



NATIONAL LEADERSHIP GRANTS FOR LIBRARIES

Sample Application LG-259845-OLS-26
Project Category: Planning

University of Idaho, Library

Amount awarded by IMLS: \$130,652
Amount of cost share: \$0

The University of Idaho in partnership with Penn State University will plan a project to complete a national inventory and needs assessment survey on archival aerial photography in academic libraries. This project will result in the completion of a national inventory of library-based archival aerial photography collections and an institutional needs assessment to make these collections more accessible to a broad audience of users and the general benefit of society. The primary audience of the project will be librarians who work with archival aerial photography including map and geospatial librarians and archivists. The project will produce a nationwide inventory of aerial photography collections held by academic libraries that will be posted online for reference by the academic library community as well as other users and service providers. It will also complete a needs assessment of academic libraries with respect to developing library services around archival aerial photography.

Attached are the following components excerpted from the original application.

- Narrative
- Schedule of completion

When preparing an application for the next deadline, be sure to follow the instructions in the most recent Notice of Funding Opportunity for the grant program to which you are applying.

Modernizing Library-based Archival Aerial Photography Collections

PI: Bruce Godfrey (University of Idaho)

Co-PI: Nathan Piekielek (Pennsylvania State University)

Introduction. A team led by the University of Idaho partnering with Penn State University respectfully requests \$130,652 for a one-year planning project to complete a national inventory and needs assessment survey on archival aerial photography in academic libraries. As the United States prepares to celebrate its 250th anniversary, archival aerial imagery emerges as a valuable historical resource that has the potential to deepen our understanding of the nation's development and maturation as a world leader. Recent technological advancements have increased the utility of and demand for archival aerial photography because they provide unique visual records of America's landscape, urbanization, and topographic changes over the last century. Many academic libraries manage large archival aerial collections, but are not well-prepared to meet this new demand. In support of IMLS National Leadership Grant (NLG-L) Agency-level Goal 3 to Advance Collections Stewardship and Access, the project will produce a nationwide inventory of aerial photography collections held by academic libraries that will be posted online for reference by the academic library community as well as other users and service providers. The project will also complete a needs assessment of academic libraries with respect to developing library services around archival aerial photography, the results of which will inform a subsequent IMLS NLG-L National Implementation grant proposal designed to meet these needs. The project will be introduced to the academic library community at a national library conference and results will be shared at another national library conference and through publication of a peer-reviewed journal article. The specific audience for this work includes academic geospatial librarians and archive managers with archival aerial photography collections; however, the anticipated impact of the project is expected to extend to a broad cross-section of researchers and the public who are interested in visual histories of America's storied landscapes.

Project Justification. As the United States approaches its semiquincentennial, archival aerial imagery stands as an indispensable "time machine" that documents the country's physical landscape evolution. While founding documents capture the spirit of democracy, aerial archives—dating back to the early 20th century—provide a unique record of how the American landscape has been shaped by population growth, the expansion of infrastructure, and the transformation of rural and urban environments. Archival aerial photography formed the building blocks of mapping efforts from approximately 1920 – 2000; they provide authentic and accurate depictions of past land surface conditions for which there are often no alternatives making their information value high and unique (Luman, Stohr, and Hunt 1997). Photography was captured on physical film that is preserved (in film or print form) in academic libraries and government archives in the tens of millions of individual photographs nationwide. Recent technological advancements have increased the utility of and research interest in these primary source documents (Kostrzewa 2024).

Across the United States, academic libraries and government archives hold vast collections of archival aerial photography. Inhibiting our nation's use of archival aerial photography is their inaccessibility – they often lack spatial indexes (i.e. maps that show **where** they were captured and **how** they fit together), and many collections remain uncatalogued and consequently there is little information on what institutions have photographs of what locations, time-periods, and map scales. Combine this with their sheer number (it often takes hundreds of photographs to cover a single study area), and the norm has become that filing

cabinets full of archival aerial photographs sit unused in the basements of academic libraries all across the country. This inaccessibility limits our country's ability to fully engage with a critical visual record of its past. It is understandable that, amid competing priorities and limited resources, these "time capsules from the sky" have been overlooked. Over time, even basic expertise in interpreting and managing archival aerial photography has become rare within the academic library community. Meanwhile, interest in place-based history, landscape change, infrastructure development, and community heritage is growing—especially as we approach our 250th birthday. This proposal will serve as an essential first step toward unlocking these hidden national assets and addressing a problem the academic library community is facing: it is ill-prepared to meet new demands for archival aerial photographs.

Only by unlocking these national treasures will we be able to illuminate how, from a birds-eye view, American landscapes have evolved: how towns expanded, highways reshaped regions, and public works projects redefined communities. Making these visual records more accessible will deepen public understanding of America's physical growth and change, foster local and national storytelling, and ensure that as we commemorate 250 years of the United States, we do so with a clearer, evidence-based understanding of the landscapes that have shaped—and been shaped by—the American people.

The problem of archival aerial photography in academic libraries was identified through a combination of published scholarship, interactions with users, and the authors' observations of trends in research. Although archival aerial photographs are largely sidelined collections within academic libraries, there has been a small and engaged community of librarians who have worked hard to make their collections more accessible and have produced some scholarship on the topic. Notable scholarship has included calls for increased access to these collections and collaboration as a means to address related challenges (McAuliffe, Lage, and Mattke 2017). Both authors of this proposal provide public and research services related to the use of archival aerial photography and the needs of both groups are not being met well at present. In the case of researchers, many can download and manipulate image files well, but require that the images be stitched together across study areas that are often larger than a few photographs and sometimes do not conform neatly to political boundaries, meaning that knowing if other institutions have collections in the next state or county over is important; to do this requires cataloging, georeferencing or both. Researchers also often require that photographs conform to contemporary data formats and standards and even when digitized and geolocated (as is typical of practice at present), archival aerial photographs do not meet this standard. Public users often do not have the ability to download and manipulate large numbers of image files and would instead prefer to navigate a website that would allow them to "see" what they need to see on an interactive webpage. Even for collections that have been digitized with spatial indexes and posted online, they lack the data structure to provide online map interactivity in the way that would facilitate access for non-specialists. Finally, the authors have noted an increasing trend in published research from a variety of disciplines that first convert archival aerial photographs into geospatial data for the purposes of measurement and quantitative analysis. This requires advanced geospatial skills that not every researcher possesses, but considering recent publications on the topic, more and more researchers are asking for assistance in performing this data conversion. It is likely that there are also other challenges that users face, and a needs assessment survey would identify challenges faced by both users (as reported by service-providers) and service providers who are trying to meet those needs. Although beyond the scope of the current proposal, we anticipate submitting an IMLS NLG-L National Implementation grant proposal to address the needs of service providers that are identified by this project (see paragraph 1 on page 5 discussing the anticipated impact on library practice).

There are six prior and existing projects on which the present proposal builds or compliments. Most importantly, the present project builds on important support that the IMLS has already made available to improve access to archival aerial photography through their 2022 grant to the Pikes Peak Library District (MA-251766-OM-22) to digitize photographs and post them online. Other projects that intersect the present one include the 2006 American Library Association publication *Guide to U.S. Map Resources* that identified 146 academic libraries with “significant aerial photography collections” that collectively number in the millions of photographs with unknown duplication between them and/or with government archives (McAuliffe, Lage, and Mattke 2017). This guide was an outstanding start at inventorying which institutions manage archival aerial photographs but fell short of providing a useful level of detail to meet user needs and the aerial photography portion of the guide is no longer being kept up to date. Throughout the early 2000s, another inventory project published a more useful level of detail about collections in The Imaging & Geospatial Information Society (ASPRS) *Aerial Data Catalog* that was often referenced by librarians in search of archival aerial photography collections on behalf of their users. The Data Preservation and Archiving Committee (DPAC) of ASPRS was responsible for this catalog and is not maintaining it (Piekielek serves on DPAC). Instead, DPAC has shifted its focus to matching private aerial photography archive managers who are deaccessioning their collections or going out of business with public (and sometimes other private) institutions that will accept them in what they call their “Purge Alert”. Their goal is to preserve valuable archival aerial photography information resources and prevent their loss for the benefit of society. This work is also important and complements the present proposal.

Rather than focusing on inventory, others have focused on education and user-services. Recognizing the same increased interest in using archival aerial photography in research that the authors of this proposal have, in 2020 an academic library colleague developed a comprehensive aerial photography usage tutorial that covers the basics of archival aerial photographs and how to access and use them (Piekielek reviewed this tutorial and submitted comments to its author). The tutorial provides a recent and introductory educational resource geared towards researchers and compliments the present proposal (Thiry 2020). Finally, in 2020 one of the authors of the present proposal (Piekielek), completed and published a trial of three software programs that convert digitized archival aerial photographs into geospatial data that would meet a broad cross-section of user needs in a new way. These software tools represent the “technological advancement” reference in this proposal’s introduction that is driving new demand for archival aerial photographs. By completing a workflow of converting photographs to geospatial data, a service provider is solving many of the challenges identified earlier in this proposal related to user needs for structured data and online interactivity. Despite episodic interest in archival aerial photography over the last 25 years from the library and non-library communities, there remains a need for a contemporary and coordinated effort to inventory resources and identify user and service provider needs in working with collections.

The immediate target audience for the present proposal is the academic library community that manages significant archival aerial photography collections. According to the *Guide to U.S. Map Resources* (2006) that is now nearly 20 years old, this community is made up of 146 institutions (although we anticipate that this number has likely changed because of downsizing and deduplication of collections). Map and geospatial librarians are often the providers of public and research services and the collections themselves are sometimes managed by a different library administrative unit like a digital or special collections department. This means that the present inventory and needs assessment survey could receive multiple responses from each institution (i.e. more than 146), each response identifying different needs in making these collections more accessible and useful. Although private and government archives

are relevant to the present project, this and follow-up proposals aim to focus their efforts on increasing the capacity of academic libraries to respond to increased interest in and demand for archival aerial photography.

The ultimate long-term beneficiaries of the current project are both the target audience of academic librarians as well as a greatly expanded audience that includes researchers, the public and, we argue, society at large. A recent informal bibliographic survey conducted by the authors shows an increase in published peer-reviewed literature that used archival aerial photography as the primary information resource, including a recent high-profile publication in *Nature Scientific Reports* that used archival aerial photography to calculate ice changes from an Antarctic ice sheet (North 2024). Other common research uses include mapping tree cover expansion (Monford et al. 2024), reconstructing and identifying historic land use (Suh, Ouimet, and Dow 2023), long-term topographic change analysis (Knuth et al. 2023), and investigating fortifications on Rome's eastern frontier (Casana, Goodman, and Ferwerda 2023).

With respect to public usage and societal impacts we cite statistics where we have access to them and anecdotes from our experiences providing user services. Pennsylvania archival aerial photography resources (to which Penn State University Libraries contributes) that are available through the state geospatial data clearinghouse, are downloaded in excess of 100,000 times every year. A few other academic libraries around the country manage similarly large online collections with similarly heavy usage, but most do not because of the challenges outlined previously in this proposal. In the authors' experiences providing public user services, these uses often include family genealogy, property boundary disputes, golf course management, hobby history research and others. Uses that include broad societal benefits include local, state, tribal, and federal government agencies by providing new information to better inform policy decisions and as primary source documents to support official government functions such as wetland and farmland review and preservation, environmental reviews related to past land uses and persistent pollutants, and cold-case crime investigation among others. There is enormous societal value in enabling government and public users to explore the social, cultural, environmental, and landscape histories of their communities through the exploration of decades of archival aerial photography.

In support of IMLS NLG-L Agency-level Goal 3 (Advance Collections Stewardship and Access), this project will complete a national inventory of historic aerial photography collections held by academic libraries and identify the needs of libraries and users (as reported by service providers) working with these collections. The project will communicate results through the delivery of two conference presentations to national library audiences (see Project Results section for details) and publication of a peer-reviewed article. Further, this project will preserve and provide access to its collection inventory results online by posting the data to both the University of Idaho and Penn State University institutional repositories as well as a companion to the article if the venue supports the submission of supplementary data files. We have targeted the *Journal of Map & Geography Libraries* as our preferred article outlet.

As an applied project, the relevance of the present proposal to have a positive impact on library practice is one of the most exciting aspects for the authors. Impact on practice would span the present as well as future follow-up projects. Results of this project will inform library practice through the provision of a nationwide inventory of archival aerial photography resources that could be referenced by academic librarians for their own use or the provision of user-services. The results of an inventory will also set the stage for potential future collaborations organized around shared or complimentary geographies and

collections. In a more general sense, the results of this project will serve to elevate awareness of archival aerial photography as important information resources within the academic library community and highlight why they need attention now.

Although the results of a needs assessment survey are unknown, we anticipate that it will identify significant opportunities for academic librarian education and training. As noted earlier, even a basic understanding of archival aerial photography has become rare in academic library communities while recent technological advancements make working with collections easier and increases the information value of photographs and their derivatives. Some likely foci of a follow-up IMLS NLG-L National Implementation grant proposal could include the development of best practices documents, expansion of the tutorial mentioned above that was produced by a colleague, development and deployment of online and in person intensive librarian training, and the development of large-scale collaborative projects around archival aerial photography collections. An informal community of practice within academic libraries around archival aerial photography work could be another result of a follow-up project. Our vision for a better world resulting from this and future work is that academic libraries become leaders in the development of archival aerial photography collections, creation of archival aerial photography data resources (i.e. derivatives of raw photographs like are often used in published research projects), and deployment of archival aerial photography services like interactive webmaps for use by researchers and the public alike. If this were to pass, it would mark a significant enhancement of current library practice with positive benefits for librarians, researchers, and society.

Project Work Plan. The project work plan will follow a linear process as it progresses through four phases of completion and assessment (see Schedule of Completion document). Throughout Phases I – III, both project Principal Investigators (PIs) and a graduate research assistant (GRA) will participate in biweekly virtual project planning meetings. The GRA’s term of work will expire at the end of Penn State’s spring semester (typically the end of May) and they therefore will not contribute to the final Phase (IV) of the project although we anticipate that they will be listed as a co-author of a peer-reviewed journal article. Project management will be shared equally between the PIs and project tasks will be divided among the project team as described below.

Phase I – Introduction and Scoping

Recruitment of a graduate student based at Penn State will begin as soon as PIs are notified that the project has been awarded. Knowledge and skills sought will include a familiarity with or interest in archival aerial photography, geographic information systems or photogrammetry. Other qualifications sought would include experience creating online surveys and analyzing survey results including functional skills working with Qualtrics software. Potential academic departments from which a GRA could be recruited include Geography (where Piekielek holds a joint appointment), Information Sciences and Technology or Anthropology among potentially others.

Although the *Guide to U.S. Map Resources* (2006) identified 146 academic libraries with significant archival aerial photography collections, we anticipate that this guide missed some institutions and others may no longer have relevant collections. As such, the present project will spend early weeks doing general outreach and cursory scoping of our intended audience. This work will include general searches of the internet performed by the GRA for institutions that were missed by the 2006 guide. It will also include

searches for and posts to relevant professional listservs or other forums where outreach about the project could take place and the survey instrument promoted. These forums could include the MAPS-L listserv of map librarians, the Western Association of Map Libraries (WAML) listserv, and the Role of Libraries in Geography and GIS Education (ROLGE) listserv, among others. Responsibility for posting to community forums will be shared among project team members. Finally, an introductory professional presentation at a national library conference will be delivered by the PI and Co-PI who are targeting the Western Association of Map Libraries (WAML) annual conference in October 2026 for this presentation. The presentation will constitute outreach and promotion of the project and subsequent survey.

Success in Phase I will include hiring a GRA, regular project meetings, a professional presentation introducing the project to a national audience and the production of a list of institutions to target for the survey as well as a list of forums on which to promote the project survey.

Phase II – Survey

Simultaneous to the completion of Phase I, the project team will begin to develop a survey tool that will be the instrument used to inventory archival aerial photography collections and institutional needs assessment of the academic library community. A small group of 2-5 stakeholders (including the two writers of letters of support for this proposal - see Supporting Documents 2 & 3) will contribute to the development of the survey tool. Stakeholders will be invited to a project team meeting to initiate the development of the survey, will be sent a draft(s) of the survey, will be invited to provide feedback, and then invited to a project team meeting to finalize the survey prior to its distribution. The total time commitment of stakeholders is anticipated to be approximately three hours.

The survey will be developed using Qualtrics software licensed by the University of Idaho (U of I) and reviewed by U of I's Institutional Review Board (IRB). PI Godfrey will manage the survey and submit it to the U of I IRB. Project team members Piekielek and the GRA will test the survey instrument from outside of the U of I network, helping to identify any issues with the survey prior to its distribution.

We anticipate that the survey instrument will be broken into two major sections including an inventory of collections by institution and then an institutional needs assessment. The first section, focusing on inventory, will ask respondents a series of questions about their archival aerial photography collection(s) including the size, whether or not they are cataloged, where they are stored, who manages them, whether they are accessible to the public and if so how, whether they are digitized, whether they are georeferenced, whether they are map ready and the approximate geographic coverage of their collection(s) if known among other questions. These questions will likely be a mix of quantitative (i.e. collection size), binary (i.e. whether or not collections are cataloged), and categorical if the project team decides to structure responses to the geographic coverage question. There may also be free text responses allowed depending on input from the project team and stakeholder group. The second major section of the survey will ask a series of questions about institutional needs for providing access to and services around archival aerial photography. Questions will be asked about existing library services as well as desired services that are not offered, but institutions would like to offer based on their observations of user-demand. There will also be questions about library service-providers, their knowledge and skills as they relate to archival aerial photography and whether professional development could improve existing library services or help an institution to develop new services and improve access. The second section, focusing on needs assessment, is anticipated to be a mix of binary (i.e. are services provided), quantitative (i.e. how many people provide services), categorical (i.e. what is the highest degree relevant to archival aerial photography

attained by service providers), and free text (i.e. what are services that you would like to provide) questions. The survey will utilize a contingency structure so that respondents will not be presented with questions that do not apply to their institution. For example, if an institution has collections but no service providers then the respondent could complete the inventory questions but would not be presented with questions about service-providers and instead would then be presented with questions about services that they would like to develop and/or professional development that would enable them to offer services.

When ready, the survey will be published through the U of I system by PI Godfrey and publicized by the entire project team using the list of listservs, forums and institutions identified in project Phase I. The project team will also ask the stakeholder group to distribute the survey through their professional network of colleagues. We anticipate keeping the survey open for a minimum of 60 days. The project team will closely monitor responses during the first 14 days to identify any unanticipated issues that occur in the survey. Any issues identified will be fixed immediately.

Success in Phase II of the project will include drafting a survey tool, incorporating feedback from a stakeholder group, receiving IRB approval for the survey and publishing it through the U of I platform. A minimally successful response to the survey would include at least 30 (21% response rate of an estimated 146 potential institutions) and half of potential institutions (73) being a resounding success. A response to either of the two sections of the survey would be considered a single response, but two responses from the same institution (e.g. a different respondent for each section) would also be considered only a single response to the survey.

Phase III – Analysis, Results and Communication

In Phase III of the project, the survey will be closed and survey responses will be summarized, analyzed, and reported on. The project team will share responsibility for summarizing and analyzing survey results. Responses to the inventory portion of the survey will largely just be summarized and formatted for legibility. If the results lend themselves to this, the inventory will also be mapped for geographic coverage of collections. Results of the needs assessment survey will be summarized in bar graphs and pie charts as well as free text responses analyzed by developing categories of institutional needs through text analysis such as word frequency. High quality graphics of survey results will be developed by the GRA. Finally, a professional presentation and peer-reviewed journal article will begin to be developed by all three project team members collaboratively.

Success in Phase III of the project will include analysis of survey results, development of high-quality graphics, and the start of preparation of a professional presentation and peer-reviewed article.

Phase IV – Project Wrap-up

Phase IV of the project will see the GRA's term come to an end and project results will be finalized, preserved, and shared. A professional presentation summarizing project results will be delivered by PI Godfrey to a national library audience. PI Godfrey is targeting Geo4Lib Camp (June 2027). During the 2024 edition of the Geo4Lib Camp, there were two presentations about on-going large-scale library-based aerial photography projects, supporting this venue as an important way of reaching our target audience.

Also, during Phase IV of the project, a peer-reviewed publication will be further developed, finalized, and submitted. Development of the article will be shared between PIs Godfrey and Piekielek although we anticipate also including the GRA in authorship if they have made contributions to the article through their

involvement in earlier phases of the project. We are targeting the *Journal of Map & Geography Libraries* as the peer-reviewed outlet for this content based on the intersection of project and journal's audience. The journal has a broad audience of map and geospatial librarians as well as archivists who sometimes manage archival aerial photography collections within academic libraries. The principal investigators have both published extensively in this journal (7 peer-reviewed articles combined, 3 about archival aerial photography) as well as one investigator having served as a Co-Editor and Chief of the journal for five years (Piekielek).

As we bring the project to a close, the digital products produced will be preserved and made publicly available by posting them to both the U of I and Penn State institutional repositories. At U of I, the repository is known as VERSO, and at Penn State it is known as Scholarsphere. Both repositories house research materials produced by researchers associated with each institution and the materials are preserved long-term according to retention policies. Project materials will be posted by project's end with no embargo period. PI Godfrey will be responsible for posting research materials to VERSO and PI Piekielek to Scholarsphere. See the Digital Products Plan for more details.

Success in Phase IV of the project will include a professional presentation to a national library audience, preparation and submission of a peer-reviewed manuscript and posting of research materials to two institutional repositories. Although not an explicit deliverable of the current project, we anticipate beginning to plan an IMLS NLG-L National Implementation Grant proposal during Phase IV of the current project.

Supporting evidence that the PIs are qualified to undertake this work is that both have experience conducting and publishing survey research, in the case of Godfrey, a survey about archival aerial photography specifically (Godfrey 2019; LaLonde and Piekielek 2018). Furthermore, the principal investigators have also contributed to the successful completion of approximately \$1.5 Mil dollars in sponsored research to date.

Project Results. This project will result in the completion of a national inventory of library-based archival aerial photography collections and an institutional needs assessment to make these collections more accessible to a broad audience of users and the general benefit of society. This will be a first step towards addressing the problem of archival aerial photographs managed by academic libraries being inaccessible and underutilized.

The primary audience of the project will be librarians who work with archival aerial photography including map and geospatial librarians and archivists. To reach this audience, during Phase I of the project investigators will announce the project at a national library conference and circulate promotions of the project on community listservs and forums. During Phase IV of the project, another professional presentation summarizing the results will be delivered to a national library audience and a peer-reviewed journal article prepared and submitted.

In the interest of preserving and making project findings accessible, survey results, conference presentations, and a pre-published version of the peer-reviewed article will be deposited in the institutional repositories of both participating project institutions with no embargo period. Survey results will be stored as comma delimited files (.csv) that are generalizable across computer platforms, and we anticipate can be adapted by other institutions and communities. The presentations and peer-reviewed

article with be stored as PDF files. Members of our target audience will be able to download and use project results for their own purposes such as to identify archival aerial photography collections in specific geographies or as a finding aid on behalf of researchers or the public. We anticipate that this resource will meet the basic information needs of our target audience for approximately 5-10 years or until they become obsolete. We anticipate this outcome informed by how similar inventories have served in this way in the past (e.g. the ASPRS *Aerial Data Catalog*). It is also our hope that by making this information available, members of our target audience will see opportunities for regional collaborations on archival aerial photography projects, like those that cross political boundaries, or through deduplication of collections.

We anticipate that the ultimate beneficiaries identified in this project will be reached through our librarian target audiences, that is as library users. The more that librarians know about their archival aerial photography collections and those held at other institutions, the better they can help end users that we have identified for the purposes of this project as researchers and the public.

Finally, the present project will also produce a national institutional needs assessment for archival aerial photography collections and services delivered by academic libraries. The information contained in the needs assessment will be an end result of this planning project, but also a beginning. Although not a deliverable of the present project, investigators will use the needs assessment results to develop and submit an ambitious IMLS NLG-L National Implementation grant proposal to address library community needs, potentially including intensive librarian education and training and the establishment of a library community of practice around archival aerial photography. By a community of practice, here we mean an active group of library professionals who develop and share with each other their own experience and knowledge around archival aerial photography and related user-services. In this way, the benefits generated by this planning project will be sustained and amplified beyond the conclusion of the current performance period.

Applicant Name: University of Idaho

Project Title: Modernizing Library-based Archival Aerial Photography Collections

Schedule of Completion

[illegible]