A Collaborative Vision for Spatial Scholarship Across the CIC

Marcy Bidney
Head,
Donald W. Hamer Maps Library
Penn State University

Ryan Mattke
Head,
John R. Borchert Map Library
University of Minnesota

Kathleen Weessies
Head,
Map Library
Michigan State University

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Summary

By working together the Libraries of the CIC can offer our academic communities a broader array of spatial resources and more robust geospatial data services. By combining funding, infrastructure and expertise we would be able to replace our existing piecemeal efforts with a scalable, state-of-the-art, yet cost-effective, campus resource. We propose a multifaceted collaboration that will address contributed and licensed scanned maps (and the hosting infrastructure to serve them), contributed and licensed vector geospatial data, and collaborative digital and print map collection management. The use of geospatial information is a long-term, interdisciplinary scholarly need, the response to which will require collaborative, innovative and transformative solutions.

Challenges we face:

- Limited resources devoted specifically to geospatial resources and services (staffing, collection dollars, data, infrastructure, etc.) at any individual library
- Increasing and more diverse user demand for data, service, and customized tools
- Diffuse constituency, advocates, and campus investments
- Limited understanding of geospatial work among generalist colleagues and administrators
- Commercial market penetration with the potential to disintermediate libraries
- Investment growth area in period of budget retrenchment
- High cost of providing specialized IT infrastructure and support for data storage

Summation of Collaborative Opportunities:

- **Digital Collections**
  - Cooperative database licensing and/or data set purchasing
  - Developing common scanning and geocoding strategies and vendors
  - Combining scanned collections and cooperatively prioritizing future scanning
- **Storage and access**
  - Co-invest in common infrastructure for storing, disseminating, and archiving geospatial data
  - Collaborate to build specialized tools on top of generically serviced data
- **Services**
  - Build user communities around centrally supported data resources
  - Promote and support the use of geospatial analysis and representation in research and instruction

Context

Space and place are concepts studied across disciplines. Sociologists study human social activity, archaeologists study how civilizations use space, religious scholars focus on the spatial aspects of particular religions, literary scholars study how characters in novels move through space and time. In other corners of the campus, biologists record the location of specimens in the field, arborists keep record the condition of stands of trees, and ornithologists track the migration of birds over multiple continents. All of these activities occur within -- and interact with -- space, both real and perceived. The list of the interdisciplinary users and uses of space and place could go on for pages and continues to grow. In the past, representation of space in each of these disciplines was limited to a two dimensional map and the only interaction a user would have with the map would be simply viewing it. Now, and in the future, an array of tools exists to create dynamic and interactive representations of space for enhancing learning and research.

The map libraries of the CIC have taken steps to meet this need. The John R. Borchert Map Library at the University of Minnesota, for instance, created a tool[1] for viewing historic aerial photographs for an Urban Studies course. The Donald W. Hamer Maps Library at Penn State is providing on-demand scanning services for students and faculty and scanned upwards of 1000 maps in 2011. Penn State will make these map images available via Flickr when appropriate and will soon be converting these files to kml for use in Google Earth. Penn State has also embarked on a long term Sanborn Fire Insurance Map scanning project that should be finishing up toward the end of 2013**.** Michigan State University is serving licensed GIS-ready map images from a server, and Purdue and University of Michigan run GIS services out of their library systems to aid patrons with their digital projects.

It is clear that the demand for geospatial information and interactive tools is increasing dramatically across the academy. While the efforts by CIC libraries to meet this demand have been earnest and forward leaning, they could also be characterized as piecemeal, site-based, and labor intensive, leaving many CIC libraries in reactive mode to address the needs of students and faculty. We should instead be taking a proactive approach to geospatial information services, delivering resources and extensible services to the user desktop. The inclusion of geospatial information at all levels of scholarship is a long-term trend that will challenge libraries to adopt collaborative, innovative and transformative strategies in response. If we fail to do so, there are others in the wings poised to act in our stead.

Geospatial information librarians across the CIC already know much of the above, but find more effective solutions elusive because they are being asked to offer niche services—largely in isolation from other colleagues—when bigger and more dynamic systems are needed; systems that require input from collection managers, disciplinary subject specialists, digital curators, and systems librarians to address and staff the complexities and specialized tools needed to manage space and time aspects of digital collections. The limited funds available for specialized geospatial staff and tools leave no choice but to seek out innovative partnerships to build the scalable systems and services required by our patrons.

As your CIC colleagues, we have come to realize that we could be working together to harness the richness of collections and expertise across our geospatial information libraries, share the costs of delivering these essential services to CIC faculty and students, and create strong, interdisciplinary,

comprehensive collections of geospatial resources for the enhancement of teaching and research across the consortium.

We envision the creation of a multifaceted strategy, built on a foundation of collaborative collection building of vector and raster geospatial data, and co-investment in a centralized infrastructure for storage, access and discovery of all CIC digital geospatial materials. The rest of this document spells out areas we believe collaboration would be most useful to fulfill our vision of building world-class services for CIC users of geospatial data and visualizations.

Building a Digital Collection

Scanned Maps and Aerial Photographs

Based on 2007 survey data, collection scanning throughout the consortium has focused on regional and/or unique items in our collections. Looking forward we could work collaboratively to create a comprehensive digital collection across all of the CIC Universities. Scanning the unique portions of our collections would ease the burden of interlibrary loan, create a one-stop place for users to search for digitized maps, and aid in the preservation of these rich -- and sometimes unique -- collections. Scanning the commonly held items, on the other hand, would free institutions to exercise options for weeding or remotely storing lesser used print collections. Moving map and photography collections online will increase their availability and utility to patrons while creating more collection management options for our libraries.

Library digital collection curators are well aware of the broad range of resources encompassed by the term “digital objects,” and the challenges of organizing, describing, storing, registering, discovering, and accessing these diverse files. While many metadata standards are applicable to an array of data types, “georeferencing” is relatively specific to a particular data type, and hence less accessible to generalists. Despite being costly to apply, it adds considerable value to geospatial data by enabling it to interact intelligently with geographic information systems (GIS) and allowing it to be integrated into geographic search interfaces.

CIC members might chose to scan their map resources locally and then contribute the digital files to a shared digital archive, or they might prefer to outsource the scanning to another CIC library or third party vendor. However the scanning is accomplished, the specifications—including derivative formats, georeferencing and metadata steps—should all conform to agreed upon standards so as to mesh with a common storage and retrieval interface. At a minimum, the CIC should support mechanisms for timely and detailed communication about scanning priorities and projects. As collaboration across our units ripens, we would expect more coordination of projects around collective priorities for exposing particular bodies of material.

CIC collections of note include: World topographic map series, Sanborn fire insurance maps, WWII captured maps, and county atlases and land ownership plat maps from the Midwest region. To allow for open sharing of these resources, the copyright status of map resources would need to be carefully investigated. Even within the constraints of copyright, we believe that many commonly called upon resources are widely held by our libraries and could be made accessible from a central repository.

Geospatial Data

As analysis technologies advance and become more ubiquitous, user demand for data from our users will increase dramatically. Geospatial data collections include vector based spatial data (point, line, or polygon), usually with physical or social attributes attached. Examples are digital models of weather station readings, transportation infrastructure, or social demographics. Geospatial data may also be raster based, such as satellite imagery. These collections are expanding in our libraries, but are rarely stored or served in an effective way. There are numerous issues we face as individual librarians trying to purchase or license data sets; storage, access and cost being the most common. These data collections range from one time purchases to ongoing subscriptions with a database vendor such as Proquest's Statistical Datasets. By moving to a cooperative purchasing program we can alleviate the cost hurdle by reducing unwanted redundancy, sharing costs, or by negotiating volume discounts with vendors. Cooperative data purchasing could create a larger and more diverse collection for all of our users, thus easing the burden on individual libraries. Cooperatively purchased data would ideally be stored one time, and in one place for ease of access (more discussion of this below).

Storage, Access and Services

As mentioned, many of the CIC Map Libraries are involved in the purchase of vendor-hosted geospatial data, and, to a lesser extent, locally storing other datasets. We need to progress to thinking collaboratively about storing and serving the locally stored datasets that are purchased from our collection development budgets. A shared storage and access initiative for commonly held resources would relieve individual institutions of the obligation of building redundant infrastructure, instead sharing the work and costs across the consortium, and providing users a one-stop place with critical mass to satisfy the demand for geospatial data. The system to be developed will require a specialized geospatial data server with a user-friendly interface that allows resource selection by ranges of location, time, and scale. A well-designed geographic interface could be the primary access point to all of the CIC collections. The interface should be a sustainable, user-friendly model that provides for ease of use on the backend for librarians and the front end for users. Some examples of well-designed geographic interfaces include ESRI ArcGIS products[2], Klokan Technologies (the providers of MapRankSearch)[3], and OpenGeoPortal[4].

Roadmap to Collaboration

Achieving this vision of a collaborative CIC approach to building geospatial collections, infrastructure, and services would require considerable investments of time and energy among an already stretched community of specialists. This could only be justified if we believe that our best path forward to serving our universities and users is to scale our efforts at levels that cannot be achieved individually. Working harder, against all odds, is not a recipe for future success. We believe the time is ripe for the geospatial experts in our libraries to reflect on the trajectory of their future efforts, and to decide if collective action could result in more than the sum of our individual parts. As in all collaborative initiatives, trust is the key to progress and success. We are therefore encouraging more robust communication within our group and the honest exchange of views around the components of building a successful geospatial collaboration. The following is a sample of the kinds of questions that will need to be addressed if we embark on building a CIC collaboration to develop and integrate geospatial resources:

People

How many, and what kind of people would be needed to make this happen, including, but not limited to map/geospatial and data specialists, library colleagues, faculty and student partners, library and campus administrators, vendors from various sectors, coordinating support, and project management?

Funding

What are the cost components of building a common repository for geospatial resources, including cataloging, scanning, acquisitions, geocoding, system building, data management, and digital preservation?

Governance and Formal Agreements

What kinds of codified agreements would be required to address project expectations, governance, communication, and ongoing member participation and direction?

Cooperative Infrastructure

How will the costs of coordination be addressed in the form of project management and cooperative infrastructure, including meetings, travel, communication, promotion, etc.?

Partnerships

Beyond leveraging existing university-wide CIC relationships, what other formal and informal partnerships would need to be cultivated—i.e. library, university, society or commercial? Who outside the CIC might be invited to participate or invest in the development of a common geospatial storage infrastructure, and when might that extension of relationships be pursued?

Leveraging Existing Resources

What existing assets— personnel, infrastructure, funding and collection—could we anticipate that the CIC map libraries might be in a position to contribute to a broader and more integrated collection or service infrastructure? How can we further communicate about our individual programs though ongoing inventories of resources and priorities, and by exposing collections through basic cataloging?

Administrative Support

How will this group communicate with, and receive the support of institutional leaders including Library Directors, AULs, Chief Information Officers, Deans of Arts and Sciences, and other key stakeholders that support significant CIC collaborations?

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[1] http://z.umn.edu/kayzarurbanstudies
[2] http://geo.data.gov/viewer/webmap/viewer.html?webmap=c9ddd599c70342aea1c7c09402db9c9c
[3] http://www.davidrumsey.com/view/articles/maprank-search
[4] http://worldmap.harvard.edu/africamap/