

Findings and Recommendations

ULS FY16 Action on Geospatial Information, Spatial Literacy, Mapping, and GIS

July, 2016

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Introduction

Scholarly interest in mapping and GIS is both increasing and broadening. As one group of GIS librarians notes, "demand for geospatial resources been observed for several years, [but] recent growth has come not only from established GIS users, but also from a widening breadth of disciplines interested in geospatial tools and resources."¹ At a more basic level, there is also an increasing consensus that "spatial literacy and geographic awareness are fundamental life skills."² At the University of Pittsburgh, we have observed these same trends; in response, the ULS annual plan for FY16 included the following action and its associated outcomes:

Action: Supply up-to-date geospatial data equipment, data resources, and dedicated staff to provide service across disciplines in the use of geospatial data and to promote the ULS' role as a campus hub for geospatial data activity and expertise.

Outcomes: Identify equipment, software, staffing, and training needs. Purchase equipment and software and hire staff. Develop communications plan. Offer training sessions provided to ULS staff and the university community. Showcase successful projects.

To support this action, a project team was chartered and began to work in November, 2015. (The complete charter, which details the project's scope, membership, and timeline is attached as Appendix A.) During the fall of 2015 and the spring of 2016, the project team gathered information, analyzed it, and produced findings and recommendations.

This report, which shares those findings and recommendations, represents the main deliverable of the project team.

Methods

The project team used the following methods to gather information:

- Developed a list of Pitt faculty, students, and librarians for input; conducted discussion sessions and/or interviews with at least 14 individuals.
- Reviewed conversations that project team member Darryl Bishop previously-conducted with three GIS-using faculty in spring 2015

¹ Scaramozzino, J., White, R., Essic, J., Fullington, L. A., Mistry, H., Henley, A., & Olivares, M. (2014). Map Room to Data and GIS Services: Five University Libraries Evolving to Meet Campus Needs and Changing Technologies. *Journal of Map & Geography Libraries*, 10(1), 6–47. <http://doi.org/10.1080/15420353.2014.893943>

² Dodsworth, E. (2012). *Getting started with GIS: a LITA guide*. New York: Neal-Schuman Publishers.

- Reviewed previously-conducted GIS environmental scan from the ULS Planning and Budget Committees FY16, and the FY17 scan on international data needs.
- Scanned peer libraries with expanded GIS services through literature / website review³, and Pennsylvania GIS Conference attendance.
- Identified relevant guidance and information from professional organization, such as ALA's Map and Geospatial Information Round Table (MAGIRT)
- Surveyed the Pitt course catalog to identify classes that teach with or incorporate GIS
- Surveyed existing equipment and software at Pitt (Geology, UCSUR, iSchool, GSPIA, Public Health, Urban Studies, CSSD, etc.)

The discussion sessions and interviews in particular generated a great deal of useful data. The project team worked collaboratively to code the interview notes and transcripts for analysis; many quotes from these interviews are incorporated in the findings below.

Findings

The Landscape at Pitt

At Pitt, the landscape of GIS, spatial analysis, and mapping can be characterized as a decentralized network of academic departments and research centers carrying out projects, typically within a specific discipline or research area. Pitt does not have a Geography department to function as a campus hub for GIS and mapping needs, and as a result there is not a single locus for GIS activity. While the university contains various labs and facilities geared specifically towards GIS/spatial analysis, those spaces generally cater only to the students/faculty within the school or department administering it.

When looking across the university we found a range of applications for GIS/spatial analysis software across subject areas and, as might be expected, a range in the level of expertise with GIS software and/or spatial analysis among these researchers. These variations in use and expertise, combined with the decentralized landscape, meant that we also found many opportunities for collaboration. Collaboration that can bring together methodological expertise, disciplinary expertise, and shared access to hardware, software, and data resources has great potential for lowering barriers to geospatial research and learning, as well as lowering costs of individual departments and research groups across campus. Such collaboration, and the possible role of the ULS in it, was viewed with strong enthusiasm and support from the faculty and students that we spoke with. Because of this, **we find the ULS is in a position to assume a greater role in fostering collaboration among students, faculty, and researchers by providing enhanced access to GIS/mapping resources, guidance, and training.**

Before presenting recommendations aimed at achieving this outcome, this report will first present additional details about the current landscape and needs around GIS and mapping services across Pitt, highlighting the academic departments offering GIS courses, surveying

³ All citations from this review are available at <https://www.zotero.org/groups/426136/items>

facilities on campus providing access to GIS/mapping software, and reviewing current ULS staffing, services, and resources related to GIS/mapping.

Academic Units and Courses

Although there is no single academic center for GIS, there are several schools, departments, programs, and centers that have strong, consistent activity around GIS, including incorporating GIS to some degree in course offerings. This group of "first tier" geospatial units includes:

- Department of Geology and Environmental Science
- School of Engineering (especially its Department of Civil & Environmental Engineering)
- School of Information Sciences (especially its Geoinformatics Lab)
- Dietrich School of Arts and Science's Urban Studies Program
- School of Public Health
- Graduate School of Public and International Affairs (GSPIA)
- University Center for Social and Urban Research (UCSUR)

These units are distinguished in part because they regularly offer courses that explicitly teach GIS; examples include "Introduction to GIS" (Geology), "Geographic Information Systems" (Information Sciences), "GIS for Public Policy" (GSPIA), and "Applied GIS" (Urban Studies). Many of these courses are open to students from across the university, and instructors report the demand is high. Commenting on the GIS courses among this group of schools, one faculty member said, "there is an insatiable demand for GIS courses," especially those "intersecting geography, social science, and things using census data." Despite this, for certain disciplines, there is a perception that such GIS courses are too far removed from their disciplinary concerns and methods. One Pitt faculty member from the History department expressed this concern:

Students want to look at change over time (e.g. redlining maps). [Yet] there is no one around that I know who instructs students [on] how to conduct longitudinal geographic analysis. Geology has lots of courses, but it is "Rocks and Dirts," which is different than social analysis.

Below this first tier group of academic units is another tier that includes a diverse group of disciplines. The units in this second tier show increasing interest in geospatial data and techniques, but usually lack explicit GIS and mapping instruction in courses. This group includes departments like History, English, History of Art and Architecture and schools like Business. A doctoral student in History explained that on an individual instructor basis, there is a push to bring spatial analysis into the classroom and assignments often require its utilization. Speaking about the course she herself teaches in History, she said, "I can't imagine not using a map in my class to show what was going on at the time." A faculty member in English picked up on this idea and emphasized that in his department instructors who are interested in using maps and spatial data need "help with pedagogical design and assignment planning".

Facilities and Resources at Pitt

Several of the "first tier" campus units mentioned above maintain their own computer labs that support geospatial and GIS work. Specifically, there are labs in Geology and Environmental Science, Information Sciences, and Engineering. However, these labs are departmental and generally not available to people from outside the unit. Sometimes, more exclusively, the labs are only available to graduate students and faculty within the unit. For example, a graduate student working in the Information Sciences Geoinformatics Lab explained that the lab is a "resource to support the director and his PhD students, not for general referral."

CSSD-maintained computer labs are often mentioned as a GIS resource, in part because the standard CSSD lab machine build includes ArcGIS, the leading commercial GIS software platform. As a result, many instructors and students make use of these labs for access to the software. However, the CSSD labs have shortcomings for both teaching and student use. One faculty member told us the "CSSD labs are not adequate. Too small, not enough seats." A graduate student said, "when a project is due they are very crowded. I have used the [lab] computers, but I much prefer to use my own computer".

Overall, the value and role of hardware in labs may be changing. The fact that many students prefer to use their own devices makes some faculty and students cautious about the value of labs in general, as one faculty member explained: "I'm starting to be leery of starting labs full of specialized equipment after observing a class led by a postdoc where every student had their own device."

Use Cases and Projects

Comments offered by faculty and students from various disciplines demonstrate innovative uses of GIS to analyze research questions and/or display their findings. This study found instances of GIS or spatial analysis not only among researchers within STEM departments and social sciences, but also in the humanities. Across disciplines, examples encountered during these interviews generally exhibited one or more of the following research characteristics:

Building Shared Data Resources and Infrastructure

Several projects involve collecting, aggregating, and serving datasets with spatial characteristics for a broad audience of researchers and the public. These projects also provide infrastructure for storing, describing, and discovering datasets. Examples include the Western Pennsylvania Regional Data Center (WPRDC)⁴, the Southwestern Pennsylvania Community Profiles⁵, and the World Historical Dataverse/CHIA project⁶.

Compilation of Spatial Data for Specific Research Areas

Academic projects are increasingly incorporating spatial data into their datasets. For instance, international security scholars at Pitt are linking geolocations to incidents of maritime piracy in

⁴ <http://www.wprdc.org/>

⁵ <https://profiles.ucsur.pitt.edu/>

⁶ <http://www.dataverse.pitt.edu/>

order construct a database that can facilitate future spatial analysis. Feedback did not specify how researchers aimed to use such data at this point, but they see utility in incorporating it nonetheless. This finding reveals that compiling spatial data does not necessarily precede an analytical project. In this case, building spatial data infrastructure, while not necessarily producing research outputs currently, is believed to be useful for future research.

Spatial Analysis Utilizing GIS Software

Despite alternatives, GIS software remains a popular tool for researchers across various disciplines. For instance, having compiled data on underground coal mine pools in Western Pennsylvania, Pitt researchers are using GIS software to analyze the risk of ground subsidence in the region and present their findings to the public. This particular project⁷ saw three different departments (Geology, Biology, and Engineering) collaborate with each other in order to synthesize their various findings into a single research product.

Spatial Analysis Beyond GIS Software

This characteristic covers spatial analysis that does not utilize GIS software. Various other tools and software can be used for spatial analysis. For instance, the faculty director of a research center specialized in organized crime and terrorism is attempting to purchase a license for Geofeedia. This software allows researchers to monitor social media content within a designated area or track a single profile over time and space. The director, a professor at GSPIA, hopes to utilize this software for a project looking to analyze social-media content within Guatemala and other areas of Central America.

Project Visualization through Mapmaking

Some projects employ GIS/mapping software as a means of displaying their findings without employing analytical tools or applications. For instance, English-literature students are working to create maps from fantasy novels, such as *Game of Thrones*, in order to plot characters and narrative over time and space. In the History of Art and Architecture department, students make use of mapping and GIS as an entry point into digital projects, such as mapping the location of sculptor studios in Paris. These projects often build the foundation for social network analysis.

Mapping for the Community Through Research and Technical Support

UCSUR, in particular, provides mapping support to community organizations through small funded projects and contractual agreements. Organizations include Community Development Corporations, Foundations, Social Service Agencies, and other Community Based Organizations.

Historical Mapping

Some researchers employ GIS/mapping software in order to carry out historical mapping projects. We learned of English-literature students using historical maps as a way to represent novels set within New York City during the Industrial Era. Pitt Archivists also report that researchers are contacting the Archives Service Center for historical maps and geospatial information in order to overlay historical maps of Pittsburgh neighborhoods onto a current-day Google Map basemap.

⁷ This project, and related research, is described at http://www.engineering.pitt.edu/Departments/Civil-Environmental/_Content/Mining-Engineering-Cert/Research/

Current ULS Staff, Services, and Resources

The number of ULS employees with designated GIS and map responsibilities has slightly decreased over the last several years. For example, a liaison librarian position for History and Political science previously had some GIS responsibility, but after a re-hire, the current position does not. Most recently, there were two ULS employees with identified responsibilities around GIS: one librarian and one staff library specialist. Those two positions are currently vacant, but because they represent the most current state of ULS staffing in this area, they will be discussed in some detail here.

For the librarian position, GIS was one of two content specializations (the other is Government Information) and four subject specializations (Classics, Environmental Science, Geology & Planetary Science, and Sociology). The overloading of his position constrained his time available for GIS support to no more than 10%. The staff member was hired in a position split between between RES and ILL; however, due to individual interests and expertise later negotiated to work with GIS at 20% of his time. Together, the combined allotment to GIS support across the two positions was probably no more than .3FTE. Additional support for web mapping and other spatial visualization tools is delivered through the Digital Scholarship Services department. There is an email distribution list, ULS - GIS Services, that contains all of the above staff.

Even with the relatively small amount of staff time allocated for GIS support, the library specialist recorded 45 GIS consults between September 2015 and June 2016. As a point of reference, the University of North Carolina, where there is a Geography department, and where the library employes 2 FTE GIS librarians, 1FTE Data Services Librarian, and several dedicated student workers, reports around 400 GIS consults and 300 walk-in support requests per year⁸.

In addition to constraining service availability, the current allocation of time for GIS work makes it difficult for staff to develop advanced expertise on the job; the librarian above reported, "I've gone to workshops, but [have] not [had] a chance to systematically work with it."

The following service areas and resources are listed on the [ULS web page describing GIS and spatial data services](#)⁹:

- (One) GIS Workstation, Software, and Licensed Resources
- Walk-in consultations
- Support for GIS and spatial analysis (including data acquisition, storage and management, analysis and preparation, mapping and visualization, and metadata)
- Training workshops
- Resource guides (i.e. links to LibGuides, image below)

In terms of training and workshops, for the past three semesters, the ULS, in partnership with a doctoral student at the iSchool, has offered one GIS-related training session, *Introduction to Spatial Analysis*, as part of the ULS/iSchool Digital Scholarship Workshop and Lecture Series. These are among the best-attended of the workshops in the series; the most recent workshop had 23 registrants. There have also been one-off workshops, such as one given in partnership

⁸ Scaramozzino et.al. (2014)

⁹ <http://www.library.pitt.edu/geographic-spatial-data-services>

with UCSUR's Southwestern Pennsylvania Community Profiles site for GIS Day in November, 2015.

ULS / LibGuides / Geographic Information System (GIS) Resources - Oakland Campus / GIS Resources @ Pitt

Geographic Information System (GIS) Resources - Oakland Campus: GIS Resources @ Pitt

This guide provides information and resources for Pitt students and faculty on the GIS resources available in Hillman Library and on the Web.

GIS Resources @ Pitt

International Data

US Data

State & Local Data

Books and Articles

Related Pitt Library Guides

- Finding Information on Geology and Planetary Science - Oakland Campus
- Finding Maps - Oakland Campus
- Finding Topographic Maps - Oakland Campus
- United States Census Information

GIS Tutorials

- ArcGIS Resources: Tutorials
Tutorials provided by ESRI.
- Fundamentals of Remote Sensing (PDF)
Natural Resources Canada (PDF)
- Geographic Information System (GIS) and Advanced Mapping Technology Tutorial Series
Provided by the Federal Emergency Management Agency (FEMA)
- GIS Tutorials and Exercises
Harvard College Library
- GIS Tutorials From The GeoCommunity
Provided by GeoCommunity
- GIS@UC San Diego: Tutorials
Guides and links compiled by UC San Diego Libraries
- Tutorial - GIS Basics
PASDA - Pennsylvania State University

Assistance with GIS Resources

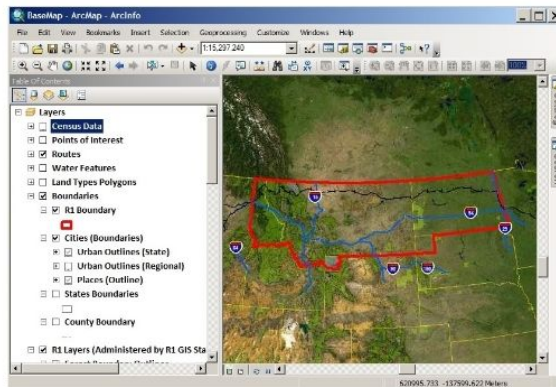


Image: "Regional Recreation Destinations and Census Data" on USDA Forest Service website.

At Pitt we receive a number of data sets on deposit through the Federal Depository Library Program, and we purchase additional data that meet the research needs of the University. Many of these data sets can be accessed in G-7 Hillman Library. For assistance in utilizing the resources in G-7, or for additional assistance in locating GIS data for your project, please contact ULS GIS Services for specialized assistance:

ULS- GIS Services

GIS Hardware and Software in Hillman Library

Needs at Pitt

Needs around Services and Support

Needs around services and support can be grouped into two main categories: 1) in-person support and training, and 2) facilitating information exchange and social connections. There is often a strong connection between these needs and those around space, discussed in the next section below.

For in-person support and training, the most prominent needs include:

- Training on workflow with a GIS project (i.e. GIS project management)
- GIS training with a connection to disciplinary perspectives, e.g. "It is important that [a GIS instructor] has a humanist background in GIS."
- Facilitating use of pre-existing training resources, such as ESRI Virtual Campus

- For ULS liaisons and public service staff who help patrons locate data, someone to then refer to for support and instruction on visualization in GIS software. An example given was of historic data in archival collections. "Death rates, we have that information. If people were able to drop those in a map, that would be cool."
- "A Data Librarian is absolutely necessary in order to offer GIS consultancy"
- Understanding coordinate systems and projections "is critical for GIS."
- Software and tools mentioned: ArcGIS, QGIS, Omeka, Neatline, Google Maps, QGIS, Javascript, Leaflet, Mapbox, OpenStreetMap, R, and Python.
- Assisting in preparing high quality maps, particularly cartographic issues such as distortion, representation, color selection. "Without a geography department here..."

In regards to facilitating information exchange and social connections, these quotes from our interviews express many of the needs and opportunities:

- "One of the values the library can add is acting as a cross disciplinary space for questions students have who want to access or use data"
- "There are a lot of smaller [GIS] projects going on, but there's no connecting them."
- "Seeing a set of projects projected on the screen, hearing what they're doing about them, having opportunity to then follow up in small group to discuss in more detail. That would be useful. I don't care what [discipline] they are coming from, it's all interesting. Seeing those projects would be great."
- "A round table or happy hour to just talk about GIS would be nice. Would be nice to hear what other departments are doing."
- Part of the hub role is advocating for resources: "The ability to request the university to buy things. This is the advocacy thing"

Needs around Spaces and Equipment

Access to computer hardware in a lab configuration remains important, but we consistently heard space needs expressed from a slightly different angle: faculty and students we spoke with are looking for a space than can serve as a hub for geospatial support and a place that will support social interaction. These factors were given more weight than simply providing access to technology and equipment. Such a space would serve as a drop-in consultation and feedback location; the Writing Center was identified as a specific model to emulate. A graduate student said, "that's a good idea to make an organization like the Writing Center for a GIS lab. A student could make a reservation with a professional for help." Another common theme was the ability to have a place to work in a collaborative or instructional manner. A faculty from Art History said, "a big problem in humanities, as a sole scholar, is we don't have a lab model. I'm seeing the value of this as -- I sit down with students and show them how I organize their information." Having a certain amount of hardware is still important, but the importance is mostly for cases where a person does not have their own appropriate equipment. As a faculty member commented, "having a small number of computers with certain things as a way of promoting accessibility. I see it as a backstop."

Large format printing was a service and equipment need that came up in many discussions. One faculty member said, "color, large-format printing. I wouldn't know where to do it." Another said, "large scale printing will make our students very happy. Our students will come over and

kiss you. Low cost or anything lower than Kinkos pricing. Many architecture programs have lab fees that cover this sort of thing. They have to pay for materials -- if there's some way of negotiating this." And later, "our students are spending hundreds and hundreds on materials. Printing is a significant cost. We would like to pursue ways of diminishing it." A third faculty member identified the library as a good location for such a service: "Plotter printers. The library is a great place for this because you are not school specific. I see you are moving in this direction. It will help solve problems."

We heard another set of needs related to presenting digital maps and visualizations of spatial data. In these conversations, space was mentioned in several scenarios: a single meeting of a class; digital poster sessions; and social events that bring together people interested in geospatial information from across the university. One faculty member described how he imagined a social event: "seeing a set of projects projected on the screen, hearing what they're doing about them, having opportunity to then follow up in small group to discuss in more detail... that would be useful. I don't care what [discipline] they are coming from, it's all interesting. Seeing those projects would be great." A graduate student instructor described working with students she is teaching: "It would be nice if we could use this space [Digital Scholarship Commons] to show our projects for a class. We would use Omeka and Neatline [digital tools] to show a geographic reference. To present that it would be nice to have a larger presentation space."

Needs around Collections, Discovery, and Access

Due to the utility of GIS in virtually every discipline, GIS users require a wide variety of resources. During our investigation, we heard references to databases and data sources including Social Explorer, the Southwestern Pennsylvania Community Profiles, American Factfinder, OpenStreetMap, Geolytics, the Getty Thesaurus of Geographic Names, PGHSNAP, Pennsylvania Spatial Data Access and other state-level data clearinghouses, all of which are available to them through the library or on the freely on the web.

Most of these resources are gathered and linked from the ULS GIS LibGuide¹⁰, and several related LibGuides covering Geology¹¹, maps¹², topographic maps¹³, and Pittsburgh census information¹⁴. These appear to be adequate means of supporting discovery and access.

Tom Twiss reported a modest number of GIS data and map inquiries -- around six per term -- and also noted that many of the kinds of requests he would previously receive, e.g., locating a country map, can now be handled by people on their own. The needs that come through now for spatial data tend to be acquisition of international data at a finer granularity than the national level. Sometimes these requests are for data that is difficult to find or simply doesn't exist, such as crime data for specific neighborhoods in Lagos, Nigeria.

¹⁰ <http://pitt.libguides.com/gis>

¹¹ <http://pitt.libguides.com/geologyinfo>

¹² http://pitt.libguides.com/hillman_maps

¹³ <http://pitt.libguides.com/topo>

¹⁴ <http://pitt.libguides.com/pghcensus>

Local data, particularly historic geospatial data that is often inherent in archival and special collections materials, is a strong and mostly unmet need. While local data can be acquired from the Pittsburgh GIS Data Downloads website and from PASDA at a state level, there are still data gaps, including digitization and georeferencing of historic maps; geotagging of historic images and prints¹⁵, and identifying geographic locations in historic texts and manuscripts.

Finally, needs mentioned earlier related to information-sharing and exchange of GIS activity at Pitt can be echoed here, as a need for local resource discovery. One faculty member said: "A frustration: there's never been any integrated cooperation in who's doing GIS at the university. It would be nice to have a directory. The library could facilitate that."

Needs around Stewardship of Spatial Data

Faculty from Geology and Civil Engineering agreed "a lot of data is being created at Pitt that just disappears." The faculty then mentioned student work as particularly vulnerable. A faculty member in Civil Engineering said, "we have capstone projects/senior design projects. Over the last couple of years half of them produced digital maps, and same thing, they are gone." Continuing on this theme, a faculty member from Urban Studies considered the potential for how a repository might allow students to carry on work that had been started in earlier classes: "I imagine there's a question of persistence as well? [projects that one student can't complete, having a repository that can accrete over time]."

"As you're storing all this data, in a couple of years' time it becomes unusable if there's not good metadata and data dictionaries. Institutionalizing that and having it come from a third party would be useful. Maybe that's a service you could provide. There's probably a lot of input you could have."

Recommendations

The recommendations that follow are meant to present a picture of steps to move the ULS from its current state to the ideal expressed in the fiscal year action: *Supply up-to-date geospatial data equipment, data resources, and dedicated staff to provide service across disciplines in the use of geospatial data and to promote the ULS' role as a campus hub for geospatial data activity and expertise.* Through our work, the project team has found the last part of the action to be a particular point of emphasis and opportunity. This overall recommendation can sit above all of the more specific ones that follow:

- **Position the ULS as a hub and connection point for spatial information use, GIS, and mapping at Pitt.**

It is also important to note that some of the recommendations below are already nearly in place, such as the small lab of GIS-equipped machines; others imply new activities or expenditures.

¹⁵ A great example of previous geotagging of ULS digitized images is the retrographer.org project.

Recommendations for Staffing, Services, and Support

- **Frame ULS support more broadly than "GIS"** to include expertise in spatial information, spatial literacy, spatial analysis, GIS, mapping, and pedagogical support for the above.
- **Establish an organizational structure, staffing, and service model** to support the following needs:
 - 1) deep expertise around spatial information, GIS, and mapping;
 - 2) disciplinary perspectives on spatial information; and
 - 3) robust availability at a public-facing service point.

A single individual cannot meet all three needs, therefore, we recommend the following structure and service model to address the stated needs:

- 1) **A Data Librarian with a specialization in spatial information, GIS, and mapping.** This professional position would develop and maintain deep expertise in spatial information, GIS, and mapping; would lead related outreach, service marketing, programming, and instruction; would work with relevant Liaison librarians across subject areas and with student workers (described below); and would coordinate the collections and technical infrastructure necessary to support the growth and opportunities described earlier in this report. This position will cultivate relationships and collaborate with a broad range of campus partners but should not be assigned individual departmental or subject liaison responsibilities.
 - 2) **A GIS Service Team, led by the Data Librarian, including Liaison librarians whose subject areas frequently include geospatial / GIS / mapping activity.** These liaison librarians and relevant specialists would be a bridge between disciplinary GIS activity and the Data Librarian; would work to create disciplinary-focused GIS and spatial information training and instruction, and would serve as a team for geospatial collection development.
 - 3) **A cohort of specialized student workers to provide a high degree of in-person, frontline support for GIS and spatial data work.** These students would work in the Digital Scholarship Commons at Hillman Library, where their presence would serve as the frontline service point for GIS and spatial data services. This group would be drawn from the departments and units with GIS coursework and would be compensated at a rate above the baseline ULS student worker. Leveraging student workers also provides a mechanism for connecting to the broader GIS community on campus. Some of the hiring and scheduling work around these students could be supported by those doing the same for other ULS student workers.
- **Build community by offering programming, events, training, and outreach** to faculty and students, and by advocating for a vibrant GIS community and

infrastructure at the university. Examples of such activities might include hosting GIS user groups or "share your work" events; hosting workshops and seminars; promoting use of training resources such as ESRI's Virtual Campus; and facilitating communication between and across those working in GIS and mapping.

Recommendations for Spaces and Equipment

- **Maintain a small lab of 6-12 machines equipped with GIS software;** use this lab as a service point for drop-in consultation and small group/individual consultation and support.
 - Include both commercial and open-source GIS applications: minimally, ArcGIS and QGIS
 - Include easy access to datasets and tutorials from lab machines
- **On a trial basis, offer large-format printing through a cost-recovery fee model.** This service may be staffed by the cohort of student workers described above.
- **Encourage use of the Digital Scholarship Commons** and its screens for presentations, programming, and events that highlight spatial and map-based learning and research.

Recommendations for Collections, Discovery, and Access

- **Continue to keep GIS, map, and spatial data LibGuides current and aligned with user needs.**
- **Enrich appropriate ULS archives and special collections material with geospatial metadata.** This work might take the form of georeferencing digitized historic maps using the Map Warper tool¹⁶; adding geospatial location data to digitized historic images; extracting or coding place names in digitized historic texts and manuscripts. This work may require tools and platforms we don't currently support, but work could potentially be done by students in classes, or by crowdsourcing.
- **Create a Pitt project showcase and resource hub** to support discovery of activity, projects, and people working with spatial information, GIS, and mapping at the university. This may be a web page, a LibGuide, or any of several other forms. In-person showcases of project work, such as those that are often part of GIS Day programming, could be another avenue.

¹⁶ Example at NY Public Library: <http://maps.nypl.org/warper/>

Recommendations for Stewardship of Spatial Data

- **Connect ULS GIS service to ULS research data management initiatives** by including the Data Librarian [or other GIS/mapping lead] on the ULS research data management track, and by explicitly including support for data stewardship within spatial data and GIS services generally.
- **Support the deposit of spatial data to D-Scholarship@Pitt and the Western Pennsylvania Regional Data Center**, ideally by piloting deposit with an interested group. Consider student research that generates spatial data as a strategic area of opportunity. Learn more about other, non-Pitt spatial data repositories as well.

Appendix A: Project Charter

Project Charter

Project Name	Expanded GIS Services
Project Lead	Aaron Brenner
Project Sponsor	ULS Senior Staff
Start Date	November 2015
End Date	June 2016

Project Background and Goals

The FY16 ULS plan specifies the following action and outcomes:

Action: Supply up-to-date geospatial data equipment, data resources, and dedicated staff to provide service across disciplines in the use of geospatial data and to promote the ULS' role as a campus hub for geospatial data activity and expertise.

Outcomes: Identify equipment, software, staffing, and training needs. Purchase equipment and software and hire staff. Develop communications plan. Offer training sessions provided to ULS staff and the university community. Showcase successful projects.

Project Scope

- Designing a service to provide resources, guidance, and workshops is *in scope*; designing a service to provide campus-wide individual GIS training or general data literacy training is *out of scope*.
- Designing a service that can support existing classes, meetings of classes, and projects external to classes is *in scope*; creating a GIS classroom that can be booked for a semester-long sessions is *out of scope*.
- Creating position description(s) is *in scope*; creating and filling new position(s) is *out of scope*.

Project Tasks

Information Gathering and Project Inputs

- Review conversations Darryl Bishop previously-conducted (2014) with three GIS-using faculty
- Review previously-conducted PBC GIS environmental scan from FY16, and FY17 scan on international data needs.
- Develop expanded list of Pitt faculty, students, and librarians for input; conduct discussion sessions and/or interviews as feasible.
- Scan peer libraries with expanded GIS services through literature and website review. Identify exemplars.
- Communicate with exemplar peer libraries. Visit as feasible.
- Identify relevant guidance and information from professional organization, such as ALA's Map and Geospatial Information Round Table (MAGIRT)
- Survey Pitt course catalog to identify classes that teach with / incorporate GIS
- Survey existing equipment and software at Pitt (Geology, UCSUR, iSchool, GSPIA, Public Health, Urban Studies, CSSD, etc.)

Project Deliverables

- Service model for ULS GIS service, indicating scope and levels of service
- Staffing plan and position descriptions
- Recommendations for equipment and software
- Report and communications to share findings and recommendations to ULS (senior staff and colleagues) and stakeholders

Project Timeline

Time Period	Project Aims and Milestones
November 2015	<ul style="list-style-type: none"> ● Create project charter, receive sponsor approval ● Confirm consultant participation ● Begin information gathering
December 2015	<ul style="list-style-type: none"> ● Convene core project team ● Continue information gathering ● Prepare for discussion sessions/interviews in January/February
January-February 2015	<ul style="list-style-type: none"> ● Convene full project team including consultants ● Continue information gathering ● Conduct discussion sessions / interviews
March- mid April 2015	<ul style="list-style-type: none"> ● Draft service model, staffing plan, recommendations for equipment and software ● Share with stakeholders and ULS senior staff; incorporate revisions

Mid April-May 2015	<ul style="list-style-type: none">● Draft final project report● Share results with ULS colleagues
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Project Team

Main Team, from ULS Digital Humanities/Social Science Specialist Track

- Aaron Brenner, Coordinator of Digital Scholarship
- Matt Burton, Postdoctoral Researcher and Visiting Assistant Professor
- Darryl Bishop, Library Specialist
- Dan Andrus, Library Specialist
- Kate Joranson, Head, Frick Fine Arts Library

Consultants

- Tom Twiss, Liaison Librarian for Environmental Studies, Geology, Sociology, and Classics, ULS
- Ryan Splenda, Liaison Librarian for Business, ULS
- Lois Kepes, Liaison Librarian for Economics and GSPIA, ULS
- Chris Lemery, Liaison Librarian for History, Political Science, and Urban Studies, ULS
- Jessica Benner, School of Information Sciences
- Liz Monk, University Center for Social and Urban Research
- David Grinnell, Reference and Access Archivist, ULS