

Illinois Campus Media Census: Final Report

University of Illinois at
Urbana-Champaign Library
Department of Preservation and Conservation
Media Preservation Unit

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Illinois

University of Illinois at Urbana-Champaign Campus Media Census: Final Report

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Acknowledgments

Over the course of 3 years, the University of Illinois at Urbana-Champaign Campus Media Census has been an intensely collaborative effort that owes its success to the efforts, many of them voluntary, of numerous members of the University of Illinois community.

The authors would like to express their gratitude first and foremost to census participants from across the University of Illinois that allowed us to rummage around their closets, basements and offices.

In addition, the authors would like to warmly thank: Jennifer Hain Teper and Kyle Rimkus for their invaluable advice, contributions, and editorial feedback; Colleen Cook for her insights and guidance during the early stages; members of the Center for Multimedia Excellence, Steering Committee for feedback and consulting; Media Preservation Graduate Assistants Ryan Edge and Andrew Crook for their hard work on endless tasks; Heather Murphy for the final design and layout; and former Dean and University Librarian Paula Kaufman for her unwavering support.

The authors would like to thank as well the following individuals who contributed valuable content to this report through text, guidance and endless conversation: Jack Brighton (WILL, Illinois Public Media); Jeff Carpenter (NCSA); Dr. Elen Deming (Professor, Landscape Architecture); Dr. James Hay (Professor & Director of Graduate Studies College of Media); Eric Kurt (University Library Media Commons); Dr. Richard Leskosky (Professor (retired) Media and Cinema Studies); Drew MacGregor (CITES Digital Media); Dr. Clark McPhail (Professor Emeritus, Sociology); Dr. David Plath (Professor Emeritus of Anthropology); and Dr. Gabriel Solis (Associate Professor, Music).

Thanks to Campus Information Technology and Educational Services (CITES) Academic Technology Services, specifically Robert Baird, Jamie Nelson and Amy Hovious for technological assistance through its iPad initiative and Applied Technologies for Learning in the Arts and Sciences (ATLAS) Statistics, GIS, Data, and Survey Research Group for census tool support and assistance in designing the data collection methodology.

Many thanks as well to Mike Casey and Patrick Feaster of Indiana University's Media Preservation Initiative for their insights and recommendations.

A major portion of this project was funded by a National Endowment for the Humanities (NEH) Challenge Grant. Many thanks to Tom Teper, Associate University Librarian for Collections and Technical Services and Associate Dean of Libraries.

Cover photo: A segment from a 35mm safety film print from the early sound-on-film experiments of Professor Joseph Tykociner (c.1922). Courtesy University of Illinois Archives, Joseph T. Tykociner Papers, 1900-1969, RS 11/6/20.

All photos in this document are courtesy of the University of Illinois Board of Trustees unless otherwise noted.

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I. EXECUTIVE SUMMARY

From February 2011 to March 2013, the University of Illinois at Urbana-Champaign conducted a two-phased Media Census to determine the extent of audiovisual holdings across the campus. The study identified 408,492 physical audiovisual assets in 101 campus units, the majority of which represent obsolete or obsolescent “legacy” formats being stored in conditions detrimental to their long-term usability. As a result, this report recommends prioritizing campus-wide planning for a sustainable infrastructure for the efficient, cost-effective preservation of valued media content.

Led by the Library’s Preservation Unit in partnership with the Center for Multimedia Excellence, the Media Census was designed to provide reliable data on the changing landscape of audiovisual materials and their use at the University. It was prompted by concerns that the rise of digital media, having caused numerous legacy analog media formats and players to disappear from the marketplace, has put a significant portion of our academic heritage at risk of permanent loss. Data gathered through the media census, by providing real numbers on audiovisual assets identified in campus holdings, shall serve as a foundation for establishing an accepted timeframe for the lifespan of these assets; planning for their short-term and long-term conservation, storage, and in some cases, digitization; and identifying and highlighting prominent collections of cultural or research value.

Among others, the report has identified specific campus needs in:

- preparing and carrying out in-depth media collection surveys and preservation assessments
- storing and maintaining media collections
- developing access systems, policies and procedures, and human resources and financial plans related to the preservation of media collections

As next steps to address these concerns, the report recommends:

- establishing a Media Preservation Lab and Studio in the University Library (currently underway)
- investigating a physical storage solution for campus media collections
- exploring collaboration with other institutions to establish regional services and digital infrastructure for media preservation

The Campus Media Census has successfully provided an understanding of the immensity and complexity of campus media collections. In collaboration with institutional and external partners, the Library’s Preservation Unit and the Center for Multimedia Excellence hope to move forward in their efforts to overcome the immense challenges facing the media preservation community.

2. INSTITUTIONAL BACKGROUND

In the build-up to the 2004 grand opening of the Siebel Center for Computer Science, several films from the 1960s, which documented the dawn of the computing age, were located and digitized to standard definition tape. Unfortunately, because of a lack of understanding of media and no clear path to achieve long-term preservation within the unit, it appears that the source films were discarded in favor of the converted VHS tapes. While this is by no means an isolated incident, the disposal of the films was egregious because of both the historical nature of the material and the people involved with the production. In 2011 we learned that the student audio engineer at the time of filming was Tomlinson Holman. After graduating from Illinois, Mr. Holman went on to become one of the inventors of the THX Sound System with Lucasfilm in 1983, and received a 2002 Academy Award for his audio engineering work.

-Drew MacGregor
Manager, CITES Digital Media Services
CME Steering Committee

2.1 The University of Illinois at Urbana-Champaign

Founded in 1867 as the Illinois Industrial University and renamed the University of Illinois in 1885, the University of Illinois at Urbana-Champaign is one of the original 37 public land-grant institutions created after President Abraham Lincoln signed the Morrill Act in 1862. The Academic Ranking of World Universities (ARWU) ranks the University of Illinois as 25th in the World (2013); 5th World rank in Engineering/Technology and Computer Sciences (2013); 17th World rank in Life and Agriculture Sciences (2013); and 29th World rank in Natural Sciences and Mathematics (2013). The University has 2,548 faculty members, including 1,851 with tenure or on tenure track, and 697 visiting faculty and instructional staff, and 12,239 graduate and professional students among its 44,520 total students¹. Additionally, Illinois ranked #2 in the most recent ranking of the nation's "Top 20 Research Institutions" in number of international students. It consistently ranks among the top Ten U.S. Universities in number of earned doctorates awarded annually.

2.2 The University Library at the University of Illinois at Urbana-Champaign

Initially founded in 1867, the University of Illinois at Urbana-Champaign Library opened in 1868 with a core collection of 1,039 volumes. This collection rapidly grew during the early 20th century with the Library acquiring its one-millionth volume in 1935 and becoming, by 1940, the fifth largest academic library in the United States. Since then, the Library has remained on the cutting edge of librarianship: becoming the first major research library to establish an online catalog in 1978 and establishing an internet-accessible networked database in 1992. The Library is also renowned for the types of materials that it has gathered over the years, including noteworthy collections of personal papers from authors such as H.G. Wells, Marcel Proust, and Carl Sandburg, as well as a distinguished collection of Abraham Lincoln-related artifacts, and holdings on topics ranging from the STEM fields (science, technology, engineering and mathematics) to the humanities.

Currently, the Library is consistently acknowledged to be one of the preeminent research libraries in the world. With more than 13 million volumes and significant digital resources, it ranks second in size among academic research libraries in the United States and first among public university libraries in the world². The Library currently employs approximately 90 faculty and 300 academic professionals, staff, and graduate

¹ <http://illinois.edu/about/overview/facts/facts.html> accessed 12/13/2013.

² <http://publications.arl.org/ARL-Statistics-2009-2010/83> accessed 5/11/2014.

assistants. It consists of multiple departmental libraries located across campus, as well as an array of central public, technical, and administrative service units.

2.3 The Media Preservation Program of the University Library

The University Library's Preservation Unit exists to ensure long-term access to the physical and intellectual contents of the Library's collections. As such, it seeks to provide this access with an eye toward maximizing the Library's investment in collections, services, and staff while continually seeking to improve the services that it provides. In 2011, the Preservation Unit's traditional book and paper focus was expanded with the addition of a Media Preservation Program tasked with ensuring that media collections are maintained and preserved throughout the Library system. While certain small-scale media preservation efforts have been made in an ad-hoc fashion over the years, the Media Preservation Program constitutes the Library's first formal, directed approach to the long-term preservation and conservation of time-based media collections.

The early years of the Media Preservation Program have been spent researching and working to understand how best to design services to meet the needs of a vast system of 25 independent libraries and collection units with a significant audiovisual legacy. This has involved building relationships with personnel, getting a sense of individual units' situations, and attempting to design and promote services that will best ensure the long-term usability of audiovisual assets. The size and diversity of the Library system has created wide-ranging and highly-varied situations in terms of collection organization and storage conditions across the institution, but the support demonstrated by the Library Administration in maintaining a robust preservation and conservation program with a strong media component is a promising sign of the Library's and Campus's commitment to the stewardship of audiovisual and digital collections.

2.4 The Center for Multimedia Excellence (CME)

Spread across the University, a vast and undiscovered treasure trove of historical documents exists in the form of film, video, audio and other antiquated media. These artifacts are the enduring heritage of the institution, but due to the inherent instability of the medium they are in danger of being lost forever if not digitized, preserved and properly treated. Our historical media could reframe the Illinois story by opening content to new audiences through a common content catalog.

-From "Multimedia Matters"

The Steering Team of the Center for Multimedia Excellence
September 2012

The Center for Multimedia Excellence (CME) evolved from what was originally known as the Educational Media Group, an informal gathering started in 2004 as a means to bring together those involved in working with media on campus. One of the group's early projects involved the composition of a report outlining a vision for a long-term campus media strategy. Members were also instrumental in the procurement of campus media servers.

The CME itself was launched in fall 2010 as an entity designed to bring media professionals from across the University of Illinois together in an attempt to better coordinate common efforts and resources related to media. A cross-disciplinary, user-driven organization consisting of IT professionals, campus communicators, educational technology experts and multimedia professionals, the CME has worked to develop campus standards, create policies, and deploy service prototypes. The group has been involved in education, research and outreach across campus. Its steering committee members have served on advisory teams and have been

utilized as subject matter experts to guide the deployment of new technologies and services. The Media Preservation Program plays an active role on the CME Steering Committee, and The Illinois Campus Media Census grew out of the CME's overarching principles of implementing best practices, and developing shared services and tools that can be accessed by the entire campus community. Media preservation and the outcomes achieved through the Illinois Campus Media Census constitute a key part of the CME's strategic efforts to create efficient and scalable institutional solutions for multimedia data management, distribution, accessibility, outreach, and production.

2.5 National and International Media Preservation Initiatives

With the completion of this study, Illinois becomes the first North American university to conduct a comprehensive campus-wide census of its media holdings since Indiana University's pioneering "Media Preservation Survey: A Report"³ (2009). While differences exist between the academic programs of these universities, the statistics gathered by their respective studies do well to point out the magnitude of the media preservation crisis, while providing valuable format-specific information to inform decision-making. Illinois and Indiana are far from alone in their concern for the future of media collections. The British Film Institute, which in 2012 presented its Film Forever preservation program, acknowledges that "much of our own film heritage isn't accessible. [...] As the cinema industry completes the transition to digital, a significant part of this heritage will become ever more inaccessible, stranded in the analog domain."⁴ The Library of Congress's recently published *National Recording Preservation Plan*⁵ states that "many endangered analog formats must be digitized in the next 15 or 20 years before further degradation makes preservation all but impossible." These views are shared widely in the media preservation community nationally and internationally, and reflect accurately on the state of audiovisual media at Illinois.

³ http://www.indiana.edu/~medpres/documents/iub_media_preservation_survey_FINALwww.pdf accessed 12/13/2013.

⁴ <http://www.bfi.org.uk/about-bfi/policy-strategy/film-forever/strategic-priority-three> accessed 12/13/13.

⁵ <http://www.loc.gov/rr/record/nrpb/PLAN%20pdf.pdf> accessed 12/13/13.

3. MEDIA CENSUS METHODOLOGY AND RESULTS

The goal of the Illinois Campus Media Census was to gather, as accurately as possible, a count of the number of media assets that exist on the University's Urbana-Champaign campus, with media understood to mean time-based audio and moving image items in analog and digital formats. Census results are intended to shed light on the massive amount of materials that are in immediate danger due to format obsolescence or simple degradation. If services are to be designed to facilitate their long-term preservation, these materials first need to be identified and their needs recorded. Additionally, the census was designed as an outreach tool with the goal of raising awareness within the campus community of the long-term issues facing both analog and digital media collections.



Figure 1. Open reel audio tapes from the University of Illinois Sousa Archives and Center for American Music, University Bands Tape Recordings, 1942-1987, stored at the Archives Research Center at The Horticultural Field Station

3.1 Overview

The census was undertaken in two phases: a preliminary survey followed by comprehensive on-site data collection. Phase One consisted of a survey in the spring of 2011 of campus units that self-reported rough numbers of their own holdings in still images, born-digital materials, and legacy audiovisual formats. This preliminary assessment of the scope of the campus's media landscape provided the impetus for a more comprehensive, accurate accounting, and led to Phase Two, conducted between May 2012 and March 2013, which focused exclusively on legacy audiovisual formats and their digital derivatives. Phase Two data was gathered during site visits by project staff. All data tables representing media holdings in this report were drawn from Phase Two activities.

3.2 Phase One

Co-sponsored by the University Library and the Center for Multimedia Excellence (CME), and designed by a taskforce within the CME with assistance from the Applied Technologies for Learning in the Arts and Sciences (ATLAS) statistical consulting staff, the results of Phase One were intended to help define a population of audiovisual collections on campus.

Structured by format type, the survey asked for rough quantities of assets (options being less than 100, 101-500, 500-1000, 1000-5000, or more than 5000) and where those assets were being physically stored (see Table 1).

Table 1. Media Types Collected in Phase One Self-Reported Survey

Analog Media	Digital Media
Motion Picture Film	Audio on external disk
Audio Cassette	Audio on backup tape
Grooved Disk	Audio on hard drive
Magnetic Cassette Tape	Audio on server
Magnetic Open Reel Tape	Video on external disk
Audio ‘Other’	Video on backup tape
Video cassette	Video on hard drive
Video on magnetic open reel	Video on server
Photographic Transparencies	Photographic images on backup tapes
Photographic Negatives	Photographic images on hard drive
Photographic Prints	Photographic images on external disks
	Photographic images on server

The survey was announced through multiple campus news venues and email lists as well as an all-campus request for participation sent from the Office of the Vice Chancellor for Research, which significantly increased the number of participating units. To facilitate better data collection, students from the Graduate School of Library and Information Science acted as door-to-door emissaries and onsite consultants. By its conclusion, the survey counted responses from 404 individuals, representing 165 (22.4%) of the University’s 735 departments, units, and programs (hereafter referred to as “units”).

A primary flaw with the data collected in Phase One was that collection sizes by range provided an inaccurate record. Follow-up site visits often revealed a high degree of unreliability in the numbers and format

designations reported by unit staff, many of whom lacked expertise in media formats. Furthermore, the uppermost value of “over 5,000” sometimes referred to collections that numbered in the tens of thousands. This validated a claim made by Indiana University that web-based surveys “typically do not achieve high success rates measured in numbers of surveys completed.”⁶ For these reasons, Phase One data does not figure at all in this report. Phase One did, however, create a general impression of the scope and variety of media on the Illinois campus and initiated an on-going campus-wide discussion on the question of media preservation.

3.3 Phase Two

With the Phase One survey suggesting the need for a more rigorous, comprehensive approach, a ten-month time period in 2012 was identified for a full-fledged campus media census. The first month was devoted to establishing parameters for data collection, the creation of a web-based census tool and associated technical needs, assessment of the preliminary data collected in 2011, and initial outreach to the University of Illinois community. The site visit and data collecting stage was set around a seven-month window, with the remaining three months dedicated to final site visits, statistical analysis of the data, and the finalization of project reports.

First, however, census authors consulted large-scale audiovisual collection assessments undertaken at other institutions, both academic and otherwise. These included Indiana University Bloomington’s “Media Preservation Survey: A Report” and “Meeting the Challenge of Media Preservation: Strategies and Solutions”;⁷ the Digital Preservation Coalition’s “Preserving Moving Pictures and Sound”;⁸ the Library of Congress’s “The State of Recorded Sound Preservation in the United States”;⁹ “The WGBH Media Library and Archives Assessment for Scholarly Use,”¹⁰ “Tracking the Real World: A Survey of Audiovisual Collection in Europe”¹¹ published by the European Commission on Preservation and Access; and “Permanence through Change: The Variable Media Approach,”¹² co-published by the Guggenheim Foundation and the Daniel Langlois Foundation for Art, Science, and Technology. In addition, the Texas Commission on the Arts’ “Videotape Identification and Assessment Guide”;¹³ Independent Media Arts Preservation’s extremely thorough bibliography of literature in the field;¹⁴ TAPE – Training for Audiovisual Preservation in Europe¹⁵ and numerous resources from PrestoSpace,¹⁶ which provides a contemporary dialogue on audiovisual preservation in the European Union, all proved valuable.

⁶ Casey, Mike. “Media Preservation Survey: A Report,” *Indiana University-Bloomington*. 2009, pg.111. http://www.indiana.edu/~medpres/documents/iub_media_preservation_survey_FINALwww.pdf accessed 12/13/2013.

⁷ Ibid and http://www.indiana.edu/~medpres/documents/iu_mpi_report_public.pdf accessed 12/13/2013.

⁸ http://www.dpconline.org/component/docman/doc_download/753-dpctw12-01pdf accessed 12/13/2013.

⁹ <http://www.clir.org/pubs/reports/pub148/pub148.pdf> accessed 12/13/2013.

¹⁰ <http://openvault.wgbh.org/pdf/WGBHMLAAssessment.pdf> accessed 12/13/2013.

¹¹ http://www.tape-online.net/docs/tracking_the_reel_world.pdf accessed 12/13/2013.

¹² http://variablemedia.net/e/preserving/html/var_pub_index.html accessed 12/13/2013.

¹³ <https://sites.google.com/site/tbmbfbsample/about-preservation-of-time-based-video-media/how-to-guides-for-video-preservation-techniques/texas-commission-on-the-arts-videotape-identification-and-assessment-guide> accessed 12/31/2013.

¹⁴ http://www.imappreserve.org/info_res/bibliography.html accessed 12/31/2013.

¹⁵ <http://www.tape-online.net/> accessed 12/31/2013.

¹⁶ <http://www.prestospace.org/> accessed 12/31/2013.

Next, the questions below were posed to stakeholders within the Library Media Preservation Program and CME to help refine the shape of the census study. They are presented with the answers determined by the stakeholder group.

Q. With the extremely high number of departments, units, and programs at the University of Illinois (735), will the authors select a smaller but representative group of departments to interview for the Census?

A. No, the authors will attempt a comprehensive census of campus media holdings rather than a random sampling approach, which, due to significant variability in the media assets between departments, is deemed inappropriate.

Q. Will the Census include still images/photographs, either or both analog and digital? If so, will it include or exclude certain types (e.g., microscopy, x-ray)?

A. The authors will NOT include still images, both digital and analog, as these visual resources constitute an entirely separate challenge with very different requirements.

Q. Will the Census include born digital audiovisual assets?

A. No, the Census will focus on time-based audiovisual materials in analog formats and any associated digital derivatives, but will not include born digital software and other computer media, as these constitute an entirely different challenge.

Q. How will the authors conduct item counts, by asset or by title?

A. The authors will count all assets at the item level with no regard to de-duplicating titles, since “title” is not always a reliable piece of metadata for differentiating unique audiovisual assets.

Q. Will the authors attempt to identify intellectual property rights for the identified assets?

A. No, the authors will not collect information regarding the intellectual property rights or copyright status of items within unit collections, as this would place unrealistic constraints on the data collectors.

Q. Will the Census include the collections of individual faculty members, or collect data at the department level only? Will the authors try to include materials from emeriti and soon-to-retire faculty, and if they do, how will they work with University Archives to best collect data on media assets they may deem valuable?

A. Whenever they presented themselves for identification, the authors would record information on faculty and emeritus faculty collections, irrespective of whether these could be said to belong to the faculty members or to the University. Decisions regarding referral to the University Archives would be made on a case-by-case basis as determined by the individual faculty member.

Q. How much information will the authors collect regarding asset content?

A. In addition to the quantitative nature of the Census, the authors will take note of “unique,” “rare,” and “commercial” content as these are encountered. This will be subject to the interviewee’s knowledge of the collection contents itself.

Q. Should the authors report on collection storage environments or housings? If so, to what degree of accuracy (i.e., item level assessment of housings, general collections storage aspects, storage location environmental characteristics)?

A. The authors will assess basic conditions of storage environments and of audiovisual carriers at site visits.

Q. Will the Census gather data on cataloguing or any other form of inventorying used?

A. Yes, the authors will inquire about the existence (or lack thereof) of cataloguing or inventorying in any form completed currently or in the past, as this is integral to knowing further information about collection contents.

Q. Will the Census gather data on the existence of audiovisual playback equipment?

A. Yes, the authors will collect data and information on audiovisual playback and other peripheral media devices held by campus units, as the disappearance of these from the market represents one of the most pressing issues facing the preservation community at this time.

Q. Will the Census include faculty/ staff knowledge and skills with regard to the use, upkeep or maintenance of legacy audiovisual equipment?

A. Yes, the authors will seek to identify individuals with the expertise and experience in using and/or repairing legacy audiovisual equipment in order to build a network of professionals around campus with identified skills who could be contacted if needed.

Q. How will the Census authors handle requests to donate or “clean out” existing collections?

A. The authors will ask census respondents their interest in and need for future preservation actions on behalf of their collections, and will provide contact information for appropriate Library repositories if interested in donation.

3.4 Evaluation of Survey Tool

During the planning stages, it was decided that an online survey tool would be utilized for the collection of data and to record the responses to the interview questions. A number of software and online tools, both proprietary and open-source were tested and examined during this process, including Survey Monkey (www.surveymonkey.com), Survey Gizmo (www.surveygizmo.com), Snap Surveys (www.snapsurveys.com), Survey Builder (www.surveybuilder.com), and FluidSurveys (fluidsurveys.com).

After discussion with Survey Research Services (SRS) of ATLAS, census authors chose the Survey Gizmo platform as the web-based tool for inputting census data. The SRS office highly recommended the platform due to its flexibility, easy-to-manage interface, statistical analysis tools, and ability to collect data in both online and offline modes (the authors knew there would be many instances where data would be entered in basements, attics and other areas where wireless connectivity would not be possible). In addition, it was initially planned that graduate students would assist in the data collection phase and therefore an easy-to-navigate platform with a small learning curve would be most beneficial to the survey team.

As the Media Census required a mobile technology platform, Campus Information Technology and Educational Services (CITES) provided the census team with iPads as part of its initiative into testing tablets

in research and teaching roles. The iPads allowed the census authors to save time by entering data on site, negating the need to gather and input data on two separate occasions.

Illinois Media Census Phase 2 - Physical Media
Page One

1. Name of Department or Unit interviewed. *

2. Department or Unit contact. *

3. Data Reporter name and contact. *

4. Site Visit Location (Building, Room #)

5. Quantity of 8mm film?

	Color positive	B&W positive
Acetate	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>
Polyester	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>

6. Quantity of 16mm film?

	Color positive	Color positive with optical strip	B&W positive	B&W positive with optical strip	Color negative	B&W negative	Full Coat Magnetic audio	Color reversal	B&W reversal
Acetate	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>
Polyester	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>

7. Quantity of 35mm film?

	Color positive	Color positive with optical strip	B&W positive	B&W positive with optical strip	Color negative	B&W negative	Full Coat Magnetic audio
Acetate	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>
Polyester	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>
Nitrate	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>

8. Quantity and type of other film? Examples would include 65/70mm, 9.5mm, and other less common film gauges.

Figure 2. Screenshot of web-based census tool

The web-based census tool (see Figure 2) was designed to collect two broad categories of data: the number of assets held and a ranked analysis of the condition of the assets and their storage environments. Criteria used for these rankings were:

- proper orientation of the assets (a particular concern for film and tape)
- temperature and relative humidity consistency and monitoring
- type of shelving and enclosure

- cleanliness of the storage environment
- sampled assessment of assets to determine base types for film and tape and apparent or potential deterioration for all formats

In a handful of cases, assets were either removed from their storage environment for immediate conservation, or flagged for conservation in the near term. As noted above, assets were counted by physical object, rather than by title. Because some collections were physically distributed over multiple units, assets were counted where they were found as a method of reducing the likelihood of duplicate or missed counts. In cases where assets were known to be under the authority of a unit other than the one where they were counted, records of this were indicated.

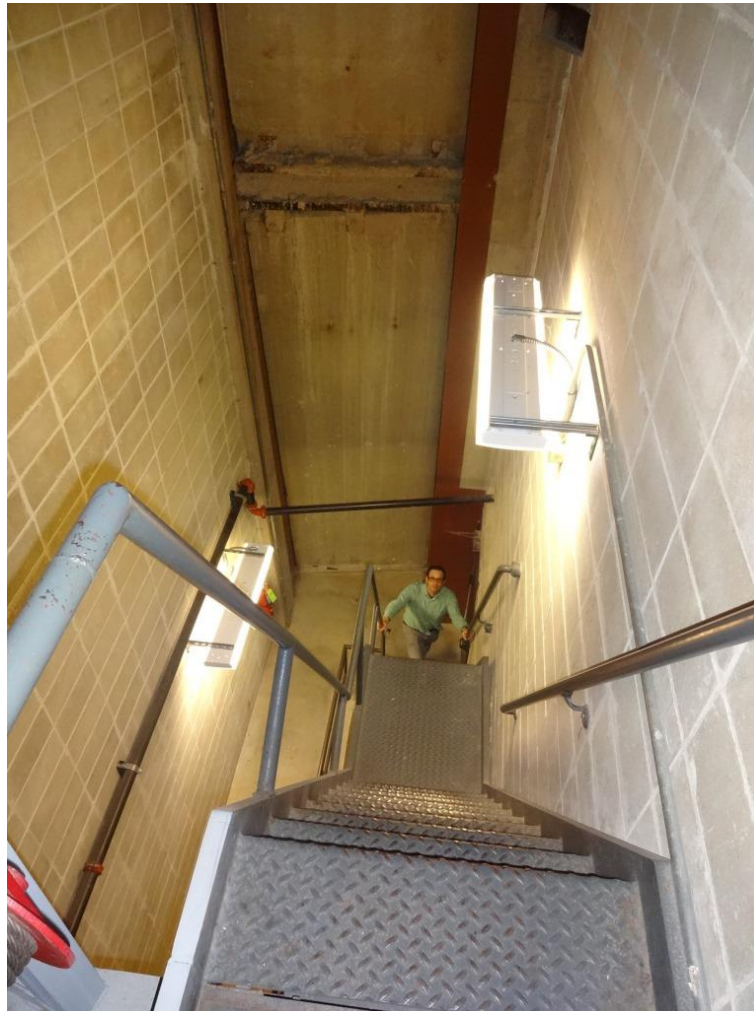


Figure 3. Tracking down media in the catwalks and rafters of the Krannert Center for Performing Arts

An additional area of data collection determined the number of assets that had been cataloged by some persistent and referable system (more than one department indicated that cataloging was done “up here” with a nod to the interviewee’s head). Online catalogues, card catalogs, databases (both shared and not), paper check-out forms, and printed lists of titles were all considered as a functional effort to catalog a unit’s assets.

3.5 Census Results



Figure 4. Box of films and audio tapes identified during the Media Census

The audio visual heritage of the University connects us in unique ways, much like old family photographs. It provides a common history and shared sense of pride and purpose in what has taken place on the campus over a century. Unfortunately the needs of preservation fall before the demands of progress, and units and colleges are ill-equipped and under-staffed to preserve and curate. To that end it is critical that we place the right resources with the experts to ensure our audiovisual heritage is not lost to the students and researchers of the future.

-Drew MacGregor
 Manager, CITES Digital Media Services
 CME Steering member

The results of the final data collected for the Illinois Media Census revealed 408,492 physical audiovisual assets, varying widely in format and age, within a diverse cross-section of 101 (13.75%) campus units. Interesting conversations amid unique storage locations unveiled a history of media usage as complex and huge as the University itself. The following presents a detailed breakdown of selected statistics. For the full detailed data sets collected during the census, please visit the following URL:

<https://www.ideals.illinois.edu/handle/2142/50110>

3.6 Campus Data

Table 2 below presents the survey results broken down into the three most general categories for describing audiovisual materials: audio, video and film. The units in the table are listed in alphabetical order.¹⁷

Table 2. Total Assets for All Reported Units

Unit Name	Film	Video	Audio	Unidentified	TOTAL
Agriculture, Consumer & Environmental Sciences	42	3,375	300	0	3,717
Albert E. Jenner, Jr. Law Library	0	116	28	0	144
Alumni Association	0	144	10	0	154
American Indian Studies	1	371	144	0	516
Animal Resources	0	63	1	0	64
Anthropology	0	15	30	0	45
Applied Health Sciences	18	92	27	0	137
Asian American Cultural Center	0	282	100	0	382
Asian Educational Media Service	0	1,358	0	0	1,358
Assembly Hall	1	110	15	0	126
Applied Technologies for Liberal Arts & Sciences (ATLAS)	0	4,455	2,600	0	7,055
Atmospheric Sciences	6	142	0	0	148
Beckman Institute for Advanced Science & Technology: Communications	2	472	1	0	475
Beckman Institute for Advanced Science & Technology: Imaging Technology Group	0	476	65	0	541
Beckman Institute for Advanced Science & Technology: Statistical Speech Technology	0	169	284	0	453
Biochemistry	0	42	3	0	45
Campus Recreation	19	51	1	0	71
Carver Biotechnology Career Services	0	23	0	0	23
Center for Advanced Study	0	60	1,011	0	1,071
Center for East Asian & Pacific Studies	0	34	25	0	59
Center for South Asian & Middle Eastern Studies	0	105	20	0	125
Center for Translation Studies	0	0	20	0	20
Chemistry Studio / SABIC Innovative Plastics Studio	0	790	0	0	790

¹⁷ All data presented in this report are as of July 10, 2014.

Unit Name	Film	Video	Audio	Unidentified	TOTAL
Communications	0	164	16	0	180
Communications for Enrollment Management Shared Services	0	59	0	0	59
Computer Science	1	974	0	0	975
Dance	0	2,336	0	0	2,336
Education: Learning Technologies	0	20	25	0	45
English	0	681	3,065	0	3,746
Entomology	85	65	38	0	188
Extension County Campuses	20	150	50	0	220
Facilities & Services	0	50	0	0	50
Foellinger Auditorium	2	0	0	0	2
French	2	69	157	0	228
Geography	0	50	0	0	50
Geology	0	217	0	0	217
Germanic Languages & Literatures	0	125	30	0	155
History	0	26	0	0	26
Human & Community Development	0	17	0	0	17
Illinois Fire Service Institute	220	3,991	435	0	4,646
Illinois Program for Research in the Humanities	0	52	185	0	237
Illinois State Archaeological Survey	4	126	1	0	131
Illinois State Water Survey - Peoria Office	0	800	0	0	800
Institute for Computing in Humanities, Arts & Social Science	0	700	0	0	700
Institute of Aviation	59	214	26	0	299
Institute of Government & Public Affairs	8	0	10	0	18
Intercollegiate Athletics	0	3,270	32	0	3,302
Journalism	0	376	0	0	376
Kinesiology	0	74	45	0	119
Krannert Art Museum Giertz Education Center	10	766	5	0	781
Krannert Center for the Performing Arts	8	135	6,380	0	6,523
La Casa	0	59	10	0	69
Landscape Architecture	15	604	56	0	675

Unit Name	Film	Video	Audio	Unidentified	TOTAL
Library: Agricultural Communications Documentation Center	12	14	113	0	139
Library: Archives - American Library Association Archives	34	372	572	0	978
Library: Archives - Sousa Archives and Center for American Music	442	327	12,883	0	13,652
Library: Archives - University Archives	2,808	7,604	19,203	0	29,615
Library: Center for Global Studies	0	30	7	0	37
Library: Collections Management Services/Gifts & Donations	11	788	710	0	1509
Library: Communications	0	690	176	0	866
Library: History, Philosophy and Newspaper Library	2	795	56	0	853
Library: Illinois History & Lincoln Collections	64	179	117	0	360
Library: Illinois State Geological Survey	14	494	2	0	510
Library: Illinois State Water Survey	1	46	3	0	50
Library: Illinois Sustainable Technology Center	0	210	112	0	322
Library: Law	0	0	0	1,619	1,619
Library: Literatures & Languages	0	16	94	0	110
Library: Media Preservation	154	119	172	0	445
Library: Music & Performing Arts	0	3,395	87,799	0	91,194
Library: Oak Street Library Facility (OSLF)	0	0	0	23,585	23,585
Library: Prairie Research Institute	26	87	12	0	125
Library: Rare Books & Manuscripts Library	4,390	628	832	0	5,850
Library: Residence Hall Libraries (7 locations)	0	0	0	7,933	7,933
Library: Ricker Library of Architecture & Art	2	163	20	0	185
Library: Social Sciences, Health & Education	0	116	557	0	673
Library: Undergraduate	0	33,288	11,000	0	44,288
Library: University Laboratory High School	0	582	14	0	596
Library: University of Illinois Press Building Basement	0	35	80,883	0	80,918
Linguistics	0	113	159	0	272
Mathematics	18	339	0	0	357
Mathematics, Science and Technology Education	0	375	26	0	401

Unit Name	Film	Video	Audio	Unidentified	TOTAL
Media & Cinema Studies	10,000	500	0	0	10,500
National Center for Supercomputing Applications	0	1,683	0	0	1,683
Natural Resources & Environmental Sciences	0	0	50	0	50
Online & Professional Engineering Programs	0	5,180	0	0	5,180
Psychology	0	1	5	0	6
Public Affairs	0	661	15	0	676
Russian, East European & Eurasian Center	0	787	23	0	810
Safety & Compliance	0	12	0	0	12
School of Music	0	77	1,700	0	1,777
School of Music: Audio Department	0	350	3,758	0	4,108
School of Music: Ethnomusicology Archives	0	0	2,100	0	2,100
Slavic Languages & Literatures	104	485	165	0	754
Spanish, Italian & Portuguese	0	25	0	0	25
Special Education	0	332	0	0	332
Spurlock Museum	22	846	33	0	901
UIC College of Nursing Urbana: Champaign Regional Program	0	68	3	0	71
University Housing	0	146	25	0	171
University of Illinois Foundation	4	441	208	0	653
Veterinary Medicine	0	173	1	0	174
WILL: Illinois Public Media	8	11,408	14,962	0	26,378
TOTALS	18,639	102,895	253,821	33,137	408,492

The raw data collected by simple item counts conducted during respondent interviews presents a widespread and diverse map of the analog media landscape on the Urbana-Champaign campus, where media items are found across a wide swath of campus units in all shapes and sizes. The summary table of total assets reported by type shows audio assets to be the highest in concentration, followed by video and film (see Table 3). This comes as no surprise, since audio has been used in the highest concentration throughout both higher education and the media industry as a whole.

Table 3. Total Assets for All Reported Units

Type	Total Number	Percentage
Film	18,639	5%
Video	102,895	25%
Audio	253,821	62%
Unknown	33,137	8%
TOTAL	408,492	100%

The relatively low number of motion picture film items was surprising given the importance that motion picture film has played in the classroom and in education in general. However, further research provided some answers. Started as “Visual Aids Services” in 1937 with a small collection of films, The University Film and Video Center grew to become one of the largest and most comprehensive educational film distribution services in the United States. Despite portions of the roughly 10,000 title (23,000 prints) collections being decimated by fire in 1961, the collection managed to grow to contain more than 40,000 prints and tens of thousands of videos, becoming the exclusive educational distributor for Disney and ABC’s World of Learning, before closing its operation in 1993 (See Figures 5, 6, 7).¹⁸ Conversations with individuals across campus indicated that at the Center’s close, the University offered campus departments the option to purchase titles relevant to their fields and then sold off as many films as they could to other educational institutions including the American Archives of Factual Film (AAFF) at Iowa State University and Indiana University, “who took about as many as would fit in a U-Haul”.¹⁹ The remaining films (approximately 20,000 prints representing 6,436 titles) were acquired by The Prelinger Archives in San Francisco, who were “delighted to have the collection.”²⁰ Both the Prelinger Archives and the AAFF were acquired by the Library of Congress where much of the Center’s films now reside.²¹ As a result of the dissolution of the Center and the breaking up of the collection, film cans and videos bearing the defunct Center’s logo appeared in units all across campus.

¹⁸ Film/Video Center Publications, 1938-1992, University of Illinois Archives, RS 31/14/802.

¹⁹ Correspondence with Rachel Stoeltje, Indiana University, July 2014.

²⁰ Correspondence with Rick Prelinger. April-July 2014.

²¹ Correspondence with Richard Leskosky February 2013-March 2014.

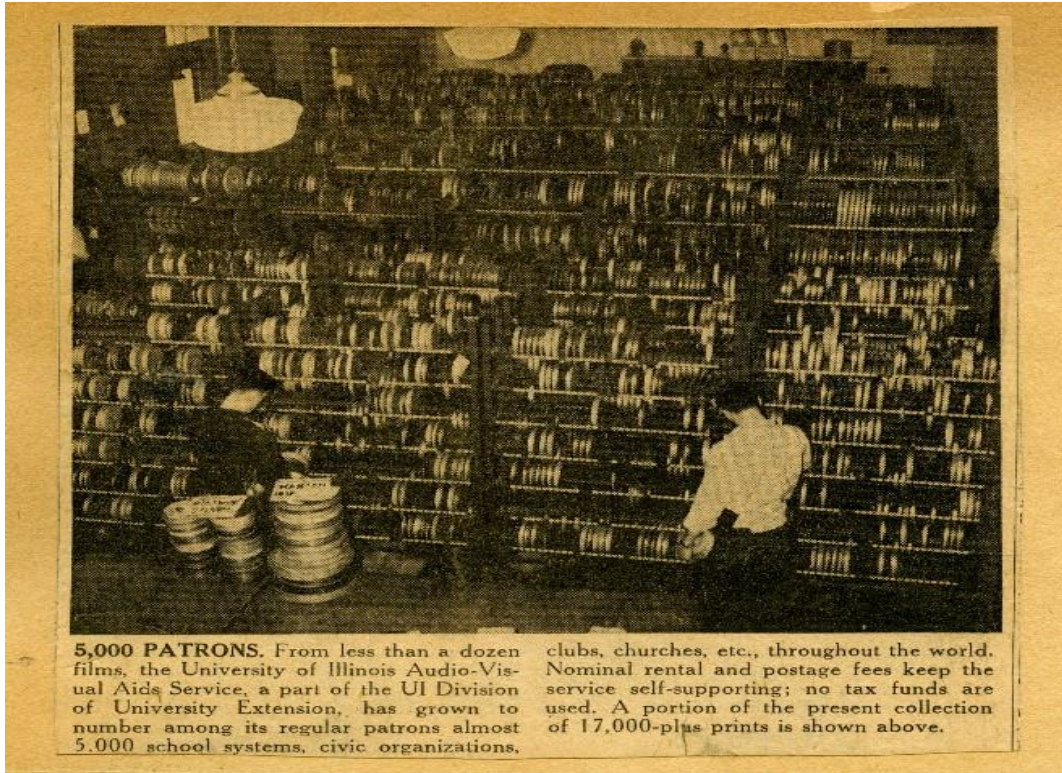


Figure 5. University of Illinois Audio-Visual Aids Service, circa 1957. Courtesy of the University of Illinois Archives, Visual Aids Services/Film Center Scrapbook, RS 31/14/10

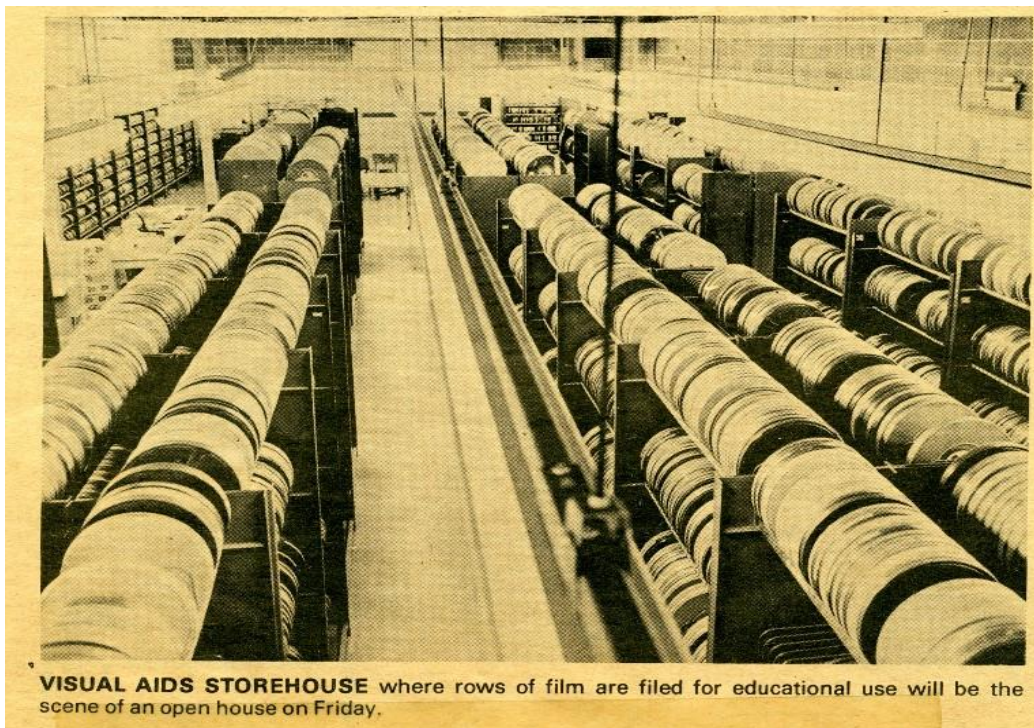


Figure 6. Visual Aids Storehouse, circa 1971. Courtesy of the University of Illinois Archives, Visual Aids Services/Film Center Scrapbook, RS 31/14/10

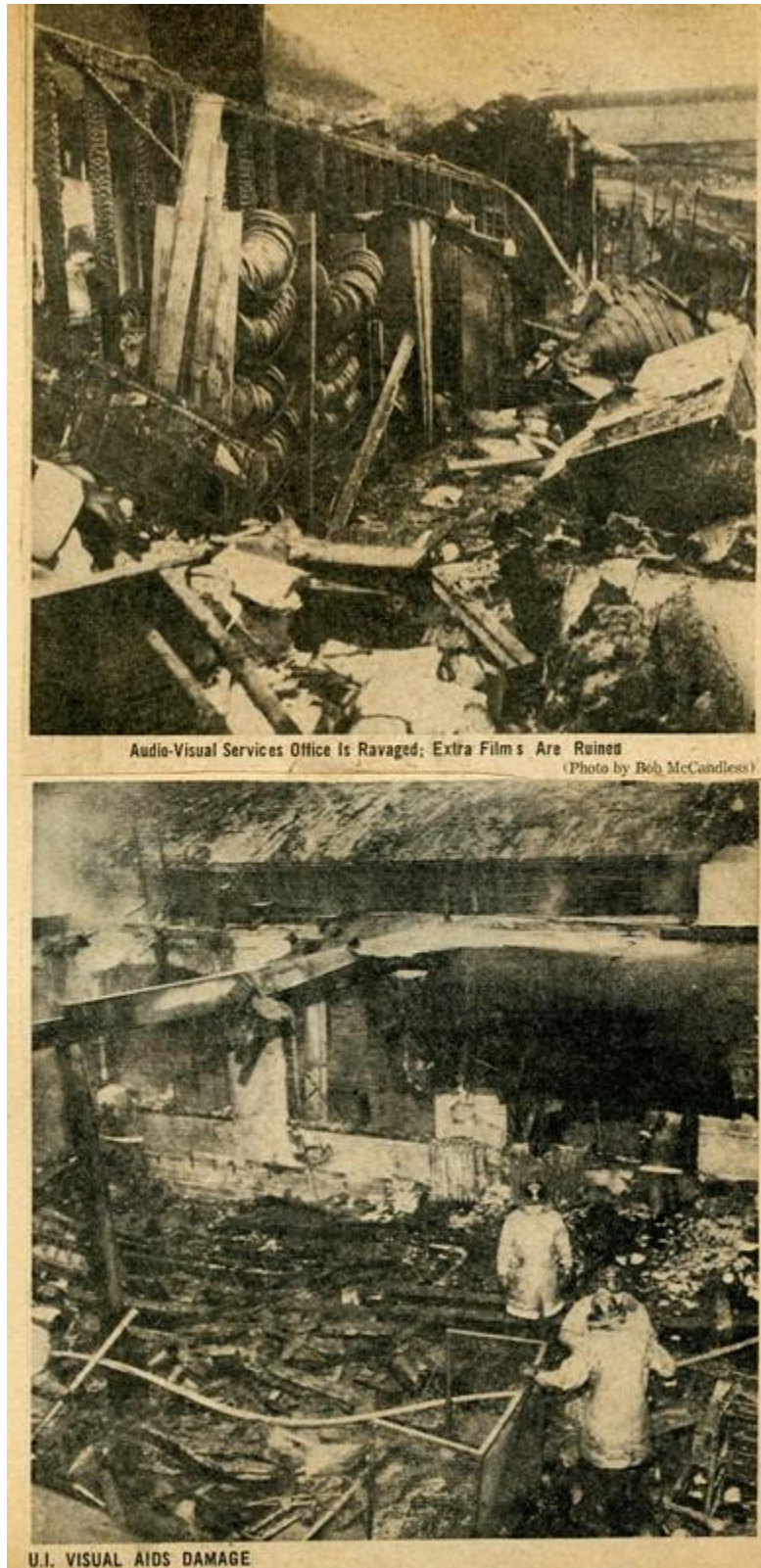


Figure 7. Visual Aids Service fire damage, February 1961. Courtesy of the University of Illinois Archives, Visual Aids Services/Film Center Scrapbook, RS 31/14/10

The table below breaks down all respondent data compiled by format, giving a view of the variety and depth of formats held across campus (see Table 4). Since media formats and their associated obsolescence factors can be used to prioritize materials for preservation reformatting, this data could prove valuable in the future.

Table 4. Assets by Format Type

Type	Quantity	Percentage by Type
Specified Film Assets		
Motion Picture Film	18,639	100.00%
Total Specified Film Assets	18,639	100.00%
Specified Video Assets		
Open Reel Videotape	1,451	1.41%
Cassette Videotape	64,617	62.80%
Optical Videodisc	36,827	35.79%
Other Video	0	0.00%
Total Specified Video Assets	102,895	100.00%
Specified Audio Assets		
Open Reel Audiotape	22,753	8.96%
Cassette Audiotape	30,352	11.96%
Optical Audio Disc	58,895	23.20%
Grooved Audio Disc	137,460	54.16%
Piano/Music Roll	1,760	0.69%
Unidentified Audio	2,601	1.02%
Total Specified Audio Assets	253,821	100.00%
Unidentified/Unspecified Media Assets	33,137	
Total Assets	408,492	

3.7 Unique, Rare and Commercial

With 24 Nobel Prize Laureates, the University of Illinois at Urbana-Champaign has a historic reputation as a center for scientific and engineering research. Civil Engineering, Physics, Computer Science, Evolutionary Biology, Biological/Agricultural Engineering, Atmospheric Science and Audio Technology are only a handful of the fields where pioneering work has been conducted.²² From early geometric visualizations to Veterinary Medicine, many of these scientific fields have utilized audiovisual documentation and products. Just a few specific examples of films from these fields located during the census include: documentation of the Nobel Prize winner Paul Lauterbur's work on the MRI (see Figure 8), the early sound on film experiments of engineer Joseph Tykociner (see Figure 18), documentation of the first observation of a tornado using radar technology,²³ films demonstrating emerging computing technologies such as Illiac I,²⁴ John Bardeen's Nobel prize-winning work in superconductivity and Nick Holonyack's development of both the quantum well laser and the LED light bulb.

This is in addition to fields in the arts and humanities, where documentation of performances, lectures, and compositions often depend on audiovisual carriers for durable, primary records of the works and as evidence in the research of the creative process itself. Subsequently, one important area of focus for the Illinois Media Census was an evaluation of the rarity and uniqueness of these university holdings. This serves several purposes: it highlights especially notable collections; it helps identify which assets are of potentially high intellectual and/or research value and should therefore be made candidates for conservation or preservation through digitization; and it potentially assists in future collections decisions, particularly with regard to commercially produced materials that may exist in several locations on the Illinois campus.



Figure 8. Film demonstrating developments in MRI technology at the University of Illinois

²² <http://illinois.edu/about/overview/facts/nobel.html> accessed 1/14/2014.

²³ <http://www.isws.illinois.edu/hilites/press/030401tornado.asp>.

²⁴ ILLIAC I was the first computer built and owned entirely by a U.S. educational institution.
<http://physics.illinois.edu/history/ILLIAC-I.asp>.



Figure 9. Motion picture films held in an off-campus storage unit from the Department of Media and Cinema Studies collection curated by Professor Richard Leskosky.

All assets identified during the census were assigned values of *unique*, *rare*, or *commercial/undetermined*. *Unique* implies that no other copy of an asset exists (or in some infrequent cases, later generations may exist but in obviously diminished quality). As this standard was applied to all primary research materials with no extant backup copy, and to assets that documented conference proceedings, interviews, and master recordings, it was a relatively common determination. *Rare* assets were more difficult to determine for several reasons, and as a result, assets were less commonly ranked this way. By the census's standards, a rare asset is one that exists in multiple copies, but is somehow uncommon within the broader context of media collections. For example, some formats, such as Edison discs, though commercially produced, were considered rare due to likelihood that few remain in existence due to age and fragility. Likewise, holdings of conference proceedings were considered to be rare if these assets were specialized enough to be held by only a small number of institutions. The third designation used was *commercial/undetermined*, and refers to all commercially manufactured items. All assets within the survey tool were assumed to fall into this category unless determined otherwise. Within the more than-270,000 assets designated *commercial/undetermined*, there are undoubtedly assets that with further item-level investigation will be determined to be either rare or unique.

The Illinois Media Census determined that across the campus, 17.12% (69,926) of the assets identified were unique, 7.01% (28,637) were rare, and 75.87% (309,929) were commercial or undetermined (see Table 5 and Graphs 1, 2, 3 for detailed breakdown).

Table 5. Unique, Rare, and Commercial Items by Format

Identified Unique Items	Number	Percentage of TOTAL items
Unique Audio	37,220	9.11%
Unique Video	25,812	6.32%
Unique Film	6,894	1.69%
Unique TOTAL	69,926	17.12%
Identified Rare Items		
Rare Audio	20,331	4.98%
Rare Video	639	0.16%
Rare Film	7,667	1.88%
Rare TOTAL	28,637	7.01%
TOTAL UNIQUE + RARE	98,563	24.13%
Commercial/Unknown Items		
Commercial/Unknown Audio	196,270	48.05%
Commercial/Unknown Video	76,444	18.71%
Commercial/Unknown Film	4,078	1.00%
Unknown Media Format	33,137	8.11%
Commercial/Unknown TOTAL	309,929	75.87%
TOTAL	408,492	100.00%

*Note: These figures are based on whether units were able to supply information concerning the scarcity of their holdings

Graph I: Comparison of Reported Unique Items

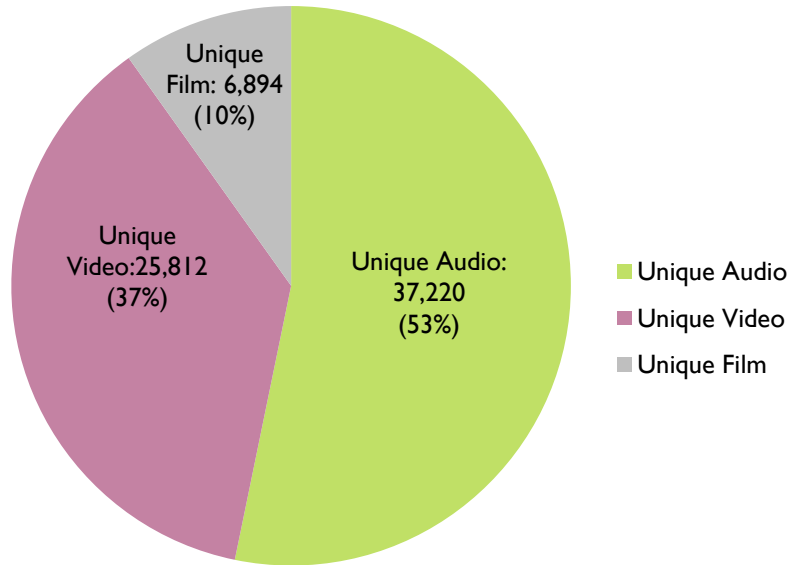
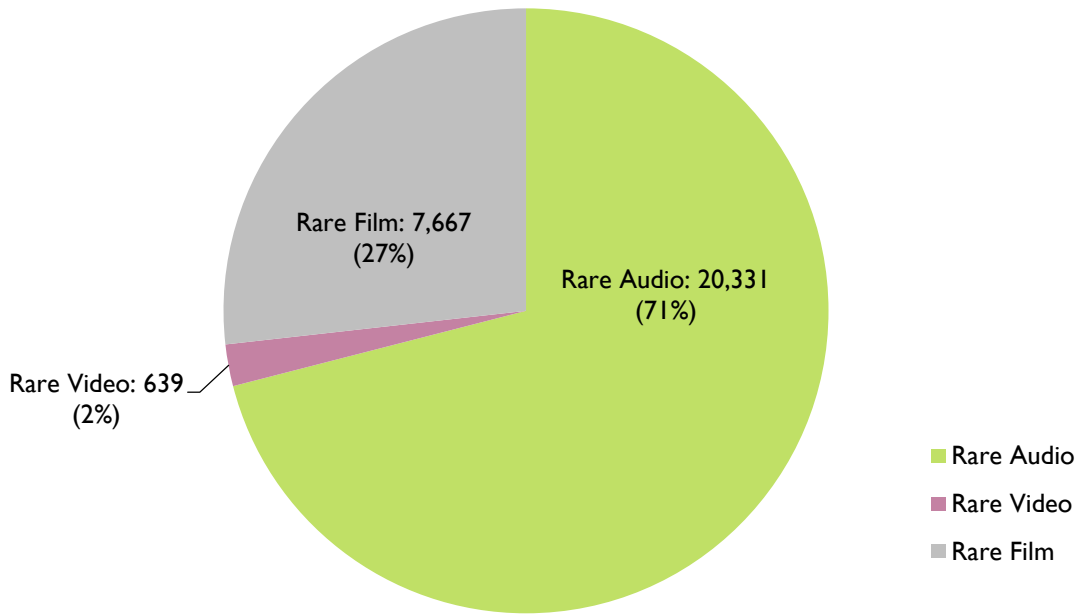
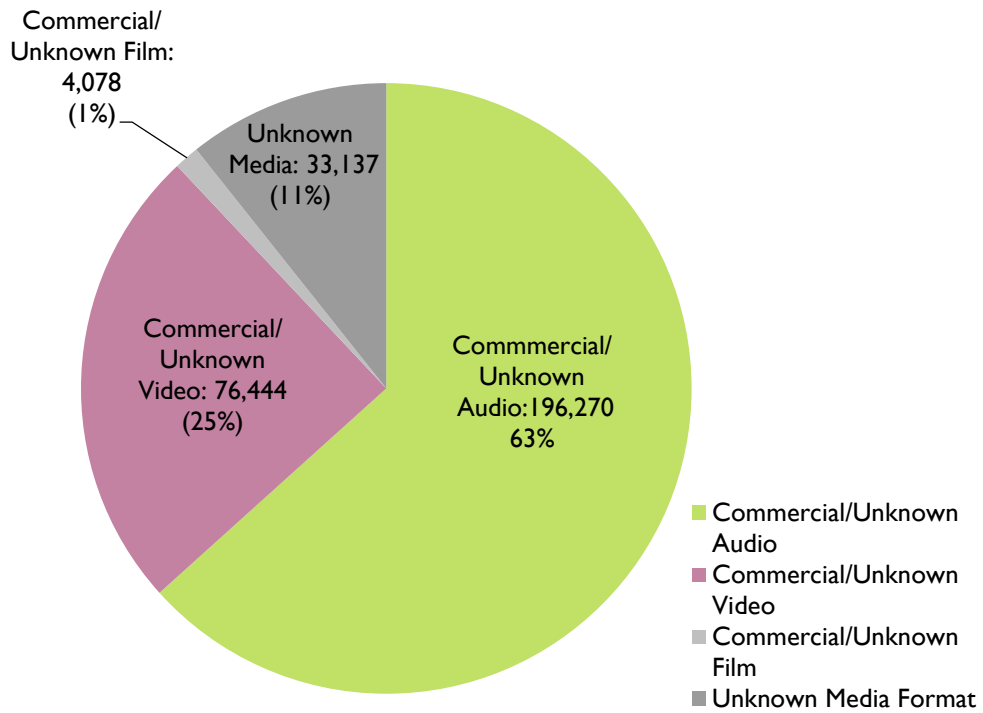


Figure 10: Example of unique audio recording of radio programming from WILL Radio. Disc is made of thinly coated lacquer on a glass base (common during World War II). These objects are easily, often irreparably, damaged due to their highly fragile nature and also can suffer from delamination and damage due to the formation of a substance known as “palmetic acid.” Image Courtesy University of Illinois Archives, Division of University Broadcasting, Sound Recordings, RS 13/6/5

Graph 2: Comparison of Reported Rare Items



Graph 3: Comparison of Reported Commercial/Unknown Items



3.8 Collection Condition and Storage Environments

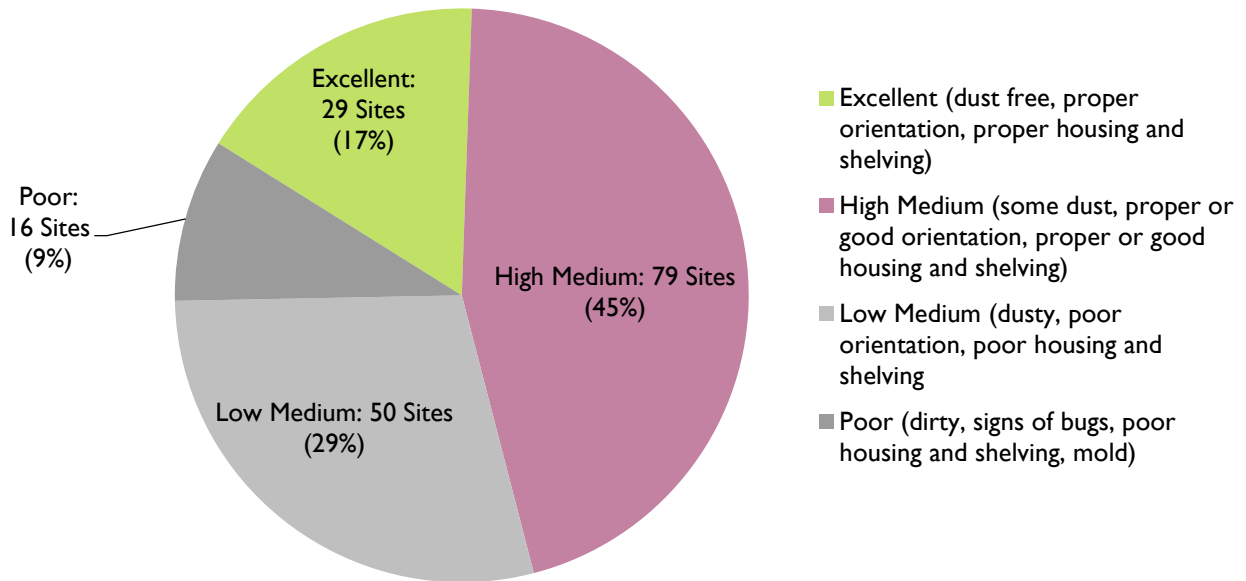


Figure 11. Room filled with analog audio recordings, films, and audiovisual equipment visited during the Campus Media Census

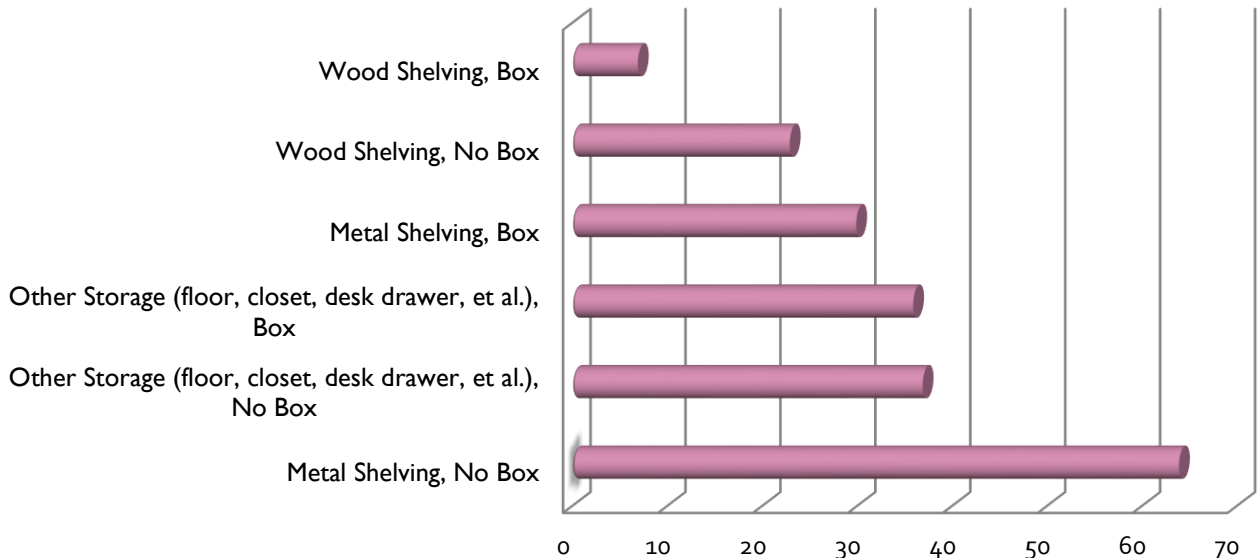
Audiovisual assets at Illinois can be found in storage environments that range from the purpose-built, such as Illinois Public Media's (PBS and NPR affiliate WILL) temperature-controlled videotape vault, to the ad hoc, with damp basements being an all too common location for older formats. The Census brought the interviewers to locations across campus, often to rarely visited annexes, storage rooms, and more than one closet filled with dusty boxes (See Figures 11, 17, 28, 32). In several cases, audiovisual collections resided in rarely-used production or editing booths, the legacy of a department's efforts to document its courses and public events. These collections commonly had numerous types of recording formats, with one era's preferred audio or video tape being replaced by the next.

The following figures (Graphs 4, 5, 6) present observations made concerning the environments in which collections are currently housed.

Graph 4: Indicate the condition of the collection's overall environment:

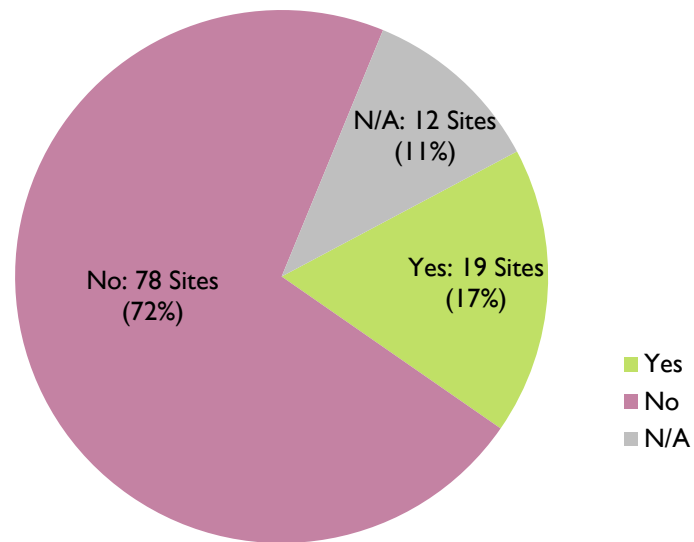


Graph 5: Storage Types for Individual Assets



	Metal Shelving, No Box	Other Storage (floor, closet, desk drawer, et al.), No Box	Other Storage (floor, closet, desk drawer, et al.), Box	Metal Shelving, Box	Wood Shelving, No Box	Wood Shelving, Box
# of sites	64	37	36	30	23	7

Graph 6: Are the temperature and relative humidity of the storage environment monitored?



While several departments maintain collections in excellent condition and regulate levels of temperature and humidity, these constitute a meager 7% of the census pool. The fact that 93% of units fall out of this range is evidence of what can only be called an unfortunate state, both within the Library system and across campus, for the long-term preservation of analog media content. A significant number of the Urbana-Champaign campus's 647 buildings (spread across 7.1 square miles) are more than a century old and many are equipped with out-of-date heating and cooling systems which are subject to extreme fluctuations in temperature and relative humidity. More than a few interviewed departments had materials stored in rooms that were only cooled by window air-conditioning units during the summer, and these were only turned on when there were people working in the room (Figure 12).

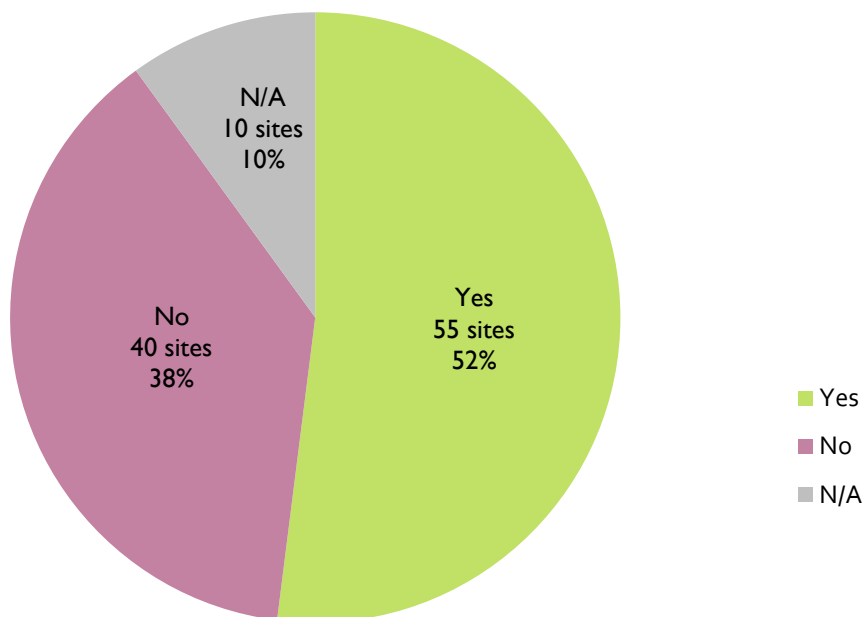


Figure 12: Window air conditioning unit (commonly found in older campus buildings) in one departmental repository

3.9 Cataloged Materials

In determining whether departments have cataloging systems for their media collections, the term “cataloging” was loosely applied to mean any type of inventory or documentation that provided some information about collection contents. Responses ranged from advanced catalog systems (such as within the University Archives, ATLAS, or the University Library) to more rudimentary forms across campus such as spreadsheets, traditional card catalogs, hand-written notebooks, and everything in between. 48% of all campus media-collecting units attest to having no system whatsoever or are unsure if one exists (see Graph 7). There were some documented cases of a database existing on an old PC that was inaccessible due to lack of departmental knowledge on how to read the database files. In addition, even those with advanced software for cataloging may not create metadata for media that is in-depth at an item level or truly reflective of media collections themselves. Oftentimes (as is the case with the Library’s automated library system, Voyager), media items have been “made to fit” into a system not designed to deal specifically with media. In fact, the Census identified only two units using systems designed for media cataloging: WILL (internal database and PBcore metadata standards) and CITL-ATLAS Instructional Resources (Collective Access).

Graph 7: Does the department have a cataloging system for their media collection?



3.10 Analog Materials Transferred to Digital Format

The table below present's data on the number of materials reportedly transferred to some form of digital file. It is important to note here that responses were estimates only made to the best of each respondent's knowledge. It was not feasible or practical to gather in-depth information on this question, and often the respondent was unsure if materials had been transferred or not. Percentages are compared against total unit assets.

Table 6: Analog Sources Transferred to Some Form of Digital File

Department	Total Assets	Total # of Transferred Assets	% of items transferred
Communications for Enrollment Management Shared Services	59	344	583%*
Safety & Compliance	12	12	100%
Public Affairs	676	500	74%
Library: Music & Performing Arts*	91,194	60,000**	66%
University Housing	171	91	53%
Journalism	376	120	32%
Dance	2,336	680	29%
Germanic Languages & Literatures	155	35	23%
Illinois Program for Research in the Humanities	237	38	16%
Mathematics, Science and Technology Education	401	60	15%
Anthropology	45	5	11%
American Indian Studies	516	50	10%
Agriculture, Consumer & Environmental Sciences	3,726	303	8%
Library: Archives - University Archives	26,614	2,150	8%
La Casa	69	5	7%
Center for Advanced Study	1,072	50	5%
Atmospheric Sciences	148	3	2%
Illinois Fire Service Institute	4,646	38	1%
Library: Archives - Sousa Archives and Center for American Music	11,068	108	1%
Library: Undergraduate	44,288	255	1%
Spurlock Museum	901	11	1%

*Department digitizes and reuses mini-DV tapes, therefore total files is greater than total tape count.

**These are single files transferred from sources to be used as "E-reserves" for specific courses. These are access files only and are used only by the requesting professor.

Census respondents cited a wide array of file formats and/or associated codecs for these transfers, and, as expected, simply “avi” or “mov” was the information provided without any further knowledge concerning the specifications or details of these files. When asked whether they had at some point made digital transfers of legacy assets, units frequently responded in the affirmative and referenced having made CD-Rs or DVD-Rs of analog originals. What this demonstrated is that “digitization” was often seen as simply the process of creating a next generation physical object, often of significantly lower quality than the original audio or video signal, rather than a preservation quality file stored in a durable manner. CD-Rs and DVD-Rs are in fact one of the most problematic media storage formats, as the dye used to create the data playback signal often begins to break down within a decade or less of the disc’s creation. A study conducted by the Library of Congress suggests that the effects of inherent material decomposition are perhaps even more acute than accelerated aging tests suggest.²⁵



Figure 13. One of several delaminated DVDs located at studios of WILL, Illinois Public Media

²⁵ See NIST/Library of Congress (LC) Optical Disc Longevity Study, 2007.
http://www.loc.gov/preservation/resources/rt/NIST_LC_OpticalDiscLongevity.pdf accessed 3/26/2013.

3.11 Audiovisual Equipment



Figure 14. Analog audio equipment observed during the Campus Media Census

A fairly small selection of audiovisual playback and peripheral equipment was identified during the Census. This information was gathered primarily on items that would have direct application to media preservation. For example, there are several professional-grade 35mm projection systems installed in campus auditoriums. While of great interest, these items would not realistically be utilized in a media preservation lab, and therefore are not represented in the data below.

The findings of the equipment survey show that while pockets of analog playback and peripheral audio and video devices do exist across the Urbana-Champaign campus, there is by no means enough equipment to ensure the ongoing accessibility of media collections. It is well known that significant amounts of equipment have been discarded over the years, and that much of what does currently exist is in a state of disrepair. It was learned that the extensive storehouse of high-quality film handling equipment used by the Film and Video Center was almost entirely liquidated.²⁶ A few units and individuals have been making periodic trips to University Surplus (where discarded state-purchased equipment is received from departments) in an effort to salvage anything that shows up.

Of equal, if not greater, concern to the media preservation community is the obsolescence of the expertise needed to care for, maintain, and repair analog audiovisual equipment (see Figure 14). The census produced stark results in this regard, with very little expertise being identified as a result of the study, although some positive results were identified on campus and within the Champaign-Urbana community.

²⁶ Richard Leskosky, correspondence, 2/27/2014.



Figure 15: An example of equipment and expertise once on the Urbana campus. Champaign-Urbana *News-Gazette*, March 13, 1982. Courtesy of the University of Illinois Archives, Visual Aids Services/Film Center Scrapbook, RS 31/14/10

3.12 Emeritus and Faculty Collections

A world-class research university has a global responsibility—it must not only publish the results of its research on human communities, it must share with them the materials its researchers collected from them. Much of that material consists of photos, films, videotapes, audiotapes, etc.—often amounting to a comprehensive record of local life. The University needs a central agency tasked with archiving these materials and disseminating them.

In the ethnic minority villages in Thailand that we have been studying for three decades most people now have cell phones; they can capture and preserve images and sounds. But until a few years ago ours were the only cameras and tape-recorders on the scene. Our photos, videos and audiotapes are the only extended record of life in those villages over two generations. That unique historical record needs to be preserved and converted into digital formats that the villagers can readily access as time goes on.

-David Plath
 Professor Emeritus of Anthropology
 Filmmaker

While the initial decision was made to collect data on as many faculty collections as possible, in the end this proved problematic. It is often difficult to identify faculty members willing to divulge information about their personal research collections. For this reason, it was decided to collect census data on faculty members only if they sought us out and would make time for a suitable interview and consultation. Ironically, this occurred

several times with a group of faculty deemed early on as “too difficult” to add to the census: emeritus professors.

It soon became clear that emeriti represent a very special class of faculty member on the campus. These are distinguished professors who have spent a significant (if not entire) portion of their careers at the University of Illinois and who, based upon the number of years and depth of their research have often amassed significant materials related to their studies. The emeritus professors who have used media in their work are a fascinating group and hold many assets of high value to University history. Due to their age, many emeriti worked solely in the analog world and are, as a general group, very concerned about their legacy and the preservation of often 30-50 years of audiovisual research materials.

Likewise, many non-emeritus faculty reached out to Media Preservation staff throughout the course of the census. While not “Emeritus,” many are also in the later years of their careers, have worked with analog materials, and also possess large and diverse personal research collections often representing decades of important study and documentation using media. While information has been collected and extended conversations continue with these faculty members, their information was not added to the overall data totals for departments due to numerous complexities which exist within individual faculty collections.

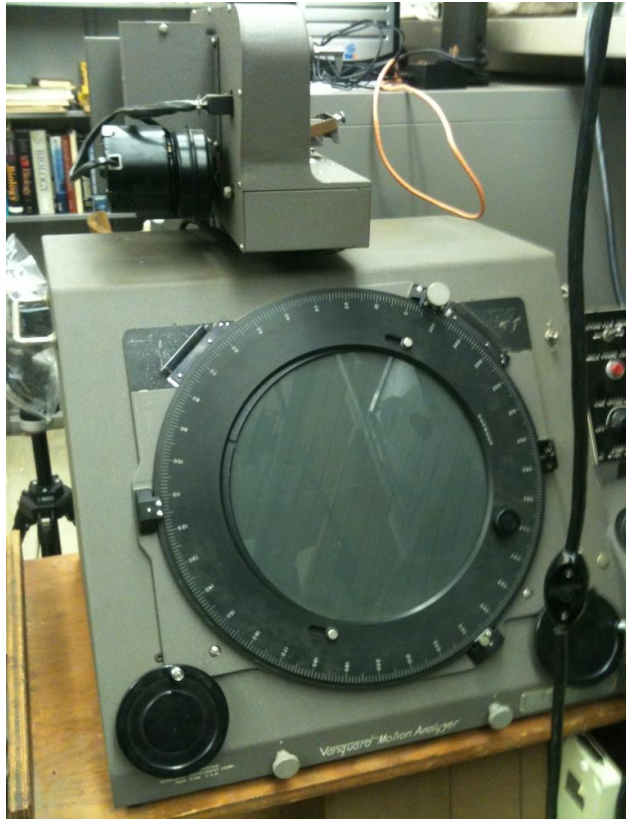


Figure 16. Motion analyzer used for underwater motion picture film shot by biologist Dr. Thomas Frazzetta. This device was used to discover several unknown animal species and their behavior.

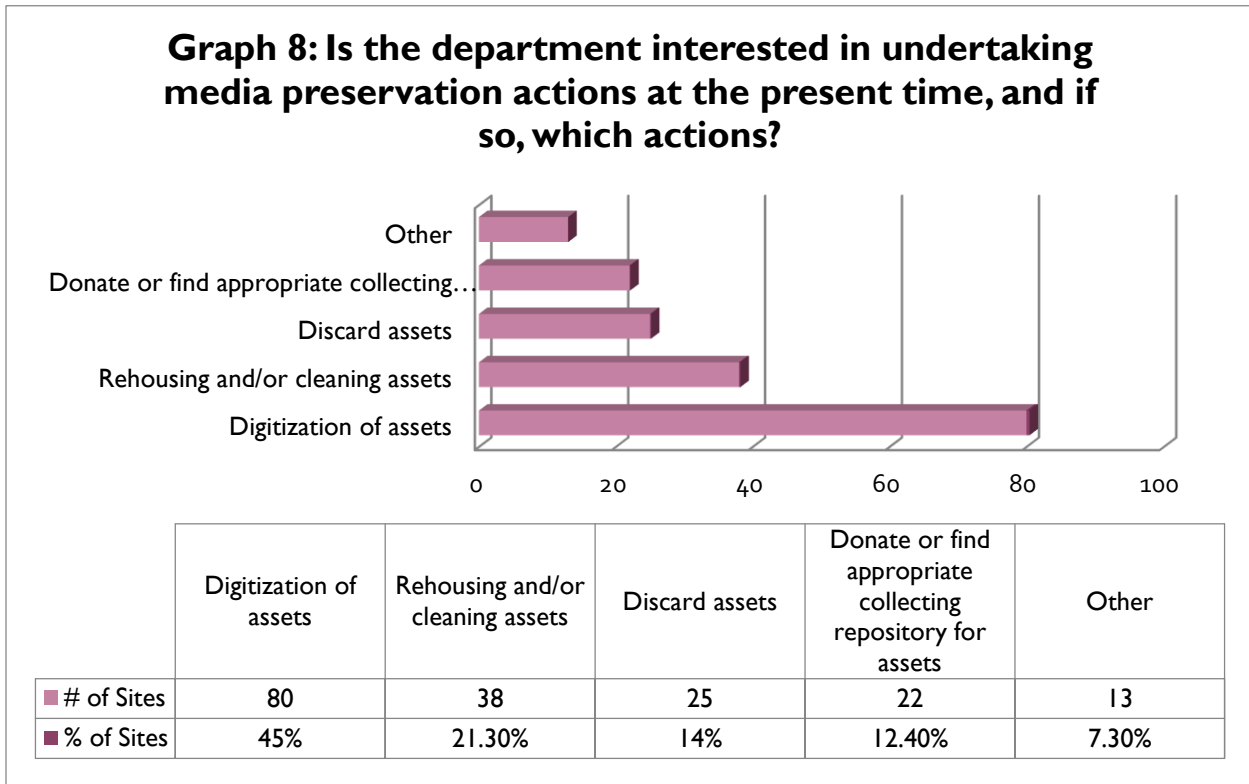
On the Utility of Film Records for Understanding Collective Action**Clark McPhail****Professor Emeritus, Sociology
U. of Illinois, Urbana-Champaign
February 2014**

For more than a century, the descriptions of and explanations for what traditionally have been called "the crowd" and "collective behavior" were based on "ivory tower" or "arm chair" theorizing, or on books written by persons who read books written by others. They were not based on observations, let alone systematic observation records of the phenomena to be explained. In the late 1950s and early 1960s I witnessed dozens of civil rights and antiwar demonstrations. No existing scholarly books or articles that claimed to describe and explain what was happening in the streets made any sense of what I was seeing and hearing, let alone what to observe nor how to record it. I obtained a federal grant. I trained graduate students, and myself, what to look for and how to record what we saw. As a social psychologist I focused on collective actions: any actions that two or more persons took with, or in relation to, one another. We initially recorded those actions with pen-on-paper. We developed our skills by first observing and recording collective actions on campus quadrangles, then in airport terminals, bus and train stations. We next ventured forth to hone our skills in civil rights, labor, and anti-war demonstrations in Atlanta GA, Charleston SC, and Chicago IL.

We complemented our field notes with Super-8mm film records during Weatherman's October 1969 "Days of Rage" in Chicago. I continued filming the next several years during anti-war demonstrations in Urbana-Champaign, ultimately producing 10,000 feet of film records. We also conducted and filmed experiments on observer-effects on what we were recording. We developed techniques for systematically coding the film records, second by second, for the direction, proximity and velocity of collective locomotion in several different experimental treatments. During a sabbatical year in Washington DC - a veritable laboratory for political demonstrations - I combined pen-on-paper field notes with hundreds of 35mm slides on dozens of demonstrations. All these visual records provided the empirical data base from which to inductively develop a taxonomy of fifty elementary forms of collective action - the directions people were facing; the sounds they were voicing; the gestures and other uses of their hands; the postures and movements of their lower limbs - that we turned into a text-and-photographic primer. We use that primer plus 35mm slides to train observers to use our taxonomy to make systematic on-site records. They took one-minute samples every ten minutes of the proportion of people in their assigned areas engaging in one or more of our elementary forms of collective action. We observed and recorded collective action in three large gatherings on the National Mall in Washington and there from produced the first quantitative descriptions of alternating and varied collective action in behavioral science history. Still and motion film records made this possible.

3.13 Preservation Actions

Graph 8 below presents the responses to the following inquiry: Is the unit interested in undertaking media preservation actions at the present time, and if so, which actions is it interested in?



These results show that there is a sincere interest on campus in the preservation of audiovisual materials. In general, Census researchers found that the vast majority of units are aware of preservation issues with media collections and understand the importance of these materials to the historical record of the institution and beyond. Additionally, the Census was an excellent outreach and educational exercise to those units that were unaware of media preservation issues facing their collections. While many respondents had taken great care in housing collections, many cited lack of knowledge about how to preserve audiovisual materials, a dearth of available funding for such endeavors, and a low level of knowledge about collection content (including the inability to view or analyze assets due to lack of playback equipment). These factors are discussed further in the Outcomes and Recommendations section of this paper.

4. BRIEF CASE STUDIES

Film collections—and preservation initiatives in film collections—are important because they preserve the past of our culture and our most important art form. Not everything that has been filmed is available in some other form, and digitizing a film does not preserve 100% of the information on the film. The Association of Moving Image Archivists promotes the policy of preserving the original film even after it has been transferred to a digital format, because, among other reasons, future formats may be more effective at capturing more of the available information on the film. Digital forms are also more ephemeral than film; in addition to the effects of age and environment on discs, algorithms and playback equipment change over the years, making accessibility less than certain.

The UIUC film collection contains numerous features and shorts from around the world which would, at the very least, be difficult to find elsewhere without intensive searches. The collection for many years supported all the Cinema Studies courses on this campus, assisted local faculty in their research and publications, and attracted scholars from around the world for their research.

I'm glad to see your concern—and optimism—for preserving these film materials. I was directly involved in the acquisition of at least 90% of them, so it gratifies me to know that some sort of lasting conservatorship of them on this campus is at least a possibility (even in such troubled Illinois economic times).

-Richard Leskosky, PhD
Professor (retired), Media and Cinema Studies

The case studies that follow profile several campus units whose situations represent frequently encountered challenges identified by Census interviews. These case studies demonstrate the wide range of content, audiovisual formats, and conditions that many units face, and furnish examples of collections brought to light by the Census.

4.1 University Library

Table 7. University Library Media Holdings

Library Unit	Film	Video	Audio	Unidentified	TOTAL
Library: Agricultural Communications Documentation Center	12	14	113	0	139
Library: Archives - American Library Association Archives	34	372	572	0	978
Library: Archives - Sousa Archives and Center for American Music	442	327	12,883	0	13,652
Library: Archives - University Archives	2,808	7,604	19,203	0	29,615
Library: Center for Global Studies	0	30	7	0	37
Library: Collections Management Services/Gifts & Donations	11	788	710	0	1,509
Library: Communications	0	690	176	0	866
Library: History, Philosophy and Newspaper Library	2	795	56	0	853
Library: Illinois History & Lincoln Collections	64	179	117	0	360
Library: Illinois State Geological Survey	14	494	2	0	510
Library: Illinois State Water Survey	1	46	3	0	50

Library Unit	Film	Video	Audio	Unidentified	TOTAL
Library: Illinois Sustainable Technology Center	0	210	112	0	322
Library: Law	-	-	-	1,619	1,619
Library: Literatures & Languages	0	16	94	0	110
Library: Media Preservation	154	119	172	0	445
Library: Music & Performing Arts	0	3,395	87,799	0	91,194
Library: Oak Street Library Facility (OSLF)	-	-	-	23,585	23,585
Library: Prairie Research Institute	26	87	12	0	125
Library: Rare Books & Manuscripts Library	4,390	628	832	0	5,850
Library: Residence Hall Libraries (7 locations)	-	-	-	7,933	7,933
Library: Ricker Library of Architecture & Art	2	163	20	0	185
Library: Social Sciences, Health & Education	0	116	557	0	673
Library: Undergraduate	0	33,288	11,000	0	44,288
Library: University Laboratory High School	0	582	14	0	596
Library: University of Illinois Press Building Basement	0	35	80,883	0	80,918
TOTALS	7,948	49,964	215,224	33,137	306,273

Audiovisual materials held by the University Library (Table 7) are spread between twenty-two units, with the highest concentrations in the Undergraduate Library, the Music & Performing Arts Library, the University Archives (including the American Library Association Archives, the Student Life and Culture Archives, the Advertising Council (AD Council) Archives, and the Sousa Archives and Center for American Music), as well as an offsite mixed storage facility in the basement of the University of Illinois Press building. Smaller, specialized collections are found in sixteen other units spread across the Illinois campus, and include a broad range of audiovisual formats stored in a variety of locations and environments.

The Music & Performing Arts Library (MPAL) is one of the country's largest of its kind, and is the site of the greatest collection of audiovisual assets on campus. MPAL holds materials ranging from early radio transcription discs to recordings of contemporary performances, with a relatively high concentration of video tape and DVD in addition to CD, grooved disc, and audio tape collections. It also holds the highest number of digital audio files on the Illinois campus, with an estimated 60,000 files on e-reserve at any one time.

The second largest audiovisual collection at Illinois resides in the basement of the University of Illinois Press Building (Figure 17). With the exception of the audio and video tape documenting several decades of School of Music performances, (a collection recently transferred to the Sousa Archives and Center for American Music), the assets located in the Press building are exclusively older formats from the Library's collection, and include more than 1,600 piano rolls; more than 800 Edison discs; more than 6,000 7" grooved discs; nearly 30,000 12" grooved discs; more than 35,000 78rpm discs; and roughly 5,600 ¼" open reel audio tapes. This collection of holdings is one of the greatest in need of revised storage, as the Press Building basement was the recent site of a major steam pipe rupture, and is not a temperature and relative humidity controlled environment—conditions that are particularly damaging to audio and video tape.



Figure 17. Audio tapes in University of Illinois Press Building basement

The Undergraduate Library is the primary repository for commercial VHS and Betamax tapes, DVDs, and audio books (in most cases consisting of multi-CD sets). As satellite libraries have consolidated their collections, many assets, especially older video tapes, have been transferred to the Undergraduate Library, making it the site of a continually growing collection of materials.

The University Archives holds audiovisual assets in two locations: the Main Library building and the Archives Research Center (ARC), located in what was once the home of the Horticulture department. Built in 1921, the Horticulture Field Lab was constructed with large, thick-walled rooms to create a controlled environment for fruits and vegetable crop storage. These areas now serve as climate-controlled vaults for a high percentage of the Archives' holdings, including significant collections of 16mm motion picture film, audio tape, and broadcast video tape.²⁷

The Sousa Archives likewise divides their collections between a designated area in the ARC and their primary offices in the Harding Band Building. In addition to large collections of audio tape and motion picture film, the Sousa Archives have sizable holdings of wax and hard plastic cylinders, acetate discs, transcription discs, and early 78rpm discs, as well as playback devices for each of these formats.

²⁷ While the Horticulture Field Lab maintained climate-controlled facilities, these vaults are not considered to be at optimal temperature and RH% for film and magnetic media.



Figure 18. Film segment from the sound-on-film experiments of Joseph Tykociner, the first to publicly demonstrate synchronized sound and film in 1922. Image depicts Tykociner's wife, Helenka, ringing a bell. Image Courtesy University of Illinois Archives, Joseph T. Tykociner Papers, 1900-1969, RS 11/6/20.

Library "general" collections consisting primarily of commercially-published items also contain high numbers of time-based media. Determining precisely how many items the Library holds and in what format, however, is no simple task, due to the way media items have traditionally been catalogued. Library cataloging has its roots in the bibliographic tradition, and its practices were designed for describing books and book-like materials. Catalog records for materials considered non-traditional in libraries are often inconsistent and difficult to work with. For the purpose of this study, the Content Access Management (Cataloguing) unit in the University Library drew a report from its catalog that counts at least 170,000 media items in a collection of more than 13,000,000 volumes, with media understood to include such categories as audio recordings, film and video, and software.

One challenge in wading through these numbers is their lack of specificity and their inconsistency in identifying format information. An item catalogued as a "disc" could very well be grooved or optical media, and an item catalogued as a "CDROM" could just as likely contain an audio compact disc as an executable file to launch a software application.

What the numbers do not address, however, is which items constitute higher preservation priorities than others. Students, faculty, and many departmental libraries lack the specialized media players or computer



Figure 19: High density book and paper storage at the Oak Street Library Facility in Champaign, IL. The facility currently contains 3.6 million items and is climate controlled at 50°F and 30%RH. Photo courtesy of Andrew Cougill, University Library.

hardware needed to make these items accessible, with this expected to worsen over time as more media formats fall out of use. In many cases the market will correct for this by reissuing popular items in newer formats or on web delivery platforms to which libraries subscribe. Undoubtedly, however, the Library currently possesses thousands of rare or unique media items that will never be published again, and whose formats assure them a very brief window of accessibility before it will be very difficult if not impossible for anyone to use them again. Recent research by the Association for Research Libraries and the Video at Risk Project at New York University suggests that academic libraries have the right to reformat materials (for preservation not access) under current copyright restrictions in their collections under the doctrine of fair use.²⁸ The obsolescence window for these collections is narrow; prioritization decisions must be made with key stakeholders and subject specialists in order to begin the preservation process as soon as possible.

²⁸ Video At Risk: Strategies for Preserving Commercial Video Collections in Libraries.
http://www.nyu.edu/tisch/preservation/research/video-risk/VideoAtRisk_SECTION108_Guidelines_2013.pdf accessed 5/20/2013.

4.2 Campus Departments

Landscape Architecture

Audio	Video	Film	TOTAL
56	604	15	675

Table 8. Landscape Architecture Assets

The Department of Landscape Architecture has been motivated by Census interviews to take action in preserving its collections. Championed by Professor Elen Deming, the department has obtained small amounts of funding and worked with the Media Preservation Unit over the past year to triage and begin the assessment and assembly of an archive that contains not just media items, but extensive photographic glass plates, slides, drawings, maps, and computer-generated data totaling more than 35,000 assets. The below was written by Dr. Deming:

Among other things, the LA Archive contains priceless hand-tinted glass slides of inter-war Chinese and Japanese gardens and temples from the 1920s and '30s—many picture places that were lost or destroyed during the past century. An historic collection of nearly 1,000 flat works on paper dates from 1914-2007, the majority produced between the 1940s and the 1980s. Karl Lobmann's extensive teaching slide collection is also an archive of local Midwestern history, with an extensive typological study of vernacular town morphologies, with images of streets, buildings, and landscapes from communities of Illinois straight out of the mid-20th century—also places that no longer exist. In addition to archaic surveying equipment, we have other "tools of the trade": ink pens, lettering sets, ship curves, and perspective grids, all now historic artifacts, as are the various projectors and computers (such as a 1980s mini-Mac). In short, a rich study may be conducted in this archive on historic changes in both the practice and pedagogy of landscape architecture over the last century.

On the value/meaning of the archive:

An archive of any merit should be protected because it is rare, meaningful, and vulnerable to amnesia and neglect, and also because contemporary digital data—unlike paper and glass—are ephemeral in peculiar ways. The very notion of an archive raises interesting questions about the role of personal memory in institutional identity, as well as the technologies, priorities, and larger values invested in the selection of items for conservation and/or public access. In Landscape Architecture, our 100-year-old archive represents collective values that transcend the faculty, staff, and students, and demonstrate our commitment to a longer term mission.

On working with the Library Media Preservation Unit:

Contacts and work sessions held during the Media Census (2012) suddenly made us aware that we had access to Library specialists concerned with many of the same issues (archival condition, storage, access) we were struggling with. (Working with the) ... Media Preservation Unit gave us the expertise, the confidence, and the motivation we needed to start the necessary planning process to save our collection for posterity.

Department of Slavic Languages & Literature

Audio	Video	Film	TOTAL
165	485	104	754

Table 9. Slavic Languages and Literatures Assets

The department holds dozens of 8mm and 16mm films, many of them Soviet-era productions, in their original (and highly decorated) boxes. The 8mm films and a quantity of ¼” reel-to-reel audio tape are stored in a dusty cardboard box in a storage room. The 16mm films are stored in the department’s library, and many are dirty from long-term storage in the open—on reels, but not in canisters. In addition, there are more than 80 VHS tapes of Soviet news broadcasts, which are at present taking needed shelf space and are on an unstable format. The department has worked to ensure that these materials have not been discarded, but as both space issues and the longevity of the formats are problems, the collection is at significant risk.

**Figure 20. Media located at the Department of Slavic Languages and Literatures.**

Center for Advanced Study

Audio	Video	Film	TOTAL
1,011	61	0	1,072

Table 10. Center for Advanced Study Assets

The Center for Advanced Study (CAS) has holdings in a number of media types, but their signature collection is the 775 audio cassette tapes and 40 reel-to-reel audio tapes documenting decades of the MillerComm Lecture Series. Since its inception, the series has brought some of the world’s most prominent scholars to the University of Illinois, but the legacy of these talks is at risk due to the cost of transfer of these tapes, and the additional complications of copyright.

Advanced Visualization Lab at the National Center for Supercomputing Applications

Audio	Video	Film	TOTAL
0	1,683	0	1,683

Table 11. Advanced Visualization Lab Assets

The following was contributed by Jeff Carpenter of the NCSA AVL and CME Steering Committee member:

In 1985, Professor Donna Cox began organizing “Renaissance Teams” at the National Center for Supercomputing Applications. She coined the term “Renaissance Teams” to describe multidisciplinary teams of experts focused on solving visualization problems and providing guidelines for successful collaboration. The Advanced Visualization Laboratory’s (AVL) mission is to communicate science, inspiring audiences to learn about scientific concepts through capturing the thrill of scientific discovery and wonder of complex systems. Working in close collaboration with domain scientists, AVL creates high-resolution, cinematic, data-driven scientific visualizations. These visualizations provide insight into computational science—a key method of contemporary science—since they are based on supercomputer-generated models of scientific theories about natural phenomenon that are so advanced they could not be brought to the public in any other way.

The lab is part of the University of Illinois’s National Center for Supercomputing Applications (NCSA), which is dedicated to providing powerful computers and expert support to help thousands of scientists and engineers across the country improve our world. AVL is also a technical research and creative production partner of eDream (the Emerging Digital Research and Education in Arts Media Institute).

<http://edream.illinois.edu>

Donna Cox and her Advanced Visualization Lab team have collaborated with scientists, engineers, and technologists to create new technologies and visualization products, which have been featured in digital full-dome planetariums, IMAX theaters, and documentary television.

Notable credits include:

- PBS NOVA “Monster of the Milky Way” and “Hunt for the Supertwister”

- *Museum of Science & Industry, Chicago “Science Storms” exhibit.*
- *IMAX “Hubble 3D” film*
- *Terrence Malik’s Palm D’Or winning “Tree of Life” film*
- *“The Dynamic Earth” dome show*
- *“Black Holes: The Other Side of Infinity” dome show*

Behind these projects is an archive of more than 1,000 video tapes, many of them on rarely-used formats such as D-1 digital video tape. As video tape is one of the most unstable media types, the primary materials behind the NCSA’s visualizations are at risk unless these tapes can be transferred to high-resolution digital files. In consultation with the Center for Multimedia Excellence and the Media Preservation Unit, the NCSA is currently preparing a transfer protocol and workflow to begin this process.



Figure 21. Jeff Carpenter of NCSA’s Advanced Visualization Laboratory with the Advanced Visualization Laboratory collection held in the basement of the National Center for Supercomputing Applications

Chemistry Studio/SABIC Innovative Plastics Studio

Audio	Video	Film	TOTAL
0	790	0	790

Table 12. Chemistry Studio Assets

We have an extensive video collection formerly used for instruction, an important chapter in the history of chemistry instruction here. The future of that collection, apart from a centralized initiative to preserve and maintain such resources, would realistically be somewhat questionable, especially as our building is vacated for total renovation next summer. Your initiative comes at just the right time to help preserve this resource for years to come.

-Douglas Mills
 Director of Instructional Technologies
 Department of Chemistry

The use of audiovisual media has been a vital component to education and research in the sciences for decades. This is evidenced through the existence of the Chemistry Department's "Chemistry Studio," a full-fledged production unit dedicated to documentation of the discipline. The department has amassed a collection of more than 700 video tapes in a variety of formats over the past 40 years. A good portion of these tapes are full educational films produced by the department, and document a wide range of experiments, procedures, and research in the field. The collection is thought to contain most of the archive of Gil Haight, a pioneer in the use of television and media in Chemistry instruction. The Haight Collection is housed in poor environmental conditions, which puts these materials at high risk for rapid degradation. This collection is in dire need of preservation actions, but the department has few resources and little knowledge of how to work with the materials. A chemical fire in the labs of the Chemical Annex Building on November 12, 2013 highlights the risk to collections held in buildings with large, active scientific research laboratories.



Figure 22. Joshua Harris counting items at the Chemistry Department's Chemistry Studio/SABIC Innovative Plastics Studio

Department of Dance

Audio	Video	Film	TOTAL
0	2,336	0	2,336

Table 13. Department of Dance Assets



Figure 23. Sign posted within Department of Dance

For decades, the Department of Dance has documented its students’ performances. The department has more than 2,000 video tapes and is in the process of transferring the master tapes to the digital domain because of their awareness of the fragility of the original media. The transfers are being done in staff members’ spare time in an environment not suited for preservation-quality video transfers. Space constraints and cost (in time and labor) of doing these transfers is a good example of the difficulties even departments with a strong desire to migrate their collections are facing.

WILL: Illinois Public Media

Audio	Video	Film	TOTAL
14,962	11,458	8	26,428

Table 14. WILL Assets

The following was contributed by Jack Brighton, Director of New Media & Innovation, Illinois Public Media, College of Media and CME Steering Committee member.

Since the dawn of radio and television, public broadcasting has faced major challenges in managing its audio and video content. The problem is one of abundance, especially at the University of Illinois, which in 1922 established WILL as one of the first educational radio stations in the nation. For nearly a century, WILL has played a key role in the development of educational broadcasting and public media and has produced hundreds of thousands of hours of news, documentaries, public events, music and cultural programs, and other educational and public service content from its studios in Urbana. Our archives reflect the best of human thought, and the most important events of the 20th century. They are records of the work and achievements of the University of Illinois and its faculty, students, and staff since 1922. This content was created by many different producers using different media formats, and stored in many different locations and conditions over the history of WILL. The WILL media archival formats include film, more than two dozen types of analog video and audio tape formats, and a rapidly growing collection of digital media files stored on servers, desktop computers, optical media, floppy disks, thumb drives, and other digital devices.

**Figure 24. Video tapes stored at WILL/Illinois Public Media**

The WILL media archives contain a great many unique recordings with tremendous value as historical, journalistic, and primary research materials. But like other public broadcasters, WILL is in the business of producing new materials, not managing archival materials over decades. WILL does not have adequate storage for its analog media collections, nor enough digital storage for its rapidly growing number of born-digital media assets. Catalog records and finding aids common to a library environment are foreign to broadcasting operations. As broadcast and digital media technologies change, like most public broadcasters WILL no longer maintains playback equipment for all the analog and digital media formats in its collections.

But media doesn't organize itself. The University of Illinois now has hundreds if not thousands of people creating media every day. At least some of this media material is extremely valuable and important for instruction, research, and outreach. There is an urgent and growing need for common standards on how we organize media and make it accessible. And in the digital age, nothing will be preserved unless we plan and care for its migration as technologies change.

Ethnomusicology Archives at the School of Music

Audio	Video	Film	TOTAL
2,100	n/a	n/a	2,100

Table 15: Ethnomusicology Archives Assets

We stand at an important juncture regarding the University's media collections. Important and unique collections, such as the ethnomusicology archive, that were gathered in the analog era are increasingly inaccessible and in danger of falling into oblivion. Digital preservation offers not only the promise of safeguarding these resources for the future, but of developing their usefulness in ways never imagined by their original collectors. For example: the ethnomusicology archive was collected largely in the 1960s and 70s, a period of massive, global social change. As such, it represents a critical tool for longitudinal study of oral traditions, a task that will be profoundly facilitated by digitization. Moreover, many of the home communities where the material was originally recorded now have sophisticated digital media tools, in libraries, schools, and arts centers. A program of digital repatriation would fulfill the spirit of collaboration in which the material was originally collected, and would critically involve local communities in the process of historical ethnomusicology. What's more, with automated strategies for data analysis digital collections promise new insights into the diversity of world music and the history of ethnographic recording.

-Gabriel Solis

Associate Professor

Music, African American Studies, and Anthropology

The Department of Musicology within the School of Music maintains an Ethnomusicology Archive that contains a large number of original recordings made by both faculty and graduate students. The holdings amount to hundreds of hours collected from all over the world, and contain materials dating to the late 19th century. Included in this archive are materials from Emeritus Professor Dr. Bruno Nettl, a pioneer and “founding father” of Ethnomusicology. This rich trove is held primarily on open reel magnetic audio tape and while a substantial amount of cataloging and even some digitization attempts have been made in the past, the collection and equipment within the archive have lain dormant and inaccessible for many years. This archive is at high risk of serious deterioration and loss if some preservation actions are not undertaken over the next several years.

Experimental Music Studios at the School of Music



Figure 25. Charles Hamm, Lejaren Hiller, Salvatore Martirano, Herbert Brun, and Kenneth Gaburo standing in University of Illinois Computer Music Studio, circa 1963-1968. Kenneth Gaburo Papers, Record Series 12/5/33. Courtesy of Sousa Archives and Center for American Music, University of Illinois at Urbana-Champaign

Electroacoustic music activities at the School of Music have earned the University of Illinois an international reputation as a leader in the field of contemporary art music. Known for significant creative and technical developments in electronic and computer music composition, the University of Illinois Experimental Music Studios (EMS) were founded in 1958 by Lejaren Hiller. Created a few years after Hiller and Leonard M. Isaacson created the first substantial computer-produced musical composition, “The Illiac Suite,” the studios were the first of their kind in the western hemisphere.

Faculty members and students working in these studios have been responsible for many of the major developments in electro-acoustic music over the years including the first developments in computer sound synthesis by Lejaren Hiller, expanded gestural computer synthesis by Herbert Brün, the creation of the Sal-Mar Construction by Salvatore Martirano, and the Harmonic Tone Generator by James Beauchamp. Today the faculty continues as an active and productive center for electro-acoustic and computer music composition, education, and research. Numerous prestigious awards have been won by faculty and students for their work in the studios.

Scott Wyatt, Director of the Experimental Music Studios for more than 30 years, is one of the few remaining resources on campus with expertise with analog media and the unique requirements needed to use analog audio equipment. Both a composer and educator who has designed and maintained the six music studios within the EMS, Wyatt and others in the EMS program can be seen as a key resource in the future success of the Media Preservation Unit. Based on the dearth of knowledge found during the census, the unique resources within the EMS highlight the need to leverage expertise and experience across campus units as well as the importance of building mutually-beneficial strategic partnerships.



Figure 26: Lejaren Hiller works with a computer as part of electronic music studies at the University of Illinois, circa 1960.
Courtesy of the University of Illinois Archives, Photographic Subject File, RS 39/2/20

5. CENSUS CHALLENGES



Figure 27. Unique films located during the Media Census in poor condition and held in inadequate storage

Collecting accurate media census data for a major state research university with a historically decentralized and fiercely independent organizational structure presented several challenges. Simply finding a definitive list of campus units among the many sub-units, research centers, and interdepartmental units proved a daunting task. In the end, it was determined that a total of 765 individual units exist on the Urbana-Champaign campus. The Census reached 102 of them, or 13%. While this implies that Census results are far from comprehensive, it should be noted that the departments profiled are generally known as those that work closely with media in their teaching, learning, and research practices.

Because the Media Census was conducted over two phases, there was some element of difficulty in ensuring the participation of departments that self-reported data during Phase One in 2011. Consultation with Indiana University’s Mike Casey and Patrick Feaster suggested that they too had seen the limits of “attempting to get through the door twice” with departments less inclined to participate in a voluntary census after initial contact had been made. Subsequently, of the 116 units that reported legacy audiovisual assets in Phase One, seventeen did not respond to repeated efforts to re-contact them over the course of Phase Two.

In a myriad of cases, simply establishing contact with units took a significant amount of effort. Multiple emails and phone calls, often involving contact with a complex network of different people, were needed to get a simple interview appointment established. A wide array of marketing channels were also used to spread the word regarding the census, including departmental listservs, a notice from then Dean of Libraries Paula Kaufman to the Council of Deans, and postings on the University’s “Eweek” staff newsletter. In addition, a number of colleagues from both within and outside of the CME helped to spread the word and seek out further possible interviewees. The standard closing question to all interviews became, “Do you know anyone else with significant collections?” This simple question alone opened the door to many hidden troves of media.

Once contact with a unit was established, an additional hurdle to locating and assessing assets was the fundamental issue of physical access. Gaining access to collections brought the census interviewers into contact with a wide range of personnel. Academic unit heads, facilities managers, faculty members, administrative assistants, communications officers, video editors, and archivists were only some of the positions held by those in charge of overseeing the collections assessed. In more than a few instances, those who were interviewed had only “heard” that they possessed audiovisual collections, or did not know exactly where materials were stored. One glaring example came from a major science department that was interested in both contributing to the Census and working to preserve their footage properly, but was unable to provide any information due to the footage being under lock and key, saying, “We do have video archived but it is managed by a longtime employee who isn't very forthcoming with general info requests. He will give you footage only if you know what to ask for. I am working on loosening his iron grip...”

The 408,492 assets identified during the Census were not always seen, counted, and assessed by Census staff; especially when large-scale cataloging systems could be relied on to provide numbers. This is especially true with regard to the general collections held by the University Library (see case study of Library General Collections, page 45-49). No matter what a final determination of the total number of audiovisual assets on the Illinois campus might be, the magnitude of the problem is enormous. There are undoubtedly many tens if not hundreds of thousands of physical audiovisual assets on the Illinois campus that remain to be identified, many held by faculty members who declined to participate in the census, many others in remote storage areas or contained within the Library's books as supplemental materials.

Following Phase Two, the Illinois Statistics Office was consulted to attempt to create a confidence interval for “potentially missing” departments and assets. But because both phases of the Census were structured with the goal of identifying as many collections of audiovisual materials as could be found, statistical analysis of these “missing” departments proved impossible. Phases One and Two of the Census were designed with a bias, in that departments that were known to have audiovisual materials were always contacted, eliminating the possibility of statistical analysis of the departments that were not identified nor confirmed to have audiovisual materials. However, the benefits of conducting a non-sample-based census include the confirmation of assets and collections in need of triage (see Figure 28); more accurate counts of all or most collections held by audiovisual producing departments; and wider communication of the goals of the Media Census and Media Preservation Program across the Illinois campus.

A further issue involving Census data, specifically those reported by some Library units, came to light during the data analysis phase of the study. Issues were found when reported stats from the interview were matched against catalog records pulled from the Library's Voyager system. There were often significant discrepancies in these numbers, highlighting once again the difficulties encountered in obtaining accurate numbers for media items. The most glaring example in this regard was found at the Albert E. Jenner, Jr. Law Library. The interview with Law Library personnel described a small, but very important collection of 144 items. However, the Voyager report provides 1,619 catalog records with media items held by this repository, with 377 records listed as within the “Law Media Collection.” Much of this could be attributed to lack of staff knowledge about additional collections or the inaccurate cataloguing of media items. Regardless, these anomalies could have major impacts on the amount of media needing preservation action in the future.

Finally, throughout the course of the Census the technologies used for data collection revealed themselves to be less than ideal. As described earlier, the Media Census required a mobile technology platform, with CITES providing an iPad as part of its initiative into testing tablets in various research and teaching roles. Although the web-based census tool was designed to be accessible both online and off, wireless connectivity was often not available in many locations and the “offline” functionality of the tool did not function as expected. The

use of the iPad in many of the cramped, dirty, and out-of-the-way locations proved to be more burdensome than helpful. In addition, the informal nature of many of the interviews, which often amounted to long, in-depth discussions rather than straight question-and-answer sessions made it difficult to enter data into the iPad during site visits. Finally, data exported from the Survey Gizmo tool needed significant manipulation due to both a lack of foresight in its design and data output, and analysis tools which were not as robust as originally thought. In the end, a simply-designed spreadsheet or database and a laptop may have proved more effective for entry of site visit data.



Figure 28. Box of films and audio recordings located during the Campus Media Census

6. OUTCOMES & RECOMMENDATIONS

A media preservation service at the campus level would allow WILL to focus on what it does best, creating excellent media content, without trying to solve on its own the storage and archival management problems common to the other campus media producers. WILL has a decades-long relationship with the University Library, and this could be strengthened by the Library's media service. A central media preservation service would serve the archival needs of all campus units involved in media, and preserve the value of what they produce for generations to come. The University Library can and should play a central role in providing common standards and leading preservation efforts for media across the entire campus.

-Jack Brighton,
Director of New Media & Innovation
Illinois Public Media, College of Media

As the mission and resources available through the UIUC library change rapidly within the current mediascape, it is crucial that the library recognize and take stock of non-literary materials (particularly video materials) for future research. The Department of Media & Cinema Studies, and the doctoral program of the College of Media (the ICR), employ professors and serve students whose research increasingly involves an expanding, and in many ways a non-traditional, trove/archive of video materials. It is crucial that the UIUC play a leading role in preserving and making available not only feature-length films and mainstream TV programming, but also film and video that have been used in other ways (e.g., industrial documentary, educational video, gaming, etc.). The library also should play a leading role in preserving and making available (perhaps through partnering) web-based material, which already has become indispensable in current media research and the emerging area of "media archaeology."

-James Hay, Professor & Director of Graduate Studies
Institute of Communications Research
College of Media

The University of Illinois at Urbana-Champaign Campus Media Census points to an immense need for media preservation services that benefit not just the Library, but the campus as a whole. Whether it is a faculty member with five videos of her doctoral research or a full-fledged production archive containing thousands of assets, the expertise that resides within the Library and other media professionals on campus has a role to play in guaranteeing that audio, video, and film documents will be available to future researchers and the general public.

Several direct outcomes resulted from the Census. Those and associated recommendations drawn from the data are outlined below. It is hoped that these will prove useful in both the short and long term as media preservation planning activities lead to plans of action.

6.1 Short Term Outcomes

Several short term and immediately recognizable outcomes resulted from the Census, many of these following in the wake of Phase Two's personal, on-site interviews. Two extreme examples of collections requiring emergency care were found in the Music and Performing Arts Library (MPAL) and the Department of Intercollegiate Athletics (DIA), where significant outbreaks of mold were affecting media materials. In both cases, some form of immediate triage was undertaken (see Figure 31).



Figure 29. Joshua Harris triaging moldy audio tapes discovered during the Census

For some departments, such as the aforementioned Department of Landscape Architecture, the Census spurred immediate action, while for many other departments, action has meant simply beginning the discussion for future undertakings. The Kinesiology Department, for example, has a small but important collection of materials. However, there is no current funding for preservation and the department is waiting for enhanced campus-wide services. In the meantime, however, the staff overseeing the collections went to the effort to attach the following sticker to each media item (see Figure 30):

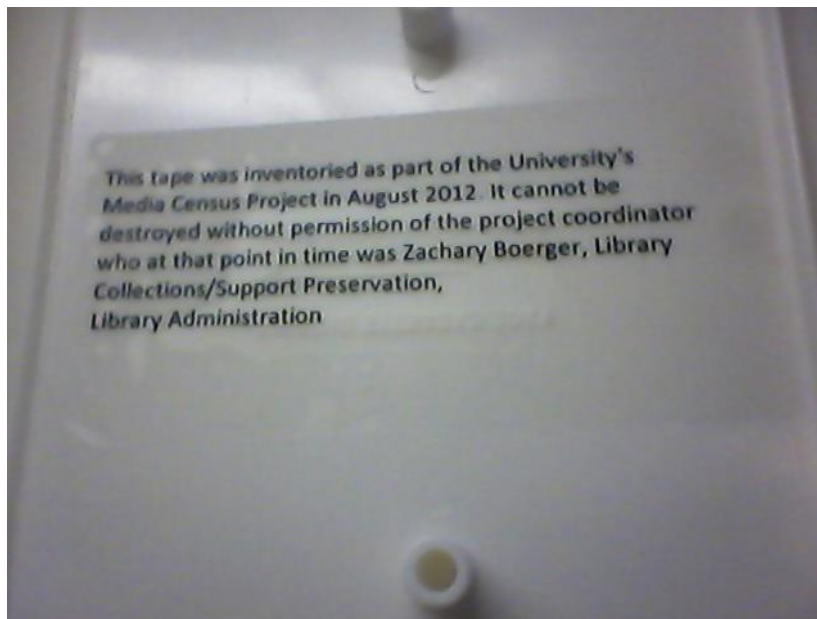


Figure 30. Stickers voluntarily produced by Department of Kinesiology and adhered to all unit media assets

An additional immediate outcome was the production of a brochure that not only described the Census but gave respondents and others (through widespread campus distribution) some information on the basics of media preservation and some of the simple actions that could be taken immediately to ensure longer term access to media in the future. A copy of this brochure can be found in Appendix A of this document.

6.2 Areas of Library Expertise

The discussions and consultations that occurred throughout Census visits led to the conclusion that little consensus exists on campus as to what a full-fledged media preservation service would entail. Because of the Library's expertise and stature on campus, however, many people are looking to the Library for leadership in this area. The exact form of the Library's engagement in a campus-wide media preservation service is a matter for future discussion, but it could realistically include:

- Assistance in preparing and carrying out in-depth collection surveys, content analysis, and preservation assessments
- Storage and maintenance of physical collections
- Writing and development of project proposals and fund raising exercises both internally (i.e., within an individual department) and externally (i.e., grant application)
- Development of policies and procedures
- Development of human resources and financial plans
- Advocacy and outreach
- In-house preservation, conservation, and reformatting projects. This could include work within both the Library's media labs, or working to set up digitization stations within a unit.
- Assistance with outsourcing projects, including working to gather quotes and develop relationships with trusted vendors in a programmatic manner
- Access systems and workflow design
- Advising and assisting on new and innovative ways to use media materials in teaching, learning, and research.

The exact form of some of these is discussed in greater detail below.

Media Preservation Lab and Studio

Informed by census data, the Library's Preservation Unit is currently in the design phases for new media care, conservation, and reformatting laboratory spaces for Library collections. In its most basic form, data on prevalent formats will guide planning for what types of playback equipment is needed in both the short and long terms. For example, very little D-2 digital video tape was found during the Census. It would make little sense for the department to purchase, acquire, and maintain the equipment needed to support D-2 tape. When encountered, this format would best be suited for outsourcing to a trusted vendor.

Conversely, the Library's Media Preservation Unit has taken upon itself to salvage playback equipment being discarded across campus for eventual use in broader preservation services. For example, the Advanced Visualization Lab at the National Center for Supercomputing Applications (NCSA), with its significant funding and need to produce cutting-edge pieces in the latest audiovisual format, playback, monitoring and editing materials, frequently purchases equipment that is later discarded as technologies change and advance. Much of this equipment will eventually be transferred to the Media Preservation Unit.

Until early 2013, the Illinois' Applied Technologies for Learning in the Arts and Sciences (ATLAS) unit provided audiovisual conversion services for non-library departments. As ATLAS' mission has been revised

to focus primarily on media content creation, it is no longer providing this service, leaving a void for units in need of format transfers. During the two and a half year period ATLAS provided transfers, the number of assets digitized essentially doubled each fiscal year, from 37 assets in 2010–11, 70 assets in 2011–12, and 88 assets for the first half of the 2012–13 fiscal year. Using a conservative estimate of 150 assets for 2012–13 if ATLAS had continued to provide this service, and estimating each asset at a length of one hour, approximately 300 hours would be required to prepare, transfer, and quality check the assets' conversions. Nearly two months' full time work each fiscal year would be necessary to accommodate the number of audiovisual format conversions ATLAS was providing at the time its mission was revised. With the great likelihood of that number increasing in the future, a significant void exists in the University of Illinois' ability to address the need for digital conversion of much of its audiovisual legacy.

Could such a service be housed in the Library's Media Preservation Unit? This remains to be seen, but Census discussions made it quite clear that faculty and staff are looking to the Library for leadership in this area. Therefore, preservation services are being designed and implemented with an eye to future scalability and sustainability that utilizes both in-house expertise and the outsourcing of certain workflows to trusted vendors. While there are large differences in the techniques needed to digitally convert different types of collections and their formats, having a centralized campus service would ensure that decisions were being made in a standardized fashion across the University in keeping with the latest developments in the profession of media preservation.

6.3 Campus Physical Storage Solution



Figure 31. A/V equipment and media assets observed during the Census held in an unused shower stall.

As professionals in the media preservation field are well aware, proper physical storage for media is an integral factor in ensuring the long-term preservation of media collections. While this is especially true for motion picture film (which benefits most by cold storage), the needs are great for magnetic and other forms of analog media as well.

Many collections held across the University are at risk of further degradation due to inadequate storage (see Figures 32 & 33). Some units are faced with additional risks. For example, certain collections are housed in laboratories that store and utilize significant amounts of chemicals or house scientific equipment that have unknown effects on media assets. Again to highlight the Chemistry Department (see case study on page 54), a chemical fire in a laboratory in the Chemistry Annex Building on November 13, 2013 forced an entire building evacuation. This occurred in a lab very close to where the department holds its tape collection. While disaster planning is one way to reduce this risk, departments that are already stretched thin and have disaster management plans that involve chemicals and other hazardous wastes cannot be expected to prioritize media items that have sat dormant for decades. Collections such as these would benefit by being transferred to a safer and more preservation-friendly environment.



Figure 32. Films and data tapes found in a campus basement during Campus Media Census

While the question often arises to “digitize and discard” outdated media formats, caretakers and preservationists would not be doing due diligence to the collections they steward by simply digitizing them and not maintaining the original for as long as possible. Until accessible digital infrastructure exists, and sufficient time has passed for digitized materials to be placed within trusted digital repositories, with commonly accepted file formats and workflows supporting their deposit and migration, it is not advisable to dismiss the importance of original media objects.



Figure 33. Examples of unique departmental films and video stored directly beneath building piping and conduit.

6.4 Media in Teaching and Learning

As the Media Commons works with faculty, staff and students towards implementing more digital media into classes and projects, it is quite beneficial to not only know what media is available throughout the University but working towards being able to access that media in an organized and efficient method. The preservation of the University's legacy media will certainly aid in future projects and give those working with the media a sense of history and context.

-Eric Kurt
Media Commons Coordinator, Undergraduate Library
CME Steering member

The challenge facing analog media materials is real and has been documented in many places. However, the desire on college campuses to utilize media materials in diverse manners is also real. To enhance teaching, learning, and research through the use of media is a strong aspiration, and many people on campus have expressed high interest in creating new materials, repatriating collections, using A/V to reach alumni and potential donors, and using materials for fundraising and public outreach. Many census respondents emphasized that they did not want to simply “preserve and set it on a shelf” or “digitize and put it on a virtual shelf.” They desire to get their work into the world and are making the realization that the digital domain offers unique and new ways to provide access. As a key part of teaching and learning agendas, many professors want to show their work to students, and also wish to empower their students to understand how media can be used to document the world around us.

On their own, however, academic departments do not have the funding and expertise to properly see to the preservation and access of all media under their care. It is out of the reach of most departments to adequately fund preservation, metadata generation, digital content hosting and storage, technological infrastructure for digital archiving, and general "how to" support. The Library and CME have important roles to play in this process, and are collaborating on a request for proposals to introduce a campus-wide multimedia platform that will provide a backbone for faculty, staff, and students to manage their media and provide access to it in a much more robust manner.

6.5 Institutional Collaboration

Media preservation on university campuses represents one of the greatest potential challenges to the field. The complex nature of many institutions makes media preservation within this landscape particularly daunting. With this report constituting the first full campus survey after Indiana University Bloomington, the similarity of both studies' numbers is beginning to furnish professionals with a sense of how much media content is likely to be found at other research universities. In contrast to Indiana University's strengths in the arts and humanities, Illinois is better known for its programs in engineering and science. For this reason, the two studies in tandem illustrate an excellent cross-section of the academic collections environment in the United States. The data collected by these two studies could be utilized by other academic institutions to draw inferences, based on the profile of the institution, on the size of their own holdings, thus reducing the need to fund costly and time-consuming campus surveys.

Given the magnitude of these challenges, it is likely that multi-institutional collaboration may provide a path to achieving economies of scale in media preservation services. Examples could include:

- **Regional centers of expertise:** A few schools within a consortium taking the lead as centers with the personnel, knowledge, and resources to lead the others.
 - **Regional/State preservation services:** Direct service points could potentially exist that would be able to provide preservation services to the others at discounted prices.
 - **Pooling of resources:** The development of consortial contracts with vendors for the outsourcing of media preservation services.
 - **Standardization:** Development of cross-institutional standards and common workflows to help to improve support and development for preservation standards as well as ease the path for future digital preservation activities.
 - **Collaborative prioritization:** While it is obvious that certain types of materials are unique to a single institution, it can be assumed that there are areas of overlap between others. For example, the University of Illinois and Northwestern University compete in a football game annually. For at least some of these games, it can be assumed that both schools maintain identical footage. It is clear that only one of these would need to be preserved and if agreements and collaborative conversations occurred between schools, the amount of redundant digitization and digital storage for duplicates could be dramatically reduced across a wide swath of universities.
 - **Media Preservation Learning Labs:** Much talk in the media preservation community focuses around the lack of knowledge needed to effectively work in the field. While this is certainly true, there are few opportunities and means by which students and professionals can currently gain hands-on experience working with analog and even digital materials. Therefore, there is a need for a Media Preservation "learning lab" in which professionals and students alike can gain hands on experience in the field. It would make sense to seek collaborative partnerships, as well as grant and donor funding, to foster hands-on media preservation education. To use facilities for workshops, training sessions,
-

and seminars would help increase knowledge, skills, and practices throughout the campus and the media preservation field.

- **Digital Storage Infrastructure:** The Media Census findings make it clear that the need for long-term preservation of time-based media assets is great. Of equal importance is the development of a robust infrastructure for the digital storage and preservation of migrated assets. Internally, the CME should be looked to for guidance on the development of shared, scalable digital storage infrastructure. Externally, coalitions in development, such as the Digital Preservation Network (DPN) can be looked upon with some optimism for the potential possibilities of collaborative storage models. It is clear however, that shared and consortial digital storage is likely to be of great interest to many in the field.

6.6 Proactive vs. Reactive Preservation

To reemphasize a point strongly made in Indiana University's campus media study and reapplied to Illinois: to create digital transfers of only the assets identified as "rare" during Phase Two of the Media Census would require round-the-clock work for 5,446 days, or nearly 15 years (averaging each asset at two hours for conservation, transfer time, quality control, and metadata creation). To digitize the entire 408,492 assets would require around-the-clock efforts over 85 years.

In many institutional settings, departments offering reformatting services do so in a reactive manner. Collection items in need of preservation or conservation services are identified, often due to user request or interest, and sent to preservation or conservation experts who in turn "fix" the problem. Currently, media assets are often handled only when there is user need or a need for access by an outside entity. While condition and other metadata is collected throughout an item's lifespan (for example: during accession, locational move or in search for other items), the actual intensive preservation and conservation work is done only on an "as-needed" basis.

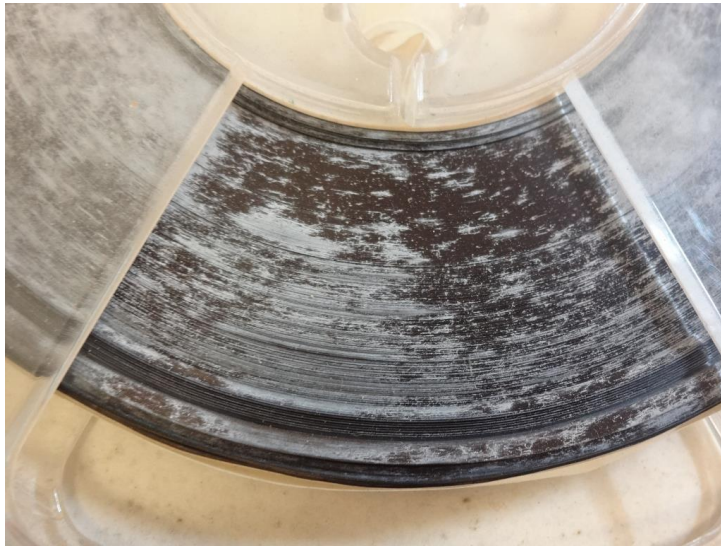


Figure 34. Unique reel to reel audio tape suffering from extreme mold growth, pest and other damage. One of hundreds located during the Campus Media Census

A much more "proactive" approach to preservation must be taken if any substantial progress is to be made in dealing with the mass of materials uncovered during this census. A proactive approach would require that the Media Preservation Unit have a much more involved relationship with its constituent departments; one in which Preservation staff are able to make concise and informed suggestions that combine both preservation

and content data. This type of prioritization is of utmost importance. A “sit back and wait” attitude will only result in massive loss over time.

7. CONCLUSION

The Campus Media Census at the University of Illinois at Urbana-Champaign has been successful in mapping and providing an understanding of the immensity and complexity of the landscape on campus as it relates directly to analog media assets. The Census brought many collections to the surface and shed light on important issues facing the preservation of the University’s media heritage. In addition, the existence of a dedicated Media Preservation Unit in the Library has made other academic media holders (including departments, individuals, emeritus faculty, and those involved in professional production) more willing to consider issues of long-term preservation in their plans for the future of their collections. It is hoped that the Census opened up doors and created new, positive relationships between the Library and campus that will endure into the future. If important audiovisual assets are not to “fall through the cracks,” it is clear that strategic prioritization and planning will be vital. Lack of funding, media format and playback equipment obsolescence, poor storage, gaps in content knowledge, and a weak campus infrastructure for the long-term preservation of digital audiovisual assets are just a few of the many challenges facing the University. In collaboration with institutional and external partners, the Library’s Preservation Unit and the Center for Multimedia Excellence hope to move forward in their efforts to overcome the immense challenges facing the University of Illinois at Urbana-Champaign media preservation community.

8. APPENDIX A: Informational Brochure



Preservation of audiovisual media requires an interrelated set of actions: proper orientation, proper cleaning and housing, a controlled climate, and an understanding of how formats differ from each other.

Cleaning/Rehousing:

All media formats benefit from proper housing and cleaning. Audio and video tape should be stored in enclosed, inert plastic cases. Grooved discs are best housed in either paper or polypropylene sleeves, and should be cleaned only with deionized water, or for vinyl discs, mild detergents specifically designed for record cleaning. Motion picture film should be stored in inert, vented plastic canisters to allow airflow through the film pack, and should be cleaned only with specially designed film solvents.

Improper film housing



Environment and Orientation:

Video tape, audio tape, CDs, DVDs, Blu-rays, and grooved discs should be stored vertically, with regular shelf spacers. Motion picture film, however, should always be stored horizontally, with the largest canisters at the bottom. Film and videotape both benefit from cool storage environments, with relative humidity levels between 30 and 50%. While film can be stored in below zero environments, video tape, audio tape, grooved discs, and optical discs should never be stored below freezing.

Proper video tape orientation



Digitization:

In addition to the proper cleaning, housing, and storage of original analog materials, conscientious digital reformatting can offer an additional layer of security to the preservation of audiovisual collections. Before undertaking any digitization project with A/V materials it is important that proper planning and research is conducted in order to make informed decisions that best fit the needs and available resources of your department. These choices are integral to both the long term preservation of the collections and their future use in instruction, research or public outreach. For more information or consultation, please contact the University Library's Media Preservation program.

Recording of Frank Lloyd Wright on 12" disc



A copy of the informational brochure can be downloaded from: <https://www.ideals.illinois.edu/handle/2142/50106>

9. APPENDIX B: Links to Further Documentation

1. The full Phase Two census questionnaire:
<https://www.ideals.illinois.edu/handle/2142/50106>
2. Full Phase Two data set with related tables:
<https://www.ideals.illinois.edu/handle/2142/50106>
3. The Indiana University-Bloomington Media Preservation Survey Report:
www.indiana.edu/~medpres/documents/iub_media_preservation_survey_FINALwww.pdf