



Empowering Your Staff through Collaboration in Training

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Meeting:

200 — *Empowering staff through preservation training! How your library and users will reap the benefits* — Preservation and Conservation with Education and Training

Abstract:

Over the years, libraries and archives have collaborated in a variety of innovative ways to develop preservation training. The need to regularly refresh staff training by providing high quality preservation courses that focus on key mission-related issues at low cost has posed some challenges. The Library of Congress has discovered that by partnering both within and outside of our program and utilizing Web-related resources, preservation training can be made more effective, better focused, and more applicable to the Library's specific trainee needs.

This session describes how the Library of Congress has experimented with several different solutions to this challenge, including a graduate level university course and two different week-long introduction to preservation courses, all of which use multiple staff for limited amounts of time to team teach and share specific areas and levels of expertise. The courses provide an overview of preservation principles and procedures from management issues and environmental monitoring to assessment, treatment, housing, and disaster recovery for all types of collections as well as strategies for funding preservation programs.

This paper describes the Library of Congress methodology for structuring preservation courses that provide maximum benefits to students at all levels. The presentation discusses what Web sites are most useful for such courses as well as how to extend staff training even when a repository has very limited resources. The presentation reviews

additional opportunities for learning more about preservation, conservation, and preservation science, as well as some of the ways to integrate that knowledge into the choices a repository makes for collections based upon standards, best practices and best scientific principles.

This session will share an overview of the week-long training offered by the Library of Congress Preservation Directorate staff for library professionals who handle a variety of materials in their daily work. The resources available on all topics will be shared as well as some of the activities that help staff learn through hands on experience to enable implementation of actions and process to preserve collections.



Book Conservator Claire Dekle teaching archivists and librarians from local repositories in Mauritius as part of a State Department visit.

Background: Over the years, libraries and archives have collaborated in a variety of innovative ways to develop preservation training. The need to regularly refresh staff training by providing high quality preservation courses that focus on key mission- related issues at low cost has posed some challenges. The Library of Congress has discovered that by partnering both within and outside of our program and utilizing Web-related resources, preservation training can be made more effective, better focused, and more applicable to our specific trainee needs.

Heritage Preservation's *Heritage Health Index Report* on the state of America's collections of 2005 indicated that 71% of American repositories (e.g., libraries, archives, and museums) need additional training and expertise for staff caring for their collections; while 80% of repositories do not have paid staff dedicated to collections care. In recent years, effective preservation training has become even harder to find due to the closing of certain graduate conservation programs,¹ as well as a number of library science and archival graduate programs cutting back their preservation training offerings.

¹ For example the University of Texas at Austin Kilgarin Center Conservation Administration Program.

Library of Congress preservation training: The Library of Congress has taken a leadership role in helping with preservation and conservation training by hosting interns and fellows; offering graduate training through several universities;² as well as by offering lectures, symposia, webinars, and week-long preservation institutes for both federal librarians and visiting professionals from other countries.

The Preservation Directorate hosted an introduction to preservation course for 22 Russian librarians, archivists, and curators via the Open World Foundation in October, 2011.



CD Book Conservator Dan Paterson demonstrates housing techniques to Russian Archivists, Librarians, Curators, and Museum Administrators.



CD Paper Conservator Cynthia Karnes explains paper housing techniques to Russian Archivists, Librarian, and Museum Administrators.

LC has also sent Conservation Division staff to foreign libraries to teach workshops after receiving funding support for travel from the State Department, US AID or specific Embassies. Most recently using funding generously provided by USAID, the Library sent a preservation specialist to the L'Institut d'Egypte in March, 2012, to help train staff responding to the catastrophic fire that burned 75% of the L'Institut's collections.



L'Institut d'Egypte staff work with burned collections items.

Other recent trips have involved staff going to Mauritius, Ghana, Uganda, Iraq, Japan, Louisiana, Puerto Rico, El Salvador, Turkmenistan, Armenia, and other venues that have experienced disasters or that require assistance to provide advice or training, generally on funding provided by other organizations such as the State Department or US AID.

² The Library of Congress offered an Introduction to Conservation graduate level preservation course with the University of Maryland in Fall, 2010, through a Intergovernmental Personnel Act agreement. Previously, the Library had regularly taught sessions for Catholic University of America.

Book Conservator Alan Haley works with Museo de Arte de Puerto Rico staffers to salvage fragile paper artifacts after teaching his workshop "When Disaster Threatens" in Spanish at two locations in San Juan, Puerto Rico, in August, 2007.



*CD Special Format Section Head Andrew Robb teaching Disaster Preparedness and Response at Tohoku University in Japan post tsunami on September 14, 2011.
Photographer: Akiko Okahashi.*

In addition, the Library has increasingly brought in experts on key issues of interest to Library staff such as mold, integrated pest management, digital documentation, and environmental management, to provide training to Library staff. This training is shared with other repositories to the extent allowed by the contracting speaker and the training format.

The Library of Congress training format: The format for Library preservation training has changed as a result of a recent semester long course on Preservation. Increasingly the Library uses a broad group of highly qualified speakers from all parts of the Library to teach preservation including conservators, preservation specialists and technicians, reformatting specialists, managers, and curators. These individuals are identified based on their topical expertise and teaching abilities. When necessary, these instructors are supplemented by outside experts.

When setting up the most recent lectures, each speaker is given guidance both on the style and substance of their presentation. In terms of content, each speaker is asked to start their speech by responding to a core list of key questions of concern to the audience.

Each speaker addresses why their topic matters and what the key three points every attendee should know about the topic under review. Each speaker indicates what impact their topic has on the effective management of their repository, as well as what three things everyone can do to make improvements on this area of activity, no matter how small or impoverished their repository might be. Each speaker makes it clear from the very beginning of their presentation why their topic has value for their program, their collections, and their repository.

Stylistically, speakers are asked to use active voice, and to describe specific examples, to integrate case studies, and provide illustrations. Speakers must avoid jargon, acronyms,

and initialisms. The goal of the speaker is to make the topic clear and concrete to the student, explaining in simple non-technical language the key decision points, options, and risks.

Managers too often think of preservation and conservation as a black hole for resources. Rarely do managers think of the immense value that preservation has in terms of providing a long life expectancy for valuable collections and an afterlife for both acquisitions and descriptive scholarship. Therefore, instructors are asked to take careful thought to share what happens when an institution fails at preservation. Each speaker clearly states what happens to collections if this essential work is not done correctly.

The speakers show how failures in preservation lead to cascading failures in such activities as the ability to serve the collections items in the reference room, the ability to create exhibitions, the ability to digitize the collections, and the ability to manage collections effectively over time for future generations of researchers. The costs of failure, as well as the benefits of success are made clear. Since listeners are given three simple steps that any individual can take regardless of budget or background, they have no excuse not to move forward and make some basic improvements in preservation.



Conservation Division Special Format Section Head Andrew Robb teaching Emergency Response actions to Federal Librarians at the 2011 FEDLINK Introduction to Preservation Practices at the Library of Congress.

After each classroom session students are taken into the conservation laboratory or a work area and shown hands-on exercises, which range from case studies to examples of housing and handling techniques. They not only learn the techniques, but also when and how they should be used. These exercises build student confidence and make the classroom lectures more concrete and understandable.

The 2011 Federal Library and Information Center Committee (FLICC) Workshop: Between July 18th-22nd, 2011, Library of Congress Preservation Directorate staff taught 25 Federal and academic librarians *an Introduction to Preservation Practices at the Library of Congress*. The entire workshop was later made available to Library staff as a webinar via the Library of Congress intranet.



Director of Preservation Dianne van der Reyden begins the FLICC workshop in the Mumford Room of the James Madison Building at the Library of Congress on July 18th, 2011.

This basic workshop started with a welcome by the Director of Preservation Dianne van der Reyden and the Head of FEDLINK Program Blane Dessey. This was followed by a session on Preservation Management taught by Ms. van der Reyden that began with a discussion on developing and assigning management resources, roles and responsibilities including the Library's mission, the Preservation Directorate mission, the Library Services Strategic Plan, and a History of the Directorate and the Directorate's various divisions with an overview of their roles.

From resources, Ms. Van der Reyden moved to risk assessments, surveys, and models, describing how to identify and manage risk. She discussed the findings of the Heritage Health Index Survey of Historic Preservation and reviewed the Library's own Preservation Heritage Assets Working Group Survey. She then discussed how to justify setting priorities based on value, use, and risk including a Preservation Priority Survey process. She completed her talk with a discussion on how to work with staff, clients, and funders including such issues as training.



Preventive Section Head Nancy Lev-Alexander describes environmental controls.

The second session by Nancy Lev-Alexander and Ben Bahlmann of the Conservation Division discussed environmental controls.

Topics covered included understanding the basic principles such as relative humidity (RH), dew point, and when mold risk becomes significant, as well as the impact of poor control of temperature and relative humidity on deterioration rate and mechanical stress for a variety of collection formats.

Ms. Lev-Alexander described the availability of risk metrics that allow custodians to calculate the combined effects of temperature and RH on the permanence of collections including the concept of Preservation Index and the Time Weighted Preservation Index. She talked about setting appropriate management policies that strike a balance between green principles and collection needs. She discussed mechanical system functions for heating, cooling, dehumidification, humidification, and ventilation, as well as for monitoring, collecting, and analyzing environmental data. The need to analyze long term trends and identify the causes of fluctuations was stressed.

For facility operations problems, Ms. Lev-Alexander suggested sealing openings in the building envelope that allow unconditioned air to enter the collections storage areas; working with facility experts to identify equipment faults and set point problems; scheduling seasonal adjustments of set points then collecting data quickly to identify problems; and developing seasonal maintenance checklists.

For facility design problems Ms. Lev-Alexander suggested identifying spaces where current building design or human occupant needs limit the repository's ability to control the environment for collections preservation purposes. She also suggested segregating collections storage areas; strategically locating collections storage areas; and educating staff and visitors on the benefits of cooler climates for collections preservation.



Preservation Specialist Ben Bahlmann describes Integrated Pest Management procedures on Monday morning.

Ben Bahlmann discussed the risks posed to collections by light, pests, and pollutants. He indicated that light provides energy that speeds chemical deterioration and causes fading and discoloration of media. Mr. Bahlmann said that all wavelengths of light cause damage, but that the higher the frequency of light, the greater the damage. As there is a reciprocal relationship between intensity of light and duration of exposure an institution can consider these factors together when determining lighting settings. Concerned managers also will determine maximum exposure for specific materials based upon their light sensitivity. He reminded attendees of the advantages of blocking light in storage locations, which can be achieved by boxing collections.

Mr. Bahlmann described Integrated Preventive Pest Management (IPPM) including the most common pests that damage collections, the types of damage they cause, how to set up IPPM, the activities involved in IPPM, building modifications useful for IPPM, and how to implement and monitor IPPM over time.

The session next addressed pollutants including types of pollutants, damage caused by them, and strategies to block them. There was a discussion of ways to lessen risk from pollutants, as well as the need to review or test certain materials used in construction. This session ended with a brief discussion of fire protection including prevention detection and suppression considerations, and highlighted times when your facility and collections are at greatest risk, and how to work with colleagues to ensure that collections are protected during these periods.

The third session by Andrew Robb and Alan Haley of the Conservation Division, reviewed Emergency Management. They discussed issues of preparedness, response, recovery, and mitigation in broad terms, as well as in detail. Preparedness issues reviewed included emergency and continuity of operations plans, specialized protocols such as water incursion protocols and mold protocols, as well as staff call lists and special staff training. Response issues discussed included assessment, salvage, and managing staff safety, morale, and mold after a water incident.

They provided a series of case studies of emergency incidents in which they had been involved in a variety of locales from the Library of Congress, to the University of Hawai'i to Iraq and El Salvador, providing lessons learned of how to manage an incident and subsequent recovery actions. Among the lessons learned were the values of anti-seismic bracing in earthquake zones; the need to wait for after shocks to finish before re-shelving items; the importance of keeping emergency plans linked to duties instead of to specific people; the value of having an off-site shelf list; and the value of good relationships with other institutions who will help you when an emergency happens.



Preservation Specialist Alan Haley speaks on Emergency Response and Mitigation on Monday, July 18th ..

Short and long-term recovery issues covered included useful tools such as Heritage Preservation's emergency response wheel and emergency manual; and how to set up a recovery space such as the Library's Collections Recovery Room. They also discussed the essential role of inventory during disaster response; packing and drying issues; and collections stabilization procedures.



Preservation Specialist Alan Haley begins the Emergency Practicum in the Collections Recovery Room

The final issue discussed was disaster mitigation including re-housing, treatment, and where necessary and possible, replacement. This session was followed by a full afternoon practicum in the Collections Recovery room and in the collections storage areas on how to recover from emergencies with table top exercises on how to manage a variety of water incidents, power outages, local flooding, toxic spills, a regional wildfire with smoke, a small explosion, an earthquake, civil unrest, an ice storm, a tornado, a large explosion with structural damage, and a hurricane.



The FEDLINK students prepare to learn hands-on emergency techniques in the LC Collections Recovery Room.

At the end of this first day after the emergency training, the federal librarian attendees were encouraged to sign a non-binding ***Charter of Library Mutual Assistance*** stating they would create a disaster plan, regularly revise their plan, share their plan with other attendees, participate in regular surveys, assessments and meetings sponsored by the Mutual Disaster Assistance Program, and collaborate on common interests and concerns.

On the second day of the workshop, Conservation Division Preservation Technicians Jamie Roberts, Jamie Schmeits, Sarah Davis, Simonette dela Torre, and Tiffany Welch began the day by discussing how to set up a workspace for housing archival materials, how to identify materials that require special attention, special collections handling and storage options including commercial and custom housing.



Preservation Technicians teach in the classroom.

Preservation Technician Jamie Roberts lead off the day by talking about the need for some basic preparations prior to handling items including washing hands (as opposed to hand sanitizer), wearing gloves when handling photographs, keeping workspaces clean, and vacuuming dirty collections storage boxes before opening them to prevent contaminating collections items in the boxes. She discussed removing fasteners and rubber bands, as well as the use of buffered paper for paper, photographs, negatives and architectural reproductions, except for blueprints and diazotypes, which should be placed in unbuffered housing. Ms. Roberts recommended storing photographs and photo reproductions separately, where possible, in cold storage. She noted that diazotypes off-gas damaging chemicals, so recommended that they be isolated and housed separately.

Ms. Roberts stated that housing should consist of buffered folders that are labeled in graphite or carbon-based ink while the folder is empty and that are appropriately sized and not overstuffed. Foldered materials go into appropriately sized boxes that are not overstuffed nor under filled so that materials do not slump. If materials slump or distort, use a spacer board to maintain good folder posture within the box. All folders must match in size within a box to reduce abrasion.

Preservation Technician Jamie Schmeits discussed rolled storage, which is helpful in addressing storage space limitations, managing already rolled items and preventing fiber weakening and creasing of textiles. She identified items that are not brittle, torn, frequently used for reference, or of unstable media as good candidates for rolling. She demonstrated the appropriate techniques for rolling flat and curled objects including textiles for storing as well as how to isolate and store incompatible materials in shared rolled storage.

Ms. Schmeits discussed how to protect rolled materials prior to boxing and reviewed housing options for rolled storage including how best to support the roll. She ended her presentation with five key points to remember when you undertake rolled storage including the need to assess the item, separate incompatible materials, roll items loosely around a core cylinder, house the roll in an acid free box, and support the roll within the box.



Preservation Technician Simonette dela Torre (far left) teaches a practicum on rehousing.

Preservation Technician Simonette dela Torre discussed the storage of flat materials including assessing the media, when to choose flat storage, and types of flat storage. She discussed foldering, encapsulation, enclosures and mats including standard and sink mats at some length. She then discussed some basic treatments necessary when preparing materials for flat storage such as dry cleaning and mending.

Ms. dela Torre finished her discussion with some helpful tips on rehousing activities, such as placing buffered paper behind art work when encapsulating. She suggested that to avoid handling, take images of any writing or other verso markings and attach it to the back of the mat or making a double sided window mat so researchers can see the recto (front) and verso (back) of items, particularly when the back of an item holds information. She also suggested rehousing same-sized collection items in appropriate sized boxes.



Preservation Technician Sarah Davis (far right) demonstrates matting techniques to students Angela Burgess and Mark Wilson

Sarah Davis and Tiffany Welch discussed caring for books and three-dimensional objects including what items need boxing, the most common types of boxes, and how books and objects are contained and custom fitted within box interiors by folded spacers, foam spacers, and folders. They discussed the types of pre-made commercially available boxes and talked about how best to box special categories of volumes including high value and high priority volumes, small volumes, and three dimensional objects including globes. They also discussed labeling systems and provided diagrams of specialized custom boxing systems.

Following the discussions the Conservation Division Preservation Technicians provided demonstrations of a wide variety of storage materials and demonstrated their creation, use, and handling.

Storage options exhibited or demonstrated included rolled storage with polyester, rolled storage in a box, sink mats with translucent paper curtains under a window, encapsulation, folders, overlays of polyester, textiles wrapped in tissue-lined four-flap enclosures, a four-flap enclosure with a cardstock folder, padded cardboard boxes, and many other alternatives.



*Preservation Technician Jamie Schmeits demonstrates
Simple preventive techniques to the students.*

Preservation Director Dianne van der Reyden then returned to the stage to speak on LC exhibitions, including exhibition pitfalls, good practices, reviewing spaces, collections transit, courier work, case design and evaluation, and the design and creation of special custom exhibit housing.



FEDLink Librarians at the LC Preservation Training.

In the afternoon, Binding and Collections Care Chief Jeanne Drewes and Section Head Clifton Bethea spoke on caring for general collections with a focus on binding of library volumes that fall outside of the rare or special collections area including trade bindings.



Chief of Binding and Collections Care Jeanne Drewes speaks on caring for general Library collections.

They provided a brief history of commercial library binding, an overview of what the Library binds and why, a review of the Library binding workflow, and a discussion of binding styles, as well as some highlights from LC's library binding contract. They next provided a summary of technologies used in binding, followed by BCCD's general collections conservation philosophy and activities. They completed their discussion with some thoughts on the efficiencies that may be obtained in collections care from the use of certain supplies, tools, equipment, workspaces, databases, and commercial housing.

Chief of Conservation Diane Vogt-O'Connor spoke on *Funding for Preservation*, including the level of need for funding, key principles of fundraising, snafus to avoid, identifying the best sources of preservation funding, writing winning proposals, making effective contacts with grant funders, and appropriate follow-through after funding is granted.



Chief of Conservation Diane Vogt-O'Connor describes the Process of finding funds for preservation.

Vogt-O'Connor identified the top preservation funders in the U.S. and in DC., both federal and foundation funding, describing the types of projects they fund. She also listed some good sources of preservation funding for beginning fundraisers, as well as some specialized sources for special needs such as emergency response funding. She described the techniques used by professional grant writers to obtain grants.

Vogt-O'Connor summarized some of the most common mistakes made by preservation professionals when writing grants including forgetting to obtain permission from your own institutional hierarchy to solicit the funds so that you find yourself competing

against someone in your own organization; as well as contacting the grant funder before reading their guidelines. She also discussed the common mistake of focusing largely on the project methodology rather than on why your project matters and who the stakeholders are, as well as forgetting to explain what happens if the project is not funded. She described how many grant writers handicap themselves by going to a funder who has no history of funding in their geographic area or on their topic or type of institution. She urged students to talk with grant funders early so they can avoid having to do a “cold sell,” which is sending your application to a funder who has no idea of who you are or why your project matters.

Ms. Vogt-O’Connor described both the costs and benefits of undertaking projects using soft money including requirements for documentation, money management, reporting, appropriate results dissemination, and many deadlines. She shared many grant submission deadlines, as well as providing lists of sources of further help on fundraising and how to obtain further training on fundraising via the Web.



Vogt-O’Connor provided copies of the free guide she worked upon with the Foundation Center, *Preservation Funding, Foundation Grants for Preservation in Libraries, Archives, and Museums*, which can be downloaded from the Website at: <http://www.loc.gov/preservation/about/foundtn-grants.html> This guide lists 2,270 grants of \$5,000+ awarded by 505 foundations to public, academic, research, school, and special libraries; and archives and museums for conservation and preservation activities.



Kaare Chaffee demonstrating exhibition preservation techniques to workshop attendees.

In the afternoon the students went with the CD Exhibit Conservator Kaare Chaffee on a site visit to the exhibitions in the Jefferson Building, where she demonstrated some of the

issues related to exhibition preservation. This was followed by a tour of the Binding and Collections Care facility with Jeanne Drewes.



Steve Herman, Chief of CALM.

On July 20th, 2011, the workshop began with a session by Chief Steve Hermann and Collections Officer Beatriz Haspo of the Library's Collections Access, Loans, and Management Division (CALM) focused on the Library's new high bay/high density remote storage facilities in Fort Meade, Maryland. They discussed the techniques followed for buildings design, layout, and move planning. The space has sodium arc lamps to reduce ultraviolet light levels. The facility features both cool (50°F and 30%RH) and cold storage modules including environments of 35 °F and 30% RH for microfilm and 25 °F and 30% RH for color film and photographs.

Indicating that the facility featured both fire-rated walls and ceiling, Mr. Herman said that in case of a fire, the compartmentalization of the space would limit the loss of any group of Library materials to <300 cubic feet. Facility fire protection includes sprinklers overhead as well as in-racks, whose maximum coverage area does not exceed 100 square feet. There is a horizontal barrier at the 15 foot level and in-rack sprinklers at the 10, 15, and 25 foot levels. While there is high pressure wet pipe system inside the modules, the cold rooms feature dry pipe systems. While the facility features water detectors and a VESDA system, all plumbing is on the outside of the facility. Mr. Herman indicated that the shelving in the facility is 29 feet high with access provided to staff by using modified Raymond high bay lifts. He said that collections are shelved by size with all books and bound periodical stored in lidded boxes.

Ms. Haspo indicated that before being placed in the box, items are vacuumed, measured to determine the box size, and counted, and then an accessions process and verification process are followed before boxes are placed on a cart for transfer to Fort Meade. General inventory control is done by barcode and warehouse tracking systems. Items are linked to barcodes to a box barcode to a shelf barcode and the location of that box on the shelf. Once at Fort Made the boxes are shelved and links between the box and shelf barcodes and the location of the box on the shelf are captured and loaded into an Integrated Library System database.

Ms. Haspo indicated that ten different box sizes are used for books and bound periodicals—five different widths and two different heights. Special collections items

housed at Fort Meade had a much wider range of box sizes—roughly 1,500 different container sizes. Book and serial items selected for the facility were in general easy to retrieve, second copies, JSTOR titles, minimal level cataloging, or digitized items. Special collections items selected were identified and prioritized by custodial divisions, then reboxed and the size of the reboxed items was mapped to an exact location on the shelves. Special format collections require special handling, security, a high level of inventory control, and central delivery and return to a special area of the Library's Madison building. She indicated that to date, more than 120,000 requests for collection items at Fort Meade had been met with 100% accuracy in locating the items.



*Mark Sweeney, former Chief of Humanities
and Social Sciences Division, current Director of Preservation*

Chief of Humanities and Social Sciences Mark Sweeney spoke about *Newspaper Microfilm: The Basics*, describing microfilm as a mature preservation strategy that has been used at the Library of Congress since the 1930s. He indicated that libraries know what will microfilm best, what the standards are, how microfilm is used, and how to care for microfilm. He discussed the National Digital Newspaper Program (NDNP), a partnership between the NEH, the Library of Congress (LC), and state projects to provide enhanced access to United States newspapers published between 1836 and 1922 via the freely accessible *Chronicling America* Website. The NDNP project provides access to 3.7 million pages of newspaper³ and more than 500 titles from 22 + states and DC, and may be viewed at: <http://chroniclingamerica.loc.gov/>. This project, which primarily digitizes from microfilm, was developed as newspapers are high volume, high usage, large size, deteriorating, and have relatively little color, making them good candidates for microfilm and digitization.

Mr. Sweeney reviewed the characteristics of good microfilm including meeting preservation goals by faithful and full reproduction, fixity, permanence of 300-500 years if the standards are followed and the need to adhere to the standards such as those of ISO and ANSI/AIIM. He stressed the need to balance the issues of permanence and access. Access issues include browsing, reproducing readable print copies, loaning copies outside of the Library via Interlibrary Loan, and searching via digital methods as well as via

³ Chronicling America now contains more than 5 million pages of newspapers as of May, 2012.

metadata. Film characteristics, such as size, image polarity, emulsion, types, bases, and film generation were described. Mr. Sweeney suggested that 35mm silver gelatin polyester based camera negatives were generally accepted as a preservation standard.

Mr. Sweeney discussed the challenges inherent in the fact the most preservation standards were developed in the 1990s, when sixty years of major microfilm production work had already been accomplished in many organizations. He talked about preparations of materials for microfilming including collation, reel programming, reel targeting, and quality control, which is maintained via measuring the resolution and density of film and holding contractors or vendors to standards.

Mr. Sweeney discussed the preferred characteristics of preservation quality microfilm including first generation master negatives, low reduction ratios (<21:1), clarity adequate to do OCR text with no TIFF enhancement, even density of text (avoiding too dark, then too light), use of disbound material or limited gutter distortion, and need for items to be in logical order prior to filming. He talked about the number of newspapers now going online only. He discussed the risks online newspapers may face for future preservation and access if appropriate digital preservation infrastructures and related resources are not available to preserve them. He ended with some useful links including the NDNP site at <http://www.loc.gov/ndnp/> and the *Chronicling America* website at <http://chroniclingamerica.loc.gov> .



Digital Conservation Specialist James Hodson.

Digital Conversion Specialist James Hodson provided an overview on digital conversion issues including challenges of copyright, color materials, searching, audience, expectations of use, selection issues, condition of original film to be digitized, costs, funding sources and their requirements. He described the risks of digital files including media failure, software failure or obsolescence, human error such as mislabeling or misfiling, communication or transmission files, media obsolescence, natural disaster, external attack, and bandwidth and display technology challenges, and organizational failure, all of which may lead to digital file loss.

Mr. Hodson indicated that there is a need to stay on top of increasing variables and user expectations for ever larger and more substantial files in every changing and more sophisticated software and more detailed metadata. The costs of this media are far beyond that of other more traditional media. These increased costs are due to the need for a new infrastructure and frequent migration needs with subsequent quality assurance

and quality control steps, plus file maintenance. Mr. Hodson discussed costs for equipment, personnel and labor, storage of files, selection, preparation, metadata creation, conservation of the physical item so it may be scanned, production of intermediates, digitization, quality control, technical infrastructure, and ongoing maintenance.

Mr. Hodson discussed a range of variables that affect costs including item size, whether the item is bound or not, output type desired (e.g., bi-tonal, grayscale, color), printing, binding, and turnaround speed. He also described the steps in the reformatting process including policy development, item selection, collation and preparation for scanning, metadata creation or collection, digitizing, quality review, presentation, and transfer. He stressed the need for policies, metadata, a repository, and trained staff.

Mr. Hodson stressed the importance of identifying what you are trying to preserve, whether it is the text, the look and feel of the work, marginalia, illustrations, or stitching. He suggested that you next identify how the original must be handled and what you can afford to do. He recommended scanning as completely as possible once with multiple ranges of users in mind. He suggested enhancing the usability of scans via OCR indexing where possible, and ensuring data integrity through the use of checksums and other data security measures.

Mr. Hodson described the steps in the digitization process in detail including collation and preparation, metadata creation, digital conversion, digital quality control issues and standards, and gave examples of selection processes and projects. He ended his presentation with a list of resources for future study at the Library including <http://www.digitalpreservatin.gov/> and <http://www.loc.gov/ndnp/index.html> ; at IFLA <http://archive/ifla.org/VIIIs19//pubs/digit-guide.pdf> ; and at IMLS at: <http://www.imls.gov/applicants/forms/dig.shtm>



Digital Preservation Specialist Steve Puglia describes standards and best practices for digital preservation.

Steve Puglia of the Office of Strategic Initiatives completed the digitization section of the program by talking about the *Federal Agency Digitization Guideline Initiative (FADGI)*. Started in 2007, FADGI is a collaborative effort by federal agencies to define common guidelines, methods, and practices for digitizing historical content. FADGI has two sub-groups that are studying specific issues, a Still Image Working Group and an Audio-Visual Working Group. FADGI's guidance is at: <http://www.digitizationguidelines.gov/> .

Mr. Puglia indicated that the process of digitization involves selection, assessment, prioritization, project management, project tracking, metadata, digitization, quality control, and systems management. One goal is to identify the essential characteristics of the originals that are to be replicated and carried forward. This process involves identifying how much data needs to be captured and what characteristics we can afford to lose.

Mr. Puglia stated that essential characteristics are informed by functional, technical, physical, qualitative, curatorial, archival, risk-related, and other assessments and may be related to the collection, record or media type and institution specific. Mr. Puglia described how essential characteristics had been defined in microfilm standards and guidelines and in photographic duplication specifications and discussed previous approaches to these types of reformatting.

Mr. Puglia discussed a variety of key factors including institutional and user perspectives such as use, sustainability and affordability; source characteristics such as purpose and people; and technology capabilities. He discussed goals including the production of consistent, high-quality, digital objects and related metadata and the need to facilitate the long-term management and preservation of the digital resources. He stated that the FADGI perspective has been that repositories should standardize their digital objects, as well as their metadata. Repositories should better define consistent approaches to digitization and digital preservation, treating large batches of images or other digital objects in the same way to promote ease of management and lower costs for management and preservation. He recommended performing a cost/benefit analysis to identify the most cost-effective approach to reformatting.

After discussing existing digital guidelines and what remains to be done in terms of filling the gaps in the guideline literature, Mr. Puglia talked about defining imaging objectives for various content categories and how to decide upon quality measures for digitization. Mr. Puglia discussed standard methods for measuring, tools and related guidelines including Digital Image Conformance Environment (DICE), Configurable Image Validators, targets, and software.

Mr. Puglia finished by discussing new and continuing work including an update of the DICE and MScan software, small targets for ADF and an oversized target, a Digital target, JPEG 2000 assessment methodology, a file format sub-group, a color accuracy study, and a revision of FADGI's technical guidelines, including linking content categories and objectives to use-case studies, providing guidance on information capture levels and image performance parameters.

This session was followed by a tour of the digital scan center.



Digital Scan Center Equipment.

On the afternoon of July 20th, there was a detailed session on Rare Book conservation by book Conservators Dan Paterson and Alan Haley, which covered the basics of the history and technology of book materials and structures; the nature and deterioration of book materials and structures; and conservation issues and treatment. Mr. Paterson began by describing the basics of books as three dimensional engineered objects including historical binding structures, the parts of a book, book materials including leaf and covering materials, leaf attachment techniques, cover-to-text attachment techniques, and covering materials.

Mr. Paterson described a wide range of variants on how books are made, including both variants on codices and non-codex three-dimensional books. He discussed book materials including cellulosic materials such as paper, wood, and cloth and animal skin such as leathers, vellum, and alum-tawed leather. He discussed adhesives including both starch and protein based adhesives as well as rubber and synthetic adhesives. Mr. Paterson also reviewed metals found in books as book furniture, then discussed media containing metallic compounds found in books.

Mr. Haley discussed types of physical damage found in books due to their environment—such as temperature, relative humidity, light, pollutants, water, pests, poor storage materials, or inappropriate enclosures—or use and handling, such as improper support, inappropriate reformatting, property marks and tags, improper shelving, and vandalism and theft. He also reviewed previous repair or treatment including tape, leather dressing, inappropriate material, or reduced function due to a too tight binding.

Mr. Haley suggested that before any treatment, ask whether a proposed treatment is necessary, what the risk is for not treating the item, what the anticipated use is, what the intrinsic value of the item is, and what bibliographic concerns might exist, as well as what the anticipated storage and use environment is. After treatment, the item will be changed, both physically and chemically. These changes require quality review to ensure that both the goals of the treatment were achieved and that no inappropriate materials were used in the treatment. The treatment must be fully documented both visually and by written description to record the condition of the item before and after treatment. Also included in the documentation are the treatment approvals and all materials used. This session ended with a tour of the rare book conservation laboratory and treatments in process.



Book Conservator Dan Paterson (center) discusses rare book structures in the Conservation Paper Laboratory.

On July 21st, the workshop's fourth day of lectures featured presentations on both paper and photographic preservation and conservation. Conservation Division Paper Conservator Susan Peckham spoke on paper conservation focusing on the materials and components of paper-based collections and how the nature of paper materials affects their condition and longevity.



Paper Conservator Susan Peckham lecturing on paper conservation.

Ms. Peckham addressed Conservation Practice for Paper-based Collections including types and composition of materials, types of deterioration, the effects of external factors on paper, and on the stabilization and conservation of paper items. She began her talk by discussing materials found in paper-based collections including parchment and paper, media, adhesives, plastics and a range of attachments to paper items including tapes, labels, starch wafers, embossed paper seals, and fasteners.

Ms. Peckham defined the difference between support materials, which bear images, and media, which form the image or text. She discussed common primary supports including paper and parchment. She reviewed both familiar and unusual media such as historic, and modern inks including stamp pad inks; pencil in graphite, colored, or copy varieties; dry media such as pastel, chalk, and charcoal; water-based media such as watercolor and gouache; and photo reproductions such as blueprints, diazotypes, and photostats. She provided a history of papermaking, explained the chemistry of paper, and described the ways that paper has been sized historically by such materials as gelatin, alum added to gelatin, alum-rosin, and synthetic sizes.

Ms. Peckham then illustrated and described the full range of media found in paper collections. She described relief prints such as woodblock prints and letterpress prints, intaglio, planographic printing, and hand-applied media. She indicated that a knowledge of media aids in dating and understanding item vulnerabilities, as well as their storage and environmental needs. She discussed historic inks. Each printing process and media vulnerability was then reviewed in-depth.

Ms. Peckham next reviewed the various factors that affect the life of paper-based collections, including inherent vice, environmental factors, inappropriate or restrictive housings, and mishandling. She described types of deterioration found on the various types of paper collections, including light damage, acid migration, media problems, foxing and stains, tears, embrittlement, and aging plastic components such as sleeves. She addressed how previous treatments affect paper items including aged mends, cellulose acetate laminations, and historic linings and silkings.

Ms. Peckham described rehousing and stabilization options for a range of materials including rolled materials and friable media. She recommended using a conservator for tape removal, stain removal, flaking or friable media, and fragile supports that cannot be mitigated with acceptable housing. She stressed the need to use a reputable conservation framer who uses conservation materials and techniques. She suggested using unbuffered paper for blueprints and diazotypes, and avoiding the use of clear polyester for friable or flaking media.

Photograph Conservator Dana Hemmenway spoke on the structure of photographs, describing their supports, image materials, binder materials, and associated materials such as mounts, mats, frames, cases, albums, and coatings. She described how to identify photographs by their dates and visible characteristics such as their format, deterioration characteristics, by visual analysis including microscopic examination, by spot tests performed by a conservator, and by instrumental analysis.



Photo Conservator Dana Hemmenway sharing photo process examples with FEDLINK Librarians.

Ms. Hemmenway spoke about the various types of photographs, including direct positives, negatives, and prints. She then provided illustrations and in-depth descriptions of the most common photographic processes and formats of photographs, including their dates, media, visual characteristics, tonality, visibility of paper fibers, visibility of binders,

their special mounting or presentation formats, as well as guidance on how and why the images deteriorate, and how to identify specific formats of film.

Ms. Hemmenway reviewed the sources of damage to photographs including biological damage such as insects, vermin, and mold; mechanical damage such as cracked cover glasses or abrasion; and chemical deterioration. She described chemical deterioration as often being due to inherent vulnerabilities, storage media, or the environment.

Ms. Hemmenway discussed storage materials (e.g., rubber cement, poor quality backing boards or mats, poor quality enclosures), and the impact of the environment. She discussed the symptoms of image deterioration including discoloration, fading, staining, yellowing, and mirroring as well as the distinct ways that different processes deteriorate. She reviewed factors that control the life expectancy of photographs that can be controlled by librarians including the storage environment of the photographs (e.g., temperature, relative humidity, light exposure, and air quality); and the quality of the storage enclosures and furniture (e.g., purchase materials that pass the Photographic Activity Test, ISO 18916). She discussed how to store photographs in folders and sleeves, as well as when to select paper or plastic enclosures.

Ms. Hemmenway described matting and special format (e.g., album, cased images, oversized) storage. She made exhibition recommendations on filtering UV light in the light source and in glazing, as well as handling recommendations. She discussed the controversy on whether gloves must be worn with photographs, and described having clean hands as a reasonable alternative. She stressed the need to support photos with two hands or a support board, and to use only graphite pencils around photographs. She recommended using this pencil to write on enclosures, but never to do so while the photo is in the enclosure and to avoid marking on the image or exerting pressure.

She also summarized when to call a conservator, rather than use Library staff for a task. She indicated that you should have a conservator undertake all stabilization, flattening of photographs, consolidation work, vacuum removal of mold, surface cleaning, cosmetic compensations, emergency response work, and preservation assessments.

The final session of the fourth day, was a talk on Research and Testing by Scientist Lynn Brostoff who talked about Cultural Heritage Science at the Library, which is concerned with the study and analysis of the physical original artifacts of the Library in support of their conservation by conservators and their management and study by curators.



Scientist Lynn Brostoff talks about Cultural Heritage Science.

Dr. Brostoff spoke about collecting and interpreting scientific data from historic artifacts. She indicated that after working closely with conservators, curators, and colleagues to define questions, PRTD captures and interprets inherent information found in original collection materials. Dr. Brostoff described how PRTD conducts technical studies to identify materials and their methods of manufacture, which aid in determining the collection items authenticity. These technical studies identify whether collections items are originals, copies, or originals with alterations or substituted parts. She indicated that PRTD also conducts degradation studies, including research into materials deterioration, deterioration characterization, and mitigation methods for deterioration.

Dr. Brostoff also described the quality assurance program that tests the Library's special collections supplies and develops and publishes supply specifications. She discussed PRTD's role in developing new and improved analytical methods based upon technology transfer and improved preservation methods to solve specific problems, such as sticky shed syndrome, for the use of Library staff. She described the methodology development process PRTD follows to adapt cutting edge techniques from fields such as biology, botany, chemistry, forensics, geology, information science, materials science, and physics.

Dr. Brostoff then provided a simplified overview of basic scientific terminology and concepts to assist students visiting the lab describing organic, inorganic, and organo-metallic materials. She defined and described some basic concepts such as chemical composition, chemical reactions, chemical properties, chemical identity, and physical properties. Dr. Brostoff described chemical and physical interactions of materials, including those that cause degradation, such as light, oxygen, pollutants, and extremes of acidity or alkalinity. She also discussed factors that contribute to chemical reactions, including temperature, moisture, and gases. She briefly discussed the scientific methodology, focusing on some common analytical methods including light meters and humidity recording devices, as well as test samples.

Dr. Brostoff then reviewed some common analytical techniques, including spectral imaging and microscopy, Fourier-transform infrared spectroscopy, Raman spectroscopy, UV-Vis and 3D fluorescence spectroscopy, X-Ray fluorescence spectroscopy, X-Ray diffraction, and environmental scanning electron microscopy, as well as their margins of error. She stressed the value of minimally -invasive and micro-analytical techniques. After providing this overview of basic scientific principles and equipment, Dr. Brostoff

described some current projects at the PRTD. The PRTD talk was followed by a session on contracting for preservation by Anne Harrison, who spoke about three major ways that FLICC/FEDLINK supports federal libraries in the area of preservation.



Anne Harrison addresses the students.

Ms. Harrison indicated that FLICC/FEDLINK provides contracting vehicles, which are agreements with a number of vendors providing conservation, reformatting services, and consultation and training that federal libraries may use to procure services. She said that through the FLICC Preservation Working Group, FLICC/FEDLINK surveys the federal community about preservation needs, manages a linked group of collaborators working together on issues of emergency response called “Safety Net,” and sponsors educational programs. Finally, Ms. Harrison stated that FLICC/FEDLINK collaborates with the Library of Congress Preservation Directorate and CENDI (a Federal interagency group of senior scientific and technical information managers from 14 United States agencies) to present educational programs and useful resources, such as the model contract for disaster recovery services.

The July 21st lectures were followed by demonstrations in the Paper laboratory on both paper and photograph conservation,



FEDLINK Librarians at LC demonstrations.



FEDLINK Librarians test their new found skills.

On July 22nd, LC Chief of Repository Development Leslie Johnston spoke on *Digital Preservation*. Ms. Johnston defined digital preservation as a broad range of actions to extend the useful lifetime, viability, and usefulness of machine readable computer files

and protect them from media failure, physical loss, and obsolescence so they may be found, opened, viewed, and manipulated. She indicated that while it is one thing to preserve a bit-stream, it is something else to preserve the content, form, style, appearance, and functionality of the original digital object.



Chief of Repository Development Leslie Johnston discusses digital preservation.

Digital preservation is a series of managed activities based on a documented policy due to decisions made by your repository as described by Ms. Johnston. These activities include both human and machine tasks that are multiple, successive, and replicable. She indicated that digital preservation involves maintenance of a byte stream including auditing of storage media and files, mechanical preservation activities, and the adoption of underlying policies that support the actions.

Ms. Johnston provided a basic terminology of digital preservation with definitions. She then explained what digital preservation specialists internationally are attempting to save including commercially produced content such as e-journals, e-books, and e-documentation; scientific, social science, and geospatial data such as observational data, research data, and data from Federal and local agencies; the Web, whose average page lasts less than two months (See the International Internet Preservation Consortium at: <http://netpreserve.org/about/index.php>) ; and government documents (see FDSys at: <http://www.gpo.gov/fdsys/>).

Ms. Johnson described a series of key documents and tools including Cornell's Digital Preservation Management Workshop and Tutorial (<http://icpsr.umich.edu/dpm/index.html>); the Open Archival Information System (OAIS) Reference Model at <http://public.cccds.org/publicaitons/archive/650x0b1.pdf>); and the Trusted Digital Repositories Attributes and Responsibilities of the Research Libraries Group at <http://www.clc.org/research/activities/past/rlg/trstedrep/repositories.pdf>). After describing the seven attributes of a Trusted Digital Repository, she discussed the various preservation strategies available including bit stream copying; replication; reliance on standards; normalization; media refreshing; migration; technology preservation; emulation; and digital forensics. She then discussed the threats to digital resources including file formats being superseded; storage media being superseded; computer media and components failures; and the continuous need for more powerful computers to handle more processing.

Ms. Johnston reviewed descriptive, technical, structural, and rights metadata plus some of the key considerations such as who will create it, how it will be created, how will it be associated with the object and stored, and how will it be updated or replaced. She described METS, XML, and PREMIS before going on to discuss legal issues of ownership, copyright, and related rights.

She stressed the need to have appropriate staff, transparent business practices and management policies, risk management, contingency plans, succession plans, and to review these plans regularly and update them. She finished with a discussion of tools, the LC Life Cycle Approach to data, and where to find LC's *Personal Digital Archiving Guidance* at: <http://digitalpreservation.gov/you>.



Mathew Barton describing the perils of audio preservation.

The second speaker, Matthew Barton, discussed *Audio Preservation*. Mr. Barton said sound formats have been in flux from their earliest days. He discussed such early sound formats as the photoautogram of circa 1860; the Edison brown wax cylinder the 1890s; its successor, Edison mass produced black wax cylinder; and the Edison Blue Amberol introduced in 1912. He played a wide variety of very early sound recordings for the federal librarians including such recordings as the *Passamaquoddy Snake Dance Song* sung by Noel Josephs recorded by anthropologist Jesse Walter Fewkes in Calais, Maine in 1890; and Sylvester “Vess” Ossman playing *Hot Time in the Old Town Tonight* in 1896 on the banjo.

Mr. Barton described the first audio format war, which was effectively over in 1915, when discs triumphed over cylinders. Although Edison produced cylinders until late 1929, Mr. Barton indicated that recordable wax cylinders continued to be used in homes and offices for many decades after this date. He warned that wax cylinders are fragile, prone to mold, and require careful handling. Handle them by inserting your index and middle fingers into the center and do not touch the playing surface. Archival cylinder playback equipment is still commercially available, though expensive.

Mr. Barton reviewed the two most common standard sizes of 78 rpm records, which were 10 inch and a 12 inch discs. He indicated that microphones, invented in the 1920s, and electrical recording greatly improved the quality and fidelity of commercial discs. Most early 78 rpm records were pressed on shellac compounds, making them brittle and easy to break. Appropriate turntables and styli, which are still commercially available, often yield exceptional sound quality with 78 rpm records.

Mr. Barton described lacquer discs, which were used for many commercial and non-commercial recordings from the 1930s on. Most such recordings have an aluminum base, but during World War II, glass was substituted due to rationing. These aluminum and glass based lacquer disc formats were most often in mono and were usually 16 inch discs. They were often used for master recordings, transcription discs, and field recordings. Lacquer discs face some special challenges. The lacquer can delaminate and flake off the base. Palmatic acid in the lacquer may exude over time, forming white particles on the surface of the disc. Reformat these discs while they are playable.

In the 1930s, tape recording was developed in Germany, though it was not widely available in the United States until after World War II. Analog tapes range in width from a quarter inch to two inches holding from 1 to 24 tracks. Some early tapes had paper backing, which was replaced by acetate around 1950, and by polyester in the mid 1970s-80s. The reformulation of some tape stocks in the 1970s and 1980s has led to *sticky shed syndrome*. Sticky shed syndrome is when the tape binder softens and sticks to playback equipment. There are solutions that can be followed, including tape baking, which allow for immediate reformatting of items suffering from sticky shed, but the solutions may be implementable only one time in some cases.

Mr. Barton then discussed the development of audiocassettes, 8-track tapes, micro cassettes, quarter inch tape, open reel tape decks, and long playing records including vinyl records, the latter which he described as being relatively stable if stored properly. He reviewed appropriate storage systems including steel shelving; a climate that is 50-55 degrees F and 30-35% RH; and upright storage in acid-free boxes. He then demonstrated professional cleaning, playback, and digitization methods followed at the Packard Campus for Audiovisual Conservation of the Library of Congress.



Amy Gallick describes issues inherent to moving image preservation.

The third and final speaker Amy Gallick, spoke about *Moving Image Collections: Preservation and Care*. Ms. Gallick began her talk with a review of the most common film formats including 35mm, 70mm, 16mm, 8mm, and some less common formats including 9.5 mm, 28mm, 22 mm, and 17.5 mm. She discussed their uses for theatrical, industrial, educational, student, and home movie venues.

Ms. Gallick illustrated and described a cross section of a piece of film stock, with the base layer, gelatin binder, and emulsion layer. She then described nitrate film, its history,

identification, storage, and five degradation stages. She noted that the playback of nitrate film is limited to theaters that have nitrate-rated projection booths. She reviewed the various types of Safety Film, which replaced nitrate film. Safety film types include cellulose acetate, cellulose diacetate, cellulose triacetate, and polyester film. She described how decaying acetate film stocks release acetic acid, which smells like vinegar and is referred to as vinegar syndrome. Vinegar syndrome leads to film shrinkage, emulsion damage, and potential powdering. Ms. Gallick described how to measure vinegar syndrome using A-D test strips.

Ms. Gallick discussed other common film problems including shrinkage and warping, mold and mildew, color fading, and mechanical problems including edge damage, scratches, dirt, and tears. Ms. Gallick then reviewed the most common magnetic and digital moving image formats from magnetic analog videotape in a range of sizes from ½-inch VHS, and ½ inch Betacam, ¾ inch U-Matic, 1-inch, 2-inch, etc; digital videotape in Digibeta, DVCAM, DVC PRO, HDCam, and D-VHS; digital discs in Blue-Ray and DVD; to digital files in MPEG. She discussed their make up in terms of their base, binder, and magnetic coatings, and reviewed the most common problems with these formats. One of the most common problems she described was tape sticky shed syndrome or binder breakdown, which leaves a residue on playback machines and ultimately destroys tape signal.

Ms. Gallick described the storage, handling, and care of motion pictures and provided the appropriate storage standards from ANSI and ISO. She recommended cold storage where possible. She suggested that repositories with modest budgets might store their film in off-site cold storage; while small repositories with few resources might house their film in polyethylene freezer bags or laminate bags within frost-free refrigerators or freezers.

She recommended housing including polypropylene and polyethylene cans and archival cardboard boxes. She also suggested that while safety motion picture containers should be vented, nitrate film should be stored in Kodak metal cans.

Ms. Gallick suggested that playing film is not necessary, particularly for smaller repositories. Smaller repositories might consider sticking with a light box and a loupe. Wealthier repositories may want to purchase a 16mm or 35 mm viewing machine, although she warned that poorly maintained machines may lead to film damage. She encouraged the use of film or video labs to produce digital files for access purposes. Ms. Gallick provided a list of training opportunities in film preservation, including FIAF summer school, AMIA conference workshops, and SAA's "Becoming a Film Friendly Archivist," workshop. She then provided details on a six national and international moving image preservation degree and certificate programs in Rochester, New York; New York City; Los Angeles; Austin; East Anglia; and Amsterdam.



Federal Librarians tour the Mass Deacidification Lab.

The final day of the workshop ended with tours of deacidification lab and the Preservation Research and Testing Lab.



Federal Preservation Research and Testing Lab Manager Steve Hobaica describes his work on Sticky Shed syndrome in tapes.

Summary: The instructors gained valuable experience in teaching; covering comprehensive and complex topics for presentation to professional colleagues who in many cases have little preservation background; and in working with colleagues to prepare linked and coordinated programs with significant overlap. The sessions were videotaped and photographed so teachers could hear themselves, which helps instructors see how they appear to their audience. The instructors also received audience feedback.

The experience of integrating individual expertise into a larger workshop featuring comprehensive coverage of the field of preservation was energizing for many of the instructors. Many instructors came to several sessions to hear their colleagues' presentations. The workshop topical flow, recommendations, lectures, and practicals synchronized effectively to provide a rich and systematic overview of current thinking on archival and library preservation and conservation, regardless of format. The experience was both enriching for staff, helping them to see in a very concrete way they form part of a powerful network of creative and hardworking experts who ensure that the Library's collections and the nation's intellectual and cultural heritage are preserved. The chance to speak, hear others, and talk with Federal librarians was very instructive.

The audience: The audience of federal librarians was impressive. They attended and participated enthusiastically in both the question and answer portions of the lectures and in the practica. For many of these professionals, this was one of the longest periods of sitting in a classroom they had experienced in many decades. Despite back-to-back information packed lectures, the audience remained enthusiastic.

The librarians who attended this workshop were overwhelmingly positive in their response to the topical content and format of the workshop. They indicated a willingness to join the Emergency network of the Library and to sign the Library's *Charter of Library Mutual Assistance*. Library instructors have heard from individual federal librarian audience members since the training occurred on a variety of special issues.

In addition to the lectures and practica, students also received an extensive Web-based bibliography that incorporated Webinars, lectures, and readings on each of the topics discussed, greatly extending the reach of the course. Copies of these 60 page handouts were distributed to attendees of the FLICC workshop and will be distributed to IFLA participants who request it by writing moey@loc.gov.

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