

INTERCONNECTED:

How Public Libraries as Essential Information Infrastructures Enhance Community Resilience

INTERCONNECTED is a three-year **Community Catalyst** Early Career Development project, Dr. Beth Patin from the Syracuse University (SU) School of Information Studies requests \$290,450 from the Laura Bush 21st Century Librarian Program for a **research in service to practice** investigation into how public libraries **build capacity** to enhance community resilience throughout disasters. SU will costshare \$132,697 in PI academic salary and fringe and graduate tuition support.

The project will address the following research questions:

- (1) What roles have public libraries previously played throughout disasters?
- (2) How can public libraries build capacity throughout disasters to enhance community resilience?
- (3) What are the critical elements of a flexible and comprehensive disaster management plan?
- (4) What are the best practices for libraries to collaborate across sectors to enhance community resilience?

By answering these questions, the proposed project contributes to both theoretical and practical knowledge of what information practices and library services can help enhance community resilience. Additionally, research outcomes will further develop understanding among Library and Information Science (LIS) researchers and practitioners about the best practices to plan for disaster management and will lead to the creation of a toolkit to practically support public libraries in addressing vital community needs throughout disasters.

Statement of Broad Need

Disasters are occurring more frequently and are also increasing in severity (Scholl and Patin, 2013). We know libraries play critical roles in their communities in the aftermath of disasters, but little research examines the roles public libraries play across multiple disaster types. Unfortunately, much of the existing research focuses primarily on medical, special, or corporate libraries. Additionally, the body of research that is available is often case studies focusing on public libraries in a specific disaster type such as a hurricane in Florida. For example, (Zach and McKnight, 2010), while studying library response after hurricanes, found that public libraries helped communities prepare before the storm, provided emergency information after the storms, provided physical shelter and aid, and assisted in cleaning up damage. Different disasters types require different plans and responses, and yet, it is impossible to prepare for every potential scenario, necessitating disaster planning to be flexible. It is essential to expand what is known about the role of public libraries during disasters and convey that information to librarians in a practical way so the information is actionable.

FEMA (2010) called for the building of core capabilities by certain organizations to confront disasters and for those organizations to measure and track progress of how communities can collaborate to better respond and rebuild after an event. These *Essential Community Organizations*, as they are designated by FEMA, are those organizations whose services are “necessary to save lives, or to protect and preserve property or public health and safety” (FEMA 2010). Specifically, FEMA formally designated public libraries (Stafford Act 2011) as essential community organizations, adding public libraries to the category of essential community services including police, fire protection/emergency services, medical care, education, and utilities. This new designation assumes public libraries have the potential to enhance resilience, justifying public libraries as a critical focus for this research study.

Despite this classification, public libraries remain underprepared to implement flexible and comprehensive disaster response plans. Additionally, there is a lack of knowledge of the roles of libraries throughout disasters and of disaster management and community resilience for library decision makers. The emergency response literature is clear about the importance of resilience and the organizations expected to be involved in emergency management. However, FEMA falls short in identifying the specific roles said organizations should play. This research fills this gap by naming specific actions, roles, and services libraries can play to make their communities more resilient.

Much of the existing research focuses on preservation of materials rather than services. Additionally, there is tension around the designation of libraries as essential which requires many librarians to work during the pandemic, hurricanes, etc. However, many librarians then did not qualify for the vaccine as an essential community worker. Experiencing Hurricane Katrina as both a victim and a librarian helped me understand the critical nature of information, especially actionable information, during a disaster. For example, FEMA forms must be filled out online. However, this means the responsibility is on victims, who might not have the infrastructure or access on a blue sky day to fill out the forms. This has been demonstrated again more recently with the difficulty some community members have had in navigating the Covid vaccination appointment websites.

Before the 2004 and 2005 Gulf Coast hurricanes, a significant amount of anecdotal evidence about the roles public libraries play during disasters was published. However, as with disaster plans and planning, there remains a shortage of scholarly research identifying and clarifying those roles. However, two studies exist that identify the roles libraries are playing in disasters. Featherstone et al. (2008) have, so far, provided the only comprehensive list of the roles of libraries throughout disaster events. They relied upon an oral history project conducted by the National Library of Medicine to identify specific roles. Researchers conducted twenty-three telephone and email interviews of North American librarians who responded to bombings and other acts of terrorism, earthquakes, epidemics, fires, floods, hurricanes, and tornados. They included various library types in their interviews but were focused on illuminating roles for medical libraries.

Featherstone et al. (2008) found “librarians--particularly health sciences librarians--made significant contributions to preparedness and recovery activities surrounding recent disasters” (p.343). They identified the roles libraries played, classifying them into eight categories: institutional supporters, collection managers, information disseminators, internal planners, community supporters, government partners, educators and trainers, and information community builders. This is the first delineation of specific roles libraries play. However, because this work’s primary goal was to consider the role of medical libraries, these roles need to be verified across different library types. Featherstone et al. (2008) also emphasize the value of collaborative relationships between libraries and local, state, and federal disaster management agencies and organizations. This is a significant distinction from previous research that does not merely investigate the library building or its collections, but drives libraries to work with outside organizations in their communities. This emphasis is the beginning of a push for libraries to have a seat at the table in disaster planning in their communities. However, it does not name what organizations libraries should work with, nor does it provide best practices for working with them.

Like Featherstone et al. (2008), Zach and McKnight (2010) recommend that libraries need to collaborate with other organizations. Still, no evidence was presented regarding how to best work with other organizations to meet the information needs of the public in times of crisis. Additionally, while she encourages libraries to collaborate with organizations, she does not mention specific

organizations with whom libraries should be collaborating. More research is needed to understand who libraries collaborate with before we can discuss best practices. This research works to confirm public libraries play these same roles as medical libraries. Additionally, it addresses this gap by identifying what organizations public libraries work with throughout disasters.

Some of the most crucial research evidence was discovered almost by accident. Though the goal of this national survey was to understand internet access in public libraries and not the role of libraries during disasters, the open-ended question at the end of their survey captured the significance of libraries after several Gulf Coast Hurricanes in 2004 and 2005. The last question of the survey asked, "In the space below, please identify the single most important impact on the community as a result of the library branch's public access to the Internet" (Jaeger et al. 2007, p. 201). Respondents overwhelmingly discussed the services they provided in the wake of several hurricanes. This survey led to their next study, reviewed below, which is a more complete study of libraries during disasters. Jaeger et al. (2007) found libraries strengthened their communities in several ways, including: Helping communities prepare; providing emergency information; giving shelter; providing physical aid; caring for community members in need; working with relief organizations; and cleaning up the damage after the storms. Their research covered a wide variety of public libraries concerning location and size, but focused singularly on hurricanes. The authors call for the need to clearly define the roles of public libraries in disaster situations within the community. This research provides the foundation for the study of actions, services, and roles libraries play. As well as responds to their recommendation for more library involvement in emergency preparedness and disaster planning.

This project addresses this issue by creating a training program for library directors to help them understand the roles libraries have previously played throughout disasters, community resilience and disaster management and through the creation of a toolkit to help them select the components of a flexible & responsive disaster management plan. This research uses the concept of resilience in order to understand how libraries both prepare for and deal with disasters within the communities they serve. Such events stress communities in many ways, and recent history suggests that libraries can be central to local response and assistance. Their ability to work within their communities is an expression of their own resilience. Organizational resilience is at least in part as the ability to effectively use whatever resources are on hand. For libraries, this may depend on their internal capabilities including staff expertise, the specific context of the disaster and the organization, the ability to improvise and adapt to changing circumstances, and a flexible and practical disaster management plan.

Resilience means: mitigating and withstanding the stress of manmade and natural disasters recovering in a way that restores normal functioning, applying lessons learned from past responses to better withstand future incidents. Given local variability in community priorities, needs, and approaches for resilience, every community faces unique challenges and must tailor relevant and achievable resilience goals and means to measure progress toward those goal selectiveness of their efforts to do so. This project works to empower library directors and managers, who know their community and its needs and resources best, to make a custom, flexible, and responsive plan that supports their unique organization.

Resilience is an important part of our emergency management plan in the United States. President Obama (2009) formally established the Office of Resilience within the National Security Council in the White House with a goal: if communities can increase their resilience, then they are in a much better position to withstand adversity and to recover more quickly than would be the case otherwise. Our

national preparedness agencies seek to create more resilient communities (Obama, 2011; White House, 2010). Unfortunately, the concept of resilience was incorporated into emergency management without the ability to predict or measure it (Cutter et al., 2008). This is an example of policy being ahead of research: we have incorporated the concept of resilience as a major aspect of our emergency response without a clear understanding of what it is or how to obtain it. Further, resilience was adopted into our national response while lacking metrics for benchmarks or measurements. Substantive and rigorous research studies are needed to identify how community organizations might add to resilience.

The United States does not currently have a consistent basis for measuring resilience that includes all of these dimensions, making it difficult for communities to monitor improvements or changes in their resilience. Without a clear understanding of what it means to be resilient, supported by research findings, local organizations have no specific directives for how they might enhance community resilience or how to determine the effective resilience indicators or measures. Although more indicators may emerge during the content analysis of resilience measurement efforts, four generally agreed upon elements include:

1. **Vulnerable Populations**—factors that capture special needs of individuals and groups, related to components such as minority status, health issues, mobility, and socioeconomic status
2. **Critical and Environmental Infrastructure**—the ability of critical and environmental infrastructure to recover from events—components may include water and sewage, transportation, power, communications, and natural infrastructure
3. **Social Factors**—factors that enhance or limit a community's ability to recover, including components such as social capital, education, language, governance, financial structures, culture, and workforce
4. **Built Infrastructure**—the ability of built infrastructure to withstand impacts of disasters, including components such as hospitals, local government, emergency response facilities, schools, homes and businesses, bridges, and roads

Although measuring resilience is a challenge, metrics and indicators to evaluate progress, and the data necessary to establish the metric, are critical for helping communities to clarify and formalize what the concept of resilience means for them, and to support efforts to develop and prioritize resilience.

Community resilience is a measure of how well communities can adapt to threats and vulnerabilities. *Adaptive capacity* is the ability of a system to adjust, change, moderate the effects, and cope with a disturbance. All communities experience a mix of shocks and stressors. Therefore, measuring resilience can help communities and organizations (NRC, 2019):

- Raise awareness and garner buy-in among community stakeholders about the importance of being resilient;
- Define what resilience means within their communities;
- Establish their baseline resilience to enable them to monitor their progress toward specific goals;
- Identify their risks and prioritize their needs and goals;
- Compare the benefits of increasing resilience to its costs in order to prioritize investments;
- Allocate limited resources for their resilience-building efforts;
- Quantify desired returns associated with investments to enhance resilience or prioritize among possible investments; and/or
- Determine whether they make progress toward goals, and if so, how quickly.

Project Design

This qualitative community catalyst project will take place over three years in three cumulative phases. The PI's body of research demonstrates the community resilience (Norris et al., 2008) conceptual framework is suitable for understanding how public libraries support their communities after disasters (Norris et al., 2008; Patin, 2019; Veil and Bishop, 2012). The theoretical approach used to frame this research is based on Norris et al.'s (2008) theory of community resilience. In their framework, Norris et al. define communities' resilience as a measure of how well communities adapt after a disaster event. They argue that resilience requires a conscious effort and must be maintained over time. This project will consist of a content analysis of library response during disasters, a second content analysis of resilience measurement efforts, and a third content analysis to understand the elements of current library disaster management plans. The findings will be used to create a toolkit for library disaster management as well as training materials and educational resources maintained on a project website. When you complete this training, you will have a real action plan to use that will help you build resilience in your public library organization bolstering your capacity to respond to and recover from disaster. The toolkit and training materials will incorporate language from FEMA to help librarians become familiar with emergency response standards and language which will allow them to collaborate with other organizations around community resilience more effectively. Additionally the toolkit will provide materials and trauma informed practice to support library directors in understanding how to support individuals through a traumatic event.

Research Questions and Outcomes

The project will address the following research questions:

- (1) What roles have public libraries previously played throughout disasters?
- (2) How can public libraries build capacity throughout disasters to enhance community resilience?
- (3) What are the critical elements of a flexible and comprehensive disaster management plan?
- (4) What are the best practices for libraries to collaborate across sectors to enhance community resilience?

The outcomes of this project are:

- (1) Identification of roles for public libraries in disaster management;
- (2) Identification of ways public libraries can build capacity throughout disasters;
- (3) Creation and evaluation of a toolkit and training materials to help library communities create flexible and comprehensive disaster management plans, including best practices to connect and collaborate across sectors.

Focus on Public Libraries

The [Robert T. Stafford Act of 2011](#) designated public libraries as *Essential Community Organizations*, requiring libraries to support and serve their communities after a declared disaster. It is critical we understand the roles they've previously played, how we can measure our capacity to build community resilience, and the elements of a flexible and practical disaster management plan for public libraries. Libraries are often considered trusted organizations within their communities and are found in 98% of the counties and parishes in the United States (Patin, 2020). However, the organizational structures of libraries, risks they face, and resources all differ. This means their resilience capacity could also vary tremendously. This research will try to account for variation in resilience among public libraries facing disaster circumstances, and speaks to the IMLS interest in "developing the knowledge and competencies in libraries that can identify opportunities and address community needs".

Research Activities

The PI will conduct a three-stage content analysis of documents to understand the roles libraries have previously played during disasters, the indexes used to measure community resilience, and the elements of library disaster plans. The first content analysis will focus on items in the [Disaster Information Management Research Center](#) database, which is composed of items identified by the U.S. Department of Health and Human Services' National Library of Medicine. This database contains a collection of published literature, both research-based and anecdotal, on the roles of librarians and information professionals in "the provision of disaster-related information" (NLM, 2016). For this project, 335 items (n=335) have been identified relating to libraries during crises and coded using the community resilience theory as an initial framework. The initial coding scheme will be deduced from the concepts of the community resilience framework (Norris et al. 2008). The content analysis focused on: the actions public libraries have taken throughout disasters; the services libraries have demonstrated previously throughout disaster; and the roles public libraries play throughout disasters to enhance community resilience.

For the second content analysis the PI will code thirty-three (n=33) different community resilience measurement efforts. Resilience measurement efforts vary widely and include: (1) defining and explaining (or operationalizing) a specific resilience construct, indicator, or community capital; (2) promotion of checklists or scorecards that centrally assemble indicators or subjects associated with community resilience; (3) processes and guidance to communities on indicators or subjects that could be measured locally; or (4) the encouragement of the use of specific databases, analytical methods, or tools for communities' use in measuring. None of these measurement efforts specifically focus on library organizations and therefore these measurement efforts need to be systematically reviewed through a LIS lens. The results of this content analysis will help the LIS field understand both theoretically and practically how resilience can be thought of in public libraries and how we can measure our own risks and capacities. For the third content analysis, the PI will gather library disaster management plans (n=100) and identify common elements, strategies, practices, procedures, and policies. The research team will use these findings to identify to inform library directors what parameters they should consider to identify their community's specific risks. The coding for these analyses will happen in qualitative coding software.

Finally, the findings from these content analyses will be used to create a toolkit of resources to help public libraries, directors, managers, and librarians understand disaster management and community resilience as well as give them the tools and resources to make their own flexible disaster management plan. The PI will use FEMA's Threat and Hazard Identification and Risk Assessment (THIRA) and Stakeholder Preparedness Review (SPR) Guide as a framework to guide the public library directors and managers through the process of building their disaster management plan to enhance community resilience (See *Supportingdocument3*). Finally, the INTERCONNECTED research team will design a workshop for library directors based on these findings. In addition to the feedback from the participants of the workshop, the PI will also receive feedback throughout the project from advisory boards (see *below*). These primary research activities will occur over three phases, as described below:

Phase One:

Recruit PhD Student.

Hire Master's student as a graduate assistant (for year 1).

Collect Items for content analyses.

Collect library disaster management plans.

Perform 3 content analyses:

- Library Roles throughout Disaster
- Resilience Measurement Efforts
- Library Disaster Management Plans

Convene Advisory board to discuss content analyses findings.

Identify components of toolkit based on findings and feedback from the advisory board.

Write Year 1 Project Evaluation Report.

Phase Two:

Write up findings from the content analyses for scholarly publication.

Hire Faculty Assistant (for year 2) and, graduate student (year 2), PhD student (years 2 and 3).

Create the first draft of the toolkit.

Convene Advisory board to discuss content initial toolkit.

Revise Toolkit based on feedback from the advisory board.

Create training videos for toolkit.

Identify resources and other materials to share on the project website.

Share revised toolkit and training materials with the advisory board.

Convene advisory board to discuss toolkit and training materials.

Revise Toolkit and training materials based on feedback.

Write Year 2 Project Evaluation Report.

Phase Three:

Hire Faculty Assistant (for year 3) and graduate student (year 3).

Recruit 20 Library Directors/Managers to attend a workshop.

Plan and Host Online Half-Day toolkit workshop for library directors.

Convene Advisory board to discuss feedback from directors.

Revise Toolkit and training materials based on all feedback.

Publish toolkit and training materials.

Convene Advisory board to discuss final toolkit and training materials and the promotion and publication of project materials.

Promote toolkit at national conferences, through traditional and social media outlets, and through webinars.

Promote toolkit and project resources through major publication venues.

Write Project Evaluation Report.

Dissemination Plan

The toolkit, training materials, project reports, and findings will be posted on the INTERCONNECTED website. Additionally, the reports, datasets, and workshop materials in PDF/A format will be housed in SURFACE the Syracuse Digital Commons (the institutional repository for Syracuse). The PI and student research team will share findings at state library conferences such as NYLA and TLA, national conferences such as ALA and ALISE, and at library leadership organizations like LLAMA. Additionally, the PI and the student research team will target publication venues such as Library Quarterly, Public Library Quarterly, and American Libraries. Finally, the research team will promote toolkit via Syracuse University Social Media, an official university press release, on the Syracuse University School of Information Studies website, the Northern New York Library Network (NNYLN), and other social media spaces for librarians.

Project Evaluation

At the end of each grant phase, a report will be generated to report on the effectiveness, efficiency, quality, and timeliness of the research. The grant report will use the finished outcomes of the project as indicators of success. In addition, the advisory board and public library directors will have the opportunity to interact with the toolkit and the training materials and to provide feedback to ensure the project is of a high quality and suitable to the public library audience. The PI and research team will use the schedule of completion to assess for timeliness.

Project Staff and Resources

INTERCONNECTED's (PI), Beth Patin, PhD is an Assistant Professor at Syracuse University's School of Information Studies. Her dissertation research examined community resilience and the roles libraries play throughout disasters to build community capacity. Dr. Patin's research agenda focuses on the equity of information and justice. This research agenda has resulted in three, overlapping streams of work: crisis informatics, community resilience, and cultural competence. She was named an American Library Association *Emerging Leader* and is the co-founder of the *Library Information Investigative Team* research group. She is currently working as a consultant on one IMLS grant – Information Literacy Instruction for Library Professionals. Dr. Patin will serve as the principle investigator for this project and will manage and coordinate all aspects of this research. This project builds on the PI's previous research and experience as a librarian during disasters and tornadoes. In 2005, Hurricane Katrina [destroyed her school library](#), motivating her to think about how libraries serve their communities during extreme events. This personal experience led to research on [resilient information infrastructures](#), [the role of public libraries in Chile after their earthquake and tsunami in 2010](#), [public libraries and community resilience](#), and [the LIS response to Covid and the 2020 protests](#). This research project works to further her agenda on libraries and community resilience.

The PI will dedicate 4 hours per week to the project during the academic year, and 20 hours during the summer semesters. Additionally, the PI will apply for a sabbatical semester to run concurrently with the start of year 2 of the proposed project. During this time, the PI will facilitate the initial creation of the toolkit, complete any remaining analysis, and work towards the creation of scholarly articles and presentations to disseminate findings from phase 1. She will supervise a student research team who will aid in organizing of resources, creating the toolkit and training materials website, and revising the toolkit as we receive feedback from stakeholders. Additionally, she will supervise a doctoral student who will focus on data analysis of findings, visualizing findings, recruiting library director participants for the workshop, communicating with the advisory board, and disseminating the findings.

Throughout the project, the PI will meet regularly with an advisory board to receive feedback on the project's progress and development. Formal meetings will occur 1-2 times per year via online conference software. The advisory board is composed of experts at the intersection of library management, disaster planning and management, and LIS research for this project. The advisory board will provide feedback and assessment on data collection instruments, project findings, as well as during the design, creation, and dissemination of the toolkit, ensuring it is relevant for LIS researchers and practical for US public libraries. Members have an extensive history of research or practical experience in disaster and/or library management. The PI will also periodically request feedback outside of formal meetings via email. Each board member will be compensated \$1000 for their time and expertise. The following five individuals have agreed to serve as advisory board members for the duration of the project:

- Dr. Marcia Mardis the Associate Dean for Research, Coordinator for Educational Informatics, and Associate Director the FSU Information Institute

- Dr. Jason Cooper, Jr. Director, Texas Target Communities; Director of Outreach, Hazard Reduction & Recovery Center; Associate Professor of Practice, Department of Landscape Architecture & Urban Planning
- Meg Backus, Executive Director of Northern New York Library Network (NNYLN)
- Jose Aponte, Former Director of the San Diego County Library System
- Seale Patterson, Director of the Hubbell Library

Additionally, three seasoned researchers have agreed to serve as mentors for this project: Dr. Marcia Mardis (Florida State University), Dr. Megan Oakleaf (Syracuse University), and Dr. Amelia Gibson (University of North Carolina). All three mentors have extensive experience serving as PI and co-PIs on large, grant-funded projects in the areas of LIS (all have worked on IMLS grants and specifically been awarded IMLS career grants). Mentors will provide advice and ongoing assessment, feedback, and evaluation at all stages of the research process, data collection and analysis, and findings.

At the beginning of the third year of the project, the PI will recruit 20 library directors and managers to test the toolkit and training materials in a half-day workshop. Their input will be critical for codifying the structure of the final iteration of toolkit. The library directors and managers will be compensated \$150 for attending the workshop and providing feedback about the toolkit and training materials.

The proposed project budget includes the costs for the INTERCONNECTED staff including the PI, a master's student assistant (3 years), a faculty assistant (2 years), and a doctoral assistant (2 years). All students will have the opportunity to publish, create, and share the results of the project and will work closely with me to develop the project. The budget also supports research-related travel, participant stipends, qualitative software, advisory board stipends, and dissemination travel costs.

Impact of Covid on Research Design

This research has been designed considering the ongoing ramification and considerations necessary to keep our community safe during a global pandemic. Advisory board meetings and the training workshop for libraries will be held online. In years two and three, the PI and doctoral student intend to travel in order to promote and disseminate the project presuming it is safe to do so by that point. However, if travel is deemed unsafe at that time, the PI will develop alternative online solutions to help disseminate the work through virtual conferences, webinars, and via social media.

Diversity Plan

As the Coronavirus pandemic and recent natural disasters remind us: vulnerable communities suffer disproportionately in the aftermath of disasters. It is critical for any resilience and disaster management research to consider which communities are systematically disenfranchised and therefore assume higher risk levels in a crisis. Age, gender, income, and race and ethnicity have an important influence on risk of loss from hazard events and the ability to cope, respond, and recover from hazard events (Berke et al, 2019). For example, the elderly may be infirmed and less able to avoid harm; women have lower pay and lower status in society resulting in disproportionate losses; and racial minority status is a determinant of higher losses. Crenshaw (1991) notes that often these population characteristics are intersectional (e.g., minority, women, and people with health limitations), aggravating the impact of these vulnerabilities. If library disaster management plans do not consider the impact of intersectionality on vulnerability, even well-intentioned policies can increase risk and exacerbate these inequalities. By intentionally planning to consider our most vulnerable community members, this research will help ensure community resilience at all levels.

The PI is from an intersectional, minoritized community, so supporting this work increases visibility and production of research by diverse LIS researchers. Additionally, the PI's background in cultural competence, information equity, and facilitating dialogue will assist in providing an inclusive atmosphere for the student research team and more candid discussions during the workshop and advisory board meetings. The members of the advisory board are intentionally diverse in terms of race, gender, and the geographic regions and types of disaster types they represent. Additionally, Dr. Cooper's research specifically works to understand vulnerable communities during disasters. Finally, students from minoritized communities will be given a hiring preference for the project's graduate and doctoral assistantships.

Broad Impact

The proposed project builds on the PI's previous research, and the anticipated findings will contribute to both scholarly and professional communities. These new findings will act as a catalyst and generate insight into libraries' roles throughout various disaster types, provide a flexible disaster management plan for public libraries, and establish guidelines for partnering with relevant disaster response organizations to help enhance community resilience after disasters. The findings of this work will broaden the scope of what is known about public libraries and various types of disasters. They will be essential in establishing an agenda of research on crisis informatics and libraries as well as improving our practice around library management in extreme events. One important goal will be to share the research findings in order to help libraries and communities work with each other and address regional problems. Our advisory board members were selected to ensure the practicality of the toolkit for diverse public libraries and are committed to leveraging their networks to help disseminate and share the toolkit. The developed best practices and protocols will provide library directors and managers the tools for assessing their library's vulnerability and creating a disaster plan to enhance community resilience.

Additionally, this project's findings can serve as the foundation for future workshops instructing librarians in creating comprehensive disaster management plans. Further, this research has a potential impact on teaching in MLIS programs by identifying a clear path to help librarians plan and prepare for extreme events. This work will seek to share our work at the Texas Library Association Annual Conference and the American Library Association and Public Library Association conferences and the Association of Rural and Small Libraries. We also plan to submit results in scholarly journals and to communicate with policy constituencies such as ALA as well as in social media groups for librarians.

To help support the sustainability of this project, the Syracuse School of Information Studies will continue to host the toolkit and training materials after the conclusion of the award. Additionally, to make sure the toolkit remains useful, the school will provide financial support to maintain the toolkit for two years after it was created. Finally, while the project aims to address public libraries' specific needs, its findings could easily be adapted for special, corporate, and academic libraries, schools.



INTERCONNECTED Schedule of completion
Year 1: 8/21 – 7/22

Tasks	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
Hire Master’s Student Assistant	[Task completed from Aug to Jul]											
Recruit PhD Student	[Task completed from Aug to Jul]											
Collect Items for content analysis	[Task completed from Aug to Jul]											
Collect library disaster management plans	[Task completed from Aug to Jul]											
Perform content analysis	[Task completed from Aug to Jul]											
<ul style="list-style-type: none"> Library Roles throughout Disaster Resilience Measurement Efforts Library Disaster Management Plans 	[Task completed from Aug to Jul]											
Convene Advisory board to discuss content analysis	[Task completed from Aug to Jul]											
Identify components of toolkit based on findings and feedback	[Task completed from Aug to Jul]											
Write Year 1 Project Evaluation Report	[Task completed from Aug to Jul]											

Interconnected Schedule of Completion
Year 2: 8/22 – 7/23

Tasks	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
Write up findings from the content analyses for scholarly publication	[Task completed from Aug to Jul]											
Hire Master’s Student Assistant (for year 2)	[Task completed from Aug to Jul]											
Hire Faculty Assistant (for year 2) and PhD student (years 2 and 3)	[Task completed from Aug to Jul]											
Create the first draft of the toolkit	[Task completed from Aug to Jul]											
Convene Advisory board to discuss content initial toolkit	[Task completed from Aug to Jul]											
Revise Toolkit based on feedback from advisory board	[Task completed from Aug to Jul]											
Create training videos for toolkit	[Task completed from Aug to Jul]											
Identify resources and other materials to share on the project website	[Task completed from Aug to Jul]											
Share revised toolkit and training materials with advisory board	[Task completed from Aug to Jul]											
Convene advisory board to discuss toolkit and training materials	[Task completed from Aug to Jul]											
Revise Toolkit and training materials based on feedback	[Task completed from Aug to Jul]											
Write Year 2 Project Evaluation Report	[Task completed from Aug to Jul]											



DIGITAL PRODUCT FORM

INTRODUCTION

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to digital products that are created using federal funds. This includes (1) digitized and born-digital content, resources, or assets; (2) software; and (3) research data (see below for more specific examples). Excluded are preliminary analyses, drafts of papers, plans for future research, peer-review assessments, and communications with colleagues.

The digital products you create with IMLS funding require effective stewardship to protect and enhance their value, and they should be freely and readily available for use and reuse by libraries, archives, museums, and the public. Because technology is dynamic and because we do not want to inhibit innovation, we do not want to prescribe set standards and practices that could become quickly outdated. Instead, we ask that you answer questions that address specific aspects of creating and managing digital products. Like all components of your IMLS application, your answers will be used by IMLS staff and by expert peer reviewers to evaluate your application, and they will be important in determining whether your project will be funded.

INSTRUCTIONS

If you propose to create digital products in the course of your IMLS-funded project, you must first provide answers to the questions in **SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS**. Then consider which of the following types of digital products you will create in your project, and complete each section of the form that is applicable.

SECTION II: DIGITAL CONTENT, RESOURCES, OR ASSETS

Complete this section if your project will create digital content, resources, or assets. These include both digitized and born-digital products created by individuals, project teams, or through community gatherings during your project. Examples include, but are not limited to, still images, audio files, moving images, microfilm, object inventories, object catalogs, artworks, books, posters, curricula, field books, maps, notebooks, scientific labels, metadata schema, charts, tables, drawings, workflows, and teacher toolkits. Your project may involve making these materials available through public or access-controlled websites, kiosks, or live or recorded programs.

SECTION III: SOFTWARE

Complete this section if your project will create software, including any source code, algorithms, applications, and digital tools plus the accompanying documentation created by you during your project.

SECTION IV: RESEARCH DATA

Complete this section if your project will create research data, including recorded factual information and supporting documentation, commonly accepted as relevant to validating research findings and to supporting scholarly publications.

SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS

A.1 We expect applicants seeking federal funds for developing or creating digital products to release these files under open-source licenses to maximize access and promote reuse. What will be the intellectual property status of the digital products (i.e., digital content, resources, or assets; software; research data) you intend to create? What ownership rights will your organization assert over the files you intend to create, and what conditions will you impose on their access and use? Who will hold the copyright(s)? Explain and justify your licensing selections. Identify and explain the license under which you will release the files (e.g., a non-restrictive license such as BSD, GNU, MIT, Creative Commons licenses; RightsStatements.org statements). Explain and justify any prohibitive terms or conditions of use or access, and detail how you will notify potential users about relevant terms and conditions.

A.2 What ownership rights will your organization assert over the new digital products and what conditions will you impose on access and use? Explain and justify any terms of access and conditions of use and detail how you will notify potential users about relevant terms or conditions.

A.3 If you will create any products that may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities, describe the issues and how you plan to address them.

SECTION II: DIGITAL CONTENT, RESOURCES, OR ASSETS

A.1 Describe the digital content, resources, or assets you will create or collect, the quantities of each type, and the format(s) you will use.

A.2 List the equipment, software, and supplies that you will use to create the digital content, resources, or assets, or the name of the service provider that will perform the work.

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG, OBJ, DOC, PDF) you plan to use. If digitizing content, describe the quality standards (e.g., resolution, sampling rate, pixel dimensions) you will use for the files you will create.

Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan. How will you monitor and evaluate your workflow and products?

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period. Your plan should address storage systems, shared repositories, technical documentation, migration planning, and commitment of organizational funding for these purposes. Please note: You may charge the federal award before closeout for the costs of publication or sharing of research results if the costs are not incurred during the period of performance of the federal award (see 2 C.F.R. § 200.461).

Metadata

C.1 Describe how you will produce any and all technical, descriptive, administrative, or preservation metadata or linked data. Specify which standards or data models you will use for the metadata structure (e.g., RDF, BIBFRAME, Dublin Core, Encoded Archival Description, PBCore, PREMIS) and metadata content (e.g., thesauri).

C.2 Explain your strategy for preserving and maintaining metadata created or collected during and after the award period of performance.

C.3 Explain what metadata sharing and/or other strategies you will use to facilitate widespread discovery and use of the digital content, resources, or assets created during your project (e.g., an API [Application Programming Interface], contributions to a digital platform, or other ways you might enable batch queries and retrieval of metadata).

Access and Use

D.1 Describe how you will make the digital content, resources, or assets available to the public. Include details such as the delivery strategy (e.g., openly available online, available to specified audiences) and underlying hardware/software platforms and infrastructure (e.g., specific digital repository software or leased services, accessibility via standard web browsers, requirements for special software tools in order to use the content, delivery enabled by IIIF specifications).

D.2. Provide the name(s) and URL(s) (Universal Resource Locator), DOI (Digital Object Identifier), or other persistent identifier for any examples of previous digital content, resources, or assets your organization has created.

SECTION III: SOFTWARE

General Information

A.1 Describe the software you intend to create, including a summary of the major functions it will perform and the intended primary audience(s) it will serve.

A.2 List other existing software that wholly or partially performs the same or similar functions, and explain how the software you intend to create is different, and justify why those differences are significant and necessary.

Technical Information

B.1 List the programming languages, platforms, frameworks, software, or other applications you will use to create your software and explain why you chose them.

B.2 Describe how the software you intend to create will extend or interoperate with relevant existing software.

B.3 Describe any underlying additional software or system dependencies necessary to run the software you intend to create.

B.4 Describe the processes you will use for development, documentation, and for maintaining and updating documentation for users of the software.

B.5 Provide the name(s), URL(s), and/or code repository locations for examples of any previous software your organization has created.

Access and Use

C.1 Describe how you will make the software and source code available to the public and/or its intended users.

C.2 Identify where you will deposit the source code for the software you intend to develop:

Name of publicly accessible source code repository:

URL:

SECTION IV: RESEARCH DATA

As part of the federal government's commitment to increase access to federally funded research data, Section IV represents the Data Management Plan (DMP) for research proposals and should reflect data management, dissemination, and preservation best practices in the applicant's area of research appropriate to the data that the project will generate.

A.1 Identify the type(s) of data you plan to collect or generate, and the purpose or intended use(s) to which you expect them to be put. Describe the method(s) you will use, the proposed scope and scale, and the approximate dates or intervals at which you will collect or generate data.

A.2 Does the proposed data collection or research activity require approval by any internal review panel or institutional review board (IRB)? If so, has the proposed research activity been approved? If not, what is your plan for securing approval?

A.3 Will you collect any sensitive information? This may include personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information. If so, detail the specific steps you will take to protect the information while you prepare it for public release (e.g., anonymizing individual identifiers, data aggregation). If the data will not be released publicly, explain why the data cannot be shared due to the protection of privacy, confidentiality, security, intellectual property, and other rights or requirements.

A.4 What technical (hardware and/or software) requirements or dependencies would be necessary for understanding retrieving, displaying, processing, or otherwise reusing the data?

A.5 What documentation (e.g., consent agreements, data documentation, codebooks, metadata, and analytical and procedural information) will you capture or create along with the data? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the data it describes to enable future reuse?

A.6 What is your plan for managing, disseminating, and preserving data after the completion of the award-funded project?

A.7 Identify where you will deposit the data:

Name of repository:

URL:

A.8 When and how frequently will you review this data management plan? How will the implementation be monitored?