



SURVEY RESULTS

EXECUTIVE SUMMARY

Introduction

ARL member libraries increasingly create, acquire, disseminate, and curate both digitized and born digital content. As a result, they have a growing awareness of and a pressing need for information on field-wide activities and plans to support the life cycle needs of these digital collections. Until now, however, relatively little information has been gathered or reported about ARL libraries' digital preservation practices and policies. This was the first SPEC survey to focus on the preservation of digital, rather than physical, materials. The definition of digital preservation includes the policies, strategies, and actions that ensure access to digital content over time.

The survey sought to identify the strategies that ARL member institutions use to protect evolving research collections and to describe the roles and responsibilities of stakeholders. It asked ARL libraries about their digital content, their strategies for preserving that content, and the staff, time, and funding they currently devote to digital preservation. It also asked each responding library to compare its digital preservation activities of three years ago to current activities and project three years into the future. In addition, to better understand the roles of research libraries in the emergent field of digital curation, the survey sought to identify issues that are and are not being addressed through current practices and policies.

The survey was conducted between March 14 and April 18, 2011. Sixty-four ARL members completed the survey for a response rate of 51%. Using the survey data and open-ended comments, this report summarizes how those libraries currently think about the preservation of their digital collections and what preservation activities they are now undertaking.

Digital Content

The survey asked what types of digital content the library licenses or manages for its institution and which content it is investing in for the purpose of preservation. Almost every library responding to this survey is responsible for managing digitized special collections, licensed materials (e.g., ejournals and databases), still images, electronic theses and dissertations (ETDs), moving images, and audio materials. Fewer than a third identified research data (including data sets and geospatial data), mass digitization collections, or art databases as current responsibilities, and only a handful manage web-harvested materials (19 or 30%) or computer games (12 or 19%).

Eighty percent of the responding libraries (51 of 64) now preserve some of their digital content and another 16% plan to do so in the future. One astute respondent commented, "This content [we have purchased or licensed from publishers] represents a significant investment of resources, whether financial, staff, or technology." Another pointed out that ensuring investments in digital preservation is "our only way to guarantee continued access to (scholarly) information in the future."

Only three respondents are not planning to preserve digital content at all. They cited the lack of experienced staff, funding for hardware and software, and institution-wide policies and strategies for digital preservation as significant barriers to preservation. Support, and ultimately approval from upper administration, for policies and strategies is deemed critical.

The categories of digital resources that most libraries are managing for their institutions are also the resources that most have chosen to preserve: digitized special collections, still images, ETDs, audio materials,

and moving images. The significance of these collections is primarily predicated on the uniqueness and overall importance of special collections and graduate student research. Respondents referred to special collections as “core (to) our identity” and “unique,” and likewise referred to ETDs as “unique output by the university community” and figure as “part of the university’s official record.”

Surprisingly, although 94% of respondents are managing licensed materials such as e-journals and databases, only 59% say that they are planning to preserve them. Ranking near the bottom of the preservation priorities are administrative records, web-harvested materials, applications/operating systems/other software, and computer games.

Local Preservation Activities

Most of the responding libraries are actively engaged in digital preservation in-house rather than outsourcing it to external parties. Ninety percent reported that they are engaged in or intend to engage in *local* activities to preserve their digital content. Half of these respondents reported that they are running digital preservation solutions in-house for their most important collections, and nearly a quarter reported that they are also running collaborative digital preservation solutions that have a local component.

Respondents described a number of factors they consider when selecting digital content for local preservation efforts. The most consistently cited criteria include local scholarly use (faculty research needs, user needs, etc.), investment level (purchased content, digitization projects, etc.), and risk factors (uniqueness, condition, etc.). Approximately 42% of respondents explicitly mentioned faculty research needs, scholarly output, and/or user needs as drivers for prioritizing content for preservation. Nearly as many give priority to content or collections that represent a significant institutional investment, including the products of digitization projects. Several institutions give priority to digital surrogates for fragile materials that preclude handling the originals. Risk factors such as uniqueness, rarity, and/or significance were also primary preservation criteria. Many institutions are making efforts to address local scholarly use, investment level, and risk factor criteria simultaneously.

When asked who will make local selection decisions, respondents most often mentioned digital initiatives librarians or collection managers. Slightly less frequently mentioned were special collections librarians and archivists. Content providers, repository managers, and library administration were least often mentioned.

Preservation Strategies: Formats

While the survey sought to gauge the current approaches research libraries use for prioritizing content and collections for long-term preservation, some of the key aims of the survey were to identify prevailing digital preservation solutions and strategies, including migration to archival formats and bit-level preservation, or combinations of these two approaches.

The question of broad support for digital formats and/or successful migration to archival quality formats has remained a topic of great interest in the digital preservation community. The survey asked if the library limits, or plans to limit, the file formats they preserve locally. Slightly more than half of the responding institutions report that they are already limiting file formats for preservation purposes. This decision is heavily influenced by concerns about format viability and technical capacity (infrastructure). As one respondent stated, “Greater uniformity of format makes management, future migration, and development of processes for ingestion, QC [quality control], and access/delivery easier.”

Several respondents mentioned the lack of available migration tools for many formats and lack of support for multiple formats in their current software repository systems. Respondents also cited a lack of financial resources as a reason for limiting formats. One institution put it succinctly, “It is ultimately an issue of time and money, in that more file types require more support. In addition, we want to focus as much as possible on archival formats (i.e., XML and non-lossy image formats) that further restricts supported file types.”

The vast majority of research libraries are committing to support only content that is deposited in an archival format or for which they have some assurances of migrating. Only a quarter of respondents have committed to more flexible support for many or

all formats, reporting either baseline bit-level preservation or some combination of format migration and bit-level preservation. Those that are not setting such limits provide credible reasons for preserving a broad range of files, including that they can preserve all formats at bit-level and consider this worthwhile for valuable resources, regardless of format. As one respondent stated, “We anticipate being able to provide bit-level preservation for any file format contributed by a member of the community that falls within the archiving scope for the repository, but will not be able to provide a full suite of preservation services for all file formats due to practical limitations such as inability to locate and implement migration tools.”

Preservation Strategies: Metadata

Fifty-one institutions reported having or creating a broad range of preservation metadata for their digital collections. Nearly all reported that they create some item-level metadata (48 or 94%), and many also create some collection-level metadata (42 or 82%). All 51 respondents reported collecting administrative metadata (e.g., access privileges, rights, ownership of material), and all but one also collect technical metadata (e.g., information describing the production process or digital attributes of the work). Slightly fewer (approximately 84%) report collecting metadata about structure or provenance at this time.

Fifty respondents reported using multiple schemas to describe their digital collections. Of these, the most popular metadata formats are Dublin Core (40 or 80%), Qualified Dublin Core (35 or 70%), and METS (35 or 70%). Slightly more than half (26 or 52%) also reported using PREMIS. As is typical in the ARL community, many reported using additional metadata schemas in their digital collections management practices, including EAD, NLM, FGDC, IPTC, MIX, TEI, RDF, MARC, VRA Core, PBCore, AESS, and Darwin Core.

Preservation Strategies: Policies

The survey sought to gauge progress toward the development and adoption of formal digital preservation policies that have been well researched in regard to prevailing standards, are developed with key stakeholders, and have a goal of securing support from upper administration.

Collaboration is a significant factor in current preservation planning and activities. A solid majority of respondents (42 or 70%) are working with other stakeholders within their parent institutions as they make decisions about digital preservation policies and investments. Most of these are working with campus IT, faculty, and administration.

Policy development is underway in a large majority of the responding libraries, but only two institutions have approved digital preservation policies in place. Discussion of preservation policies is underway at 27 of the responding libraries (44%), and 13 (21%) have written drafts. Of those libraries that are in discussion and draft stages, the majority are approaching policy development as a campus-wide initiative, inclusive of stakeholders beyond the library such as campus IT, university archives, offices of scholarly communication, offices of strategic initiatives, and digital services, among others.

On the whole, the responding libraries are consulting well-developed, community-derived digital preservation standards. These include resources such as the Reference Model for an Open Archival Information System (OAIS), the Trustworthy Repositories Audit & Certification: Criteria & Checklist (TRAC), JISC's Digital Preservation Policies Studies, along with the Interuniversity Consortium for Political and Social Research (ICPSR) and Cornell's Digital Preservation Policy Framework, among others.

Based on respondents' comments, it is much more likely that a group within the library, rather than an individual, will have primary responsibility for researching and developing the library's digital preservation policies. These groups are not likely to have membership from outside the library. In the relatively few libraries that give an individual policy development responsibility, it is typically a digital initiatives librarian or special collections head.

Similarly, the authority to approve the library's digital preservation policies and investments resides with a library group, which usually includes a library administrative team. A majority of respondents (60%) indicated that library administration has primary responsibility for authorizing and approving digital preservation policies. Only a few explicitly indicated that an authority external to the library (e.g.,

the university president, vice provost, university IT, or campus CIO) would have a role in approving the library's digital preservation policy.

Resources and Funding

Most of the respondents report they are now funding digital preservation through a mixed revenue model that includes a range of internal and external funding sources. The good news is that 83% of respondents report that their libraries fund at least part of their digital preservation activities through their general operating budgets. More than a third report having a dedicated preservation budget. Many also report that other internal funding lines, including their IT budgets (62%) and their materials budgets (38%), cover a portion of their digital preservation work. Grants and awards still provide a hefty percentage of funding (38%), and some institutions (35%) report even having gifts and endowments as an additional, and growing, funding source for digital preservation. Almost all expect their funding to increase or at least stay about the same in the next three years. Interestingly, only two respondents speculated that funding might decrease in part because "...there will no longer be the costs of setting up various parts of the preservation activities."

Survey respondents' comments reveal that funding fluctuations, both positive and negative, are often tied to grant money, including state funds, National Science Foundation (NSF) grants, and National Digital Information Infrastructure and Preservation Program (NDIIPP) awards. Other respondents referred to the shift from print-based work to digital work and the resulting increase in funds available for digital preservation, though as one respondent noted, "The shift is slow."

When asked to compare today's levels of investment in staff, time, and funding to the investment levels of their libraries three years ago, the majority of respondents reported that they are investing more. Two-thirds say they have more staff devoted to digital preservation, three-fourths say they are investing more time, and 60% say that they are spending more money on digital preservation. Only three respondents (6%) report that they are investing less staff and time, and seven (15%) are investing fewer dollars in digital preservation.

Twenty-nine of the 45 university libraries (64%) have from one to three FTE responsible for digital preservation. But at seven libraries there is less than one FTE. Usually the digital preservation responsibilities are divided among two or more library staff and only rarely is an entire FTE embodied in one individual.

Barriers to Digital Preservation

The survey sought to gauge both the willingness and capacity of respondents to keep pace with the growth of digital content at their libraries. Not surprisingly, almost all of the respondents (46 or 94%) stated that their libraries want to invest in preserving more digital content than they currently do, but their comments indicate they face a number of similar barriers to additional efforts. The most frequently reported barriers to preservation were staffing and expertise. The responding libraries are struggling to dedicate staff to digital preservation and to foster staff expertise to keep pace with the technical challenges inherent in digital content, technical infrastructures, and digital preservation best practices.

Funding and resources for technical development, equipment purchases, and support for on-going operations were also frequently cited barriers. Several institutions reported having difficulty making the transition from grant-funded support to dedicated institutional funding for sustained operations. Finally, several libraries reported that their institutions lack clear institutional policies and/or strategies for guiding investments. Other less-cited, but still significant barriers include legal issues regarding deposit, lack of trustworthy repository status, and the absence of reliable standards for complex digital data.

Thirty-four libraries reported they plan to manage a digital archive/repository that is intended to support preservation functions. But strikingly, 70% of these respondents reported that some institutional units, including academic units, administrative units, and data centers, are "indifferent" to deposit, or are "not actively seeking deposit." They cited several commonly perceived and expressed barriers to deposit, such as awareness, library capacity (real or perceived), complicated submission workflows, and concerns about future access to their content.

Despite real and perceived barriers to digital preservation progress, the responding libraries are moving forward—planning to preserve more content, improve their strategies, and develop policies that will better ensure the long-term viability of their digital assets.

Future Digital Content

Only a few of the libraries responding to the survey are satisfied with maintaining their current levels of digital preservation. As mentioned previously, most libraries do want to preserve more, especially collections such as research data, geospatial data, various media, faculty research, university history, and web content. Those that are not already hosting and preserving ETDs and digitized special collections commented that these would probably receive their attention in the future when additional resources allow expansion of their activities. Most reported conditions similar to one respondent who stated, “All areas will require more, set by collection priorities and risk.”

Future Preservation Strategies

Compared to three years ago, most of the responding libraries are currently investing more staff, time, and funding in their digital preservation activities. The majority anticipate that this trend will continue over the next three years. As one respondent said, “Increased reliance on digital resources has made this imperative.” Another commented, “As the library’s digital collections grow in size and diversity, so too will the need for staff working in all aspects of digital preservation.” Only four libraries expect their investment to decrease. As one respondent stated, “It’s hard to predict an increase in our funding/budget situation going forward given the current climate. As a result, we can only be pessimistic for purposes of this survey and expect the worse: further budget cuts or at best, level funding. We do continue to actively pursue research grant opportunities, however.”

Currently, respondents use a range of strategies for preserving most digital resources. Their first choice solution is using a library-managed digital archive/repository. This strategy is followed by collaborative solutions, either with other administrative and/or technical units in the institution, in a participatory

solution such as the MetaArchive, or in a hosted solution such as the HathiTrust.

While the majority of respondents predict that using a library-managed digital archive/repository will remain their primary strategy, an increasing number anticipate that participating in collaborative solutions will be part of their future strategy. Nearly 25% of those that expect to collaborate are not currently collaborating as part of their preservation strategy. A vendor-based solution is the least likely future preservation strategy. Among the “other” anticipated strategies, respondents mentioned homegrown solutions and institutional and statewide repositories.

When attempting to explain why future strategies might be different from their current preservation strategies, three reasons were cited most frequently: 1) They are not now, but they plan to collaborate. 2) Their repositories will develop further. 3) They will take advantage of third-party or remotely hosted solutions (HathiTrust usually). Also mentioned, but less often, were changes due to centralization of efforts within their institutions.

Training

Research libraries are turning to institutional peer staff and seeking broader community-based opportunities to improve expertise in digital preservation. The vast majority of respondents reported that conferences and workshops are the primary methods used to increase staff expertise. Independent study is another frequently used method. Thirty-six respondents (62%) take advantage of training provided by professional organizations. Fewer look externally to vendors or consultants. Several rely on in-house training or presentations by library staff.

When asked what types of services their library would find valuable for improving its role in preserving digital content, respondents identified standards/best practices (81%), preservation planning (76%), and policy recommendations (75%) as their top needs. A slightly smaller majority expressed a need for technical training (71%) and conversion/migration services (61%). Interestingly, slightly less than half would find appraisal and selection training valuable, and one-third want theory training. This may indicate that research libraries are eager to move past conceptual

decision-making and are beginning to make practical progress in accomplishing digital preservation.

Conclusion

ARL libraries curate a diverse and growing range of digital collections that include digitized and born-digital special collections, licensed materials (e.g., ejournals and databases), research data, art databases, web-harvested materials, administrative records, and electronic theses and dissertations (ETDs). The curatorial challenges they face for these assets are acute. The collections often began with ad-hoc and idiosyncratic data storage structures resulting from project-driven needs (e.g., to host scanned copies, to amalgamate data in a variety of formats and databases, or to establish an effective workflow for accepting born-digital works). Of necessity, the libraries have allowed these collections to expand and have regularly acquired new digital collections over the last several decades before they could implement clear mechanisms for the preservation of this digital content.

Today, methods for preserving digital content are becoming standardized and digital preservation models (e.g., MetaArchive, UC3 Merritt, DAITSS, HathiTrust) are readily available in the field. This survey revealed, as the digital preservation field is maturing, that most ARL libraries are rising to the challenge of establishing policies, workflows, and infrastructures to systematically preserve their rapidly expanding bodies of digital content. The survey also revealed that most ARL libraries are actively engaging in in-house digital preservation rather than outsourcing it to external parties, thus maintaining their control and ownership over the digital content that they curate. Survey respondents also predicted that they would continue turning to library-managed and collaborative solutions over vendor-based, hosted solutions for their core collections.

Tempering our excitement at the unprecedented levels of reported preservation activity are some of the comments made throughout the survey that demonstrate that the definition of “digital preservation” is still murky for some librarians. A number of respondents confused “back ups” with “preservation” and referred to access-oriented repository services as though they were preservation solutions. For

example, respondents stated that they are “organizing and backing up digital assets in-house,” and named non-preservation services, such as Archive-It, as their preservation strategies. However, others are quite sophisticated in their understanding of preservation and their responsiveness to the current environment, including one member who reported, “We’re keeping our eye open for the most effective strategy...right now it is hedging by employing multiple options.” This mixture of responses demonstrates that there is still a serious need for training opportunities in digital preservation and life-cycle curation for the ARL community.

Judging by the survey findings, most ARL libraries view digital preservation as a complicated mix of technical and organizational responses to the needs of aging content. Most also see the provision of digital preservation services for their campuses as a key component of their 21st century missions. They are actively expanding their policies, workflows, and technical capacity for preservation.

This expansion is, in itself, challenging. It requires a paradigm shift in thinking about the library’s mission as an active caretaker of non-physical content; it also requires heavy resource allocations to establish a solid infrastructure for digital life-cycle curation. However, there is a second challenge that ARL libraries cite and must respond to at the campus level. Respondents report that other campus entities (e.g., research data centers, administrative units) are often both unaware of the library’s growing capacity for digital curation and ambivalent at best about engaging the library’s services for their own data collections. If ARL libraries are to maintain their core role as the campus’s source for collecting, providing access to, and preserving not just analog but also *digital* collections, they must find new ways of engaging with their campus constituents, including through advertising these services and engaging directly with the content producers. Doing so will help to ensure that the campus turns to a central entity—the library—to maintain its scholarly communications channels and materials in the increasingly digital age, rather than distributing this responsibility across other campus units or outsourcing it altogether.

SURVEY QUESTIONS AND RESPONSES

The SPEC survey on Digital Preservation was designed by **Gail McMillan**, Director of Digital Library and Archives, Virginia Tech; **Matt Schultz**, Collaborative Services Librarian for the Educopia Institute; and **Katherine Skinner**, Executive Director of the Educopia Institute and Program Manager for the MetaArchive Cooperative. These results are based on data submitted by 64 of the 126 ARL member libraries (51%) by the deadline of April 18, 2011. The survey's introductory text and questions are reproduced below, followed by the response data and selected comments from the respondents.

Though ARL has periodically gathered data about preservation practices and policies, past surveys have largely focused on the preservation of the library's physical materials. Now that libraries are providing an increasing number of digital resources, both digitized and born-digital, there is an increased awareness of and a pressing need for information on activities and plans to support digital collections. However, relatively little has been amalgamated and reported about digital preservation practices and policies. By completing this survey, your institution has the opportunity to contribute to a more complete picture of the ARL digital preservation landscape.

This survey is the first SPEC survey that focuses on *digital preservation* that will document and identify the range of issues and how ARL members are addressing them. The definition of digital preservation includes the policies, strategies, and actions that ensure access to digital content over time. Preservation is not just back up, but the managed set of activities necessary to ensure that digital content remains viable, usable, and renderable into the future (preservation metadata, format migration, fixity checking, etc.) This survey encompasses all of the ways in which a library may be investing to advance digital preservation, for instance locally managing digital content, collaborating within or across institutions, or using a vendor-based hosting solution.

BACKGROUND

1. What types of digital content (digitized or born-digital) is your library currently licensing or managing on behalf of your institution? Check all that apply. N=63

Digitized special collections	61	97%
Licensed materials (e.g., e-journals, databases, etc.)	59	94%
Still images	58	92%
ETDs (electronic theses and dissertations)	56	89%

Moving images	55	87%
Audio materials	54	86%
Library or IT-hosted web resources (e.g., institutional websites, discussion lists, scholarly portals, etc.)	40	63%
Research data or datasets (e.g., engineering, architectural, geospatial, etc.)	38	60%
Mass digitized collections	38	60%
Any art or visual materials with a database or digital component	37	59%
Administrative records (e.g., Word documents, spreadsheets, databases, e-mails, etc.)	25	40%
Applications, operating systems, or other software	23	37%
Web-harvested materials (e.g., externally hosted websites, discussion lists, scholarly portals, etc.)	19	30%
Computer games	12	19%
Other content	8	13%

Please specify the other content.

Conference proceedings hosting, e-journals hosting.

Current newspaper content.

Electronic journals hosted locally.

Research and scholarly publications such as pre-prints, post prints, and conference presentations.

Scholarly articles in PubMed Central.

Scholarly papers, technical reports, grey literature.

State government reports, environmental resource inventories.

TEI-encoded texts; HTML-encoded texts.

2. Is your library actively investing in the preservation of any of this digital content (as defined in the introduction), either alone or in collaboration with other entities? N=64

Yes	51	80%
Not yet, but planning to	10	16%
No	3	5%

Comments

At this point, only through third parties like HathiTrust.

Current investment is modest, but expanding.

Involved with several digital preservation network initiatives.

Looking into TRAC DRAMBORA to find out what we need to do this. Also looking into Cloud based distributed storage.

Only our ETDs could be considered actively preserved at the present time. Our other digitized materials are still handled in a pretty ad hoc manner, which is a cause for concern. Unfortunately, we are still at the very beginning of our efforts to develop a real digital preservation program.

Our library has an agreement with JSTOR, has contributed to the Internet Archives by paying for digitization of monographs in our collection and is a member of the Ontario Council of University Libraries which pays for the ongoing development of Scholars Portal and the activities underway to achieve TDR status.

Very preliminary discussions prior to beginning planning.

We are a Hydra partner, primarily with Stanford & Hull, but with the Hydra community, as well.

We have invested and are continuing to invest in in-house software development, hardware, storage platforms, and digitizing equipment.

We have joined LOCKSS, and are thinking about joining HathiTrust. We are also members of Portico. We are currently writing a digital preservation action plan and will begin evaluating other solutions for digital preservation soon.

We store files on a server with some basic preservation measures, but have not yet implemented a full-fledged digital preservation model.

We're in the organizational stage of building a sustainable digital preservation program. So far, we have data organized and backed up and have created policy surrounding it, but have no software system in place to manage it and no specified source of established, ongoing digital preservation funding.

If you answered "Yes" or "Not yet, but planning to" please continue to the next screen. If you answered "No," when you click the Next>> button below you will jump to the Barriers to Investing in Digital Preservation section.

DIGITAL CONTENT BEING PRESERVED

If your library is planning to invest in the preservation of any digital content, please answer as many of the following questions as possible based on your current plans.

3. Please indicate which types of digital content (digitized or born-digital) your library is investing in (planning to invest in) for the purpose of digital preservation. Check all that apply. N=61

Digitized special collections	56	92%
Still images	55	90%
ETDs (electronic theses and dissertations)	54	89%
Audio materials	51	84%
Moving images	50	82%
Research data or datasets (e.g., engineering, architectural, geospatial, etc.)	50	82%
Mass digitized collections	42	69%
Any art or visual materials with a database or digital component	36	59%
Licensed materials (e.g., e-journals, databases, etc.)	36	59%
Library or IT-hosted web resources (e.g., institutional websites, discussion lists, scholarly portals, etc.)	32	53%
Administrative records (e.g., Word documents, spreadsheets, databases, e-mails, etc.)	30	49%
Web-harvested materials (e.g., externally hosted websites, discussion lists, scholarly portals, etc.)	27	44%
Applications, operating systems, or other software	13	21%
Computer games	6	10%
Other content	7	12%

Please specify the other content.

As of yet we have no concrete plans, just desires.

By the end of the summer we will be managing data/datasets & ETDs. By the beginning of April we will be collecting open access scholarly works from faculty. Our focus is on preservation & access.

Current newspaper content.

Electronic journals locally hosted.

Research and scholarly publications such as pre prints, post prints, and conference presentations.

Scholarly papers, technical reports, grey literature.

TEI-encoded texts, HTML-encoded texts.

DIGITAL PRESERVATION POLICIES

4. At what stage of development are your library's digital preservation policies? N=61

Not yet started	6	10%
In discussion stages	27	44%
In draft written stages	13	21%
Written but not reviewed	2	3%
Written and under review	2	3%
Approved	2	3%
Other stage of development	9	15%

Please describe the other stage of development.

Digital preservation policy for local digital repository has been approved.

I am making ad hoc decisions about what to formally preserve at this time.

It is selective, i.e., to a relatively high stage in a digital asset agreement form for digital projects, but still in discussion for all digital assets needing preservation.

Local digital projects in discussion; licensed materials preserved via protocols also in discussion.

Nothing exists locally.

Of course, this is only true of the highest-level digital preservation policies, not the policy surrounding the technical specifications of the proposed program.

Repository dependent. Some are more far along than others. There is no library-wide digipres policy as of now.

The Digital Preservation Decision Tool has been approved, but we are in the process of moving to a new digital preservation system, Rosetta, and a new records management program, Filenet.

Written and approved at a broad level as part of a general preservation policy. Due to be reviewed and updated.

5. Please briefly describe which individual or group has (will have) primary responsibility for researching and developing your library's digital preservation policies. N=55

A leadership team with members from the digital library group, library IT, and the special collections library.

A preservation steering committee.

Ad hoc group composed of Digitization Librarian, University Archivist, Special Collections Librarian, Assistant Special Collections Librarian, Assistant University Librarian for Information Technology, and University Photographer. Other library personnel are as needed.

Associate Dean for Special Collections and Digital Initiatives, head of Digital Library Center, Associate Dean for Digital Scholarship and Technology Services, Dean of Libraries.

Assistant Director for Digital Information.

Collaborative efforts between the library, library information technology services, institutional information technology services. Within the library, department of preservation, institutional repository manager, and information technology services.

Collaborative process: Preservation and Conservation Services; Institute Archives and Special Collections; Scholarly Repository Services Manager; Technology Directorate.

Collaborative. Members include Library Technologies, Special Collections, Collections and Technical Services.

Department of Digital Scholarship and Programs.

Digital Collections and the Library Technology Division, in conjunction with other library departments under the auspices of the Digital Library Coordinating Committee.

Digital Initiatives: Coordinator of Digital Initiatives and Associate Dean for Technical Services.

Digital Initiatives unit.

Digital Initiatives Librarian.

Digital Library Initiatives Department, Library Systems, and Special Collections.

Digital Library Program, Collection Development.

Digital Library Services.

Digital Preservation Committee.

Digital preservation librarian, consulting with relevant stakeholders.

Digital Preservation Team is currently undertaking this work. A Digital Preservation Officer/Digital Preservation Librarian is currently being recruited. Chief Librarian will ultimately approve and sign off on digital preservation policy.

Digitization and Digital Curation Working Group.

Director, Centre for Scholarly Communication; Associate Vice-Provost, Collections; University Archivist.

For collection materials, the responsibility is distributed among Library Operations' Public Services, Technical Services, and History of Medicine Divisions. These divisions are represented on the Digital Repository Oversight Group and the Digital Repository Ingest Group.

Director, Libraries Digital Program; Director, Preservation and Digital Conversion; Digital Preservation Steering Committee (to be formed).

Head, Special Collections.

Information Technology, Special Collections & Archives, Collection Development, and Preservation departments.

IT, Digital Projects, Preservation Committee.

Library Administration, Head of Library Systems, and Head, Digital Initiatives.

Library Digital Programs and Entrepreneurial Library Program.

Office of Digital Initiatives & Open Access.

Office of Strategic Initiatives and Library Services Preservation Directorate.

Our activities are distributed, as are responsibilities. Policy decisions are ultimately approved by Administration. In this particular instance, the policy was developed and reviewed by the Digital Repository Steering Committee and Preservation Program Advisory Committee.

Our Digital Library Team.

Our Institutional Development Repository Team and its successors.

Our team of librarians and IT professionals that make up our Digital Library Initiatives Group.

Our University Libraries have a Cyber Infrastructure Working Group through which all policies are reviewed and approved before implementation.

Preservation Department and Digital Library Services.

Preservation Librarian, Director of Special Collections, IR Committee.

Primary responsibility: 2 virtual libraries with other parts of IT department and a review committee made up of interested faculty and staff.

Related leadership responsibilities are shared among a handful of positions and development of the campus institutional repository is the primary driver for current work on digital preservation policy. The Electronic Records Archivist chairs the library planning committee and the implementation group for the campus IR. The Head of the Preservation Department wrote the existing policy, is a member of the library's IR planning committee and convenes the preservation component of the implementation group.

Scholarly Resources, Data Librarians, Center for Southwest Research, E-Scholarship committee, and Library Information Technology.

Specific roles around digital preservation have not been clearly defined, but the Archives, Scholarly Communication and Digital Services, and Systems department have been collaborating to preserve digital content using preservation repository systems, for example Archives-managed dark archive (DSpace), SCDS-managed institutional repository (DSpace), and through harvesting of our digital collections and IR in MetaArchive.

To Be Determined.

The development of digital preservation policies is coordinated by the Digital Preservation Strategist who resides in the Libraries IT Division. Additional participation by internal and external stakeholders is expected and final approval given by leadership and administration.

The Digital Archivist will be taking a study leave later this year to develop digital preservation policies for the archives. Many of these policies will be able to be applied to library materials. Other groups with responsibility for developing these policies are our IT department (LETS) and Collection Development.

The Digital Case Working Group. (Digital Case is our institutional repository/digital library. The working group is comprised of representatives from Metadata Services, Preservation, Technology Team, Library Administration, and the Digital Library Programs group.)

The Digital Preservation Archivist, under the direction of the Head of the Digital Technologies Department. To a lesser degree, the Data Curation Working Group and the Digital Library Council.

The Digital Preservation subcommittee of the Digital Library Team; this committee has had uneven periods of activity. We have requested funding for a Digital Asset Librarian for FY2012, and if approved, that person will be the primary person responsible and would coordinate with the committee. We have also requested funds for a Digital Data Curation Librarian, who would be tasked less with the technical implementation of the actual preservation of assets, than with outreach to faculty and the wider university community in an effort to articulate needs.

The following library and technology departments/units that have (will have) these responsibilities include: Digital Library Technologies, Scholarly Communications, the Special Collections Library including University Archives, Digitization and Preservation Department, and Collection Development.

The head of our digital library will probably lead the effort to draft preservation policies after convening an advisory group.

The Libraries' Digital Scholarship Program Working Group, the Preservation Coordinator.

The work is distributed over several professionals or committees around the library and most policies largely are governed by the Digital Library Access, Repository, and Scholarly Communications Services Advisory Group.

There will be a steering committee for this.

This is done by the Digital Services Team in consultation with the Deans and with the statewide Florida Digital Archive. The UF Libraries are partners with the Florida Digital Archive (FDA), hosted by the Florida Center for Library Automation (FCLA), with FDA as a resource for all of the State University Libraries. Each university has a technical liaison to FDA and those representatives report to their Deans, and the Deans serve as a governing unit for FCLA and thus FDA as well. Because of the complexities of digital preservation, this is active and evolving work.

UMass Amherst Libraries Digital Preservation Working Group, Five Colleges Digital Preservation Task Force.

University Archivist.

6. Please briefly describe the resources or policies that were (will be) used in researching and developing your library's digital preservation policies. N=53

An extensive literature review and environmental scan was used. Additional assistance provided by conferences and workshops with specific relevance.

Anything available, including online resources, printed resources, and live experts.

Archival/library literature on digital preservation. Existing digital preservation policies online. Standards documents. List-servs. Twitter feeds of those involved in digital preservation. Interviews with individuals outside of the organization involved in digital preservation.

Audit materials (TRAC, DRAMBORA), Digital Curation Tool from the DCC, curation lifecycle model.

Best practices and other documentation from other, prominent national and academic libraries.

Best practices at other research libraries.

California Digital Libraries, other institution's policies, workshops, and webinars.

Department of Digital Scholarship and Programs staff, Department of Preservation staff, central IT server infrastructure, OAIS.

Existing preservation policy, external digipres policies, existing repository specific policies.

HathiTrust, CIC libraries, and similar institutions that already have written policies.

Information from the DCC and JISC in the UK, work done by CDL, articles in DLIB.

Institutional peer review and professional literature.

IR: <http://smartech.gatech.edu/policy>; Archives: http://library.gatech.edu/archives/forms/Collection_Policy.pdf.

JISC Digital Preservation Policies Study and the many policies it cites as well as the digital repository policies for Cornell University, University of Illinois, Johns Hopkins, University of Michigan, and others.

Literature on digital preservation policies; examples of digital preservation policies in place at other institutions; best practices for digital preservation.

MetaArchive Cooperative's Preservation Committee's work.

NLM's Collection Development Manual, Trustworthy Repositories Audit and Certification (TRAC), policies developed by pre-eminent external institutions.

OAIS Framework, ICPSR Workshop materials (specifically the Action Plans), other higher education institutions with established digital preservation programs/policies.

OAIS Model.

OAIS, TRAC, DRAMBORA, NSF data management guidelines, other institutions' policies, consortial policies.

Other libraries policies and practices, national and international standards.

Other libraries' published policies; TRAC checklist.

Other repositories' policies, preservation standards and best practices for different formats, workshops offered by professional organizations, professional literature.

Our policy basically put the existing practices of the unit into writing.

Peer policies, including entities such as ICPSR, Data Asset Framework.

Policies from other ARL libraries and resources from the MetaArchive Cooperative.

Policies from other institutions.

Preservation environmental scan from our Synergies project. Work with COPPUL and CARL libraries on preservation initiatives. JISC Digital curation model. Keeping up to date with current literature.

Professional literature published or distributed by organizations such as CLIR, CNI, OCLC/RLG, Northeast Document Conservation Center (NEDCC).

Professional literature. Other libraries' policies.

Resources: TRAC and DRAMBORA audits. No policies yet except: lots of copies keep stuff safe.

Resources available from JISC, NDIIPP, other national libraries, ALA, SAA, and NIST.

Review of institutional requirements and existing policies from other institutions and projects, along with tacit knowledge of current institutional staff and project team members that has been developed through prior digital preservation projects.

See: <http://www.it.ufl.edu/policies/> (especially data of value) and http://fclaweb.fcla.edu/FDA_documentation.

To Be Determined.

The Cornell/ICSPR Digital Preservation Policy Framework.

The resources most heavily used include the OAIS Reference Model (ISO 14721:2003); Audit and Certification of Trustworthy Digital Repositories (CCSDS 652.0-R-1, Draft); A Framework of Principles for the Development of Policies, Strategies and Standards for the Long-term Preservation of Digital Records (InterPARES 2 project, 2008); the ALA Definitions of Digital Preservation; Digital Preservation Policies Study (JISC, 2008).

The TRAC Checklist is being used to do a first pass of where we stand.

TRAC checklist and audit reports, preservation policies at other institutions, Digital Curation Centre.

TRAC guidelines; external published reports; experience of other colleague institutions.

TRAC, NDIIPP, LC, Cornell policy, NEDCC policy template.

TRAC, OAIS, JISC Materials, PLATTER, CDL Microservices, PA-SIG community, Beagrie Policy Studies.

TRAC; and resources from the Digital Preservation Management Workshop.

Trustworthy Repositories Audit & Certification: Criteria & Checklist (TRAC), Drambora and Platter.

University of California system-wide collection development and University of California Riverside collection development.

University of Waterloo Statement on Information Management, & associated policies & guidelines (<http://www.secretariat.uwaterloo.ca/guidelines/stmtinfomgt.html>). University of Waterloo Taskforce on the Long-term Preservation of University Records. (2010). Report to the University Records Management Committee. Blue Ribbon Task Force on Sustainable Digital Preservation and Access. (2010). Sustainable economics for a digital planet: ensuring long-term access to digital information: final report of the Blue Ribbon Task Force on Sustainable Digital Preservation and Access. Charles Beagrie Ltd. (2008). JISC digital preservation policies study. British Library, et al. (2010). Long-term preservation services: a description of LTP services in a digital library environment. California Digital Library, UC Curation Center. (2010). Merritt: an emergent micro-services approach to digital curation infrastructure. National Archives (UK). (2011). Digital preservation policies: guidance for archives.

Various reports from professional organizations, and conference content.

We have consulted the CDL document SIP; ICPSR Workshop 2008 (week long) on digital preservation attended by our Metadata Librarian, books and articles such as Borghoff, Rodig, et al. "Long-term Digital Preservation," etc.

We used the TRAC document, OAIS, DRAMBORA, as well as the policies from peer institutions such as the University of Michigan to guide the development of our digital preservation policies.

We used/use Library of Congress Digital Preservation guides, compared policies and procedures with University of Pennsylvania digital preservation labs. Some digital preservation standards have been vetted with LoC members, presented at conferences, and reviewed with moving image archivist professionals through AMIA.

We will benchmark/consult with other peer institutions as we develop our digital preservation policies.

We will look at a variety of current practices and policies, don't have a specific set to mention.

Workshops, conferences, Internet resources, other institutional resources.

7. Has your library worked with other stakeholders at your institution to inform your library's decisions about digital preservation policies and investments? N=60

Yes	42	70%
No	18	30%

If yes, please identify these other stakeholders.

Academic Computing services.

All service units.

Archives, museums, school of information, some academic programs.

Archives, records management, Information Technology, faculty, administration.

Campus Administration and campus IT.

Campus IT, research community.

Campus IT, UALC (Utah Academic Library Consortium) Digitization Committee.

Campus stakeholders and administration.

Campus-wide Computing Services and Graduate School.

Central information technology unit, office of research.

Central IT, campus administration, select faculty.

Collection curators and owners in other areas of the university.

Content contributors from academic departments; Executive VP for Research.

Curators of Special Collections and Branch Librarians.

Development of the campus IR, which is based in the library and is central in the library's digital preservation efforts, has been done in collaboration with IT at the campus level, colleagues in the School of Information and Library Science, and faculty who create, deposit, and use digital content preserved by the library.

Digital Library Technologies, Information Technology Services, the Special Collections Library, the Libraries' Information Technology Department (I-Tech), Cataloging and Metadata Services Department, Scholarly Communications, and the Digitization and Preservation Department.

Director of Digital Information Strategy (university-level position), Office of Information Technology (university-level).

Faculty and research teams, Research Services Office, University Administration.

Faculty as authors and journal editors, the University Press of Florida (statewide), the Harn Museum of Art, the Florida Museum of Natural History, individual departments, centers, institutes, and colleges, and others.

Faculty researchers and central administration, particularly regarding research datasets.

Faculty, administrators.

Faculty, graduate students, and other campus departments/units.

Graduate College, the Graduate School of Library and Information Science, Office of the CIO and CITES (academic computing).

Institute IT division; and VP for Research.

Institutional information technology services.

It's still in the early stages, but we're talking with University Archives and the campus IT group.

NLM's Lister Hill Center for Biomedical Communications, National Center for Biomedical Information (NCBI), NIH Library.

Other units within the library, including Library Systems, University Archives, Rare Books and Special Collections.

Our IT department (LETS) has informed the university's IT unit (IST) about the costs involved in digital preservation.

Special Collections curators.

UC Libraries Preservation Advisory Group; CRL.

University Council, Information Services, University Business Administration, Academic Colleges, Registrar's Office, University Records Management's Digitization Services.

University Information Technologies.

University Information Technology Services, faculty in the School of Library and Information Science and School of Informatics and Computing, Office of the Vice Provost for Research, Office of the Vice President for Research, other libraries and archives within the institution.

University Information Technology, High Speed Computing.

University IT department.

University Records Office, Information Technology and Communication, Office of Research, Faculty Senate, individual faculty.

University Secretariat, and Information Systems & Technology Department.

VP for Research and Graduate Studies, Academic Computing, University Archives.

We are in frequent contact with the Office of the Vice President of Research, as well as faculty members and department heads from our local Graduate School. Focus meetings have occurred with graduate students and faculty.

We have had several initiatives. One was a survey similar to this one created by the Digital Curation Committee that was internal to the library (in 2007). This survey had to be withdrawn due to its complexity and the failure of the survey itself to clearly communicate definitions and distinctions. The same survey could probably be distributed now without the same complications, as these issues are much better understood by a broader group of librarians. More recently, a much more focused survey was distributed by Chemistry and Engineering Librarians to their faculty on their needs for digital preservation (especially of scientific datasets). There have been ongoing discussions with other digital centers at the university, especially the Humanities Digital Workshop, and the American Culture Studies department, which has created several digital projects.

8. Please briefly describe which individual or group has (will have) primary responsibility for authorizing and approving your library's digital preservation policies and investments. N=55

Administrative Counsel, Preservation Committee.

Assistant Director for Technology.

Associate Dean for Technical Services.

Associate Dean.

Associate Director for Library Operations, NLM Director.

Chief Librarian; policies proposed and recommended by Digital Preservation Team.

Dean of Libraries, Associate Dean for Library Technologies and Digital Libraries, Associate Dean for Collection Development.

Dean of Libraries and Libraries Senior Leadership Team.

Dean of Libraries.

Department of Digital Scholarship and Programs will propose a program to stakeholders, funding for which will be approved by Library Administration.

Digital Initiatives unit.

Digital Library Access, Repository, and Scholarly Communication Services Advisory Group, mentioned above.

Director of Libraries, possibly Vice Provost (to whom library reports).

Directors Council (senior administrators).

Final approval comes from the Dean.

For us it would be authorized by the Digital Strategies Group (made up of digital collection managers, the head of Library Systems Department and the Library Director and Associate Director) and the Libraries Senior Management

Group. For any Five College policies or investments, they would be approved by the FCLC: Five College Librarians Council (made up of the Five Colleges library directors).

Funds for new positions (in digital preservation and elsewhere) are occasionally identified in committees, and recommendations made to the Dean's Council, where decisions are made, refereed by the Dean. There is a dedicated fund for innovative technology, and investments in disk space (on a backed-up SAN) some commercial software, and/or training on software is sometimes drawn from these funds. This fund is overseen by the Associate Dean for Technology.

Libraries administrative team.

Libraries Administrators Group.

Library administration (3 responses).

Library Administration and the Digital Case Working Group.

Library Administrative Committee.

Library Affairs Dean.

Library Dean.

Library Dean and Library Executive Committee along with Campus CIO.

Library information technology services, library administration.

MIT Libraries Senior Administrative Group.

Most probably Library's Executive Committee (comprised of Dean and AUL equivalents).

Our activities are distributed, as are responsibilities. Policy decisions are ultimately approved by Administration.

Our Libraries Cyber Infrastructure Working Group will have primary responsibility, along with vetting of digitization standards and procedures through the Digital Data Curator.

Our library administration team has final authorization/approval authority.

Primary support would be given by the Libraries Leadership Committee (director level) with final approval at the Cabinet level and the University Librarian (Dean).

Specific roles around digital preservation have not been clearly defined, but the heads of Archives, Scholarly Communication and Digital Services, and Systems will be responsible for authorizing and approving future overarching digital preservation policies and investments.

To Be Determined (2 responses).

The Administrative Council, which comprises the University Librarian, Associate University Librarians, and senior administrators.

The Dean is the official authority for all policies and expenditures.

The Digital Library Council, which reports to the Executive Council (which consists of the Library Director and all Associate Directors).

The head of our digital library will probably lead the effort to draft preservation policies after convening an advisory group. The dean of the library would, of course, have final authority.

The Libraries' Leadership Council.

The library's Executive Committee.

The library's management advisory committee.

This is yet to be determined.

Ultimately, the dean of libraries.

Ultimately, the Dean will approve, but the Director of Digital Initiatives, Head of Digital Services and scholarly Communication, and Assistant University Archivist will make recommendations and execute the policies and plans.

University Librarian, Associate University Librarian for Information Technology and Systems, Associate University Librarian for Scholarly Communications and Collections.

University Librarian, Library Executive Group, Digital Repository Developer, Preservation Officer, Institutional Repository Development Team.

University Librarian and the library's senior administrative team, which includes the Assistant University Librarian for IT.

University Librarian, and Associate University Librarian, Digital & Discovery Services.

University Librarian; Digital Preservation Steering Committee.

University Libraries, Dean's Cabinet and University IT.

University President/Board of Trustees.

DIGITAL PRESERVATION STAFF AND FUNDING

9. Please indicate how many staff are (will be) charged with digital preservation responsibility at your library. Include both the number of FTEs and number of individuals. N=47

	Minimum	Maximum	Mean	Median	Std Dev
Individuals	1.00	100	8.30	5	14.67
FTE	0.20	100	4.71	2	14.62

Individuals:	FTE:
1	0.25
2	0.20
2	0.50
2	1.00
2	1.00
2	1.00
2	1.00
2	1.50
2	—

Individuals:	FTE:
3	0.50
3	0.50
3	1.00
3	1.00
3	2.00
3	3.00
3	3.00
3	3.00
3	3.00
4	0.50
4	1.00
4	2.00
5	0.50
5	1.00
5	1.00
5	1.50
5	2.00
5	5.00
6	2.00
6	2.25
6	4.25
7	1.40
7	2.00
7	5.75
7	6.00
8	1.00
8	2.00
8	3.00
10	1.00
10	2.50
11	1.50
11	5.00
12	5.50
15	15.00
17	2.75
18	6.00
30	10.00
100	100.00

10. What opportunities does your library (plan to) pursue to increase staff expertise in digital preservation? Check all that apply. N=58

Conference attendance	52	90%
Workshop attendance	51	88%
Independent study/assessment	47	81%
Training provided by professional organizations	36	62%
Local courses in computer or digital technology	21	36%
Training provided by vendors	19	33%
Hire consultants	11	19%
Other	11	19%

Please specify the other opportunity.

Coordination with other University of California campuses.

Doing!

Formal and informal training programs organized by staff within the library and within a consortium.

Hire staff with appropriate experience.

Internal peer informational presentations.

No formal plans in place, but staff who will be involved in digital preservation have attended various conferences and workshops in the past.

Staff recruitment with some expertise required.

The Libraries are supportive of these opportunities when needed, but none are officially planned at this time.

Unknown.

We also pursue training by library staff to other library staff in other areas, for instance, in XML and related technologies. We hope to extend this to topics in digital preservation as our efforts in implementing a system and workflow continue.

We will draw on the MetaArchive Cooperative's considerable expertise.

11. How does your library fund its investments in digital preservation? Check all that apply. N=58

General operating budget	48	83%
IT budget	36	62%
Grants or awards	36	62%
Materials budget	22	38%
Dedicated preservation budget	20	35%
Gifts or endowments	20	35%
Other source of funding	6	10%

Please specify the other source of funding.

Central IT investment in storage, digital libraries, digital repositories, and data curation services.

Part of the student fee for electronic theses and dissertations goes towards digital preservation of these materials.

Student technology fees.

To Be Determined.

This is currently in flux because of several changes in the way technology fees are allocated. Currently, many of these sources may be used. In the future, a single source may be available and designated for this.

Unknown.

If your library is currently investing in the preservation of digital content, please continue to the Digital Preservation Trends section.

If your library is planning to invest in the preservation of digital content, but is not currently doing so, please click below, then click the Next>> button to jump to the Local Digital Preservation Activities section.

Planning to invest in the preservation of digital content N=9

DIGITAL PRESERVATION TRENDS

12. Does your library want to invest in preserving more digital content than it currently does? N=49

Yes	46	94%
No	3	6%

If yes, which digital content types, collections, or research areas does your library want to preserve more of?

All areas will require more, set by collection priorities and risk.

All of those from question 3 that we're not currently preserving.

All types of born-digital content; digitized collections.

Archived websites; data sets; born-digital archival collections.

Areas for growth include data and institutional repository. Digitized and digital collections are rapidly expanding, and will include both text and multimedia materials, as well as complex objects and linkages.

Audio and moving image materials that would be converted to digital format.

Audio visual, media, objects in the institutional repository.

Audio, still images, research data.

Audio, video, still image, manuscripts/special collections, research data.

Audiovisual files, data sets, electronic records.

Born-digital administrative records of enduring value created by the university, such as annual reports, course catalogs, Faculty Senate meeting minutes, Board of Governors meeting minutes, departmental newsletters and bulletins, and university web pages.

Born-digital resources created by the University Libraries; born-digital resources and digital surrogates created by the university; digital resources acquired by the University Libraries; digital resources licensed by the University Libraries which we have the rights to archive.

CAD files, research data, and more audio and video content.

Data sets and research data are currently an emerging topic for us. Another anticipated field would be software, websites, and perhaps even forensic data curation.

Data sets from faculty research, web archives, audio recordings and moving images, orphaned works.

Datasets, video.

Digital images, ETD, CAD.

Digital video, web harvesting.

Digitized library collections (materials from main library collection and special collections/archives). Faculty research collections (digital media, datasets, image collections).

Digitized special collections. Moving images. Scholarly articles/journals.

Email and other administrative records, data bases and data sets created by university researchers.

ETD.

ETDs, datasets, scholarly works from the university community.

ETDs, faculty scholarship, and electronic journals.

In priority, digitized special collections and ETDs, websites.

Locally created text, images, audio, and video. Research data. University administrative records. Scholarly publications. GIS data. Student papers and projects. ETDs.

More of the same material, but also datasets and other raw data (we only have a few examples to date).

Research data.

Research data and data sets.

Research data and other born-digital material produced by our faculty and students.

Research data preservation, historical data preservation, and audio-visual materials.

Research data produced by university community.

Research data, born-digital records.

Research data, electronic records.

Research data, faculty generated content.

Research data; ETDs; Web-harvested materials; Administrative records and faculty papers; Moving images; Visual materials; Licensed materials.

Since we currently do very little digital preservation we would want to preserve virtually all digital content types (images, text, audio, video), digitized collections and born-digital archival material, and the research output of the university community.

Small tail research data, in conjunction with other campus entities.

Special collections: images, manuscripts, theses. WRCA: Water Resources.

Text, data sets, image & time-based media in the following areas: university archives, special collections subject areas (women's studies, local history, the history of mathematics, architecture, dance and ballet, fine printing, and urban planning), and geospatial data.

The Libraries are keeping pace with the current need, but this is ever growing. The Libraries digitize over 1 million pages of materials each year (this includes images, audio, video, archival materials, books, etc.) and the Institutional Repository has over 1 million pages of digitized and born-digital materials and grows steadily through researcher self-submitted items.

Unique materials from the university.

Unpublished video and audio, electronic personal papers in special collections, digital faculty research content, unique data sets.

We are creating digital surrogates of many media types, such as film, video, and audio recordings, which may or may not be digital per se, but those surrogates then require digital preservation. In addition, we do not currently, but are planning to try to address, preservation of data sets in the sciences and social sciences (though this may entail engagement of a third party, i.e., ISPCR). Since creating the Digital Library Services unit, we have generated extensive digital content. Much of this is in XML, which in itself is a preservation format but also requires digital preservation in a system. We have a backlog of images, created in or for Special Collections needing digital preservation.

We are currently preserving digitized and born-digital archival collections of note but are interested in preserving research data sets as well as archival collections of note on formats that we have not yet begun to preserve en masse (such as moving image materials).

We would like to become more knowledgeable of digital preservation as it relates to audio and video materials, as well as born-digital electronic records.

We have a growing body of born-digital and to-be-digitized resources that will need to be incorporated into our developing preservation strategies.

Please briefly describe up to three barriers that are limiting your library from investing more for the preservation of this content. N=43

A lack of a digital preservation strategy and policies. Baseline funding for digital preservation. Staff.

Availability of objects that fit these fields. Training and development staff. Software development timelines.

Budget constraints are the primary impediment to additional investment in digital preservation.

Budget reductions of the last two years; staffing.

Budget, lack of readily available community standards and practices, and other projects taking priority.

Budget, staff, and space.

Challenges of unsolved problems with preservation of research data and migrating from grant funded projects to base operational support.

Competing budget demands; still investigating best approaches.

Competing priorities.

Complete development of an overarching campus plan.

Conversion of the materials has not yet taken place. The library does not currently have in-house expertise or hardware/software capable of managing the conversion process. Still image digitization and some text digitization has a higher priority based on a variety of factors such as preservation, collection strength, sources of funding.

Copyright issues. Publisher cooperation. Cost. Donor reluctance (for special collections).

Costs to establish new systems, staffing shortages, and inability to hire additional staff.

Drastically limited funding and staff resources. But we are hiring at least three new librarians to work on digital repository issues (curation) and new library leadership is enthusiastic about digital preservation.

Expertise, cost.

Funding.

Funding is an issue but not so challenging as the shortage of staff time to dedicate to preservation activities, including planning, monitoring, and documenting. Skills gaps and recruitment of new staff that have expertise in digital preservation and curation is also a challenge.

Funding, policy decisions, and legal constraints for copyrighted materials.

Funding. Staff/local expertise. Technical infrastructure.

Funding/staffing levels. Staff skills. Competing priorities.

Human resources who can work on this are limited; administrative emphasis has been focused on building digital collections and has only recently shifted to include preservation.

In our current budget climate, immediate needs have more compelling claims on available resources. Lack of money & staffing.

Inadequate systems for deposit and dissemination. Costs difficult to assess, leading us to elevate other institutional priorities and delay attention to digital preservation. Storage not addressed as a capital cost.

Known continued growth of digital content; defined costs for technology; staff/labor costs to transfer files.

Lack of affordable, scalable strategy for massive distributed storage, shortage of technical staff to implement digital curation/preservation tools.

Lack of expertise, lack of technology, lack of standards...

Lack of staff expertise. Lack of resources to hire experts. Lack of time to identify all the resources worthy of digital preservation.

Money.

No new staff resources available; no new funds available for storage; complex technical requirements.

Not enough staff, and lack of advanced technology skills necessary to set up and manage a preservation repository architecture.

Not enough staff, expertise, and money.

Server capacity, programming expertise, time.

Staff time. Staff expertise. Funding.

Staff time to locate, collect, appraise, organize, and describe content; staff expertise and tools available for preserving content over long-term, in particular staff with programming expertise and a trusted digital repository for managing content.

Staffing requirements. Lack of availability of suitable applications. Vast amount of server storage space required.

Staffing workloads. Need to develop common understanding of what "preservation of digital content" means in both the local and global context. Lack of understanding about the long-term investment costs.

The biggest barrier for greater preservation of data sets and many other categories of content is funding for additional programmers and staff to work with content producers, manage metadata, and carry out ingest processes. Preserving a significant amount of audio and moving image content will require a much larger and costlier scale of storage and computing capacity. Current copyright law is a barrier for effective preservation of orphaned works.

The cost of hiring a programmer to build a trusted digital repository, the storage costs of archiving large numbers of digital files, and the need to raise the knowledge level across the board of issues related to digital preservation.

Time and resources. Expertise to deal with complexity. Availability of best practices/good models.

To this point, major barriers have included general knowledge of the issues of digital preservation (as described in early efforts to survey library staff). This is much less a barrier now, as these issues are understood by a wider range of librarians than they were several years ago. Dedicated personnel. This is the primary current barrier, as this is a time-consuming effort, difficult to distribute amongst multiple staff members, as we have tried to do in the past. Technical knowledge. This is our smallest barrier, as we have staff who understand the basic issues of digital preservation and possess some knowledge of relevant systems for implementing digital preservation, but there is still a gap to address in knowledge.

Trust. Scale. Meaningful partnerships.

We are actively working on this now. We had to wait to hire some qualified staff to do the development work and they are now in place to augment existing staff.

We still lack the appropriate knowledge base to become a trusted digital repository for research data sets, but we have a working group dedicated to this issue. As for moving image materials, we are venturing into this area with the recent purchase of a 16mm film to digital file datacine transfer machine. The biggest challenge connected to this area will be the lack of a uniform lossless compression codec for digital video versus storage space needs for digital video.

13. Compared to three years ago, is the number of staff, amount of time, and funding currently deployed for investing in digital preservation more, less, or about the same? N=49

	N	More	Less	About the same
Staff	49	33	2	14
Time	49	36	3	10
Funding	48	29	7	12
Number of Responses	49	39	8	18

If you answered More or Less, please explain.

A new department was created (Digital Library Initiatives) and more preservation-bound hardware was recently purchased.

Added staff.

Approximately one more FTE is working on digitization of materials than three years ago.

As our digital collections grow, we are spending more time ensuring that we have the appropriate infrastructure to be the basis for a full digital preservation service.

As we have gained expertise and as our world has become even more digital, this has become a higher priority and more staff and time have been devoted to efforts.

Digital preservation is a key part of our digital production operation, which has added new staff in recent years as the demand for a more robust digital conversion service within the library has increased.

Five specialized staff added with data management responsibilities and funds reallocated for additional storage.

Increased reliance on digital resources has made this imperative.

Investing more time and thinking about it more than we currently are able to do.

It's a larger university priority.

More staff and funds are available this year because of Sloan grant to create content for the Medical Heritage Library (MHL) project which will also be preserved in NLM's Digital Collections repository.

New staff hired with digital preservation experience.

No funding or positions are dedicated exclusively or primarily to digital preservation, however, the number of people and the proportion of their time devoted to digital preservation is growing.

No new dedicated staff, but getting more attention across the board.

Our efforts are in their early stages. As they've matured, they have required more resources.

Our investments in all of these areas has increased as we have focused more attention on developing and implementing a robust digital repository and the policies needed to sustain it.

Slowly shifting staff, money, and time from print-based demands to more digital, including digital preservation. The shift is slow.

Special Collections has contract staff with expertise in this area and co-op students assisting with digitization projects. The library has also invested in a one-year web archiving pilot project, using the Archive-It subscription service. The Map Library has carried a major digitization project of historical aerial photographs over the past three years.

Staff and time: Increasing volume of digital content. Funding: Current economic environment.

Staff are diverting time from digitization program toward digital preservation; incremental additions are being made to funding for preservation-oriented digitization projects.

The department has grown from 4 to 7.

The Digital Archivist was hired three years ago so staff and time devoted to the topic of digital preservation has increased since his hiring.

The funding for digital preservation is less due to the end of our NDIPP grant.

The internal processing work has been further automated and enhanced so that less staff time is required to keep pace with the need. However, the storage space continues to grow and that increases costs, especially given that existing materials of course remain.

The major increase has occurred because of a large NSF award.

There has been a significant investment in creating, collecting, and now preserving digital resources over the last two to three years.

There has been an increase in both electronic records required to be maintained by the libraries and more digital acquisitions for special collections resulting in needed more staff time and funding.

There was no library-wide effort underway three years ago.

This is an area the library is currently very invested in developing and several recent hires were made in the past year for research programmers to help develop an additional digital repository.

Three years ago we had not yet begun to think about digital preservation in any meaningful way. Now we have a FTE dedicated to this area as well as several FTE who are engaged in digital preservation discussions on a regular basis.

We are in the process of recruiting staff to increase support of preservation and other areas. However, these positions have not been filled, yet.

We have been tasked with providing an even greater focus on digital preservation and development of our platform, which means the same amount of staff investing more time. Unfortunately, consistent cuts to our funding at the state level over several years means less funding is available than when we started.

We have experienced overall cutbacks in the last three years. Most staff positions have been preserved, but we have been unable to significantly fund training and storage in ways that are needed.

We have had trouble keeping a Coordinator of Digital Initiatives. We have had the same one now for almost two years, so more time is spent on this. We invested in CONTENTdm, thus increasing our spending.

We hired additional staff and require their time, along with a project management team to roll out the institutional repository.

We hired two digital library developers in the last three years.

We've successfully grown endowed funds for some of this activity.

Within the last three years we have hired a Digital Collections Curator and Digital Library Architect to better position the Libraries to invest in digital preservation efforts. Projected/known funding reductions/cuts will impact future investments in infrastructure and staffing.

14. In the next three years, do you expect the number of staff, amount of time, and funding deployed for investing in digital preservation to increase, decrease, or stay about the same? N=49

	N	Increase	Decrease	Stay about the same
Staff	49	30	1	18
Time	49	36	1	12
Funding	49	34	4	11
Number of Responses	49	39	4	22

If you answered Increase or Decrease, please explain.

A number of our FTEs, who may only work on DP issues in a limited capacity now, will soon become more involved due to the nature of the job in front of us. And the job in front of us will have little chance of success without an increase in funding. It's too soon to say whether that increased need for funding would go towards staff positions such as programmers/system administrators or whether it would go to purchasing management software.

Additional staff are being hired to develop our digital repository which will increase the number of digital objects and metadata needing to be preserved. We have also just received a grant and have another one under consideration which may increase funding. However, new library administration will increase funding for digital curation, including preservation.

As digital collections grow, staff time needed to manage them will need to increase.

As our efforts become more robust and fundamental to our mission, they will inevitably require additional support from all three resource categories.

As part of our strategic plan it is acknowledged that digital preservation will be a significant commitment we will make and that adequate resourcing will need to follow.

As the library's digital collections grow in size and diversity, so too will the need for staff working in all aspects of digital preservation. While ingest should become more thoroughly automated, it seems likely that for some time to come collections will require a lot of pre-ingest work. Similarly, the work associated with initial development of the library's digital preservation infrastructure and procedures should decrease but in any three year span some components of the preservation ecology will change and require renewed administrative and technical investment. Within the next three years the library should also be ready to undertake some form of external audit, which will also require a substantial time commitment as well.

Budget cuts and increase in the digital assets the team is responsible for.

Continued university commitment.

Creating, collecting, providing access to, and preserving digital resources is a strategic initiative in the Libraries, and we are investing in this effort.

Digital preservation is (will continue to be) a high priority strategic initiative in the next three years.

Expect to hire staff with preservation expertise, and use some IT time to develop preservation platform.

Hopefully, digital preservation policies will be in place by next year, demonstrating the need for a sustained effort which would require increased staff, time and funding.

In addition to NSF award continuing for next three years, we anticipate additional investment through library base operations (e.g., hiring of a new archivist focused on electronic records).

It's hard to predict an increase in our funding/budget situation going forward given the current climate. As a result, we can only be pessimistic for purposes of this survey and expect the worse: further budget cuts or at best, level funding. We do continue to actively pursue research grant opportunities, however.

More funds will be "redirected" from physical conservation/preservation toward the digital.

More resources will be required to move effectively into preservation of research data.

New grant positions expected; grant funding expected; repurposing of current staff time toward digital preservation.

New library leadership and more interest from outside the libraries in preservation of digital scholarship.

Plans to add a digital preservation librarian. Money within the preservation budget (within materials budget) is slowly being shifted from completely paper-based preservation to digital preservation.

Plans to hire one new digital library developer FY2012.

Preservation is seen as a priority.

Research data archives initiative under development and expected to grow significantly.

Same as above, yet always having to balance sustainability.

Statewide initiatives getting underway.

The funds, and hence staff, available will decrease unless we can secure external funding from granting agencies or through participation in collaborative efforts such as the MHL.

The increasing prevalence of digital resources and of digitization for preservation of analogue materials means that staff time and funding will increasingly be diverted to digital preservation activities.

The internal processing work has been further automated and enhanced so that less staff time is required to keep pace with the need. However, the storage space continues to grow and that increases costs, especially given that existing materials of course remain.

The need will increase, so hopefully, our investment will as well.

The volume of unique digital content that the library is being asked to accept and care for is increasing rapidly.

This will become even more important and there is a commitment from the campus to devote more resources to the effort.

Time will decrease as the process changes from the work needed to set up a pilot to being part of a smooth workflow. Funding will decrease because there will no longer be the costs of setting up various parts of the preservation activities.

We are hoping to pursue funding for dedicated positions in the area of digital preservation.

We have put in budget requests for two additional positions, which are both primarily concerned with digital preservation. We have also put in a budget request for a large initiative, which would include funding for disk space and membership in the HathiTrust. These are hopeful answers, and there may be no increase.

We may be at risk of losing valuable assets otherwise.

We will continue to develop in this area and have plans to hire at least one additional full-time staff member in digital preservation, this one residing in the preservation unit.

We will have more individuals in the library participate in adding content to the digital archive.

We will move from policy development to implementation.

Will need to increase to meet needs.

EXAMPLES OF DIGITAL PRESERVATION INVESTMENTS

Please select up to three of the most significant types of content your library is investing in for digital preservation. For each asset type, identify the strategies your library currently uses to ensure its preservation, how satisfied the library is with each strategy, the strategies you anticipate the library will be using three years from now to ensure its preservation, and briefly explain any changes.

Asset Type 1

15. Please select one type of digital content. Please briefly describe this asset and its significance for preservation. N=50

Administrative records	Legally required to preserve it.
Audio materials	Sound recordings of various analog formats. Unique recordings not commercially available and not impeded by copyright laws. Fragile condition.
Digitized special collections	We are digitizing rare and unique items from our library collections that are difficult or impossible to find elsewhere.
Digitized special collections	As rare and/or unique material, this forms the core of our identity. Digital conversion serves as access and stems conservation needs of physical. Preservation of digital is vital to this effort going forward.
Digitized special collections	Digitized versions of text, images, audio, and video in our special collections. For particularly short-lived formats (e.g., audio- and videotape) our preservation master file may soon be our record copy. Overall, our investments in digitization and associated metadata, and the continued growth of our collections, will mean that we will not want to redigitize content, even if the original is still available.
Digitized special collections	NLM's historical collection of American imprints up to 1865.
Digitized special collections	Regionally important collection of digitized historical publications, including monographs, newspapers, maps, photographs, postcards, and other materials.
Digitized special collections	These are unique materials in the world, digitized from UF and partner collections.
Digitized special collections	These are very high quality images of our special collections materials.
Digitized special collections	This asset type includes digital objects created during digitization of special collections, including a variety of formats for still images, moving images, encoded text, and audio recordings. Significance for preservation varies in this broad category, including the following. A well-managed digital reproduction is expected to outlive some original source materials due to their physical and chemical characteristics. Digital surrogates reduce the need to handle fragile originals for the purpose of browsing and some forms of consultation. For unique objects, digital reproductions are often the only means of access that will be available if the original objects are destroyed or seriously damaged in a disaster. As the owner of the original objects and the creator of the digital reproductions, the library has a primary responsibility for their preservation.

Digitized special collections	We have a large number of digital collections, mostly of print and images. These represent national projects (Our Roots) as well as unique local collections. The national collections bring with them a commitment to access over the long term. The local collections provide material that is otherwise inaccessible.
Digitized special collections	We have very unique special collections and are using CONTENTdm to archive the digital copies we have made so far and will continue to do so in the future.
Digitized special collections	We manage (for the state) the Kentucky Digital Library. We have over 1,000,000 digital objects that demand preservation.
ETDs (electronic theses and dissertations)	All of our university's master's theses and doctoral dissertations published since 2001; one of our colleges also paid for digitization of all of their retrospective theses/dissertations.
ETDs (electronic theses and dissertations)	Current and retrospective theses and dissertations are in cIRcle, the library's Institutional Repository, preserved in perpetuity. This content represents unique output by the university community.
ETDs (electronic theses and dissertations)	Electronic Theses and Dissertations (ETDs) represent the unique research and scholarship output of our university's graduate students and, therefore, it is extremely important that they be available for long-term access.
ETDs (electronic theses and dissertations)	Electronic theses and dissertations are essential products of the university's activities in the areas of teaching and scholarship, and we need to ensure continuing access to and usability of these resources.
ETDs (electronic theses and dissertations)	Electronic theses and dissertations; part of the university's official record and critical for long-term retention. ETDs are born digital and are no longer available in print.
ETDs (electronic theses and dissertations)	ETDs are replacing printed theses and dissertations in all Rutgers graduate programs. As of October 2007 degree date, all Graduate School-New Brunswick dissertations are submitted electronically. Other graduate schools including Graduate School-Newark, Camden Graduate School, and the Graduate School of Applied and Professional Psychology are participating in the program as well.
ETDs (electronic theses and dissertations)	Our eTDs and eHTs (electronic Honors Theses) are a growing e-collection area. The Graduate School and the Honors College are trusting the University Libraries to preserve these university publications for the long term.
ETDs (electronic theses and dissertations)	The theses and dissertations produced by the graduate students of the university are important for preservation because they are unique items and represent a segment of the research output of the university community.
ETDs (electronic theses and dissertations)	[No description provided.]
Licensed materials	eJournals , eBooks, and databases.
Licensed materials	Electronic journals.
Licensed materials	Electronic journals. Need to insure that we have continual access even if journal goes out of business.
Licensed materials	OCUL Scholars Portal is working towards TDR status.
Licensed materials	Provide continued access to journal articles/research literature that we have invested in.

Licensed materials	The Libraries has invested heavily in ejournals and cancelled many print subscriptions as ejournal prices have increased substantially and materials budgets have remained the same or decreased. Investing in the preservation of ejournals is our only way to guarantee continued access to this information in the future.
Licensed materials	We have a membership in Portico. The necessity for preservation of licensed materials is generally well understood, but this material in the digital age is subject to loss due to economic and legal considerations, beyond physical ones. We have submitted a budget request to join HathiTrust, but do not yet have experience with the latter.
Licensed materials	[No description provided.]
Mass digitized collections	Content from our collections digitized by Google and managed and preserved by HathiTrust.
Mass digitized collections	Digitized books through the Google Book Project. We are contributing public domain Google Book Project books to HathiTrust.
Mass digitized collections	Primarily digitized print materials; as participants in Google/Hathi we are participating in a project to create a massive online collection of digitized books. Ensuring its safety is critical, both for future users of these materials in their traditional sequential page form, for those who would use the contents computationally or in other ways not yet imagined, and as a part of a broader strategy for archiving print. Freeing up space on physical shelves is only possible if the digital surrogates are well cared for, preserved, and secure.
Mass digitized collections	UM has the primary responsibility for managing the HathiTrust shared digital repository, which contains over 8.5 million digital volumes.
Mass digitized collections	We are digitizing large collections of historical records from our University Archives in a mass digitization model, primarily for preservation purposes. These records are important to the history of the university.
Research data or datasets	Institutionally generated research data by faculty which is the basis for continuing scholarly output.
Research data or datasets	Research datasets primarily generated by scientists and engineers typically through grant funding. However, it's worth noting a rising trend from social scientists and humanists as well.
Research data or datasets	We are working with faculty in the natural sciences to select, digitized where necessary, and preserve very large sets of data. In some cases these data are in danger of disappearing because of budget constraints or lack of resources, but they are valuable tools for teaching and research. They include type specimens, field notes, catalogs, and georeferenced images.
Still images	Images from our extensive photographic archives. These unique images document local and regional history. In some cases, the original images have their own preservation challenges so preservation of the digital content is increasingly important.
Still images	Images from the Libraries' Special Collections and the Water Resources Archives (WRCA).

Still images	Over 400,000 images, both born-digital and converted. Overwhelmingly, the images come from the University Photographer and her staff and document campus events. The remainder mostly come from conversion projects of Special Collections materials and relate to local history.
Still images	We digitize and preserve thousands of unique photos in digital format from our Special Collections department. These fragile photos are used by our patrons and are also historically valuable, which is why they've been marked for digital preservation.
Still images	We have many digital image collections (~300,000 including licensed content). The collections are moderately used.
Web-harvested materials	10 years of national and international content related to elections and events.
Web-harvested materials	University web resources important for documenting the history of the institution, via Archive-It.
Born digital	Important to the university for teaching, learning, and for institutional records. Since the items are born digital, it is critical that they be preserved in a timely manner.
Born digital and local digitized	Assets for which we hold a primary or unique responsibility for stewardship. These are not generally covered by other options for preservation.
Born-digital archival collections, both hybrid (paper and electronic) and e-only.	Includes archival collections of individuals and organizations. Collecting electronic archives and records are an extension of our historical role in collecting paper-based archival collections. Being able to acquire, ingest, process, secure, preserve, and provide access to e-archives is critical for our current collecting objectives and for current and future scholars and researchers.
Geospatial	Geospatial data as part of NDIIPP.
Local scholarly materials and research	Local scholarly materials and research: the university's digitized and mostly born-digital intellectual output, e.g., technical reports, electronic theses and dissertations, images, audio, video, conference proceedings, articles, white papers, pre-prints, post-prints, etc.

16. Please identify the strategies your library currently uses to ensure the preservation of this type of asset. Check all that apply. N=50

Using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.)	21	42%
Participating in a collaborative, participatory solution (MetaArchive, etc.)	14	28%
Collaborating with other administrative and/or technical units in the institution	13	26%
Using a vendor-based, hosted solution (Portico, etc.)	11	22%
Participating a collaborative, hosted solution (HathiTrust, etc.)	10	20%
Other strategy	11	22%

Please describe the other strategy.

Currently, we are organizing and backing up digital assets in-house with no managed repository aimed at DP in use yet. We're in the investigative stage at this time.

Developing new infrastructure through NSF award for Data Conservancy.

Development in-house of our own repository software, which is open source and available to others.

Partnership with non-profits, e.g., Internet Archive.

Server.

Storing processed and raw files on a locally hosted, backed-up server.

Texas Digital Library PresNet.

The master PDFs are duplicated in CONTENTdm as part of our normal delivery workflow. They are also stored on long lasting physical storage.

Using Rosetta and FileNet with other entities in our consortium.

We are storing files on a file server with rudimentary digital preservation measures in place and are investigating more robust options for a more comprehensive digital preservation environment.

We not only participate in HathiTrust, we are essential for its fundamental operations and ongoing development.

17. How satisfied is the library with the strategies currently used? Check all that apply. N=49

Satisfaction scale: Very Satisfied (no complaints), Mostly Satisfied (infrequent problems, yet no major complaints), Neutral (working fine, but open to alternatives), Mostly Unsatisfied (major recurring problems, looking seriously at alternatives), Very Unsatisfied (ready to change strategies immediately).

	N	Very Satisfied	Mostly Satisfied	Neutral	Mostly Unsatisfied	Very Unsatisfied
Using a library-managed digital archive/ repository (such as DAITSS, Archivematica, iRODS, etc.)	22	6	9	6	2	—
Collaborating with other administrative and/or technical units in the institution	14	5	2	6	2	—
Using a vendor-based, hosted solution (Portico, etc.)	14	4	5	6	—	—
Participating a collaborative, hosted solution (HathiTrust, etc.)	12	4	4	5	—	—
Participating in a collaborative, participatory solution (MetaArchive, etc.)	14	6	5	4	—	—
Other strategy	10	3	1	4	3	—
Number of Responses	48	18	23	16	7	0

18. What strategies do you anticipate the library will be using three years from now to ensure the preservation of this type of asset? Check all that apply. N=49

Using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.)	28	57%
Collaborating with other administrative and/or technical units in the institution	21	43%
Participating a collaborative, hosted solution (HathiTrust, etc.)	21	43%
Participating in a collaborative, participatory solution (MetaArchive, etc.)	20	41%
Using a vendor-based, hosted solution (Portico, etc.)	15	31%
Other strategy	7	14%

Please describe the other strategy.

Continued development in-house of our own repository software, which is open source and available to others.

Further development of Data Conservancy.

Hydra-based institutional repository.

It is too soon to know which direction we will be headed, but if I were to take a guess I would say it will be a library-managed archive, whether it be open-source or a vendor-based solution. Either way, it may also require collaboration with other units in the institution as well as with such solutions as HathiTrust or Archive-it.org. However, these last two solutions do not address the needs of all data types and therefore can only be seen as partial solutions to our problem.

Not sure yet.

Partnership with non-profits, e.g., Internet Archive.

Texas Digital Library PresNet.

19. If the future strategy is different from the current strategy, please comment on why you think it will change. N=20

Development of internal repository is underway.

Discussions are underway for a collaborative statewide repository and service.

Hopefully, the need for digital preservation will be recognized within the higher echelons of the university administration, and other administrative and/or technical units in the institution will become involved in finding solutions to the problem.

I believe there will be some centralization of IT services (such as research computing and data management) in response to the budget climate.

In the future, we might have a more directed and focused strategy than we currently have.

Increased repository size and additional funding acquired to support the initiative.

Its not an "either or" proposition, it is an "and both" ideology.

NLM is the process of joining Portico.

Our CONTENTdm solution provides at least one level of replication. However our concern is that CONTENTdm's actual purpose is *not* digital preservation. It is only offering us duplication of our files as a side effect.

Services will improve; we will have defined our own needs and capabilities more precisely.

The collaborative approach will have multiple other effects.

The future strategy will include ensuring that the library's repository meets the requirements for a trustworthy digital repository. We anticipate that it will take several years for us to achieve this goal.

The library is leading efforts now and is collaborating with Campus IT to extend the model to a broader constituent base on campus.

The potential for using HathiTrust for image collections is something the library would like to investigate in the wake of the project from the University of Minnesota.

There will be more shared goals and knowledge, which will move toward a more shared solution.

Third party services will probably be required to effectively manage growing number of items.

View the preservation of this type of content as something multiple nodes might preserve in a preservation network.

We anticipate expanding our digital collections.

We are looking into a more sustainable preservation strategy.

We are using ProQuest for our ETDs.

If you want to describe a second asset type, please continue to the next screen. If not, please click below, then click the Next>> button to jump to the Local Digital Preservation Activities section.

Only one asset type to describe. N=8

EXAMPLES OF DIGITAL PRESERVATION INVESTMENTS, CONT.

Asset Type 2

20. Please select one type of digital content. Please briefly describe this asset and its significance for preservation. N=40

Applications, operating systems, or other software	Currently the Libraries duplicate all CDROMs and disks that accompany printed material as a preservation copy.
Digitized special collections	Digitized collections primarily from Rare Books and Manuscripts, and Government Publications, Maps and Law.
Digitized special collections	Important primary resources that are unique.
Digitized special collections	In a world where many resources are available on the web, digitized Special Collections are unique offerings for a given institution, and the responsibility of the holding library.
Digitized special collections	Special Collections has approximately 2 million photo-negatives that are being digitized in small batches for access projects and to meet researchers' needs. Availability of access copies of these images reduces handling of the negatives and is therefore significant for preservation. We anticipate that the digitized versions will eventually become the preservation copy of these images due to deterioration of older photo-negatives.
Digitized special collections	Text based materials: records, letters, some manuscripts. Materials have been scanned mostly into image formats with some in PDF format.
Digitized special collections	The Archives has digitized many of its special collections, including a few rare books. These items are significant for preservation due to the uniqueness and fragility of the physical items.
Digitized special collections	The University Libraries has been selecting, funding, and digitizing special collection materials since scanning began in 1992. See the "Digitized Collections" link on the Libraries Web home page (www.libraries.psu.edu) for the complete collection listing.
Digitized special collections	These materials chosen for local digitization are usually rare or unique; the digitized copies we store and disseminate to researchers are, likewise, found here and nowhere else. Often digitization is performed to a very high specification and at relatively high cost, so preservation is critical to protect our already significant investment and ensure that future researchers continue to have access to authenticated versions of the same digital surrogates.
Digitized special collections	Without preservation of Special Collections' digital surrogates, the library will fail in its mission to make its information resources (especially rare books, manuscripts, and University Archives) accessible by the widest possible community for the long term.
ETDs (electronic theses and dissertations)	Electronic theses and dissertations submitted by graduate students.
ETDs (electronic theses and dissertations)	ETDs represent the intellectual output of the university.

ETDs (electronic theses and dissertations)	All theses and dissertations are now submitted in electronic format and preserved by the library for the campus. These are permanent research records for the university.
ETDs (electronic theses and dissertations)	Electronic Theses and Dissertations.
ETDs (electronic theses and dissertations)	ETDs and project theses produced by our students.
ETDs (electronic theses and dissertations)	Institution no longer collects print copies.
ETDs (electronic theses and dissertations)	Mandatory electronic submission since 2004; currently digitizing 17,000+ legacy print theses. More than 400 ETDs produced each semester. Theses and dissertations are the primary example of the quality of graduate programs at the university, and it is imperative that they be preserved.
ETDs (electronic theses and dissertations)	Theses and Dissertations that are produced by our graduate students, which document the intellectual history and activity of the institution.
ETDs (electronic theses and dissertations)	We have managed a collection of ETD's for several years and the graduate school is now moving toward mandatory ETD submission.
Licensed materials	As stewards, we believe in supporting efforts to capture licensed materials such as scholarly journals.
Licensed materials	Electronic-only e-journals deposited for copyright.
Licensed materials	Journals and other material licensed from vendors.
Licensed materials	Many years' worth of several thousand electronic journals published by numerous major scholarly publishers, including all backfiles for Elsevier and Springer.
Licensed materials	Over 90,000 unique ejournal titles and over 800 databases. The library's financial commitment is significant, the resources are accessible to all users 24/7. Users identify ejournals as the most important library materials for their research, teaching and study in the LibQUAL+® surveys.
Licensed materials	Scholarly journals acquired through database subscription, important to preservation of and ongoing access to the scholarly record.
Licensed materials	We have a huge investment in licensed collections and wish to preserve access based on the license, should the vendor no longer support the material.
Mass digitized collections	Given that HathiTrust contains an enormous number of digital assets reformatted from research library collections, it is important that this corpus of work be collectively preserved long term by libraries. Again, investing in the preservation of this content is our only way to guarantee continued access to this information in the future.
Moving images	NLM's historical film collection.
Moving images	We have a great deal of archival film and video material within Special Collections that is in danger of deterioration due to age and instability of it's binding elements. This material is significant for preservation due to unique content, patron demand, and high risk of analog masters deteriorating.
Moving images	We have built a video conversion lab and are currently improving our ability to digitally preserve video.

Research data or datasets	Data sharing and preservation has become a requirement for most researchers at our university. In particular, investigators for NSF grants are expected to share with other researchers, at no more than incremental cost and within a reasonable time, the primary data, samples, physical collections, and other supporting materials created or gathered in the course of work under NSF grants. Grantees are expected to encourage and facilitate such sharing. Our digital preservation platform for data is being positioned as a solution these researchers can use to satisfy NSF requirements.
Research data or datasets	[No description provided.]
Still images	Large number of institutionally created and externally created image collections, hosted on a homegrown digital repository called DLXS, which was designed in the early 90s and has been continually updated over time.
Web-harvested materials	The web is fast becoming our primary, world-wide publishing platform. Publishing innovation, creativity, and current reporting are moving to the Web and disappearing from print. Websites and related social media are often the only outlets for important cultural and historical information, e.g., in the area of human rights. Unless we successfully and continuously harvest, preserve, and make available key web content, significant chunks of history and culture will evaporate before our eyes (and in fact already have).
Archives' dark archive	Archives' dark archive: restricted-access instance of DSpace used to preserve and provide access to digital content for reference purposes (for example, master images, audio, video, access copies of the same, material withdrawn from IR for legal or permissions reasons).
Books digitized from our collection	Brittle books that can no longer be used and are not yet digitized by others.
Born-digital content	Such as documents associated with a 2009 flood of our campus and surrounding areas. The digital file is the master and loss would be permanent.
Converted materials: analog to digital	Some physical materials need to be preserved digitally because of the nature of condition of the originals. We are scanning existing materials and preserving them digitally.
Digital audio recordings, transcripts, and related documentation.	Archival versions of the audio, transcript, and supporting documentation for the interviews recorded digitally by Southern Oral History Program interviewers.
Faculty scholarly publications	Published faculty research. To provide a record of the university's success meeting the research and dissemination of information aspects of its mission.

21. Please identify the strategies your library currently uses to ensure the preservation of this type of asset. Check all that apply. N=40

Using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.)	20	50%
Collaborating with other administrative and/or technical units in the institution	10	25%
Using a vendor-based, hosted solution (Portico, etc.)	9	23%
Participating in a collaborative, participatory solution (MetaArchive, etc.)	8	20%
Participating a collaborative, hosted solution (HathiTrust, etc.)	5	13%
Other strategy	9	23%

Please describe the other strategy.

Archiving files on a server with basic digital preservation measures in place while exploring options for a more comprehensive system.

Currently, we are organizing and backing up digital assets in-house with no managed repository aimed at DP in use yet. We're in the investigative stage at this time.

Data generated out of research projects funded through specific programs.

Homegrown software and repository architecture.

Images are stored on the library's servers, in a preservation file format (TIFF). Bit-preservation is assured through library systems administration and backup procedures. Metadata is managed in Special Collections databases.

In-house development of our own digital repository software that is open source and available to others for use.

Texas Digital Library PresNet.

University system-wide digital repository.

Using Rosetta and FileNet with other entities on our consortium.

22. How satisfied is the library with the strategies currently used? Check all that apply. N=39

Satisfaction scale: Very Satisfied (no complaints), Mostly Satisfied (infrequent problems, yet no major complaints), Neutral (working fine, but open to alternatives), Mostly Unsatisfied (major recurring problems, looking seriously at alternatives), Very Unsatisfied (ready to change strategies immediately).

	N	Very Satisfied	Mostly Satisfied	Neutral	Mostly Unsatisfied	Very Unsatisfied
Using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.)	20	5	9	6	1	—
Collaborating with other administrative and/or technical units in the institution	10	2	3	5	1	—
Using a vendor-based, hosted solution (Portico, etc.)	10	2	5	3	1	—
Participating a collaborative, hosted solution (HathiTrust, etc.)	9	1	5	4	—	—
Participating in a collaborative, participatory solution (MetaArchive, etc.)	8	4	2	3	—	—
Other strategy	8	2	2	3	2	—
Number of Responses	38	10	20	11	4	0

23. What strategies do you anticipate the library will be using three years from now to ensure the preservation of this type of asset? Check all that apply. N=40

Using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.)	25	63%
Collaborating with other administrative and/or technical units in the institution	13	33%
Participating in a collaborative, participatory solution (MetaArchive, etc.)	13	33%
Participating a collaborative, hosted solution (HathiTrust, etc.)	12	30%
Using a vendor-based, hosted solution (Portico, etc.)	11	28%
Other strategy	7	18%

Please describe the other strategy.

Currently, we are organizing and backing up digital assets in-house with no managed repository aimed at DP in use yet. We're in the investigative stage at this time.

Cloud storage (DuraCloud?)

In-house development of our own digital repository software that is open source and available to others for use.

Texas Digital Library PresNet.

Transitioning to a new homegrown solution in the next calendar year.

University system-wide digital repository.

Using Rosetta and FileNet with other entities in our consortium.

24. If the future strategy is different from the current strategy, please comment on why you think it will change. N=13

Anticipate that this need will decrease over time.

As HathiTrust deals with materials beyond books, we will examine the prospects for leveraging or integrating with that infrastructure.

Developing and implementing preservation policies and systems in line with the requirements for trustworthy digital repositories will be a more efficient and reliable approach to preservation than the current strategy.

DLXS is no longer able to successfully meet our needs.

Hopefully, the need for digital preservation will be recognized within the higher echelons of the university administration and other administrative and/or technical units in the institution will become involved in finding solutions to the problem.

I believe HathiTrust will open up to more types of content and we will take advantage of that expansion.

It is likely that we may diversify in copies or by project or format; for example, we may store one copy in our local repository, and replicate copies to DuraCloud. We may begin to store non-book material in Hathi as the capacity of that system increases. The library is unlikely to be able to support a truly massive storage system without collaborating with other campus units.

Services will improve; we will have defined our own needs and capacities more precisely.

Still using vendor based but probably participating in LOCKSS.

The library will explore whether it is appropriate and worthwhile to put these materials into HathiTrust.

We are planning to duplicate preservation of these files with MetaArchive to ensure preservation in the unlikely eventuality that our digital repository were to fail.

We have moved the ETD's into a Digital Commons repository. We will be exporting those from Digital Commons into a microservices-based local repository managed by the library.

We would like to duplicate content remotely.

If you want to describe a third asset type, please continue to the next screen. If not, please click below, then click the Next>> button to jump to the Local Digital Preservation Activities section.

Only two asset types to describe. N=14

EXAMPLES OF DIGITAL PRESERVATION INVESTMENTS, CONT.

Asset Type 3

25. Please select one type of digital content. Please briefly describe this asset and its significance for preservation. N=24

Audio materials	Significant audio holdings from across campus, including ethnographic field collections and documentation of performances within the School of Music.
Audio materials	Sound recordings are wonderfully rich primary sources and suffer from a host of endangered media packages (reels, cassettes, etc.)
Audio materials	Unique sound recordings that make up a significant and large research collection.
Audio materials	We are in the early stages of creating a media (audio and moving image) preservation program, and digitization of obsolete media (more sound than moving image at this point) is critical in preserving and accessing these materials.
Digitized special collections	Historical and cultural materials in the collections of the Center for Southwest Research and Special Collections and many other institutions in New Mexico and across the region.
Digitized special collections	Our digitized special collections are numerous, with unique content.
ETDs (electronic theses and dissertations)	ETDs are the intellectual output of the university and are thus significant.
ETDs (electronic theses and dissertations)	Local student scholarship with limited significance for preservation at this time because we still retain a paper copy of theses and dissertations and send them to UMI.
ETDs (electronic theses and dissertations)	[No description provided.]
Licensed materials	Content we have purchased or licensed from publishers, and for which we have permission to preserve. This content represents a significant investment of resources, whether financial, staff, or technology. It is part of our mission to preserve our investment in our scholarly resources.
Licensed materials	Electronic resources licensed consortially for the ten University of California campuses through the California Digital Library.
Mass digitized collections	24+ million files for digitized collections represents more than 15 years' investment.
Mass digitized collections	The University Libraries is currently engaged in the mass digitization of paper and microfilmed monograph content.

Moving images	The Archives contains an extensive film and video collection. Many of these items are significant for preservation because of technological obsolescence and uniqueness of the content.
Moving images	We have unique moving image collections that we are transferring from analog to digital, and are also acquiring digital video. These are important to the history of the university and the region.
Research data or datasets	By preserving local research data, we provide persistent and reliable access to the research output, scholarship, and creative works of faculty, academic staff, and students at the university.
Research data or datasets	Expected to include data from a wide range of research in a variety of data formats. The most significant ingest to date is a database of records compiled by the Research Laboratories of Archaeology (RLA). It is significant for preservation because it enables use of a collection of over five million artifacts collected over the last 60 years. In addition to the fundamental roles of this database for discovery and organization of the collection, it is also important for managing access according to legal restrictions and professional ethics.
Research data or datasets	Research data sets of all kinds need to be preserved for the future, for historical research and for validating research findings. Federal mandates now require that institutions take responsibility for insuring the availability of research data.
Research data or datasets	This includes data and related supplemental files (codebooks, technical reports, published articles, etc.), as well as research publications.
Still images	These are images (primarily photographs) housed in our rare and special collections.
Web-harvested materials	Materials that are generated by the university and posted on the web as document of record.
Locally hosted journals	Through our Synergies project we provide hosting for journals using the OJS software. These are mostly peer reviewed Canadian journals in the social sciences and humanities. We have a commitment to sustainability for the journals that we work with.
News	We have a unique online archive of both born-digital and digitized newspapers and television news reports. It represents university, regional, and international reporting, including some of the earliest web-accessible news. Like the previous two examples, without this digital archive the library will fail in its mission to make its information resources (including its unique faculty-staff-graduate student newspaper) accessible by the widest possible community for the long term.
Scholarly articles - PubMedCentral	[No description provided.]

26. Please identify the strategies your library currently uses to ensure the preservation of this type of asset. Check all that apply. N=25

Using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.)	15	60%
Collaborating with other administrative and/or technical units in the institution	8	32%
Participating in a collaborative, participatory solution (MetaArchive, etc.)	6	24%
Participating a collaborative, hosted solution (HathiTrust, etc.)	5	20%
Using a vendor-based, hosted solution (Portico, etc.)	3	12%
Other strategy	5	20%

Please describe the other strategy.

Local back up of servers where digital copy is stored.

Right now, due to file storage and ingest complications into a repository environment, these materials are stored only on our servers, which are backed up, but not really a trusted preservation strategy.

Stored on local servers, backed up and monitored 24/7/365.

Texas Digital Library PresNet.

Using Archive-It.

27. How satisfied is the library with the strategies currently used? Check all that apply. N=24

Satisfaction scale: Very Satisfied (no complaints), Mostly Satisfied (infrequent problems, yet no major complaints), Neutral (working fine, but open to alternatives), Mostly Unsatisfied (major recurring problems, looking seriously at alternatives), Very Unsatisfied (ready to change strategies immediately).

	N	Very Satisfied	Mostly Satisfied	Neutral	Mostly Unsatisfied	Very Unsatisfied
Using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.)	15	3	7	6	—	—
Collaborating with other administrative and/or technical units in the institution	8	2	3	4	—	—
Using a vendor-based, hosted solution (Portico, etc.)	2	—	2	—	1	—
Participating a collaborative, hosted solution (HathiTrust, etc.)	6	2	4	1	—	—
Participating in a collaborative, participatory solution (MetaArchive, etc.)	3	1	3	—	—	—
Other strategy	3	—	1	3	—	—
Number of Responses	23	5	14	11	1	0

28. What strategies do you anticipate the library will be using three years from now to ensure the preservation of this type of asset? Check all that apply. N=24

Using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.)	19	79%
Collaborating with other administrative and/or technical units in the institution	10	42%
Participating in a collaborative, participatory solution (MetaArchive, etc.)	10	42%
Participating a collaborative, hosted solution (HathiTrust, etc.)	7	29%
Using a vendor-based, hosted solution (Portico, etc.)	6	25%
Other strategy	3	13%

Please describe the other strategy.

Continue to use Archive-It but also monitor market for other strategies.

We partner with the British Library, University of Manchester, and the European Bioinformatics Institute to create UK PubMed Central. It includes content provided to the PubMed Central International archive by participating publishers.

Texas Digital Library PresNet.

29. If the future strategy is different from the current strategy, please comment on why you think it will change. N=8

As collaborative, hosted solutions like HathiTrust and CLOCKSS prove themselves, we will naturally incorporate them more fully into our planning.

Hope to add more born-digital ETDs in the future.

Interested in exploring shared/hosted solutions for audio/moving image materials in the future as they emerge.

Hopefully, the need for digital preservation will be recognized within the higher echelons of the university administration and other administrative and/or technical units in the institution will become involved in finding solutions to the problem.

There is a campus-wide effort to improve efficiency and reduce duplication of effort. The library anticipates increased collaboration with Information Technology Services and the Odum Institute for Research in Social Science.

We are currently constructing a fedora repository that will eventually accept media files, but for now, it is only ingesting still image files.

We're keeping our eye open for the most effective strategy...right now it is hedging by employing multiple options.

Will look at partnering with other nodes with like interest in preservation networks, both for redundancy and geographic separation. Other reasons may also lead us in this direction.

LOCAL DIGITAL PRESERVATION ACTIVITIES

If your library is engaged in or is planning to engage in **local** activities to preserve digital content (such as using a library-managed digital archive/repository or collaborating with other administrative and/or technical units in the institution as opposed to a service provider), please continue to the next screen.

If not, please click below, then click the Next>> button to jump to the Improving the Library's Preservation Role section.

Not engaged in *local* activities to preserve digital content. N=6

30. Does your library (plan to) have restrictions/limits regarding what digital file formats it preserves locally? N=51

Yes	35	69%
No	16	31%

If yes, please briefly describe the major factors impacting these limitations (e.g., external/internal policies, technological factors, financial issues, user needs, etc.) N=35

Assessment of risk for long-term access in development. Best edition statements for copyright deposit in development.

Campus policies, faculty interest, funding, technology capacity.

Concerns about technical viability of certain formats; greater uniformity of format makes management, future migration, and development of processes for ingestion, QC, and access/delivery easier.

Do not currently plan to have limits, assuming formats are migratable. If format is not fully migratable, it will be bit-stream migrated.

Financial, technology, file formats that are not open source and cannot be guaranteed long-term preservation.

Financial, technological.

For the institutional repository, we accept standard formats that we can make a commitment to migrate and provide access to over the long term.

Formats that will be sustainable and provide functionality and high quality.

Internal policies, technological factors, costs, user needs.

Our preservation policy will outline preferred file formats for preservation, based on the sustainability factors described in the Library of Congress' "Sustainability of Digital Formats" documentation: disclosure, adoption, transparency, self-documentation, external dependencies, impact of patents, technical protection mechanisms. Other mitigating factors will include local hardware/software support from the university Information Systems & Technology department, discipline-specific requirements for file & data formats of stakeholder groups within the university community, and the costs associated with guaranteeing support for a range of file formats over the long term.

Policies will fall from decisions around technology limits, scalability and sustainability concerns, risk analysis, user needs, and other factors.

"Preservation decisions will be made within the context of the Collection Policy, balancing scholarly and historical value, user accessibility, and cost constraints." SILC limitations, limit total number of objects, limit of formats (not audio, video).

Technical, financial.

Technically our repository will accept any file format, but due to technological factors and complexities with managing and migrating obsolete file formats over time we will limit the file formats we commit to preserving over time.

Technological factors (2 responses).

Technological factors. The limits of the application used will be the limits to the preservation efforts.

Technological factors and financial issues.

Technological factors and the need to optimize our storage efforts.

Technological factors will mean that our strategy will include normalizing file formats.

Technological factors, institutional preservation priorities.

Technological factors. We would like to limit formats in the hope that if we only have to deal with a certain number of different data types, we can more easily keep control of future migration efforts.

The file formats chosen for preservation will be primarily based on external policies (i.e., accepted preservation format standards) but technological factors such as what our digital asset management system can accommodate and financial issues will also be factors.

The library may ingest any file format, but only perform bit-level preservation on some files.

This can be limited by some software (i.e., DAITSS) but it is mainly a matter of limiting file types in order to be able to manage them, especially forward migration. We have not yet implemented local preservation but have a system in place. It is ultimately an issue of time and money, in that more file types require more support. In addition, we want to focus as much as possible on archival formats (i.e., XML and non-lossy image formats) which further restricts supported file types.

Under discussion.

We anticipate being able to provide bit-level preservation for any file format contributed by a member of the community that falls within the archiving scope for the repository, but will not be able to provide a full suite of preservation services for all file formats due to practical limitations such as inability to locate and implement migration tools. Financial issues will be a factor that will limit the size and volume of files we are able to preserve, but not necessarily for file format support decisions specifically.

We are building our repository with the goal of offering bit-level preservation for almost any format. However, we do not have firm plans for supporting format migration over time and, for this reason, may limit deposit of some formats. Financial constraints may also prevent us from accepting responsibility for very large research datasets (e.g., astronomy, genomics) even if the demand were to materialize.

We don't feel that we can guarantee the long-term preservation of random file formats. We will focus on a smaller subset of formats, and migrate files that arrive to us in other formats.

We follow best practices identified for digital preservation. We respond to the kinds of files/formats that our community requests. We prioritize files/formats that are represented in our local collections.

We make specific promises and guarantees about the content we preserve, and create extremely tightly defined package types for each content type. We value (amongst other things) a high level of repository functionality, consistency, reliability, and ease of maintenance over time. Therefore we restrict the type of digital file formats to those that can allow this. For new content types we typically begin with pilot projects and move forward from there.

We use CONTENTdm so can only use the formats it supports.

We will restrict file formats to open formats.

Will be based on our capability to migrate material forward.

31. Please briefly describe the criteria your library uses (plans to use) to select digital content for local preservation. N=47

Any content created locally within the library that is judged to be a potential scholarly resource will be preserved. This will include images scanned from Special Collections, XML created in Digital Library Services, etc. This would exclude library business records. Finer distinctions will be made as we approach implementation.

Collection priorities.

Criteria vary, as does the preservation actions that accompany the decision.

Digitization: Anticipated interest level, fragility of originals, and availability of resources. Born-digital: Uniqueness, perceived value to the collection, technical feasibility, and availability of resources.

Existing criteria for accepting community materials in Archives. Existing criteria for nominating collections for digitization based on curator or faculty interest. Current and emerging archiving needs of researchers contributing gray material (reports, presentations), published articles, dissertations and other works, and researchers preserving digital research data.

Faculty needs, risk and consequence of loss, contractual obligations (e.g., grant funding requirements), and cost-effectiveness/feasibility of non-local options are among the factors considered to prioritize selection of digital content for local preservation. Local storage capacity and needs for processing before ingest are also practical factors that affect selection.

Faculty research data as required by funding agencies. Vendor-generated content that we purchase (e.g., data sets, Archivision, Saskia products) or receive in compensation for participating in projects. Digital collections or products the library creates for scholarly or research use. Content that we license, and for which we have permission to archive (e.g., LOCKSS). Digital information we collect as part of our archival responsibilities to the university. Digital materials we acquire as part of a gift, typically to RBMSCL.

If a collection of materials has been selected for digitization, we plan to commit to its preservation.

If the library created it or purchased it.

Institute priorities.

It will depend on the type of asset or institutional context.

Lack of shared/collaborative services to support preservation; rareness/uniqueness of materials; alignment of materials with collection development policies.

Library collection development policies determine what we collect and therefore what we preserve. For faculty-authored research collections, the collection owner determines what is worth preserving.

Locally produced scholarship.

NLM Collection Development Manual. NLM's Digital Projects Selection Policy.

Not yet developed.

Our unique local collections have priority, however, we also include as much other material as we can.

“Preservation decisions will be made within the context of the Collection Policy, balancing scholarly and historical value, user accessibility, and cost constraints.”

Produced by our faculty, students, or staff (or somehow affiliated). Has to be research quality material.

Produced or owned by the university.

Rarity, uniqueness, scholarly value.

Research, administrative, and other materials that constitute the intellectual output of the university.

Research significance, uniqueness, projected use, cost to maintain, long term accessibility of the file format.

Selection decisions are (will be) based on the format of the original created work with born-digital and other e-records having a high priority.

Some of the criteria used for the selection of digital content selected for local preservation will be its rarity, uniqueness, whether it's of interest to our user community, is physically deteriorating or experiencing technical obsolescence.

Still in development, but we will develop policies in collaboration with our Information Services & Technology group.

Subject experts choose.

Taken from our Digital Preservation Checklist:

1. Our collections are part of a co-operative global effort to preserve and provide access to digital collections, therefore potential specific items more suited to another region or country may be passed along to other institutions if they will receive a higher priority for preservation somewhere else.

a. Does this collection belong with another regional institution due to its subject matter?

b. Is there an analog/hard copy in good condition that will be available long term within another institution?

c. Are these objects commercially produced items preserved by someone else?

d. Is there a digital copy permanently archived in another Trusted Digital Repository?

e. Does the library have more than one physical copy of the items in this collection?

2. Our aim is to preserve digital collections that will not be preserved elsewhere, therefore we need to take into account the specific preservation needs and priorities of potential collections.

a. Is the content at risk due to physical deterioration, near-obsolete media/format, or short object life-span (1–3 years)?

b. Would the digital files be difficult or impossible to recreate if lost?

3. Part of preserving digital assets includes copying items for preservation and possibly displaying and distributing those copies. Therefore, certain copyright requirements must be taken into account before depositing objects with the Digital Archive.

a. Do you have rights to this material?

b. Are the works in your collection in the public domain?

c. Do you have permission to use this material?

If you can answer at least three NO answers to question 1, at least one YES answer to question 2, and at least one YES answer to question 3, your collection would be a good candidate for digital preservation.

The main criteria are: importance of the content for research and/or administrative needs of the university; uniqueness of the content (i.e., not available at another library); level of risk to the viability of the content over time (i.e., born-digital materials receive higher priority than materials that have been digitally reformatted and have an analog counterpart).

The material must be produced or sponsored by a member of the university community. The depositor must either hold the rights or sufficient permissions. The library must receive permissions to preserve the materials. The material must be in electronic format.

The UMass Amherst Libraries Collection Development Policy (see Appendix A), and more specifically, the document Collecting, Digitizing and Storing Digital Content Criteria (see Appendix B) defines the priorities and criteria for acquiring digital content for long-term digital preservation. Materials should also conform to the UMass Amherst Libraries Guidelines for Digitization.

This is as yet undecided.

Under development (2 responses).

Unique and endangered.

Unique, relevant to the teaching and research mission of the university, open standards if possible, enough information available to adequately describe.

Uniqueness and significance of the material; scale of investment in the material.

Uniqueness, condition, user needs.

University Archives and Special Collections content will be selected according to their respective collection development policies. A Special Collections digital preservation policy to supplement these policies and prioritize digitization and digital preservation work is in development. Similar policies for locally preserved digital content will be developed by other library departments, where necessary (e.g., the Map Library) and will be coordinated through the overall library preservation policy and strategy.

University scholarship, library digitized materials not preserved through other sources (HathiTrust, etc.)

Up to now we preserve a wide variety of formats in our repository. This includes images, text, newspapers with ALTO, audio, video, etc. Files are generated by staff and meet generally accepted standard file types and configuration.

Users requests and deteriorating items.

Value of materials; do we have it in print or is it born digital; is there an official obligation to preserve content (e.g., ETD).

We preserve all results of local cultural heritage and mass digitization programs. Whether and how we can preserve websites, born-digital archival content, data sets depends on funding available. In each of these areas, collection policies are being developed to guide selection.

We will preserve all files created by our own digitization operation and will attempt to put workflows into place to preserve born-digital electronic records from our special collections.

Will focus on material that falls out of scope of other resources we currently have available, i.e., Hathi, LOCKSS, Archivelt, Portico, etc.

32. Please briefly describe who has (will have) primary responsibility for making local selection decisions. N=47

As a national library, preservation responsibility is inherent in our decision to acquire born-digital material.

Associate Dean for Special Collections and Digital Initiatives; Head of Digital Library Center; Associate Dean for Digital Scholarship and Technology Services; Digital Collections Committee.

Collection Development and Special Collections & Archives Departments.

Collection Services.

Content creators and digital collection managers will play a key role in identifying and collecting digital content for the Libraries' Digital Preservation Program. Due to a higher risk of loss associated with digital formats, content creators, digital collection managers, and the Digital Creation and Preservation Working Group must collaborate closely to manage digital assets throughout their entire lifecycle. Members of this stakeholder group will be responsible for a wide variety of tasks. Their work will include following best practices and the procedures recommended by the Digital Strategies Group, the Digital Creation and Preservation Working Group, and the Metadata Working Group. Digital Creation and Preservation Working Group members will be responsible for collaborating with content creators and digital collection managers to determine the long-term value of digital collections and assess the likelihood that preservation of the materials is feasible given existing technical support and available resources.

Content owners.

Curatorial areas, in consultation with technical infrastructure staff.

Curators, subject librarians, bibliographers.

Department heads are responsible for selection decisions within their departments. The coordination mechanism for prioritizing preservation efforts across departments will be developed as part of the library's digital preservation policy and strategy.

Depending on data type and subject area, scholarly resources, Center for Southwest Research and Special Collections, data librarians, and faculty and students.

Digital Initiatives Librarian will coordinate local selection decisions.

Digital Initiatives unit.

Digital Library Coordinating Committee, in consultation with curators and subject specialists.

Digital Library Council.

Digital Library Services unit within Library Technologies.

Digital preservation team and digital initiatives managers.

Digital Projects Librarian.

For local digital content deposited in the University of Washington's ResearchWorks, see the collection policy: <http://researchworks.lib.washington.edu/policy-collection.html>. Other digital content (e.g., digitized collections) will be reviewed in a similar context, using collection and preservation policies.

Head, Scholarly Communication and Digital Services; Head, Archives and Records Management; Digital Collections Archivist; Digital Initiatives Librarian.

Head, Special Collections and University Archives; Head, Digital Library Services.

Institutional Repository Development Team and its successor.

It will vary by asset type as well. For content generated by faculty or students, they will necessarily have some role in selection decisions. For library-based content, local selection decisions will be discussed by the library and codified in policy document.

Joint decision of multiple stakeholders including: Institute Archives and Special Collections; Preservation and Conservation Services; selectors, Collection Strategy and Management.

Librarians from the department of Digital Scholarship and Programs, along with special collections curators.

Libraries' Digital Scholarship Program Working Group, Special Collections & Archives.

Library administrators in consultation with curators, collection managers, and technical staff.

Library Dean's Council (Library Administration) in conjunction with Head, Digital Initiatives.

Library.

Manager, Repository Technology, working with project managers and collections staff.

Not fully defined, but will likely be shared responsibility between collection managers/collecting units and operators/funders of institutional preservation repository services

Not yet decided (2 responses).

Preservation Department and Digital Library Services.

Preservation Librarian, Director of Special Collections, Archivists/Librarians.

Scholarly Communications Librarian.

Selection decisions will be distributed among those with responsibility for collection development and those working directly with scholars and researchers.

Special collections library, the digital library, and subject liaisons

Stakeholder groups.

Subject experts.

The collections department.

The coordinators/architects of our various repositories.

The curators of the special collections decide what digital content to preserve.

The Digital Archivist and other archivists on staff, as well as the Director of Libraries, Collections Coordinator, and LETS staff will make these decisions.

The University Archivist (hiring in process), subject specialists, and Deans as applicable.

This will be collaborative to some extent, but if the two positions identified earlier are funded, these will work together in presenting policies to the Digital Preservation committee.

Those units/departments who have (will have) these responsibilities will include the Collection Development Council, the Content Stewardship Council, and other digital library committees (Digital Collections Review Team, Digital Operations Team).

Unknown at this point.

LOCAL DIGITAL PRESERVATION METADATA

33. What level(s) of preservation metadata does your library (plan to) have and/or create for digital content? Check all that apply. N=51

Item-level	48	94%
Collection-level	42	82%
Other level(s)	5	10%

Please specify the other level(s).

Archival series-level metadata for university archives & for special collections manuscript collections.

Granularity varies for research data projects, but could actually be at the sub-item level depending on how data sets are defined.

Series level for archival items.

Series or folder level.

Some folder level.

34. What type(s) of preservation metadata does your library (plan to) have and/or create for digital content? Check all that apply. N=51

Administrative metadata (e.g., access privileges, rights, ownership of material)	51	100%
Technical metadata (e.g., information describing the production process or digital attributes of the work)	50	98%
Structural metadata (e.g., for purposes of linking different parts or units of data)	44	86%
Provenance metadata (e.g., chain of custody and related audit trails)	42	82%

35. What metadata schema(s) does your library (plan to) have and/or create for digital content? Check all that apply. N=50

Dublin Core	40	80%
Qualified Dublin Core	35	70%
METS	35	70%
PREMIS	26	52%
MODS	25	50%
Other schema	18	36%

Please specify the other schema.

Domain specific schemas or formats for research datasets.

EAD finding aids.

EAD, NLM, FGDC.

EAD.

EAD.

In development. Other metadata schemas may be recommended/used.

IPTC.

MARC, EAD.

MARC, MIX, TEI, RDF.

MARC, VRA Core, TEI header, AES57 audio technical metadata, AES-X098C process history metadata, locally defined schemas for technical and digital provenance metadata.

MARXML is automatically also created, although many of the fields may not map depending on the data available.

MIX; Darwin Core.

NLM-defined DTDs for PubMed Central.

Preservation schema has not been chosen as of yet.

Rules for Archival Description.

VRA Core, MARC, EAD.

VRA core, MARXML, PBCore, MIX, TEI.

We're using Dublin Core now and plan to look more into PREMIS and METS/MODS.

DIGITAL REPOSITORY SOLUTION

If you indicated above that your library is using a library-managed digital archive/repository (such as DAITSS, Archivematica, iRODS, etc.), please answer the following questions.

36. If your library is planning to invest in digital preservation, do you plan to manage a digital archive/repository that is intended to support preservation functions? N=38

Yes	34	90%
No	4	10%

37. Please identify the perceived willingness of various groups within your institution to deposit their digital content with your library's digital repository solution(s) for preservation purposes. N=33

Willingness scale: Very Willing (no barriers to deposit), Mostly Willing (minor barriers to deposit, but mostly negotiable), Indifferent (not actively seeking deposit), Mostly Unwilling (major barriers to deposit, but may be negotiable), Very Unwilling (major barriers to deposit, non-negotiable).

Institutional Group	N	Very Willing	Mostly Willing	Indifferent	Mostly Unwilling	Very Unwilling
Academic units	32	3	13	14	2	—
Administrative units	31	4	9	15	2	1
Data Centers	30	—	10	16	2	2
Other unit(s)	10	3	4	3	—	—
Number of Responses	33	9	21	23	4	2

Please specify the "Other unit(s)."

Very Willing

Colleges, Departments, Institutes, Centers, and others.

Libraries.

We are working with the NIH Library and our own History of Medicine Division to deposit to the repository and they are very willing contributors.

Mostly Willing

Individual scholars, a few, selected academic units.

Labs, research centers, and institutes.

Libraries, archives, and museums outside of the central library system.

Indifferent

Don't know. We really haven't publicized this outside of the library. We wanted to get a handle on our own materials before branching this out to the rest of the campus.

38. For the groups identified above as Mostly or Very Unwilling, what are some of the perceived or expressed barriers to depositing their digital content with your library for preservation purposes? N=6

Demonstrated capability of Libraries to retain authenticity and reliability of records. Complicated process of submission. Perception of inability to access materials after submission.

Expediency. Existing infrastructure satisfaction. University-level policies, extant and non-existent.

Our special collections curators prefer to work within their own units. The academic units want an institutional repository but don't want to work with copyright issues.

The library does not plan to preserve the digital output of these units since this role is theoretically played by Archives, a separate unit.

Time, extra work, lack of understanding of the importance of long-term preservation.

We cannot currently preserve and provide access to large collections of local digital content, so we are not yet actively soliciting deposits from the above groups. Current plans are for academic and administrative units to deposit digital content in repositories managed by the university IST department, with responsibility for archival content eventually transferred to the library after it is no longer needed for current business.

Additional Comments

Assurances of long-term support and funding for preservation, appropriate security.

I have left this section blank for the following reasons. First, we have not adequately tested for willingness, as our system is not yet implemented as a service. (We plan to implement this as an internal service to the library first and expand it to the university later). Second, the question makes this sound like a user-submitted model (it may not be so intended) similar to IRs. We will try to offer the service where it is perceived as needed by stakeholders, but not on a self-submission model.

IP issues/concerns, time to participate.

Lack of understanding of the benefits and available Creative Commons licensing models.

Money, apathy, organization.

More than anything, it seems to be an awareness issue. In cases when we have engaged the academic units or data centers, there is willingness and even eagerness in some instances to deposit content within the library's evolving digital preservation infrastructure.

Our digital preservation infrastructure is not developed enough for us to be able to propose digital preservation services to other units on campus. So we are not sure what their response would be.

Takes up too much time.

BARRIERS TO INVESTING IN DIGITAL PRESERVATION

39. Please briefly describe up to three barriers to investing in the preservation of digital content for your library. N=3

Lack of expertise/understanding of full scope of what "preservation" means in a digital context (and a sense of it being overwhelming). Conveying a proper sense of urgency to political stakeholders (municipal government). Proper management/governance structure to facilitate a digital preservation strategy.

No clear path forward.

Staff with training and experience. Funding for hardware/software and staff with training and experience. Buy-in from university administration and faculty who have content.

IMPROVING THE LIBRARY'S PRESERVATION ROLE

40. What types of services would your library find valuable for improving its role in preserving digital content? Check all that apply. N=59

Standards/best practices	48	81%
Digital preservation planning	45	76%
Policy considerations/recommendations	44	75%
Technical training	42	71%
Conversion/migration services	36	61%
Appraisal & selection training	28	48%
Theory training	20	34%
Other service	10	17%

Please specify the other service.

Affordable and practical external audit.

Any of these could be useful, depending on contents/structure.

Clarification of role of libraries in preserving 3rd party data.

Clear benchmarks/articulated metrics to evaluate our progress.

External services to provide ongoing, real time format validation, transformation, and migration.

Grant writing.

It would be very helpful if institutions that already have preservation policies would be willing to share them.

Management: building momentum to initiate a digital preservation program. Project management training.

Many of our digital resources lack good (or often any) metadata. While it is important to create and preserve not only the digital objects, but also their descriptive, technical, administrative, rights, etc. metadata, we have hundreds of thousands of digital resources. We need help in strategizing how to overcome this daunting amount of work.

Models enabling us to estimate resource requirements so we can weigh them against the benefits.

ADDITIONAL COMMENTS

41. Please enter any additional information that may assist the authors to understand your library's strategies for digital preservation. N=21

Barriers to investing in digital content: Lack of an overarching and proper preservation strategy. Ideally the library would use the same system the university uses to preserve research and administrative data. Lack of funds is a barrier. The number of "copies" that is believed to be necessary. Preservation is not really achieved if there is only one copy.

Barriers to investing in digital preservation include limited funding and limited human resources.

Barriers to investing in the preservation of digital content: institutional priorities and resources; no well-articulated role in the academic environment; consequences of not preserving the material not immediately evident.

Building a reliable digital preservation infrastructure is quite a challenging task, given our limitations in terms of staff and expertise. We strongly believe that in the longer term, community-based solutions will be the most viable for us, but the ones that exist now are not necessarily well tailored to our needs, or are still in their infancy. We strongly hope that ARL will help move things in this direction.

Currently, we have multiple copies of items. We are aware of the importance of a digital preservation plan, so we are looking into it. We have a storage system that self replicates and checks itself, but it is not a 10-year and digital preservation solution. Also looking into Cloud/distributed storage for digital preservation.

Digital preservation is a priority area but it continues to prove challenging to give it the full attention it deserves in light of the large number of other digital projects we execute. However, digital preservation has become a consistent expectation for most of our collections work; preservation goals and outcomes are addressed in projects as they arise even though they may lack some of the formality and detail required to satisfy TRAC and other standards.

It would be useful to unbundle the survey by asset type given range of issues, approaches, institutional context, etc.

Our approach must be collaborative on an international level. Sustainability will be key.

Our digital resource programs are the most sophisticated in the region. Additionally, we host online digital asset management tools for repositories in three adjoining states and 15 cultural heritage institutions in New Mexico.

Our goal is to collaborate with other stakeholders on campus to ensure preservation of the university's valuable digital information assets. We provide expertise in preservation planning, metadata management, and archives management, but we have no plan to implement a repository solution to meet all of the university's preservation needs. We foresee that the university's ongoing preservation strategy will involve a range of university systems—including web content management systems, document management systems, digital asset management systems, and dedicated archival repositories—guided by an overarching university preservation strategy and policy, with preservation plans developed for each collection or resource requiring long-term preservation.

The costs of participatory solutions such as MetaArchive or the Florida Digital Archive tend to run high for institutions such as our own with collections over 20 TB and projected to grow at least 10 TB a year. The challenge for us now is deciding on whether to commit the funds to a collaborative venture, or spend funds internally to run our own trusted digital repository.

The libraries are responsible for establishing guidelines for the retention of the university's digital records but preservation of the content has for now been delegated to individuals and units.

The library is a participant of the COPPUL LOCKSS PLN. We are also implementing Archivematica this year.

The library seeks to complement rather than duplicate the preservation activities of the University Archives.

We are a partner in HathiTrust, LOCKSS Alliance, CLOCKSS. Archive-It is used for preservation of institutional websites. Local digital preservation capability is being built using our Fedora-based digital library repository in conjunction with a 5.7 petabyte archival storage system run by central IT. We envision using this system as the primary preservation repository for materials that cannot be accommodated by the external/collaborative efforts in which we are participating.

We are uncertain of the balance that will be needed between locally developed solutions and external preservation services. How many web archives do we need nationally/internationally? Already, we are "outsourcing" some of our long-term preservation responsibilities to HathiTrust. Is this a viable solution for other kinds of content? We are actively developing new systems and services to allow electronic archives to be ingested, preserved, and made accessible.

We could not answer the questions in the survey because, as mentioned at the beginning, we are in the process of very preliminary discussions in advance of planning. We know that we will be committing to digital preservation.

We do have an IR, but it's currently only being used for scholarly research.

We have a digital curation services unit, in addition to the institutional repository and the Google Book Project, but the work of that unit is still in development. Thus we could not answer many of these questions at this time.

We have known for some time the importance of digital preservation. But the costs and magnitude of the endeavor is discouraging. We aren't giving up, but will continue to plan and hope to have an economical solution relatively soon.

We have no current plans due to staffing and equipment shortages. We lack skilled staff dedicated to these initiatives, money, and university buy-in. Other stakeholders do not understand what we are trying to communicate regarding this. We participate in the OhioLINK DRC and digital materials are archived there, but are not being curated or preserved to our knowledge.

RESPONDING INSTITUTIONS

University at Albany, SUNY
University of Alberta
University of Arizona
Boston Public Library
Boston University
Brigham Young University
University of British Columbia
University of Calgary
University of California, Riverside
University of California, Irvine
Case Western Reserve University
University of Colorado at Boulder
Columbia University
Duke University
University of Florida
Florida State University
Georgetown University
Georgia Institute of Technology
University of Illinois at Chicago
University of Illinois at Urbana-Champaign
Indiana University Bloomington
University of Iowa
Johns Hopkins University
Kent State University
University of Kentucky
Library of Congress
University of Louisville
McGill University
McMaster University
University of Manitoba
University of Massachusetts, Amherst
Massachusetts Institute of Technology

University of Miami
University of Michigan
Michigan State University
University of Minnesota
National Library of Medicine
University of New Mexico
University of North Carolina at Chapel Hill
North Carolina State University
Northwestern University
Ohio University
University of Oklahoma
Oklahoma State University
University of Oregon
Pennsylvania State University
Purdue University
Rutgers University
Smithsonian Institution
Southern Illinois University Carbondale
Syracuse University
Temple University
Texas A&M University
Texas Tech University
University of Utah
University of Virginia
Virginia Tech
University of Washington
Washington University in St. Louis
University of Waterloo
Wayne State University
University of Western Ontario
University of Wisconsin—Madison
York University