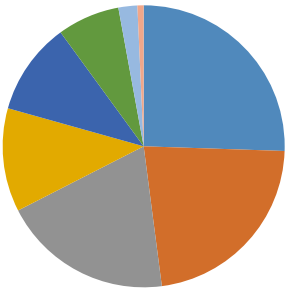

# Smithsonian Institution

## Pan-Institutional Audiovisual Collections Survey

## Final Project Report

2016-2017

# Smithsonian Institution

## Pan-Institutional Audiovisual Collections Survey

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**Report Completed:** 28 March 2017

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# 1 Executive Summary

From December 2015 to January 2017, eight Smithsonian units participated in a year-long comprehensive survey of audiovisual collections consisting of analog film, audio, and video held across the Institution. Proposed by the Audiovisual Archivists Interest Lunch (AVAIL) group and funded by the National Collections Program's Collections Care and Preservation Fund (CCPF), this project provides foundational data for the development of pan-institutional guidelines on the preservation and care of audiovisual materials. The Smithsonian Institution Archives served as the lead unit for the project with contracted audiovisual archivist, Kelli Hix conducting the survey, reporting findings, and providing future recommendations.

The primary goals of the survey were to first document the breadth and scope of audiovisual collections by gathering group-level data on formats, condition, and storage environments, and to secondly report on areas of greatest strength and greatest need in preservation practices as identified by staff during on-site interviews.

### Participants

- Anacostia Community Museum (ACM)
- Archives of American Art (AAA)
- Center for Folklife and Cultural Heritage (CFCH)
- The Human Studies Film Archives (HSFA)[1]
- National Air and Space Museum Archives (NASM)
- National Museum of African American History and Culture (NMAAHC)
- National Museum of American History Archives Center (AC)
- Smithsonian Institution Archives (SIA)

### Outcomes and Recommendations

The survey identified 263,633 physical audiovisual assets held in more than 30 different locations over eight units. Many of these collections are actively deteriorating due to the degradation of media formats and obsolescence of playback equipment. Long-term preservation of these assets require digitization and adequate storage environments. Without these preservation strategies, collections are at risk of permanent loss.

Some of the **primary concerns** revealed during the survey:

- improper environmental conditions for audiovisual media
- lack of access systems and item-level management systems relating specifically to the needs of audiovisual collections
- insufficient funding and staff infrastructure to perform audiovisual preservation

Moving forward as a leader in the field, the report **recommends**:

- developing and initiating a detailed plan for proactive preservation across the units that addresses the prioritization of collections, effective preservation workflows, media lab readiness, and staff roles
- investigating and implementing long-term storage spaces for audiovisual collections based on ISO standards for temperature and relative humidity, airflow, and fire suppression

[1] In October 2016, the Human Studies Film Archives was renamed the National Anthropological Film Collection in the National Anthropological Archives.

# 2 Introduction

## 2.1 Overview

From December 2015 to January 2017, eight Smithsonian units participated in a year-long comprehensive pan-institutional audiovisual collections survey. The goal of the project is to support the Institution's mission of excellence in collection care by documenting the scope and breadth of audiovisual collections across the participating units and reporting on areas of greatest strength and greatest need in preservation and conservation practices. The Smithsonian Institution-based audiovisual archivist interest group, AVAIL, proposed and provided support for the project. Smithsonian Institution Archives served as the lead unit for the project under the direction of Alison Reppert Gerber, Preservation Coordinator. Contracted audiovisual archivist, Kelli Hix conducted the survey and prepared the report. Funding for the project was provided by the National Collections Program's Collections Care and Preservation Fund (CCPF).

The units who participated in the survey were:

- Anacostia Community Museum (ACM)
- Archives of American Art (AAA)
- Center for Folklife and Cultural Heritage (CFCH)
- The Human Studies Film Archives (HSFA)[2]
- National Air and Space Museum Archives (NASM)
- National Museum of African American History and Culture (NMAAHC)
- National Museum of American History Archives Center (AC)
- Smithsonian Institution Archives (SIA)

## 2.2 Analog Audiovisual Collections at the Smithsonian

***"The Smithsonian's collections represent our nation's rich heritage, art from across the globe, and the immense diversity of the natural and cultural world."***

The Smithsonian Institution's archival collections contain hundreds of thousands of analog audiovisual assets on dozens of technically complex formats. In addition, many of these audiovisual collections have been recognized nationally and internationally for their cultural value and are included in the National Film Registry or inscribed in UNESCO's Memory of the World Registry. The content includes oral histories and institutional documentation; global scientific studies; narrative and experimental films; rare home movies and vernacular films; documentary and educational films; animal studies in the wild and in captivity; primary documents depicting global human anthropological research; interviews with artists, scientists, and cultural figures; unique recordings of world folk music; and footage documenting important moments in national history.

[2] In October 2016, the Human Studies Film Archives was renamed the National Anthropological Film Collection in the National Anthropological Archives.

Highlights from the audiovisual collections at the Smithsonian Institution include:

**Anacostia Community Documentation | ACM**
This collection contains moving images and audio recordings documenting the dynamic history of the Anacostia Community in Washington, DC.

**Black Mosaic Exhibit Interviews | ACM**
These interviews and oral histories are associated with the groundbreaking 1994 Black Mosaic exhibit at ACM, which looked at the immigration of people of African descent from Central and South America and the Caribbean to the Washington metropolitan area.

**Oral History Collection | AAA**
The largest collection of art-related oral history interviews in the world, AAA's Oral History collection contains audio and video interviews with artists, curators, and collectors dating back to 1958. The collection contains interviews with artists as wide-ranging as Edward Hopper and Anaïs Ninn, and cover topics from Latino artists working in Florida to the New Deal Art Programs.

**Gallery Collection | AAA**
This collection contains recordings produced or collected by significant galleries. It includes early video art from the 1971 exhibition, "Artists' Videotape Performances," one of the first shows to include video art; the publicity archive of the Leo Castelli Gallery, a key gallery during the rise of the art market in the 1980's; and rare recordings of second generation New York School Poets performing at the 98 Greene Street Loft from 1971-1973 in the Holly Solomon Gallery records.

**Moses and Francis Asche Collection / Folkways Records | CFCH**
The collection contains the master audio recordings created for Folkways Records, now operated by the Smithsonian Institution as Smithsonian Folkways Records. The recordings document American and International folk music, live readings, and sound recordings. Folkways is best known for its original recordings of artists such as Leadbelly and Woody Guthrie, who shaped American music in their own time and whose work went on to influence the folk and rock movement, and live readings by poets such as African American and Afghan poet Nancy Dupree. In addition, the collection contains a wide range of subject matter from early experiments in electronic music to recordings of a typical 1963 office to the sounds of various insects and animals.

**Folklife Festival Documentation | CFCH**
This collection documents fifty years of the international exhibition of living cultural heritage held annually on the National Mall.

**Dixon-Wanamaker Expedition to Crow Agency, 1908 | HSFA**
The collection contains the only known film footage that survives from the 1908 Wanamaker expedition to American Indian reservations. A highlight of the content is the recreation of the Battle of Little Bighorn which includes participants who were in the original battle in 1876.

**The John Marshall Collection, 1950-2000 | HSFA**
This collection documents the Ju/'hoansi (!Kung) people in Namibia over an incredible 50-year period. Considered not only "unparalleled in the history of film and in the history of documenting humanity,"[3] but also one of the precursors to the cinema verité movement, The Marshall Collection was the third moving image collection to be inscribed on UNESCO's Memory of the World Registry (2010). *The Hunters*, one of the edited films from this collection, was added to the National Film Registry in 2003.

**World Travel Collection, Gustave Oberlander | NASM**
This collection, documenting the Oberlander family travels, contains extremely rare early color footage of the family's trans-atlantic trips, many of them taken in the ill-fated Hindenburg just before its fatal crash in 1937. The footage includes a trip to Nazi Germany and the 1936 Berlin Olympics, featuring American athlete Jesse Owens.

**United States Air Force Training and Documentary Film Collection | NASM**
This collection contains rare footage documenting Air Force Training procedures.

**African American Home Movie Collection | NMAAHC**
The wide-ranging content in this collection contains footage from 1920's amateur film of rural Oklahoma black life, such as the Rev. S. S. Jones films, to celebrity / notable figures' home movies, such as the films of Cab Calloway and J. Max Bond. The footage serves to document the African American experience throughout the 20th century.

**Master Recordings of Music Performances and Interviews | NMAAHC**
This collection of unique transcription discs includes master session recordings of Charlie Parker, Billie Holiday, and Cab Calloway.

**History of Advertisement Collection | AC**
This popular collection contains footage documenting the history of television advertisement. The collection depicts the "themes and techniques of persuasion" and displays the evolution and increasing sophistication of advertising in our world.[4] Marlboro, Alka-Seltzer, Federal Express, Cover Girl, and Nike are a few of the companies represented in the collection.

**The Faris and Yamna Naff Arab American Collection | AC**
This collection documents the history of Arab Americans in the United States. Based on a ground-breaking 1962 oral history project conducted by Dr. Alixa Naff, the collection records the emigration and arrival stories of first-generation immigrants. This is a mixed-format collection that includes correspondence, newspapers, photographs, and diaries, while at the collection's core are more than nearly 40 open reel audiotapes and audio cassette oral histories from 1962 to 1994.

**Oral History Collection | SIA**
This ongoing video and audio project contains unique interviews with Smithsonian Institution secretaries, curators, and staff. It documents the history of the Institution and the experiences of those who have shaped it.

[3] Cynthia Close, "Remembering John Marshall", http://newenglandfilm.com/magazine/2005/07/remembering-john-marshall-1932-2005
[4] http://americanhistory.si.edu/collections/subjects/advertising, accessed 15 March 2017.

**Animal Research Records | SIA**

These records were created and maintained by Devra G. Kleiman and document the research and breeding programs at the National Zoological Park. The records include behavioral studies of endangered animals including the giant pandas, Hsing-Hsing and Ling-Ling, and documentation of the Golden Lion Tamarin Release Program.

## 2.3 Project Background

***"Since its founding, more than 164 years ago, the Smithsonian has become the world's largest museum and research complex, with 19 museums, the National Zoo, and nine research facilities."***[5]

Audiovisual assets are everywhere at the Smithsonian. Videos run in gallery spaces; films are projected in on-site theaters; time-based artworks are on display and in archives; and unique home movies and scientific observational footage are housed in research archives. Yet, in many units, analog audiovisual assets remain somewhat hidden in mixed media collections or undocumented at an item level. In the past, in order to better understand the needs of these assets and the Smithsonian's ability to care for them, the Institution has engaged in several projects aimed at gathering statistical data about their audiovisual collections. In 1994, an audiovisual survey was led by Merry Foresta and conducted by Tom Freudenheim with the goal of gaining a better understanding of the scope of audiovisual assets across the Institution. Twenty years later, in 2014, the Smithsonian Institution Office of Policy and Analysis (OP&A) reviewed digital practices and created the report *Scaling Up: A Study of Collections and Digitized Processes and Costs*. The latter project sought to better understand the cost of digitizing collections, including audiovisual collections. These two efforts offered starting points for creating awareness and advocacy for audiovisual collections and their preservation needs.

In November 2014, the Smithsonian-based professional group, Audiovisual Archivists Interest Lunch (AVAIL) developed and proposed a pan-institutional survey of audiovisual collections, with the intention of offering a definitive and current count of audiovisual assets and compiling expanded documentation of the Smithsonian's greatest strengths and challenges in audiovisual collections care. This survey and its findings should serve as a common platform for communication and collaboration among participating units and builds on the concepts developed during the Photographic and Born Digital Surveys which took place in previously at the Institution. In March 2015, the pan-institutional audiovisual collections survey was funded by the Collections Care and Preservation Fund (CCPF), and launched in December that same year.

It is challenging to understand the scope and size of audiovisual collections at the Smithsonian due to the independence with which each unit operates and the differing methodologies used to track and care for audiovisual assets. The differences arise, at least in part, from the incredible variation in the missions and histories of each unit. Several of the archives surveyed were originally founded with the specific mission to care for and collect audiovisual assets, such as the National Air and Space Museum (NASM) and the Human Studies Film Archives (HSFA). Other units' collections of audiovisual assets have grown organically as they are donated with paper and photo research collections, such as the Smithsonian Institution Archives (SIA), Archives Center (AC), and the Archives of American Art (AAA), while portions of the National Museum of African American History

[5] https://www.si.edu/About/History, accessed 10 February 2017.

and Culture's (NMAAHC) analog collection is created or collected specifically for exhibition purposes. [6] Other units, most notably the Center for Folklife and Cultural Heritage (CFCH), also operate as production facilities, and part of their mission is to care for self-produced audiovisual documentation.[7] The strength in this diversity is the existence of staff with a wide range of expertise, experience, equipment, and resources to be shared.

Acknowledging this strength, AVAIL was founded in 2009 by Smithsonian staff so that audiovisual archivists across the Institution could "discuss issues related to their audiovisual holdings and draw from the collective experience and wisdom."[8] Since most of the founding members were the only audiovisual archivist in their unit, AVAIL provided a forum for discussion and a resource for collective problem solving. [9] AVAIL remains active to this day, and it operates a listserv, meets throughout the year, and supports project planning for audiovisual collections care.

[6] For example, NMAAHC creates copies of films in its collection for use as analog film loops for exhibition and educational purposes in the museum.
[7] CFCH cares for thousands of original assets documenting the American Folk Festival, now the Folklife Festival, which is an annual festival that celebrates folk music, food and traditional culture on the National Mall.
[8] Kimberly Tarr and Wendy Shay, "How Film (and Video) Found Its Way into 'Our Nation's attic'," *The Moving Image (Spring 2013)*. It should also be noted that AVAIL is open to non-Smithsonian archivists.
[9] Ibid.

# 3 Project Concepts and Foundations

## 3.1 Audiovisual Archiving

Analog audiovisual assets present complex preservation and conservation challenges for archives. Over the last 120 years, there have been numerous moving image and audio formats, each created in response to new needs in the filmmaking, exhibition, and broadcast communities. Each of these formats has specific requirements for conservation, preservation, and playback, which must be taken into account when planning for their long-term viability. Not only must the physical asset be cared for, but the increasingly obsolete playback equipment, most of which is no longer manufactured, must be collected and maintained in order to view or listen to the content. The obsolescence of much of this equipment, the shortage of replacement parts, and the scarcity of technicians who can calibrate and repair the equipment are some of the most notable barriers to the preservation of audiovisual materials.

***"Many endangered analog formats must be digitized within the next 15 or 20 years before further degradation makes preservation efforts all but impossible."***[10]

Four year have passed since the above statement was made by the National Recording Preservation Board of the Library of Congress, meaning that the expected lifespan for some types of analog audiovisual assets is now closer to 10 to 15 years. Though different types of audiovisual assets have different lifespans, all analog audiovisual material eventually suffers from physical wear and chemical breakdown.

Physical breakdown may occur from repeated playback, incorrect handling and storage, or poor shipping and storage scenarios. Tape and film tearing, scratching of emulsion and magnetic layers, broken perforations, edge damage, and breaking of housing and casings are common examples of physical damage.

### AUDIOVISUAL STATIONS AT SI

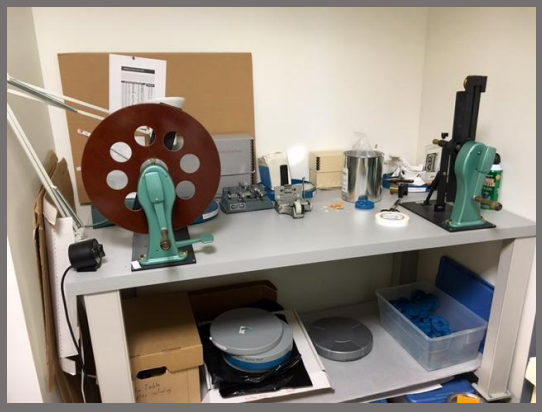
*Archives Center (AC) maintains an audiovisual media preservation desk area with increasingly obsolete playback equipment (below).*

*The Archives of American Art (AAA) stores their audiovisual playback equipment on racks that save space and make the work space more functional (below).*

[10] Library of Congress, "Library of Congress National Recording Preservation Plan", (National Recording Preservation Board of the Library of Congress, Council on Library and Information Resources (December 2012), http://www.loc.gov/programs/static/national-recording-preservation-plan/publications-and-reports/documents/NRPPLANCLIRpdfpub156.pdf

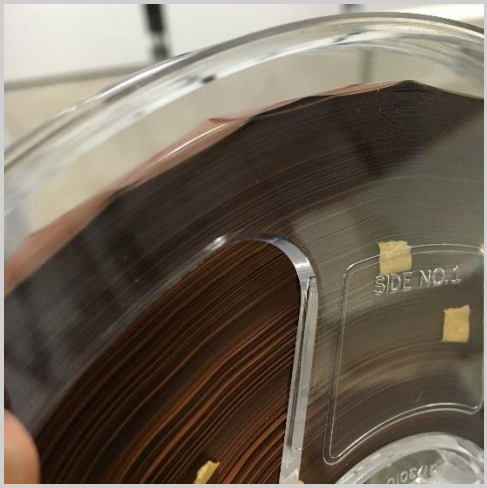
*The National Museum of African American History and Culture (NMAAHC) uses the Lasergraphics ScanStation Motion Picture Film Scanning System for the preservation of their film collections (below).*


*The Smithsonian Institution Archives (SIA) maintains a film rewind and inspection station in their audiovisual preservation lab (below).*

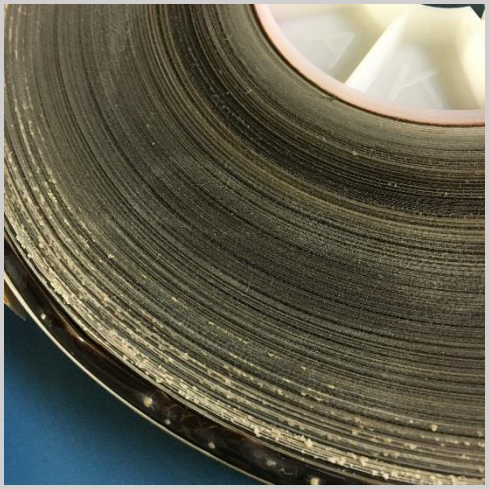


Audiovisual media can also suffer from chemical breakdown, often due to the natural deterioration of the plastic and organic compounds from which the assets are made. In the case of magnetic media, chemical breakdown often manifests as binder hydrolysis or "sticky shed syndrome," which causes the magnetic material carrying the content to flake off the carrier tape. For acetate-based film and tape, chemical breakdown commonly occurs as acetic acid decay or "vinegar syndrome," a chemical reaction which causes the film to break down and off-gas acetic acid or "vinegar." Color fading is another common chemical breakdown which occurs in films.

There are many examples of how time and usage affects audiovisual assets. In all cases, damage affects playback ability, causes damage to the playback equipment, and results in partial or total loss of the content. Good conservation practices, such as correct housing orientation and environmental controls, are used to prevent or slow deterioration of assets. Furthermore, these standards all mitigate damage in the case of a collections emergency, such as flooding, fire, or other natural disasters. Conservation best practices prolong the life of audiovisual media until digitization can be accomplished and/or until the archive decides the original asset is no longer viable.




*Several audiovisual assets from the survey exhibited moderate to significant levels of deterioration. A lacquered audio disc (left) from the Anacostia Community Museum (ACM) is experiencing significant flaking of the coating, while a ¼-inch open reel audio tape (right) from the Center for Folklife and Cultural Heritage (CFCH) exhibits substantial warping.*



*A brittle, warped reel of acetate film (left) from the Archives of American Art (AAA) is showing the highest level of decay. The acid-detecting strip is yellow, which indicates a level "3," or more than 20 ppm of acetic acid in the surrounding air. A reel of film (right) from the Archives Center (AC) has an active mold infestation, which could be caused by inappropriate storage conditions.*

Intellectual control of collections presents its own set of unique challenges. Audiovisual collections can represent an enormous amount of metadata. Often dozens or hundreds of technicians, artists, and actors are involved in its creation. Production information may be widely available through primary resources, but when this is not the case, the archive has important decisions to make regarding its role in documentation. Rights and reproduction issues are complex, and become more so with the incorporation of music or use of stock footage, yet must be clearly defined in many cases in order to provide access or re-use. Multiple copies of the same or similar content brings up questions of how the archive will preserve and document these differences. The acquisition of complex production elements, such as camera originals, outtakes, and raw sound recordings, require similar decision-making for archives.

## 3.2 Project Terms, Vocabulary, and Concepts

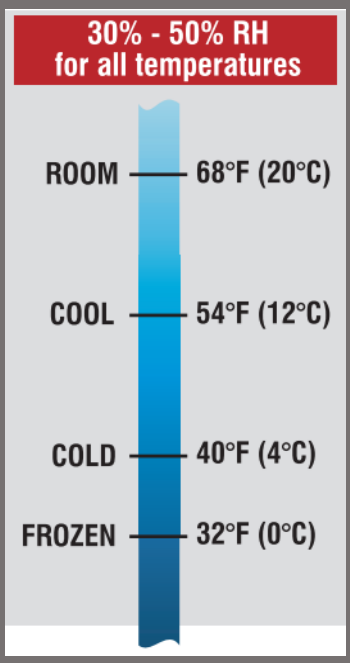
**Best practice standards** are referenced throughout this report and refer to the body of accepted collections care methodologies in the field of audiovisual archiving. These standards are defined by archivists and standardizing bodies such as the International Organization for Standardization (ISO), research and documentation organizations such as the Federal Agencies Digitization Guidelines Initiative (FADGI), and the Image Permanence Institute (IPI). Professional organizations, such as the Association of Moving Image Archivists (AMIA) and the International Federation of Film Archives (FIAF) also contribute to defining best practices. Such standards are referenced specifically in the report when they are deemed necessary to provide context or clarification to an observation or recommendation. This report was written with the knowledge that the methodologies for achieving archival standards manifest themselves differently from institution to institution, according to differing mission statements and available resources. The report is not intended to create policy or serve as a comprehensive resource for best practices. Instead, the focus of the report is to document observations and findings, note how these relate to best practice standards, and support self-evaluation and advocacy for progress in collections care.

For the purposes of this report, **conservation** describes archival activities which stabilize and treat the analog media in order to increase its physical longevity. Assessment, environmental control, rehousing, and repair are all examples of activities and tools used in the conservation of audiovisual media. **Preservation** refers to the process

of reformatting audiovisual content at archival best practice standards. In contemporary practice, this reformatting almost always means digitization, though it is essential to note the place of photochemical methods on the spectrum of preservation activities. Both conservation and preservation are vital to the archive's work and are imperative in meeting stewardship directives.

Across the Smithsonian, units use the vernacular terms "**cool**" and "**cold**" to describe a variety of conditions under which archival collections are stored. For consistency, the narrative of this report uses these terms, as well as the term "**room**," as they are defined by the IPI, unless quoting unit responses directly. This graphic (right) offers a definition of these terms.[11] Each temperature point represents a median temperature.

**Photos** in this report were taken during the survey for the purposes of this report and are of Smithsonian Institution collections, workstations, and equipment.




*The Image Permanence Institute (IPI) designates four temperature categories. In this context, ROOM, COOL, and COLD are characterized by one "anchor-point" temperature. FROZEN applies to temperatures of 32 °F (0 °C) and below.*

[11] Peter Z. Adelstein, "IPI Media Storage Quick Reference", (Image Permanence Institute), https://www.imagepermanenceinstitute.org/webfm_send/301

# 4 Project Scope

## 4.1 Primary Deliverables of the Survey

The project provides the following deliverables:

- **Survey Multiple-Choice Questionnaire Results |** *Results from the multiple-choice survey questions in spreadsheet and visual graphic form*
- **Unit Interviews |** *Copies of in-person interview questions and answers*
- **Inventory Spreadsheets |** *Copies of spreadsheets with raw data counting unit audiovisual holdings*[12]
- **Project Report |** *Narrative report containing major findings, data points, and methodologies*
- **Individual Unit Reports |** *Narrative reports for each unit containing a snapshot of major data points and methodologies specific to each unit*

## 4.2 Timeline and Schedule

The multiple-choice questionnaire, interviews, and inventory took place from December 2015 to December 2016. The following timeline outlines the work schedule. The work schedule was developed by the unit participants based on the size of their collections and the scope of their collections management systems. The required inventory timeframes were estimated but did not exceed four weeks for any participating unit.

| Activities | December 2015 | January 2016 | February 2016 | March 2016 | April 2016 | May 2016 | June 2016 | July 2016 | August 2016 | September 2016 | October 2016 | November 2016 | December 2016 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preliminary edit of survey tool and interview questions | December 9 | | February 12 | | | | | | | | | | |
| Send multiple choice questions to appointed staff | | | February 5 | | | | | | | | | | |
| NMAAHC Inventory | | | Feb 16 - | March 1 | | | | | | | | | |
| ACM Inventory | | | | March 1 - 16 | | | | | | | | | |
| NASM Inventory | | | | March 18 - | April 18 | | | | | | | | |
| AAA Inventory | | | | | April 19 | May 13 | | | | | | | |
| NMAH AC Inventory | | | | | | May 16 | June 17 | | | | | | |
| HSFA Inventory | | | | | | | June 20 | July 15 | | | | | |
| SIA Inventory | | | | | | | | July 18 | August 31 | | | | |
| CFCH Inventory | | | | | | | | | | September 1 - 30 | | | |
| Project wrap-up | | | | | | | | | | | October3 - | | December 9 |
| Iron Mountain | | | | | | | | July 18 - 22 | | | | | |

[12] Due to the large amount of data captured, the inventory spreadsheets are divided by unit. For some units, several spreadsheets may be used to document the collections.

# 5 Project Methodologies

The following offers a list of methodologies used to conduct the survey. The methodologies are provided in order to clarify the process behind the survey activities, and in the hope that they might serve as a reference for other institutions engaging in similar projects.

## 5.1 Project Workflow

- Once grant funding is received, a **statement of work** is written and a **request for quote** is disseminated through the appropriate public outlets.
- The lead unit for the project selects contracted audiovisual archivist.
- Survey questions and inventory fields are reviewed and revised by the contractor and unit participants (project working group), as needed.
- Samples of collections are inventoried and fields are revised according to test sample findings.
- Contractor conducts **initial site visits** to participating units to meet staff and examine work and archival storage spaces.
- **Multiple-choice questionnaires** are provided to unit liaisons.
  Individual unit survey activities begin at each site, including **interview**, **inventory**, and **condition assessments** (including A-D testing).
- Contractor meets with working group at the halfway point to offer **project updates**.
- Complete individual unit survey activities.
- Wrap-up and **report writing**.

## 5.2 Multiple-Choice Questions

Multiple-choice questions were created based on questions used in the Photographic Survey and originally developed for use in the Messier Tool.[13] The project working group revised and adapted the questions to better address audiovisual collections prior to the beginning of the project. Responses to most of the multiple-choice questions are based on the unit's self-perception and the observations and experiences of the unit representatives. The responses are not based on numerical data gathered during the survey. The purpose of the questionnaire is to provide a more clear understanding of the unit's general areas of strength and weakness in audiovisual collections care and to indicate areas where deeper investigation and the gathering of further statistical data might benefit the unit and the Institution.

The project used Google Forms to submit the questions and collect responses. Google Forms was chosen because of its ability to auto-populate an MS Excel spreadsheet and its ability to automatically generate graphs and charts. In addition, it is simple to edit and revise, and it is widely used and available.

[13] Ultimately, the Messier database tool (a Microsoft Access Database) was not used to organize or describe the data gathered during the survey. The database was originally developed for photographic assets and was nearly a decade old by the time this project began. Because the tool required extensive updates in order to be used for audiovisual assets and the learning curve required to use Microsoft Access was quite steep, the Messier tool was not used to hold data or generate charts and graphs for the project.

## 5.3 Interview

Selected staff members from each participating unit were provided with written interview questions before the interview was conducted. The contractor performed the interview on site, usually on the first day of the unit survey. Conducting the interview verbally and at the start of each survey proved to be useful in familiarizing the contractor with the unit's history, collection, and storage spaces. This method also tended to lead organically to wider conversations outlining the methodologies to be used in conducting the inventory portion of the survey. The interview took approximately one working day to complete for each unit. After the verbal interview was completed, the interviewee was able to edit the document and make any additions or clarifications while consulting other staff as needed. Many of the interviews are written in third-person voice, especially when the response to interview questions was highly collaborative.

## 5.4 Condition Assessment

Accurately assessing condition of audiovisual assets requires item-level evaluation and often includes playback or, in the case of film, detailed inspection. Cassette-based formats, in particular, may show no visual sign of poor condition but may be in an advanced stage of physical or chemical decay. While this survey does not conduct item-level condition assessments, the group felt it was important to make notes regarding holistic collection conditions. When assets exhibited visible condition issues, such as signs of mold, broken carriers or cartridges, or high levels of acetic acid decay, it was noted in the inventory spreadsheets. To this end, the group developed a five-point condition scale to provide a quantifiable method of assessment. A detailed methodology for applying the scale to collection assets is listed in *Section 5.8. Inventory Field Descriptions*. Any methodologies specific to each unit are listed in the individual unit reports.

## 5.5 Testing Using Acid-Detecting Strips

Acetic acid decay is a type of chemical decay that affects all film and open reel audio assets with cellulose acetate as their base substrate. In order to gain a general understanding of levels of decay present throughout the collections, acid-detecting (A-D) strips were used to test samples from each collection for acetic acid decay. The Image Permanence Institute's (IPI) A-D strips are dye-coated paper strips that detect and measure the severity of acetate-based film deterioration. When placed in close proximity to collection assets, the strips change in color based on the parts per million (ppm) of acetic acid vapor in the environment. IPI's specific test guidelines were followed during the survey.[14] Any methodologies specific to A-D testing at each unit are listed in the individual unit reports.

| A-D Strip Level | Film Condition | Recommended Actions |
|---|---|---|
| 0 | **GOOD** – no deterioration | Cool or cold storage |
| 1 | **FAIR TO GOOD** – deterioration starting | Cold storage, Monitor closely |
| 1.5 | **RAPID DECAY** starting – point of autocatalytic decay | Cold or frozen storage |
| 2 | **POOR** – actively degrading | Freeze |
| 3 | **CRITICAL** – shrinkage and warping imminent, possible handling hazard | Freeze immediately, Reformat |

[14] "IPI User Guide for A-D Strips", (Image Permanence Institute), https://www.imagepermanenceinstitute.org/webfm_send/309

Comprehensive testing was not possible since many of the units do not note the base substrate of their assets at item-level, many audiovisual assets are interfiled with other material types, and some assets were physically inaccessible during the survey. Approximately two hundred (200) assets were tested in each unit.

The A-D testing performed during this survey is intended to provide only general information regarding levels of acetic acid decay. In many units, audiovisual assets do not have unique identifiers linking a specific physical asset to a specific inventory line. In these cases, the unit representative and the survey contractor made the best effort to align the A-D strip test result with the correct asset or group of assets.

## 5.6 What Fields are *Not* Included in the Inventory and Why

### 5.6.1 Detailed Collection Content

The survey, and specifically the inventory, was not intended as a substitute for a collections management system or a replacement for intellectual control over collections. The decision was made to address highlights of collection content and cultural significance in the individual narrative unit interviews. The inventory provides individual titles and collection titles, when possible, as a reference.

### 5.6.2 Generation, Duplicate Copies, and Preservation

Some, but not all, units designate the *generation* of an audiovisual asset in their collections management system. For example, they may call the asset an *original*, *master*, or *reference* copy. Units define these terms differently. In addition, the asset's designation can change over time, as a *master* copy may deteriorate and a *reference* copy may become the best copy extant. Since there are no unified terms or documentation process noting generation, the project working group determined that there was no consistent method to document the existence of copies for the purposes of the survey. For the same reason, the inventory did not document which assets have been preserved. The multiple-choice questionnaire provided unit interviewees the opportunity to estimate how much of their collection is preserved and how much is duplicated.

### 5.6.3 Duration

The duration of assets is a primary factor in budgeting and planning for preservation. Determining the duration with any certainty often requires playback. For many formats, even estimating duration requires a substantial amount of technical information, including playback speed, reel size, tape thickness, and footage. Some units document the duration of their assets and some do not. Some gather the above-mentioned technical data, which can be used to estimate running time, while others do not. The inventory gathered a basic range of technical data and noted duration and tape stock length for assets whenever possible. The result is that the amount and type of data describing duration varies widely from unit to unit, and at this time the decision was made to forgo estimates as to the duration of the collections as a whole until such a time as the units identify a collective or individual methodology for doing so. The raw data supplied in the report is intended to support such a process.

### 5.6.4 Cubic Footage

During the survey, it was noted that most units do not measure the cubic footage of their audiovisual collections separately from their other collections. It was also noted that many of the units store audiovisual assets in boxes with other types of material as mixed media collections. Therefore, data

describing the cubic footage of the actual audiovisual assets often would not reflect the true amount of space that the collections take up under current storage conditions or provide a true comparison of existing storage spaces and needs. For this reason, the survey does not provide a measurement of overall cubic footage of audiovisual collections. Cubic footage measurement tools and charts are provided in this report as appendices, which will support individual units' efforts to document the cubic footage of their audiovisual collections should such a measurement prove useful for storage planning in the future.

## 5.7 Creating the Inventory

The primary goal of the inventory was to create an estimated count of how many and what formats of audiovisual media are in each participating unit's collection. The inventory was intended to provide a starting point for understanding the scope and breadth of the collection and as a tool for cross-unit comparison. It is not intended as a substitute for cataloging or intellectual control workflows within units, though it may act as a supplement for such workflows.

The inventory was created at a "group-level." Each format type in a selected collection was given a line item in the inventory spreadsheet. For example, if a collection contained both ¼-inch audiotapes and compact audio cassettes, two line items would be recorded in the spreadsheet, noting the item count for each format.

| A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SI Unit | Building | Room | Date Inventoried / Imported | Collection # / Accession # | Box # | Shelf Number | Title / Description | Item Count | Medium | Format | Base Substrate / Material Type | Diameter | Playback Speed |
| AC | AC | AC Back Room | 6/7/2016 | | | 44D3 | | 10 | audio | 1/4 inch audio tape | | 7 | |
| AC | AC | AC Back Room | 6/7/2016 | | | 44D3 | | 5 | audio | 1/4 inch audio tape | | 5 | |
| AC | AC | Vault | 6/7/2016 | | | 1C1 | | 15 | video | ¾ inch videotape: U-matic | polyester | | |
| AC | AC | Vault | 6/7/2016 | | | 1C1 | | 6 | video | VHS | polyester | | |
| AC | AC | Vault | 6/7/2016 | | | 1C1 | | 14 | video | Betacam SP | polyester | | |
| AC | AC | Vault | 6/7/2016 | | | 11B4 | | 17 | audio | Compact audio cassette | polyester | | |
| AC | AC | Vault | 6/7/2016 | | | 8N4 | | 4 | audio | 1/4 inch audio tape | | 7 | |
| AC | AC | Vault | 6/7/2016 | | | 8N4 | | 2 | audio | 1/4 inch audio tape | | 5 | |
| AC | AC | Vault | 6/7/2016 | | | 8N4 | | 15 | audio | Compact audio cassette | polyester | | |
| AC | AC | Vault | 6/10/2016 | | | 11C2 | | 8 | audio | Compact audio cassette | polyester | | |
| AC | AC | Vault | 6/10/2016 | | | 10J7 | | 1 | audio | Compact audio cassette | polyester | | |
| AC | AC | Vault | 6/10/2016 | | | unknown | | 30 | audio | Audio disc | metal and c | 12 | |
| AC | AC | AC secure storage | 6/10/2016 | | | 18B3 | | 2 | audio | 1/4 inch audio tape | | 7 | |
| AC | AC | AC secure storage | 6/10/2016 | | | 18B3 | | 2 | audio | Compact audio cassette | polyester | | |
| AC | AC | AC secure storage | 6/10/2016 | | | 18B1 | | 8 | audio | Compact audio cassette | polyester | | |
| AC | AC | AC secure storage | 6/10/2016 | | | 44G3 | | 2 | video | ¾ inch videotape: U-matic | polyester | | |
| AC | Iron Mountain | | 7/8/2016 | 311 | 1-86 | | Ellington | 851 | audio | 1/4 inch audio tape | | 7 | |
| AC | Iron Mountain | | 7/8/2016 | 301 | 87-90 | | Ruth Ellington | 182 | audio | 1/4 inch audio tape | polyester | 7 | |
| AC | Iron Mountain | | 7/8/2016 | 415 | 1-5, 11-15 | | Duke Ellington | 144 | audio | 1/4 inch audio tape | polyester | 7 | 7 1/2 IPS |
| AC | Iron Mountain | | 7/8/2016 | 327 | 1-14 | | Rutgers NEA Jazz Ora | 160 | audio | 1/4 inch audio tape | | 7 | |
| AC | Iron Mountain | | 7/8/2016 | 328 | 1-2 | | Rutgers Radio Intervi | 25 | audio | 1/4 inch audio tape | | 7 | |
| AC | Iron Mountain | | 7/8/2016 | 879 | 1-14 | | Rock-n-Soul | 179 | video | Betacam SP | | | |

*This snapshot shows an example of portion of a typical inventory from the survey.*

Microsoft (MS) Excel was chosen as the inventory creation tool. It was chosen for its ease of use, the quick speed with which data can be entered, the flexibility of sorting and viewing data, and its widespread adoption in office and archive environments. The enormous amount of data collected during the project – over 20 fields for upwards of 260,000 assets – proved to be too much for one spreadsheet to successfully manage. In order to maximize functionality, the project maintained separate spreadsheets for each unit, and, in some cases, several spreadsheets per unit. All spreadsheets use the same fields and structure in order to both streamline comparisons and facilitate future migration.

Some units did not use every field listed in the inventory spreadsheet. For example, some units do not use box numbers or shelf numbers as part of their collections management standards, so that data field was not able to be recorded. In those cases, the unused field is left blank. When any data was not actively collected by the unit, such as duration, diameter, or footage, or couldn't be determined without item-level inspection, fields were left blank. Some units collect additional data, such as item-level asset numbers, in addition to collection accession numbers and location numbers. In cases in which the additional data was relevant to the project, but only for one unit, that data was included in the "Notes" field in the spreadsheet.

Optical disc media such as compact discs (CD's) and digital video discs (DVD's) are not included in this survey. Microfilm and minidiscs were also not included in this survey. These formats were accounted for in the previous Photographic and Born-Digital surveys at the Institution.

The inventory was created using a combination of hand-counting and importing of existing spreadsheets, catalog records, and documentation. The individual unit reports, compiled in Appendix G, document the methodology for the creation of each individual unit's inventory.

## 5.8 Inventory Field Definitions

The following is a list of the fields included in the project inventory spreadsheet, along with the methodologies for noting that data.

a. **Unit |** *Acronym of the unit responsible for the collection.*

b. **Building |** *The building in which the collection is held.*

c. **Date Inventoried / Imported |** *Date the data is imported from existing collections databases or hand-counted.*

d. **Collection / Accession Number |** *Identifier for the asset or group, if known. For large collections that must be hand-counted, this field may not have been collected in the interest of prioritizing the gathering of format and count information.*

e. **Box Number |** *External container number, if used by unit.*

f. **Shelf Number |** *Storage location identifier, if used by unit.*

g. **Title / Description |** *This field was intended for reference only and may not reflect copyrighted title or title at item-level. If titles were available for import from an existing database, they were recorded. If only a collection title was available, that title was recorded. For large collections that were hand-counted, this field may not have been collected in the interest of prioritizing the gathering of format and count information.*

h. **Estimated Item Count |** *If the count was item-level, each item was recorded as a line item. If the count was at the group or collection level, the estimated number of items for each format type was entered on a separate line. One collection may be spread across several lines by format on the inventory spreadsheet. For large collections counted by hand, estimates may have been made based*

*on the count from a sample box known to contain similar or the same assets. Film cans were considered one asset, unless they were known to contain multiple reels or sample visual inspections showed otherwise.*

i. **Medium |** *Field formatted as a drop-down menu:*

1. ***Video:*** *analog video format with or without audio*
2. ***Audio:*** *analog audio format*
3. ***Film:*** *motion film format with or without audio, including full coat magnetic film tracks*

j. **Format |** *Controlled vocabulary documenting format is based on PBCore standards*[15] *and internal standards. During the development stage of the survey, PBCore vocabulary included inconsistencies in capitalization and punctuation and did not include all of the formats required to conduct a survey of Smithsonian collections. Therefore, the PBCore vocabulary was slightly modified for the project.*[16] *The spreadsheet field was formatted as a drop-down menu. Formats were listed next to like formats to increase time efficiency.*

1. *1/2 inch videotape open reel*
2. *1 inch videotape open reel*
3. *2 inch videotape open reel*
4. *D1*
5. *D2*
6. *D5*
7. *D9*
8. *VHS*
9. *S-VHS*
10. *VHS-C*
11. *Betacam*
12. *Betacam SP*
13. *Betamax*
14. *Betacam Digital (Digibeta)*
15. *MII*
16. *¾ inch videotape: U-matic*
17. *¾ inch videotape: U-matic S*
18. *¾ inch videotape: U-matic SP*
19. *HD Cam*
20. *DVCAM*
21. *MiniDV*
22. *DVCPRO*
23. *8mm video: Hi8*
24. *8mm video: Digital-8*

[15] The Public Broadcasting Metadata Dictionary Project. Public Broadcasting in the United States developed PBCore so producers and local stations can better share, manage, and preserve the media they produce. http://pbcore.org/

[16] For example, the term "Film: unique format" was used to describe uncommon film formats, mostly found in collections created by the Smithsonian Astrophysical Observatory Satellite Tracking Program.

25. *8mm video: Video8*
26. *¼ inch audio tape*
27. *¼ inch audio cartridge*
28. *1/2 inch audio tape*
29. *1 inch audio tape*
30. *2 inch audio tape*
31. *1/2 inch digital audio tape*
32. *Grooved audio disc*
33. *Audio Cylinder*
34. *Compact audio cassette*
35. *8-Track audio cassette*
36. *DAT*
37. *Microcassette*
38. *Mini-cassette*
39. *Minifon cartridge*
40. *Echo-matic cartridge*
41. *NAB cartridge (Fidelipac)*
42. *Dictabelt*
43. *Nagra SN (SNN)*
44. *Wire recording*
45. *DTRS*
46. *U-matic 1600*
47. *Digital linear tape (DLT)*
48. *Film: 70mm*
49. *Film: 35mm*
50. *Film: 28mm*
51. *Film: 17.5mm*
52. *Film:16mm*
53. *Film: 8mm*
54. *Film: Super-8mm*
55. *Film: 9.5mm*
56. *Film: unique format*
57. *Full coat magnetic audio: 16mm*
58. *Full coat magnetic audio: 35mm*
59. *Full coat magnetic audio: 17.5mm*
60. *Filmstrip*

k. **Base Substrate / Material Type |** *For groups of material counted by hand, the carrier material may be estimated by identifying other assets in the group. The term **composite** is used primarily for audio cylinders composed of composite wax and plastics. The term **laminate** may refer to cellulose nitrate or cellulose acetate, depending on the date of the grooved disc. Video and cassette-based formats are assumed to be polyester. The spreadsheet field was formatted as a drop-down menu.*

1. *acetate*
2. *nitrate*
3. *polyester*
4. *vinyl*
5. *metal*
6. *shellac*
7. *composite*
8. *metal and laminate*
9. *glass and laminate*
10. *fiber and laminate*

l. **Diameter (inches) |** *Used only for open reel formats and grooved audio discs. Film was described in footage, rather than by reel diameter.*

m. **Playback Speed |** *The spreadsheet field was formatted as free text and, most frequently, used for audio assets. The inventory used decimals rather than the standard fractions in order to protect the integrity of the data within an Excel spreadsheet. The speed was only documented if known. For example: 7.5 ips, 33.33 rpm, 24 fps, etc.*

n. **Estimated Footage Each |** *The average estimated footage of each reel – for film only.*

o. **Estimated Total Footage |** *The estimated total footage of the group-level count in a row – for film only.*

p. **Estimated Duration Each (minutes) |** *Estimated based on one asset in a group. If known, enter duration in minutes. If unknown for cassette formats, use the tape stock length. If unknown for non-cassette formats, enter diameter, playback speed, and other technical information so that an informed estimation can be made in the future.*

q. **Estimated Duration Total (minutes) |** *Estimated duration of the entire group of assets by multiplying number of assets by the individual estimated duration.*

r. **Visible Media Condition |** *In order to determine visible condition, a representative asset from the group was assessed. In cases in which the asset cannot be viewed because it is stored in an inaccessible area, institutional knowledge of the collection was used to estimate the condition. The following scale was used to document condition (see below). Using **1** as a baseline, the number was increased by 1 for any signs of deterioration or damage. Condition factors include heavy dirt, dust or rust; vinegar odor; "sock" or "crayon" odor; popped strands; stepping, bad winds; or deterioration inside case. If the asset or group was tested using acid-detecting (A-D) strips, each strip level increased the condition by 1. If mold was visible or the object reads 3 on the A-D strip test scale, it receives an automatic 5. In cases in which the data was imported from existing databases, samples were pulled to determine condition or data from the existing database was used to assist in determining condition.*[17]

[17] For further details, please see *Section 5.4. Condition Assessment*. For details on how condition scoring was applied within each individual unit, please see the individual unit report.

1. *no visible damage*
2. *minor visible damage*
3. *moderate visible damage*
4. *significant visible damage*
5. *severe visible damage (likely to require specialist intervention)*

s. **Fungus Evident |** *Assets showing any substance which could be fungus was noted for the purposes of this survey knowing that some white powders may be evidence of chemical breakdown, rather than fungus. This field was intended to provide guidance for the units when determining overall collection condition issues, as well as identifying areas which require further research.*

t. **Storage Temp (°F) |** *The set temperature for a collection storage space.*

u. **Storage RH (%) |** *The set relative humidity point for a collections storage space.*

v. **A-D Strip Test Date |** *The day/month/year of the reading of an acid-detecting strip test.*

w. **A-D Strip Test Level |** *The record of the A-D strip test level, following the IPI-recommended scale of 0-3. Possible options for the field were: 0, 1, 1.5, 2, and 3. See 5.5 Testing Using Acid-Detecting Strips for more information.*

x. **Notes |** *Used to document information specific to the unit which may not be relevant to other units.*[18]

[18] For example: a specific type of numbering system or additional condition notes

# 6 Findings: Data and Observations

The survey collected a vast amount of narrative and numerical data. The raw data, in the form of spreadsheets, multiple-choice question responses, and interviews, was provided to all participating units and project stakeholders with the following intent:

- To promote project transparency.
- To provide the opportunity to use the data after the end of the survey in new ways.
- To provide the opportunity to build on the data and inventories after the end of the survey, if desired.
- To aid in self-evaluation.
- To provide narrative passages which can aid in future and current collection advocacy efforts.
- To provide access to all findings, not just those highlighted in this report.

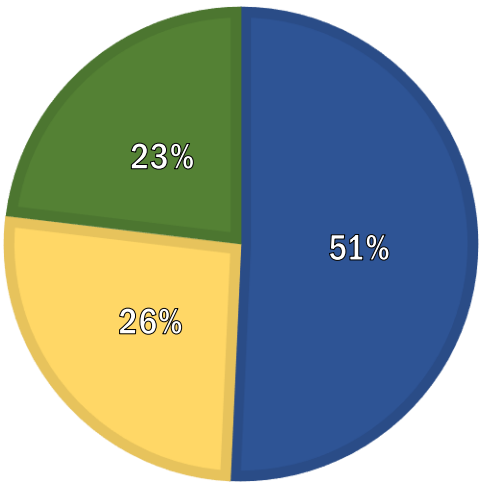
The following section spotlights the most essential observations and the greatest needs identified during the survey. This section is divided thematically and offers narrative descriptions supported by data from the interviews, multiple-choice questions, and inventory. Some of the charts display the same data in a different graphic format for visual reference. Some charts and graphs generated during the survey were not used in this report, but are in the appendices for reference.

## 6.1 Scope and Size of Audiovisual Collections

Analog audiovisual collections at the Smithsonian are constantly expanding, and, with that expansion, these collections bring constant preservation challenges. By gathering comprehensive data on the size and scope of audiovisual collections, the Smithsonian will be more informed when making decisions regarding equipment, staff, and training. The numbers generated during this survey reflect only the time period during which each unit was evaluated. Some units may have experienced significant growth since the implementation of the survey.

TABLE AND PIE CHART | Total Audiovisual Assets in Participating Units by Medium

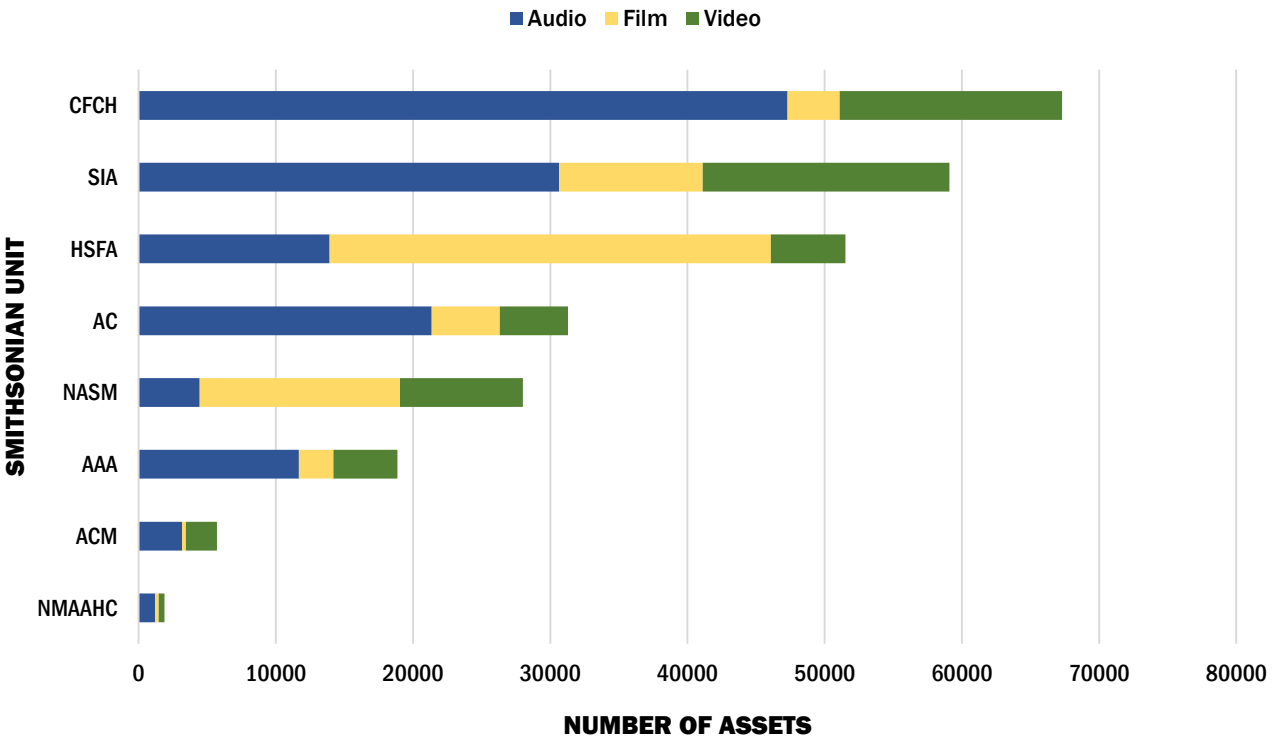
| | |
|---|---|
| **Total Audiovisual Assets** | 263,663 |
| **Total Audio** | 133,727 |
| **Total Film** | 69,037 |
| **Total Video** | 60,899 |



## TABLE | Total Audiovisual Assets by Unit and Medium

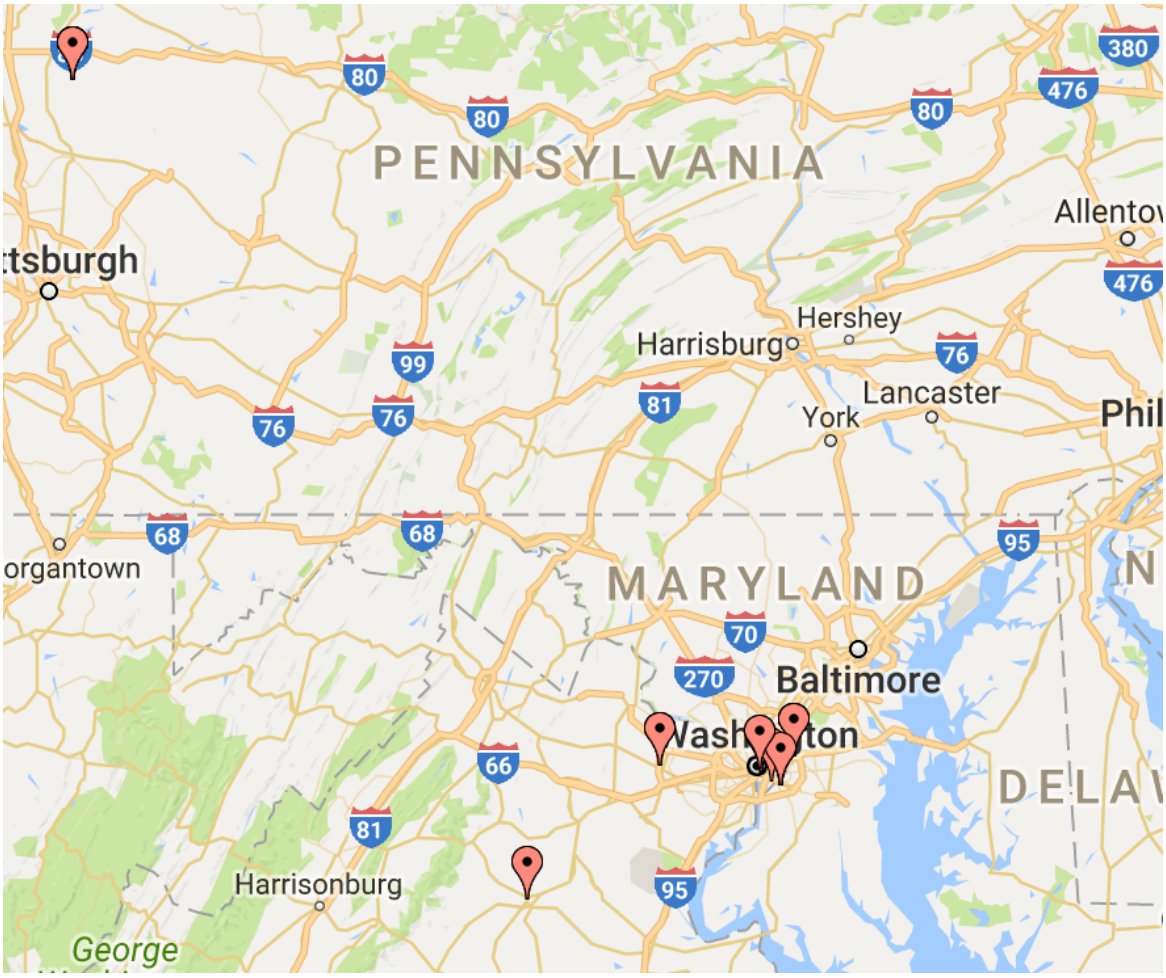
| UNIT | AUDIO | FILM | VIDEO | TOTAL |
|---|---|---|---|---|
| CFCH | 47,282 | 3,811 | 16,213 | 67,306 |
| SIA | 30,643 | 10,464 | 17,988 | 59,095 |
| HSFA | 13,917 | 32,153 | 5,453 | 51,523 |
| AC | 21,359 | 4,958 | 4,980 | 31,297 |
| NASM | 4,453 | 14,604 | 8,939 | 27,996 |
| AAA | 11,685 | 2,515 | 4,656 | 18,856 |
| ACM | 3,177 | 273 | 2,265 | 5,715 |
| NMAAHC | 1,211 | 259 | 405 | 1,875 |
| **TOTAL** | 133,564 | 69,037 | 61,062 | **263,663** |

## BAR GRAPH | Total Audiovisual Assets by Unit and Medium



## 6.2 Location of Collections

The following geographic map displays the general location of the collections surveyed during this project.




Seven out of eight units surveyed store a portion of their audiovisual collections in off-site locations, separate from the archive work space.[19] Off-site storage spaces are typically used for collections overflow and long-term storage of assets which have been preserved, or storage of collections which require specialized environments, such as frozen storage. Most off-site storage sites, such as Iron Mountain in Boyers, Pennsylvania and the Library of Congress's National Audiovisual Conservation Center (NAVCC) in Culpeper, Virginia, offer the benefit of stable temperature and relative humidity for audiovisual collections.

However, several drawbacks were observed during the survey that make storing unpreserved audiovisual collections off site undesirable. Physical access to the assets is limited, making day-to-day collections care and environmental monitoring a challenge. Retrieval of off-site assets for use by researchers or for preservation work is a financial burden. The use of third party storage vendors reduces the Smithsonian's control over environmental conditions and proper handling of assets during transport, the negative effects of which were observed during the Iron Mountain visit during the survey. Several boxes were found to have been punctured, torn, or crushed, which most likely occurred during one of many transports between facilities. Assets are also often relocated or re-

[19] Multiple Choice Survey Response, *Section 8: Storage*

## COLLECTIONS STORAGE AT SI

*The Center for Folklife and Cultural Heritage (CFCH) stores their ¼-inch audiotapes upright in their original containers (below).*

*The Archives Center (AC) stores some assets individually on shelves, while other are in boxes with other media types (below).*

*The Archives of American Art (AAA) has hand-cranked, moveable shelving (below). Audiovisual collections are stored in archival boxes.*


organized in the storage spaces by the vendor. While the items are closely tracked by the vendor, this re-organization caused challenges for Smithsonian units when determining the exact location of assets within the storage space or how much storage space was remaining to units sharing the off-site space.

### 6.3 Storage Space and Managing Collection Growth

Both lack of collections storage space and room for collection growth was found to be a significant challenge for half of the units surveyed. One unit, the Center for Folklife and Cultural Heritage (CFCH), reported lack of storage space as a "primary concern."[20] Only two units reported planning for long-term growth – Human Studies Film Archives (HSFA) and the National Air and Space Museum (NASM). They are prepared for an estimated ten years or more of audiovisual collections growth. Interestingly, these two units were originally founded for the purpose of caring for audiovisual collections.

During the survey, it was observed that archives without adequate collections space constantly reorganize and move collections within or between spaces which are intended for long-term storage. This activity has a cumulative negative effect on both archival workflows and collections care activities. The repeated moving process exposes collections to increased risk for physical damage, presents challenges in tracking the collections, and diverts staff time from preservation and access projects. With many units reporting limited staff as a significant barrier to proper collections care, this activity pulls staff resources even thinner.

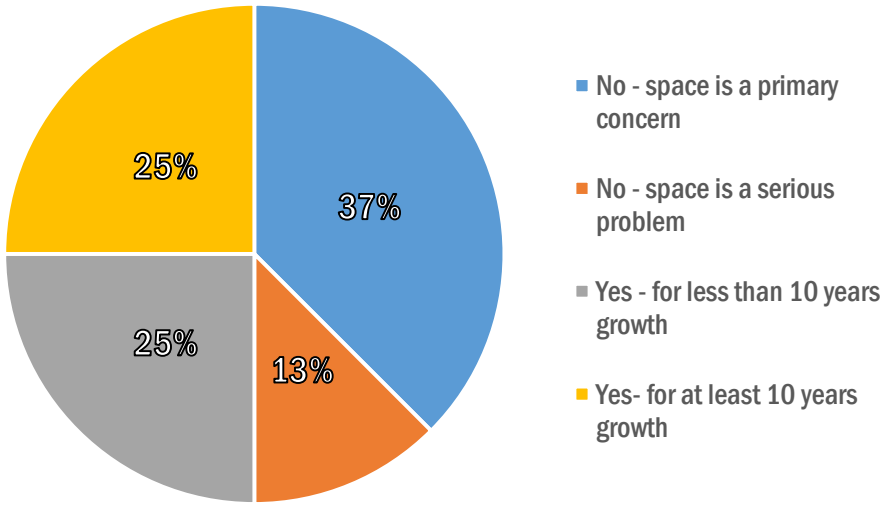
Constantly moving collections to alternative locations affects their availability to both staff and the public. CFCH reported that its collection has been through four major moves over the last eighteen years and "each move put us out of commission with our public outreach mission for nearly two years."[21] During the survey, thousands of video assets at CFCH had to be moved off site to accommodate incoming donations, even though staff was currently

[20] Multiple Choice Survey Response, *Section 8: Storage, Question 1*.
[21] Survey Interview Response, CFCH.

preparing to perform on-site cataloging and conservation work on those assets.

Many unit collections that are frequently moved are stored in record storage boxes, in order to facilitate these moves or anticipated future moves. While the use of these boxes is useful for handling assets, it also tends to promote storage of audiovisual assets in an improper orientation inside the boxes. It is also an added expense for units, as it requires the purchase of record storage boxes, even in cases in which the assets already have adequate individual housing.

**QUESTIONNAIRE RESPONSE | Does your unit have adequate space for the storage of its audiovisual collections?**




## 6.4 Environmental Conditions in Audiovisual Collections Storage Spaces

Environmental conditions greatly affect the longevity and viability of analog audiovisual assets. Excellent environmental standards increase the lifespan and health of the collections and protect them from damage caused by poor climate, dust, dirt, pest infestations, and mold. Good storage conditions can also mitigate damage to collections in the case of a collections emergency, such as a flood or fire. Excellent storage practices over the long-term can make the preservation process more effective and efficient, as healthy assets cause less playback problems and, in turn, provide higher quality image and sound which best reflects the integrity of the original content.

As temperature and relative humidity are two of the most important environmental factors affecting the longevity of assets, and the most commonly measured, the survey focused on the documentation of these two factors in order to get an overall sense of storage conditions at the Smithsonian. It's important to note that different types of audiovisual assets require different temperature and relative humidity conditions to optimize their long-term preservation. The International Office for Standardization (ISO) provides detailed guidelines for the storage of audiovisual assets, as well as the storage of mixed media collections.[22]

[22] Several ISO standards directly address audiovisual media, such as ISO 18911:2010 *Imaging materials—Processed safety photographic films—Storage practices*; ISO 18923:2000 *Imaging materials—Polyester-base magnetic tape—Storage practices*; and ISO 18934:2011 *Imaging materials—Multiple media archives—Storage environment*. See https://www.iso.org/home.html for more information.

Adherence to ISO standards for each media type creates an optimal environment for long-term preservation. Any variance from those standards has a significant long-term effect on the condition of the collection. However, the reality is that many Smithsonian archival units have mixed media collections and must store different types of materials in one climate temporarily or permanently. In cases in which it is not immediately possible to create separate storage environments, the target temperature and relative humidity should cause the least harm and greatest benefit to all media types. The *IPI Media Storage Quick Reference* can provide guidance in determining mixed media collection environmental standards. As a general rule, mixed media storage conditions should fall within the range of 36 to 55 degrees Fahrenheit and 30 to 50 percent relative humidity,[23] with the goal of adhering as close to ISO standards as possible without being too cold, too warm, or too humid for any of the housed media types.

The following graphic provides a snapshot of environmental conditions in participating units by unit and asset type. Temperatures are listed in Fahrenheit. It should be noted that some mixed collections listed contain paper and optical media, which have different storage considerations. In addition, some of the storage spaces are used as temporary storage or acclimatization areas.[24] For these reasons, this report is written with the understanding that the staff of each archive is in the best position to determine their target storage conditions and how well those targets are met. The chart is provided as a tool for further self-evaluation when comparing existing conditions to recommended standards.

[23] Peter Z. Adelstein, *IPI Media Storage Quick Reference*, (Rochester, NY: Image Permanence Institute, 2009). Retrieved 2 March 2017, https://www.imagepermanenceinstitute.org/webfm_send/301.

[24] Frozen storage at MSC does not have controlled RH levels. Temperature and RH conditions are based on the findings in the following publication: Mark McCormick-Goodheart and Henry Wilhelm, *The Design and Operation of a Passive Humidity-Controlled Cold Storage Vault Using Conventional Freezer Technology and Moisture-Sealed Cabinets*, (Wilhelm Imaging Research, Inc., 2004).

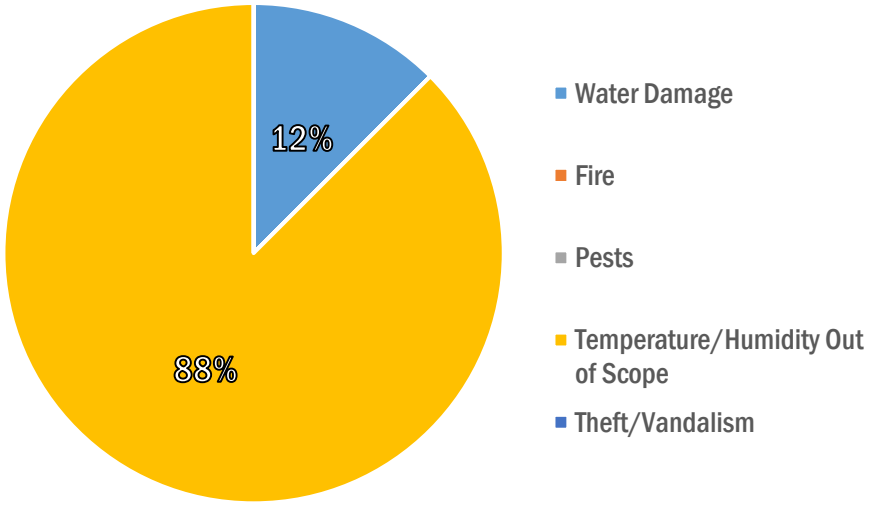
### TABLE | List of Storage Environmental Conditions for Audiovisual Collections at the Smithsonian

| UNIT | LOCATION | AUDIOVISUAL MEDIA TYPE | TEMP | RH |
|---|---|---|---|---|
| **ACM** | Anacostia Community Museum, Storage Room | film, magnetic media, grooved discs | 68 | room |
| **ACM** | Iron Mountain | film, magnetic media, grooved discs | 55 | 35 |
| **AAA** | Victor Building, Concourse 2 (VB) | film, magnetic media, grooved discs | 65 | 40 |
| **AAA** | Victor Building, 2nd Floor | film, magnetic media, grooved discs | 68 | 40 |
| **AAA** | Victor Building, Concourse Main Storage (VC) | film, magnetic media, grooved discs | 68 | 40 |
| **AAA** | Iron Mountain | film, magnetic media | 55 | 35 |
| **CFCH** | Museum Support Center, Cool Storage | magnetic media | 50 | 50 |
| **CFCH** | Museum Support Center, Frozen Storage | film | -4 | room |
| **CFCH** | Capital Gallery, 2nd Floor | film, magnetic media, grooved discs | 68 | 55 |
| **CFCH** | Iron Mountain | magnetic media | 55 | 35 |
| **CFCH** | Pennsy Facility | magnetic media | 70 | 55 |
| **HSFA** | Museum Support Center, Pod 2, Room 212 | film (reference) | room | room |
| **HSFA** | Museum Support Center, Pod 3, Room 211 | magnetic media | 55 | 30 |
| **HSFA** | Museum Support Center, Pod 3, Room 212, Staging | film (temporary storage) | 55 | 30 |
| **HSFA** | Museum Support Center, Pod 3, Room 213 | film | -4 | room |
| **NASM** | Steven F. Udvar-Hazy Center, Film Cold Storage | film | 38 | 30 |
| **NASM** | Steven F. Udvar-Hazy Center, Acclimatization Room | film (temporary storage) | 50 | room |
| **NASM** | Steven F. Udvar-Hazy Center, Video/Main/Cool Storage | magnetic media | 50 | 50 |
| **NMAAHC** | Pennsy Facility, Cool Storage, Room FF58 | magnetic media | 52 | 24 |
| **NMAAHC** | Pennsy Facility, Cold Storage, Room FF60 | film | 26 | 30 |
| **AC** | Archives Center, CV064, Basement | film | room | room |
| **AC** | Archives Center, Basement Vault | film, magnetic media, grooved discs | room | room |
| **AC** | Archives Center, 1st Floor Secure Storage | film, magnetic media | 65 | 40 |
| **AC** | Museum Support Center, Garber Facility | film, magnetic media, grooved discs | 70 | 50 |
| **AC** | Pennsy Facility, Cold Storage, Room FF60 | film | 26 | 30 |
| **SIA** | Capital Gallery, 3rd Floor, General Storage | film, magnetic media, grooved discs | 60 | 45 |
| **SIA** | Capital Gallery, 3rd Floor, Frozen Storage | film | 18 | room |
| **SIA** | NAVCC, Nitrate Storage | film | 39 | 30 |
| **SIA** | Iron Mountain, Room 8-NE-1 | film, magnetic media, grooved discs | 63 | 30 |
| **SIA** | Iron Mountain, Room 10-W-1 | film, magnetic media, grooved discs | 55 | 35 |

There is wide variance in the individual units' abilities to meet best practice environmental standards for the storage of their audiovisual collections. Some units meet high standards and some units rely on storage conditions that pose a significant threat to the longevity of their analog audiovisual collections. Based on survey responses, the Anacostia Community Museum (ACM), the Archives of American Art (AAA), the Center for Folklife and Cultural Heritage (CFCH), and Archives Center (AC) self-reported the poorest environmental conditions. Furthermore, these reports are supported by the temperature and relative humidity levels documented during the survey.[25]

[25] HSFA collections stored at room temperature are not mentioned as a primary concern here, as these spaces generally contain reference video copies of master film assets and because the master copies are stored in good environmental conditions.

**QUESTIONNAIRE RESPONSE | What is the biggest environmental risk to the repository in the last five years?**




When asked to self-evaluate, seven out of eight units report the biggest environmental risk to the repository in the last five years is temperature and relative humidity conditions being out of scope for their asset types. Four out of eight units report that less than 26% of their audiovisual collections are stored at acceptable environmental standards.[26] These responses indicate that appropriate environmental storage conditions are a significant point of collective concern, even given the fact that some units, such as the National Air and Space Museum (NASM) and the Human Studies Film Archives (HSFA), have excellent overall environmental control.

*Audiovisual collections at the Anacostia Community Museum (ACM) are stored in boxes with mixed media types (left). Film reels in the National Air and Space Museum (NASM) collections are stored in archival cans and organized according to size (right). Each can is labeled with corresponding collection information.*

[26] Multiple Choice Survey Response, *Section 6: Environment*.

## 6.5 Conservation, Housing, and Stabilization

Audiovisual assets are not only affected by the climate and general conditions of their storage environments, also called macro environments. Their longevity and health is also affected by the conditions inside their enclosures, also called micro environments, by their orientation on shelves, and by the preparation that goes into their long- and short-term storage. Proper housing protects the asset from dirt, dust, and pests while allowing for adequate airflow. Proper orientation prevents crushing, damage, and deformation to the tape or film. These activities also prevent chemical damage by limiting exposure to unstable papers and plastics and mitigating acetic acid decay.

Conservation and housing vary widely from unit to unit. Some store similar formats together, a practice which lends itself to proper housing and orientation, while promoting the most efficient use of space. Some units interfile audiovisual assets in archival boxes with other paper and photo collections. This interfiling method physically contextualizes collections from the same donor, allows for uniform shelving specifications based on archival box size, and aids archives in measuring cubic footage.[27]

*Some of the film collections from the Archives Center are stored in their original cans (below).*


*Films are also stored in partially sealed plastic bags at the Archives Center (below).*

However, interfiling audiovisual media has significant drawbacks. It makes batch digitization of like assets and item-level cataloging efforts inefficient, because assets are more difficult and time-consuming to physically locate. It often means that audiovisual assets are housed in boxes with acidic paper and other materials which can cause damage over time. The practice leads, in some cases, to a less efficient and more costly use of storage space, as audiovisual assets are stored in acid-free boxes even when they already have adequate, item-level containers.

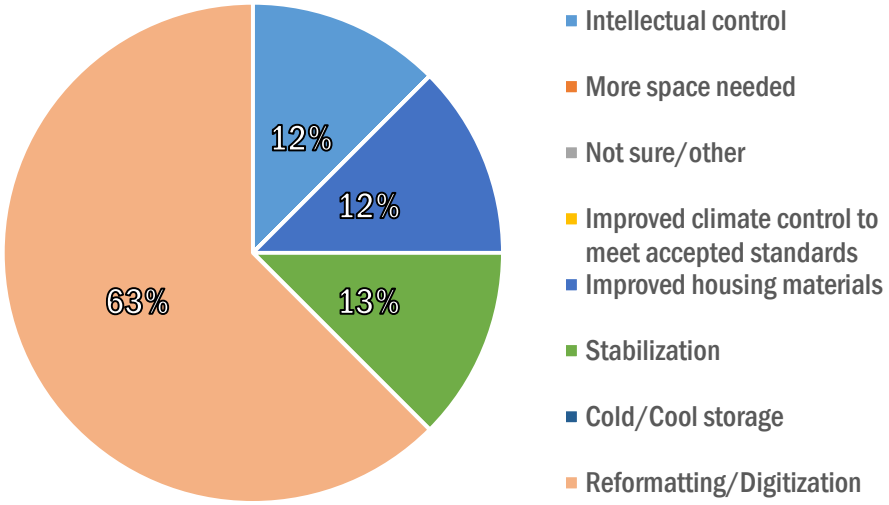
*Audiovisual media stored in acid-free boxes aids in keeping collections physically together, but does not provide the most efficient use of space (left), and in some cases, does not adhere to best practices for asset orientation (right). These collections are in the Archives of American Art (AAA).*

Five of the eight units surveyed report that less than 26% of their collection has received "some treatment for stabilization, such as splicing, cleaning, popping of record tabs, or rehousing."[28] This data, along with observations gathered during the survey, indicates that housing and stabilization protocols for audiovisual assets needs to be an area of review for many of the units. When prioritizing conservation work for assets at high risk for loss, such as common magnetic media formats, archives should balance the need to promote the longevity of the physical asset with the benefit of timely digitization efforts.

## 6.6 Digitization and Preservation

The need for timely, preservation-level digitization is one of the primary findings of the survey. The chart below shows that five of eight units reported that digitization and reformatting are their first priority for collections care.[29] This prioritization of digitization is supported by the fact that the units also reported less than 26% of their audiovisual collections are digitized at preservation level. Significant portions of audiovisual assets at the Smithsonian are not digitally preserved while the physical assets continue to degrade.

**QUESTIONNAIRE RESPONSE | What is your first priority for audiovisual collections care?**




[28] Multiple-Choice Survey Response, *Section 7: Housing and Stabilization*.
[29] As seen in the chart below, the other three units report conservation and intellectual control efforts as their first priorities.

*The Archives of American Art (AAA) maintains an in-house video digitization station for the creation of access copies of audiovisual assets (above). However, AAA is not currently able to digitize audiovisual collections for preservation.*

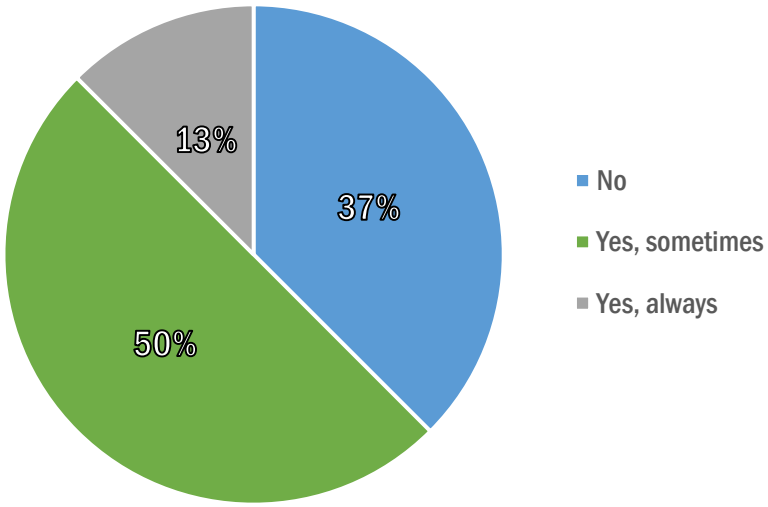
## 6.7 Preservation Methods and Equipment

Archives have the choice to perform preservation in-house, out of house, or to use a combination of the two. Five out of eight units surveyed reported that they perform some audiovisual preservation activities using in-house capabilities.

Most of the participating units surveyed have the basic equipment necessary for playback and digitization.[30] It is a lack of staff, rather than lack of equipment, that is cited as the primary reason preservation is not performed in-house at a preservation level. Viable equipment exists in many of the units work spaces, but sits unused, or under-used, due to insufficient staff resources.

Due to these constraints, many units choose to outsource digitization to vendors. Outsourcing large digitization projects relieves the Institution of the need to build audiovisual digitization stations, maintain equipment, and supply full-time staff. However, it still requires significant in-house resources in the form of project management and quality assurance procedures. Most projects require at least one dedicated staff member, while larger projects require a dedicated team. Assets must be tracked, packed, and shipped; files must go through a quality assurance process upon delivery; metadata must be managed and tracked; and strong communication and coordination with the vendor must be maintained.

**QUESTIONNAIRE RESPONSE | Do you digitize audiovisual materials for preservation in-house?**




[30] Units are encouraged to fully document all analog audiovisual equipment via the Smithsonian SharePoint system to promote inter-unit equipment sharing.

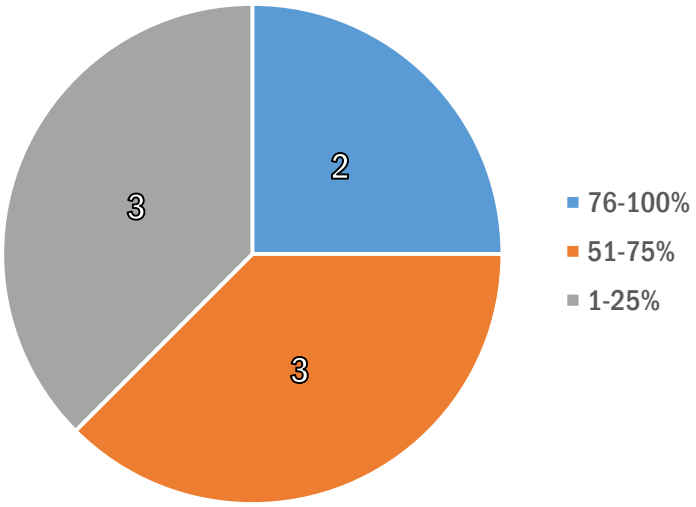
## 6.8 Collection Condition

In general, assets observed during the survey tended to show decay, both in type and extent, typical to their format and current storage conditions. No serious pest or widespread fungus infestations were found. Instances of increased decay and fungus growth tended to be higher in collections stored in environmental conditions that did not align with ISO standards, such as the collections at the Archives of American Art (AAA), Archives Center (AC), and the Anacostia Community Museum (ACM). However, many audiovisual assets have a very limited lifespan when in appropriate environmental conditions. Therefore, a proactive, responsive, and evolving plan for conservation and preservation is necessary to mitigate further loss to collections.

## 6.9 Collection Uniqueness

The graph below shows that five of the eight units surveyed report that 50 - 100% of their collection content is "unique." This response indicates that collections are likely to contain a substantial amount of rare content extant only in their collections. The existence of a large percentage of unique material would support prioritization of large-scale preservation.

**QUESTIONNAIRE RESPONSE | What percentage of your collection do you know is unique?[31]**

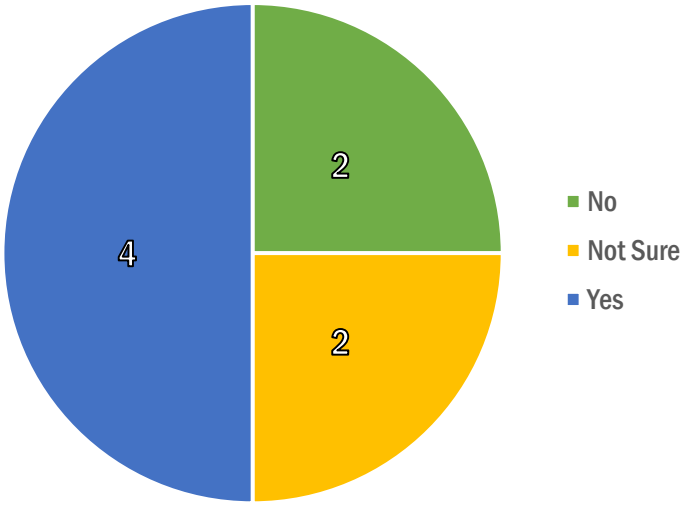



## 6.10 Emergency and Disaster Response, Mitigation, and Recovery

Five of the eight units report having an emergency response and recovery plan in place. However, only two units, the National Air and Space Museum (NASM) and the Smithsonian Institution Archives (SIA), have a plan that specifically addresses the recovery challenges unique to audiovisual collections.[32] This report recommends the implementation and dissemination of disaster mitigation and response plans specific to audiovisual collections for all units.

[31] For this graph, the sections indicate the number of units that responded in a particular manner. For example, three (3) units reported that 1-25% of their collection is known to be unique.
[32] Multiple-Choice Survey Response, *Section 5: General Preservation.*

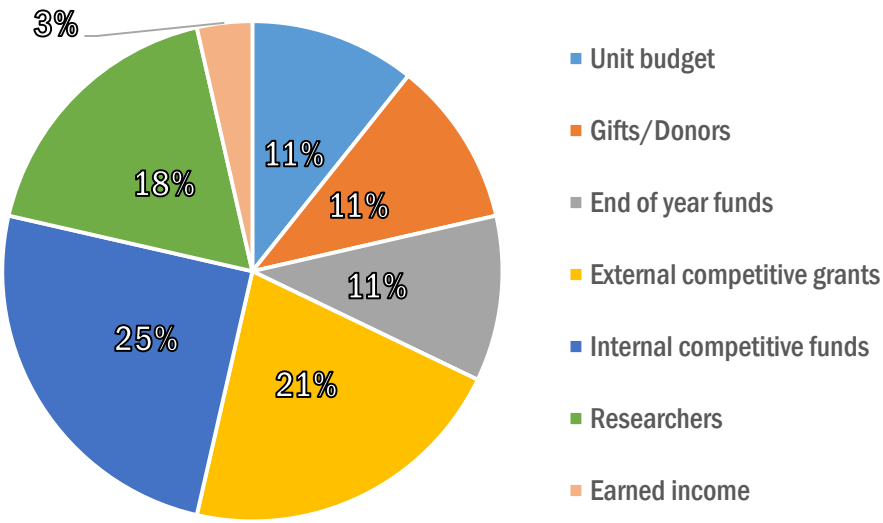
**QUESTIONNAIRE RESPONSE | Does your disaster recovery plan incorporate the specialized disaster recovery requirements for your audiovisual collections?**[33]




## 6.11 Funding for Preservation

The most common way units report securing preservation funds is through internal competitive funds and external grants, followed by funding acquired from researchers. Across the units surveyed, only three units report that preservation is a designated line-item in their annual unit budget. This is a strong indication that the digitization of these collections is not a core activity for many of the units charged with their long-term care.

**QUESTIONNAIRE RESPONSE | Where does your unit get funds for digitization of audiovisual collections? (select all that apply)**



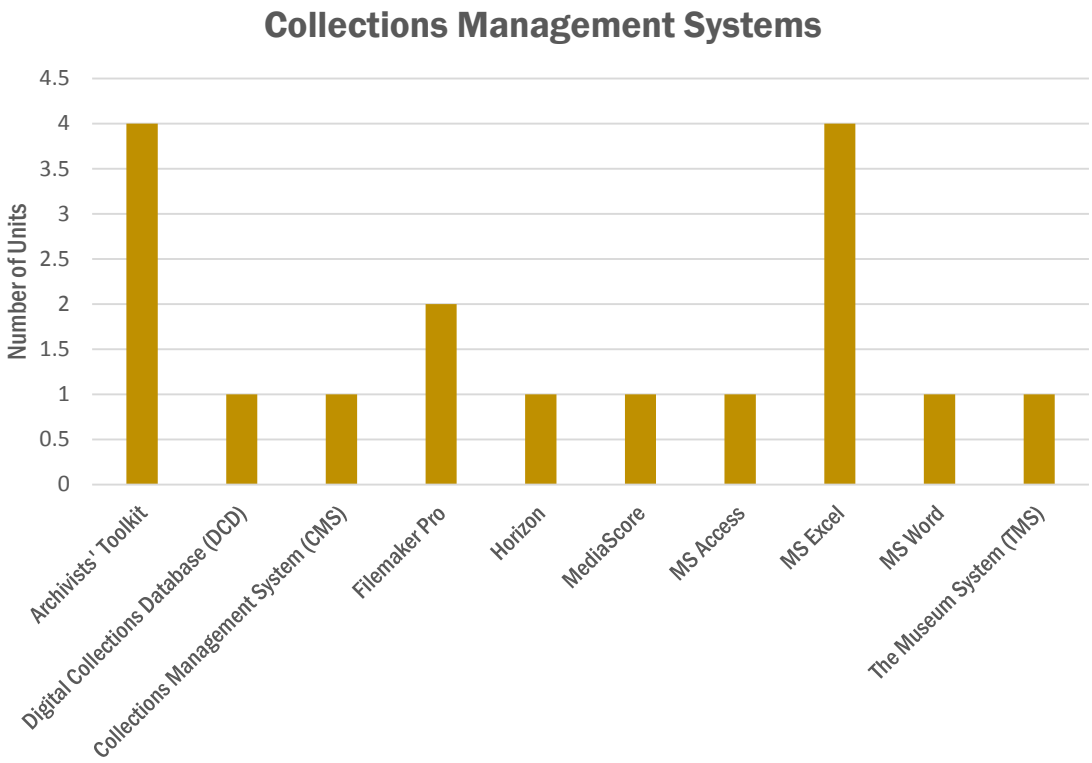

[33] For this graph, the sections indicate the number of units that responded in a particular manner. For example, four (4) units reported that their disaster recovery plans incorporate the specialized requirements of audiovisual collections.

## 6.12 Intellectual Control / Collection Management

During the survey, it was observed that intellectual control of collections should be reexamined by many of the participating units. For example, both Human Studies Film Archives (HSFA) and the Center for Folklife and Cultural Heritage (CFCH) do not currently have a centralized database for cataloging and tracking audiovisual assets.[34] During the staff interviews, both the Archives of American Art (AAA) and the Anacostia Community Museum (ACM) mentioned that the use of multiple systems at times requires re-entering information into different databases, which has a negative impact on staff productivity.[35]

While the National Air and Space Museum (NASM) and the National Museum of African American History and Culture (NMAAHC) maintain item-level control over most of their audiovisual assets, most units surveyed do not. Assets are cataloged at collection-level or group-level, with little information about item-specific data, such as duration, content, and condition. Item-level control offers many advantages in collections care. It is beneficial in asset tracking, documentation of content and complex rights issues, collecting and disseminating collection content information, and maintaining accurate preservation and post digitization workflows. Item-level control also provides the ability to report on-demand statistical data about the current state of collections and, in turn, statistical reporting allows for collections care planning and advocacy efforts to be more effective and efficient. While item level control is ideal for audiovisual assets, units may prioritize such an activity differently depending on their unit mission.

A variety of systems for intellectual control are used throughout the Institution. The following chart documents the different software used to track audiovisual assets within participating units.




[34] Survey Interview Response, CFCH and HSFA, *Section 6: Intellectual Control and Access.*
[35] Survey Interview Response, AAA and ACM, *Section 6: Intellectual Control and Access.*

## 6.13 Staff, Education, and Training

During the interview portion of this survey, the lack of staff was reported to be the largest barrier to performing preservation and conservation work, alongside adequate funding. Six of the eight units surveyed have only one full-time staff member who is charged solely with managing audiovisual assets. Two units, the Anacostia Community Museum (ACM) and the Center for Folklife and Cultural Heritage (CFCH),[36] have no full-time staff dedicated to the care of audiovisual assets. No unit reported more than one audiovisual archivist on staff full-time.

In cases in which there is a full-time audiovisual specialist, that person's duties tend to vary from unit to unit. For example, the Archives of American Art's (AAA) audiovisual archivist reports that only about 50% of her time is used for preservation and conservation activities. The rest of her time is divided between collections processing, project management, and training and education. The Smithsonian Institution Archives' (SIA) audiovisual specialist focuses on digitization, though her work is not limited to digitization of audiovisual assets. Her core responsibilities focus heavily on still image digitization. For many units, staff tasked with general collections processing also tend to process some audiovisual assets by default. This presents challenges when specific technical knowledge and expertise is required to perform tasks, such as identifying obsolete audiovisual formats or determining preservation priorities and methodologies.

Many units utilize contractors to perform specific audiovisual related projects. For example, AAA is currently contracting a specialist for a one-year project to inspect major portions of its film collection. CFCH uses contractors to perform high level technical tasks, and reports that in these cases "the contractor becomes the de facto audio expert."[37]

During unit interviews, staff were asked to identify topics in the preservation, conservation, and digitization of audiovisual assets in which staff would have an interest. The need for further training in audiovisual digitization practices, especially for film, was the most common response. ACM, a unit with no audiovisual specialist, pointed out that "staff training would not be a substitute for a specialist." The National Museum of African American History and Culture (NMAAHC) emphasized the need for Institution-wide support and advocacy for audiovisual preservation. Unit responses are listed below and full responses can be found in the unit interview documents.

[36] CFCH has the largest audiovisual collection surveyed with 67,306 total assets.
[37] Survey Interview Response, CFCH

**INTERVIEW RESPONSE | What audiovisual preservation, conservation, or digitization topics would you, your staff, or your co-workers be interested in learning more about or receiving training in?**

| UNIT | TOPICS FOR TRAINING |
|---|---|
| ACM | The current staff could use some training on basic handling for stabilization and conservation of audiovisual materials. Staff training would not be a substitute for a specialist. |
| AAA | Understanding film production, housing for cold storage and freezing film, film scanning; understanding analog video signal and signal management in the digitization process; descriptive standards besides EAD (like RDA, PBCore, etc.) |
| CFCH | Film digitization, understanding choices for digital video files, codecs and specifications for storage and access, principles of film care and handling. |
| HSFA | Digitization topics and methods. Solutions to equipment obsolescence and maintenance issues that are becoming a bigger and bigger problem. |
| NASM | Digitization of all types of audiovisual materials. |
| NMAAHC | The staff would like information on how to most effectively lobby for audiovisual conservation and preservation support from the Smithsonian Institution administration, the DPO, and the Castle. |
| AC | Digitization, especially film digitization. |
| SIA | SIA staff is interested in learning more about handling, cleaning, and digitization of film and open reel audio. |

# 7 Summary of Observations and Recommendations

## 7.1 Conclusions

### Institutional Obligation

The over 260,000 audiovisual assets housed in the archives across the Smithsonian contain a wealth of content, much of which directly supports the four grand challenges of the Smithsonian Institution.[38] For example, footage documenting the scientific study of animals at the Smithsonian Institution Archives (SIA) supports the grand challenge: **Understanding and Sustaining of a Biodiverse Planet**; footage documenting hidden cultures and dead languages in the Human Studies Film Archives (HSFA) supports the **Valuing of World Cultures**; African American home movies at the Anacostia Community Museum (ACM) and the National Museum of African American History and Culture (NMAAHC) are examples of footage which supports **Understanding the American Experience**. Although these collections strongly support the Smithsonian's grand challenges, units report that less than 25% of their collections are digitized at preservation-level.

Recognized as the world's largest museum, education, and research complex, the Smithsonian Institution is, in many ways, in an excellent position to preserve the content of its audiovisual collections.[39] Audiovisual archivists on staff have a high level of expertise and knowledge and are active in the field within and outside of the Institution.[40] Most units already have the foundational equipment necessary to perform archival-quality digitization or provide access through playback. With thirty million annual visitors, over four hundred thousand followers on Instagram alone, and publicly-accessible theaters in several of its museums, the Smithsonian has enormous potential for providing access to audiovisual collection content.

### Challenges

Despite these advantages, there are challenges to be addressed. During the survey, it was observed that **adequate storage space** and **environmental control** that meet best practice standards was a primary concern for some of the units, though several units have excellent storage environments. **Lack of intellectual control** at an item-level causes difficulties in locating assets, redundancy in the creation of tracking workflows, and creates a barrier to comprehensive preservation planning, as data about many collections is unavailable. Units without one central database documenting audiovisual collections face challenges in tracking and documenting their audiovisual assets. Most units do not have **audiovisual-specific disaster response policies**, even though disaster recovery for audiovisual assets can be highly successful if appropriate and swift action is taken immediately following a disaster.[41]

[38] The Four Grand Challenges are listed in the Smithsonian Institution Mission Statement: https://www.si.edu/About/Mission
[39] In addition, there is a current global movement to recognize and address the preservation needs of audiovisual collections in large institutions throughout the world. The National Phonotheque of the Czech Republic, The Indiana University Media Preservation Initiative, The New York Public Library Moving Image and Audio Preservation Assessment, The British Library's Save Our Sounds Project, and The Flemish Institute for Archiving (VIAA) are just a few examples of other large institutions executing large-scale audiovisual assessment and preservation programs at the time of this report.
[40] Archivists who participated in the creation of this survey are involved in other audiovisual media-specific organizations, such as FADGI, AMIA, and IASA.
[41] There is a wealth of information on this topic, but perhaps Audio and Video Preservation Specialists at Specs Brothers, LLC put it most bluntly in their online article on emergency response: http://www.specsbros.com/disaster-recovery-emergency-response.html

### Digitization as Preservation

The need for timely digitization arose as the most commonly cited challenge. Units report that the foremost barrier to improved preservation activity is lack of specialized audiovisual staff and lack of financial support for preservation. Though this report does not specifically cover preservation and playback equipment, many of the units have adequate playback and digitization equipment but lack staff dedicated to their operation.

Many of the units perform both in-house preservation using staff resources and out-of-house preservation using third party vendors. Preservation projects range from the digitization of a single tape in response to a research request to proactive efforts that batch digitize assets considered to be at great risk by archival and curatorial staff.

***The ideal preservation workflow is holistic—it supports the short-term needs of researchers and other content users, the long-term needs of the collection and the Institution, and focuses on quality, efficiency, and sustainability.***

Both reactive and proactive preservation are necessary to support the activities and mission of the Institution, as one serves the immediate needs of researchers and exhibitions, and the other serves the long-term goals of collection care. As noted in the recommendations section below, this report recommends best practice level digitization which prioritizes at-risk, unique assets and supports the Institution's priority of "**Broadening Access**: Digitizing our collections, exploring next-generation technologies, and improving the visitor experience."[42] Improved digitization and access to collections also directly supports the Institution's primary values, especially "**Excellence**: Deliver the highest-quality products and services in all endeavors; **Integrity**: Carry out all our work with the greatest responsibility and accountability; and **Service**: Be of benefit to the public and our stakeholders"[43]. This report also recommends the creation of a clear, thorough, written management plan when embarking on any preservation project, especially a comprehensive or large-scale preservation project.

Digitization requires significant resources; however the practice of *not* digitizing also consumes enormous resources, though they may be less visible. The longer one waits to digitize, the more resources are needed to deal with slowed workflows caused by decaying tapes, time taken to perform advanced processes to address damaged assets, and equipment breakdown.[44]

The following offers a brief overview of suggestions and recommendations based on the survey findings, observations, and staff feedback. Several of the recommendations focus on conservation and improved intellectual control. However, units should consider that many of the physical assets—for example, those on magnetic media—are at a high risk for loss and that there is a short window of time in which those assets might be saved. In order to limit the loss of the most at-risk assets, the need for improved conservation should be always be weighed against the need for timely digitization.

[42] This priority is listed in the SI's Mission statement: https://www.si.edu/About/Mission
[43] These values are listed in SI's Mission Statement at: https://www.si.edu/About/Mission
[44] The Cost of Inaction Calculator, a free tool by the consulting and software development firm, AVPreserve, estimates the cost of waiting to perform preservation and can be found here: https://coi.avpreserve.com/

## 7.2 Primary Recommendations

### 7.2.1 Proactive Preservation of Analog Audiovisual Assets

#### IMPLEMENTATION

- Develop and initiate a thorough and detailed plan for proactive preservation describing deliverables, processes, and staff roles.
- Prioritize collections for preservation based on physical risk, uniqueness of content, copyright, intellectual significance, etc.
- Review in-house preservation workflows and use of third party vendors by describing the use of vendors and clearly outlining how vendors are vetted and vendor projects are managed.
- Review and determine target file formats for preservation based on archival directive of sustainability and respect for the original.
- Review all digitization practices and related practices (quality assessment, fixity checks, metadata, etc.) to ensure best practice standards are clearly defined and met.
- Review collaborative versus unit-by-unit preservation practices and methodologies.
- Review systems for item-level asset control necessary to support sustainable digitization.

#### OUTCOME

- Prevent loss of unique assets under the care of the Smithsonian Institution.
- Increase in access to archival collections.
- Provide the highest quality extant footage to clients and researchers.
- Support more efficient use of on- and off-site storage space.
- Increase efficiency in production, research and access workflows.

### 7.2.2 Develop Long-Term Storage Spaces and Improved Environmental Conditions

#### IMPLEMENTATION

- Develop and implement target environments based on ISO standards for film and magnetic media, including temperature, relative humidity, airflow, and fire suppression.
- Implement cleaning, maintenance, and monitoring practices.
- Develop solutions for long term storage and room for growth.

#### OUTCOME

- Prevent damage and loss of assets.
- Prolong life of assets.
- Prevent excessive moving of collections which diverts staff from primary duties and endangers collections.

### 7.2.3 Align Housing and Orientation of Analog Assets with Best Practice Guidelines[45]

#### IMPLEMENTATION

The following is offered as a brief overview of housing and storage best practices:[46]

##### FILM

- Store on 3" cores.
- Attach clean leader.
- Re-house in archival cans which allow some airflow but which divert direct water exposure.
- Remove from plastic bags, remove paper and plastic from can interior.
- Do not stack multiple reels or rolls of film directly on top of one another.[47]
- Stack cans in stacks of five or less to prevent crushing and loss of airflow, and allow for access.[48]

##### VIDEO CASSETTES

- Store vertically, preferably spine-up.
- Re-house as necessary.
- Pop record tabs.

##### OPEN REEL VIDEO

- Store vertically.

##### OPEN REEL AUDIO

- Store vertically.
- Store in acid-free containers with stabilizing hub, if possible.
- Secure the tape end to the reel.

##### AUDIO CASSETTE TAPES

- Store vertically.
- Pop record tabs.

##### GROOVED DISCS

- Store vertically.
- Support every four to six inches; support should be firm, even pressure but not crushing or damaging.
- Store in acid free sleeves.
- Store on non-moving shelving.

[45] The value of conservation work should be weighed against the need for immediate preservation for at-risk assets
[46] Best practices for media storage are widely documented. NARA's website is one good resource: https://www.archives.gov/preservation/formats
[47] For example, two reels of film should not be stacked together in one can.
[48] Archival can manufacturers provide a variety of recommendations based on the durability of their cans.

#### OUTCOME

- Prevent damage and loss of assets.
- Prolong life of assets.
- Support conservation and prepare for digitization and/or long-term storage.

### 7.2.4 Review Systems for Intellectual Control and Asset Tracking

#### IMPLEMENTATION

- Review the possibility of item-level tracking of audiovisual assets.
- Consider an active, central database for units which do not have one.
- Review workflows that require re-entering of data into multiple databases.
- Review use of normalized vocabulary and description and ensure format types are uniformly and correctly identified.

#### OUTCOME

- Supports statistical data useful in collections care management and reporting.
- Supports advocacy efforts and planning for digitization.
- Supports access by providing accurate information regarding collections and content.
- Provides the foundation for long-term conservation and preservation workflows.

### 7.2.5 Establish, Publish, and Distribute Disaster Response, Mitigation, and Recovery Policies for Audiovisual Assets

#### IMPLEMENTATION

The following resources offer guidance on initial response activities for audiovisual media:

##### FIRST ACTIONS

Association for Moving Image Archivists (AMIA), *First Actions for Film Tape and Discs*
http://www.amianet.org/sites/all/files/Disaster_first_steps_1.pdf

##### MAGNETIC MEDIA

National Archives and Records Administration (NARA), *Data Mitigation and Recovery, Magnetic Media*
https://www.archives.gov/preservation/conservation/magnetic-media.html

Peter Brothers, *Disaster Recovery for Tapes in Flooded Areas*
http://www.amianet.org/sites/all/files/Disaster%20Recovery%20for%20Tapes%20in%20Flooded%20Areas%20by%20Peter%20Brothers.pdf

##### MOTION PICTURE FILM

National Archives and Records Administration (NARA), *Emergency Preservation Programs*

https://www.archives.gov/files/preservation/records-emergency/pdf/motion-picture-film.pdf

Mick Newnham, *Disaster Recovery for Film in Flooded Area*
http://www.amianet.org/sites/all/files/Resource_Recovery_for_films_in_flooded_areas.pdf

### GROOVED DISCS

National Archives and Records Administration (NARA), *Phonographic Discs*
https://www.archives.gov/files/preservation/records-emergency/pdf/phonographic-disks.pdf

## OUTCOME

- Best recovery in case of disaster or emergency for audiovisual assets.
- Increased staff safety in case of disaster or emergency.
- Most efficient use of funds in case of disaster or emergency.

# 8 List of Appendices

A. Infographic | Phase One Summary and Phase Two Proposal
B. Spreadsheet | CFCH Cubic Footage for Audio Assets
C. Spreadsheet | Collection Management Tools
D. Spreadsheet | List of Storage Environment Conditions for Audiovisual Collections at the Smithsonian
E. HSFA | Operational Policies
F. SIA | Audiovisual Reformatting Workflow
G. Individual Unit Reports