to help search engines and individuals better assess page relevance.

- The repository is efficiently managed to minimize search engine “crawl” errors.

Both simple and advanced searching is offered from within the repository.

Simple Search (See: <http://scholarsmine.mst.edu/>).

- The simple search will locate content that includes all of the terms you enter. The terms may be in any metadata field or in the full text.
- You may use a drop-down menu to specify content from the repository as a whole or across all repositories which use bepress™ Digital Commons.
- Additionally, if you are searching from a particular collection, you may use the drop-down menu to specify content from that collection/series.

Advanced Search (See: <http://scholarsmine.mst.edu/do/search/advanced/>).

The default advanced search is set to "All Fields," which will query all the criteria used in a simple search. You may refine results using the drop-down menus provided, for example:

- Abstract searches both the Abstract and Description metadata fields at once.
- Subject searches several metadata fields at once, including Subject Area, Disciplines, and Keywords.
- Document Type searches are case-sensitive. Examples include thesis, dissertation, and book.
- Publication searches for the title of the collection where the document is posted in Digital Commons. The full list may be found at <http://scholarsmine.mst.edu/communities.html>.
- Department(s) searches the Department metadata field.
- You may also use the +/- buttons to include an additional row of search criteria. When doing so, you will have the ability to specify whether the new row should narrow or broaden the results by using "AND," "OR," or "NOT" Boolean operators.

Searches may also be refined by date range or limit, sorted and exported:

- Date range limits results to content published within the specified period. The format for date range is MM/DD/YYYY - MM/DD/YYYY. Example: 08/01/2001 - 08/01/2011.
- Limit search to: You may use the drop-down menu to specify content from the repository as a whole, or across all repositories using bepress™ Digital Commons. Additionally, if you are searching from a

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particular publication/collection, you may use the drop-down menu to specify content from that publication.

- Sort by automatically displays results in order of relevance (i.e., closest match), but may be changed to publication date if desired.

Results Format (exports) –

- links is the default format. This returns the search results with links to document cover pages.
- Bibliography Export returns the search results in Refer format, suitable for import into ISI Bibliography programs, such as EndNote and ProCite.

Saving Search Results and Research Alerts - After formulating a search, there are two action choices in the bar above your results: "My saved searches" and "Save this search." To save the results of the search, click the "Save this search" button. For both actions, you must be logged in. Both actions will take you to a page entitled "Research Alerts," which contains:

- My Saved Searches. You can run searches from this page, see when the search was last run and if there are changes.
- My Email Preferences. This enables you to receive notifications of future content that matches your criteria.

Hierarchical Browsing - Content within the repository can be browsed using multiple multi-layer predefined hierarchical structures (See: <http://scholarsmine.mst.edu/>):

- Collections
- Disciplines
- All Authors
- Faculty Authors

- Expert Gallery – The expert gallery (currently under development) will allow users to discover subjects or research experts among our faculty. See: <https://works.bepress.com/experts/missouri-university-of-science-and-technology/>

Scholars' Mine supports Qualified Dublin Core. Metadata catalogs can be customized to specific collection requirements. Additional metadata standards/schemas can be accommodated if necessary.

Scholars' Mine supports the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) for the sharing of repository records. A number of options are available to ensure metadata is properly exposed to harvesters, making it discoverable through a variety of other platforms and services.

The repository participates in the Digital Commons Network - The Digital Commons Network brings together free, full-text scholarly articles from hundreds of universities and colleges worldwide. Curated by university librarians and their supporting institutions, the network includes a growing collection of peer-reviewed journal articles, book chapters, dissertations, working papers, conference proceedings, and other original scholarly work. (See: <http://network.bepress.com/about/>)

The repository is also listed in:

- OpenDOAR (See: <http://opendoar.org/>)
- ROAR (See: <http://roar.eprints.org/>)

Recommended citations are offered in the descriptive metadata and persistent-identifiers are provided for each repository entry.

## Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

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## 14. Data reuse

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

The repository maintains administrative and descriptive metadata in Qualified Dublin Core. These elements are required for research data:

- Creator (Author(s)).
- Date (Publication Date).
- Description (Abstract, TOC, etc.).
- Format (Size, duration, etc.).
- Publisher (Responsible entity).
- Rights (Property rights, Intellectual property rights, reuse rights).
- Title (Name).

As a mediated repository library staff evaluate submissions and augment the metadata as needed. Additional information will be added including:

- Contributor (Granting Agencies, Sponsors, Research Assistants, etc.).
- Coverage (Applicability of the data, Jurisdiction, Relevance).
- Date (Embargos, Restrictions to access, Duration of access, etc.).
- Description (Additional description, Usage information, Instructions, etc.).
- Format (Supplementary file formats, etc.).
- Identifier (Additional relevant identifiers).
- Language (Languages(s) used).
- Relation (Additional related resources both internal to the repository and external).
- Rights (Licensing, Usage rights, Limitations, etc.).
- Source (Derivative sources, etc.).
- Subject (Keyword, Phrases and Classification codes using controlled vocabularies).
- Type (DCMI file types).

If necessary the descriptive metadata will be customized to accommodate the submission. Additional descriptive files (readme files) may be used to further define the metadata.

Descriptive data is maintained in Dublin Core. The actual data files are maintained in file formats and types appropriate to the designated community. The repository has no restrictions on file formats or types.

Datasets associated with publications (Priority 1) and Stand-alone datasets (Priority 2) will be monitored for evolving or changing formats. Should changes be necessary, the researcher will be notified and appropriate actions taken with the researcher's consent and involvement.

The library maintains sufficient expertise internally and through other experts to ensure the success of any required future migrations of individual datasets. Our adherence to accepted standards and best practices should minimize any issues in this area.

Regarding migration to a new hosting platform, there are no plans for such a migration. Should it become necessary to do so, a plan would be created to ensure a successful migration. Here again adherence to accepted standards and best practices should minimize any issues.

As a mediated repository, library staff work directly with researchers both before and during data submission. Issues relating to the understandability of the data are reviewed and addressed. Solutions include:

CoreTrustSeal Board

W [www.coretrustseal.org](http://www.coretrustseal.org)

E [info@coretrustseal.org](mailto:info@coretrustseal.org)

- Augmenting descriptive metadata
- Customizing descriptive metadata
- Providing readme files with additional description, instructions, etc.
- Making changes to the data file formats, structure, etc.

## **Reviewer Entry**

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 15. Technical infrastructure

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

By default the repository is able to support a wide range of international and community standards, including but not limited to OAI-PMH, ETD-MS, U.S. Federal Government Section 508 Guidelines, guidelines of the W3C Web Content Accessibility Guidelines, and guidelines for inclusion in community initiatives such as OpenAIRE, SHARE, RIAN, NDLTD, DPLA, Library Archives Canada, Portico, and CLOCKSS.

Here is a partial list of standards used:

#### Web accessibility

- Section 508, an amendment to the United States Workforce Rehabilitation Act of 1973, is a federal law mandating that all electronic and information technology developed, procured, maintained, or used by the federal government be accessible to people with disabilities.
- Web Content Accessibility Guidelines (WCAG) 2.1 defines how to make Web content more accessible to people with disabilities. Accessibility involves a wide range of disabilities, including visual, auditory, physical, speech, cognitive, language, learning, and neurological disabilities.

#### Metadata harvesting

- OAI-PMH - The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) is a protocol developed for harvesting (or collecting) metadata descriptions of records in an archive so that services can be built using metadata from many archives.
- ETD-MS - an Interoperability Metadata Standard for Electronic Theses and Dissertations

#### Metadata Schemas

The repository can house data in any known schema including:

- Dublin Core
- Darwin Core
- EAD
- RIF-CS
- DDI
- MARC
- METS
- MODS
- And others

#### Default metadata Values

##### Geographic Coverage

- Getty Thesaurus of Geographic Names (TGN)
- Library of Congress Authority File
- ISO 3166
- DCMI Point (Coordinates)
- DCMI Box (Value string)

#### Time Period

- Library of Congress Authority File
- DCMI Period (Text String)
- W3C-DTF (Date and Time formats)

#### File Types

- Internet Media Types [MIME]

#### Identifiers

- Government Document Classification System
- International Standard Book Number Classification System
- International Standard Music Number Classification System
- International Standard Serial Number Classification System
- US Patent Office Patent Classification System
- Serial Item and Contribution Identifier Classification System

#### Language

- ISO Language Codes 639-1
- ISO Language Code 639-2

#### Subjects and Keywords

- Library of Congress Authority File
- Medical Subject Authority File
- Local Authority File

#### Document Type

- DCMI type vocabulary

#### Relations

- WC3
- DOI

Standards are reviewed every three years or more frequently if needed.

Standards were implemented throughout the design of the repository from planning through implementation. Some standards were in place in the selected software platforms. These platforms were chosen because of their use and conformance to accepted standards. Other standards were implemented during the creation of content collections in the repository.

Currently, as new submissions are processed they are reviewed by qualified library staff to confirm that they conform to accepted standards or determine if a new metadata schema (standard) is required to ensure that the submission meets the requirements of the repository and the expected community of use. New metadata standards and requirements are reviewed by the repository management team and approved by the Scholarly Communications Librarian and the Metadata Services Librarian. New standards or changes affecting the overall operation of the repository are approved by the Scholarly Communications Librarian in consultation with the Advisory Committee.

Current repository infrastructure is based in the cloud through services provided by bepress™ and our mirrored service through Amazon S3. Additional infrastructure for the storage of support files, working files and full resolution graphic files is maintained on local servers. All contents is organized in a file/folder hierarchy and the Amazon S3 service mirrors the file/folder hierarchy maintained by bepress. The infrastructure provided by bepress and Amazon is adequate for our needs and there are no plans for changing it.

Currently, we are planning on implementing a streaming service for video and audio content through bepress™. Current content is streamed via a local server. bepress™ has recently increased storage and bandwidth capacity to accommodate large datasets. There are no additional planned changes to this infrastructure at this time.

The library does maintain a separate set of servers for preprocessing, streaming, and dark archiving. These servers are managed locally by campus IT. We control this local infrastructure and the file/folder hierarchy is periodically reviewed and modified if necessary. We also expand storage requirements as necessary. We are also exploring the possibility of utilizing either Amazon or Google for dark archiving. There are no additional infrastructure changes planned.

A software inventory and system documentation are maintained in a private wiki and through vendor support sites.

#### CoreTrustSeal Board

W [www.coretrustseal.org](http://www.coretrustseal.org)

E [info@coretrustseal.org](mailto:info@coretrustseal.org)

JabRef, an open source bibliography reference manager is used in the preprocessing of content for the repository and as a support database of citations housed in the repository. JabRef uses BibTeX as its' native file format and has been customized for managing our faculty's research and publication records, and to produce exportable bibliographic files which can be ingested into our repository. No other community supported software is used.

A variety of commercial software is used in our digitization processing including the Adobe suite of products, Abbyy FineReader, and others.

Real time data streaming is not available. Access to data files housed in the repository is via download. Connectivity is fully redundant with multiple upstream links and can handle speeds of up to 1 Gbps.

## **Reviewer Entry**

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 16. Security

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

### Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

Our service provider (bepress™) maintains production servers at a high availability colocation facility with multiple backbone connections and backup generators or in redundant Amazon Web Services availability zones. Additionally, they maintain failover web, database, and storage servers to continue to serve content in case of failures. All critical system metrics are automatically monitored, including server response time for static and dynamic pages and web server load. Engineers are on call 24/7/365 if load begins to impact services, investigation begins immediately, and restoration is top priority. (See our backup strategy: <http://libguides.mst.edu/scholarsmine/backupstrategy>)

- For additional information see: [https://www.bepress.com/reference\\_guide\\_dc/safeguarding-content-digital-commons/](https://www.bepress.com/reference_guide_dc/safeguarding-content-digital-commons/)

System security is managed by the Scholarly Communications Librarian in consultation with the Campus Security officer when necessary. Security and disaster management for the repository is contracted to our repository vendor (bepress™). bepress™ follows a best practice approach for all security issues. The repository is monitored against attacks and suspicious behavior. Appropriate actions are taken to reduce spam and encrypted backups are sent to Amazon S3.

- See: [https://www.bepress.com/reference\\_guide\\_dc/safeguarding-content-digital-commons/](https://www.bepress.com/reference_guide_dc/safeguarding-content-digital-commons/)

The repository resides in the cloud in a hosted environment. Our contractual arrangement with our service providers ensures that in the event services are discontinued for any reason all descriptive and administrative metadata and all digital objects within the repository will be returned to the University. The University would then recreate the repository in another environment.

A comprehensive risk analysis is scheduled to occur in 2018 using the DRAMBORA toolkit.

### Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*

## 17. Comments/feedback

*Minimum Required Statement of Compliance:*

0. N/A: Not Applicable.

## Applicant Entry

*Statement of Compliance:*

4. Implemented: This guideline has been fully implemented for the needs of our repository.

*Self-assessment statement:*

For more information visit:

- Scholars' Mine: <http://scholarsmine.mst.edu/>
- About Scholars' Mine: <http://libguides.mst.edu/scholarsmine>
- About SelectedWorks: <http://libguides.mst.edu/selectedworks>

This application is being done in preparation for the receipt of research data from several campus research centers. These centers focus on research funded by the United States Department of Transportation. Additionally, this research data will be referenced by the Missouri Department of Transportation and other Research Centers Nationwide.

## Reviewer Entry

*Accept or send back to applicant for modification:*

Accept

*Comments:*