The Future Of Digital Data In Map Collections: One Perspective*

Colleen Beard

Colleen Beard is at Brock University Map Library, St. Catharines, Ontario CANADA
cbeard@spartan.ac.brocku.ca

We can only anticipate what the future holds in terms of integrating digital spatial data into map libraries, and I am from a small one which does not yet accommodate it to any great extent. However, I have been actively investigating the requirements for integrating digital data into my collection. Extensive investigation is necessary since I have to be certain that the data and equipment choices that I make can be justified. As a result, I feel I have been able to anticipate, to some degree, where map libraries may be headed in terms of acquiring digital information and providing related services.

These services can be grouped into four, somewhat overlapping categories: traditional services, electronic atlases, custom map making, and GIS analysis.

TRADITIONAL SERVICES

Acquiring, maintaining, and providing access to geographic information, both locational and attribute, is traditionally the fundamental role of map libraries. The fact that this data is now available in digital form does not alter this role. Just as people consult and borrow paper maps, they can now view digital maps and extract what they need for their own purposes. This does not mean, however, that the move to digital data is straightforward.

SOURCES OF DIGITAL DATA

External sources of data include products from commercial firms or government agencies, such as electronic atlases, the *Digital Chart of the World* (*DCW*), *National Topographic System* maps, *Ontario Base Maps* (*OBM* - topographic maps at 1:10,000 scale), and the *Electronic Atlas of Canada*. The Internet is also a valuable external source for map files in various formats, remote sensing data, and gazetteer and bibliographic data.

Internal sources of data at Brock University include approximately fifty computer outline maps created on the Macintosh by the map library for in-house indexes. These maps are produced in multiple layers which makes them useful to researchers who wish to select information to construct their own maps. They are used extensively by students, faculty, and staff in geography and other departments, as well as by local newspapers. We are currently investigating the process to make these maps available on the Internet as gif images, with access by anonymous ftp.

IMPLICATIONS

Acquiring digital data may sound fairly straightforward, but there are significant issues that have to be addressed. These include deciding what data to collect, determining the means of access, and developing the skills required by map library personnel.

Collection policies are standard for paper maps, though not necessarily in written form, but very few exist for digital data collections. Many

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things need to be considered before acquiring digital data. The sheer quantity of data available makes selection difficult, as does the fact that it comes in many forms. For example, since every 18 days we can, in theory obtain new Landsat satellite coverage, does this mean that we collect it? Of course, it does not. But, then, what do we select? Also, can we justify collecting remote sensing data if all we can do with it is provide a display of the reflectance values on the screen? Can we justify purchasing electronic atlases if they don't provide anything more than what is already available in a paper product?

The second issue is determining the means of access we provide, which can be done at various levels. The first is to have the products simply circulate on loan as we do for paper maps. This is possible for data that is stored on floppy disk (such as topographic and outline maps or some electronic atlases). However, there are products that can only be used with certain software, such as the *DCW*. The second level is to provide computer facilities on the premises so that users can download data to their own files. A third possibility is to provide access to the map library's computer files through a local area network so that external users, regardless of their location, can download information to their hard drive. A fourth option is to use the network for access to remote databases off-campus. An example of this would be accessing the OBM database from a provincial agency's host computer, or satellite imagery from a federal agency. This method places more emphasis on "access on demand," perhaps for a fee, rather than on acquiring a quantity of data for the purposes of ownership.

The third issue is skills. Working with digital data requires skills that are very different than those required for paper maps. When I first requested data from government databases on floppy disk, I was asked questions such as: "what format would you like it in?" and "what system are you using?" Needless to say, I was not sure on both counts. Acquiring ready-to-use digital data is not a simple task.

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One of the new requirements is knowledge of data formats and their compatibility with various computer systems and software. We should at least be able to recognize, for example, that users of the MapInfo program require data in dxf format and that the ARCInfo export format will not work. If we fail to communicate with users in these terms, they will quickly lose confidence in the map library. So, how do we develop this knowledge? Standards for digital data transfer and techniques for converting one format to another are no doubt being created, but I have had no choice other than to proceed by trial and error. It is a very complex and confusing area, and at this point, I am seriously considering a course in computers!

The ability to download data files from one database and import them into a mapping program for further analysis is another skill we should develop. But, this too has its complications (we all know how easy it is to download a file from *DCW*!). Downloading sometimes requires special software and also a conversion of some sort. One problem we are investigating at the moment is transferring FreeHand files from the Macintosh computer to CorelDraw for use on the PC. Once we have mastered this skill, are we then responsible for instructing the users in how to do it themselves?

Another requirement is knowing how to use the Internet to search remote hosts and download files in a format compatible with our systems. Again, this is not a simple task. However, students are now being instructed in how to use the Internet in their courses and are quickly learning its potential as a source of information. This will affect our role dramatically.

ELECTRONIC ATLASES

A second service of the map library is to provide access to electronic atlases. This is closely related to the first category mainly because providing this type of data could be done using traditional methods. The simplest case would be that the products circulate on a sign-out basis. This may be possible with some atlases like *PC Maps N' Facts*, but products like the *Electronic Atlas of Canada* and the *DCW* are meant to be used on systems where users can search and query the database, design their own maps, and extract data. This certainly requires a more sophisticated level of access.

Electronic atlases certainly serve a useful function in the map library, but we do have to be selective. Atlases which provide the ability to search and query a database and produce specific maps seem more useful than the "view only" type which offer nothing more than that obtained from an existing paper product.

CUSTOM MAPPING

A third facility that could be considered is to provide access to databases, thus allowing users to produce their own maps using a program such as MapInfo. This involves merging base maps with aggregated statistical data that already resides on the map library's computer. For example, a fourth year geography student at Brock University is currently producing a database of the Niagara Region census tracts based on 1991 Statistics Canada data. This involves creating a base map and tabulating attribute data to provide user-defined choropleth mapping. Although a very useful function of the map library, it is an ambitious one–mainly because it requires a fair bit of expertise with the program to obtain a good quality map, as well as time to prepare the attribute database. This process could be accelerated if existing data files were used, such as the digital boundary and census files. This level of service raises the issue of who is responsible for producing the maps–the user or the staff.

GIS ANALYSIS

Providing comprehensive GIS capabilities in a map library seems to be a topic of much debate among map librarians. According to the proper definition of GIS, this technique involves functions that go well beyond that of creating maps. I am referring to the use of GIS for geographical data analysis–for example, the process of overlaying several attribute data sets as a means of problem solving. I would also question whether it is our responsibility to provide image processing facilities within our libraries, mainly because this involves an enormous amount of remote sensing and GIS expertise. A level of map library service that supports a GIS system, such as ARCInfo, which serves a very small percentage of our clientele at such a great expense, is difficult to justify. If users are so advanced with the use of digital spatial data that they require full GIS analysis to work with it, they likely have access to it already. We would simply be providing another workstation. The map library that provides this facility would serve a dual purpose–as library and laboratory. Is this our responsibility? I do recognize that we should provide the data that is required by this level of analysis, which means that we must remain aware of the systems that are being used and the types of data and formats that are required.

CONCLUSION

I have presented four functions that could be considered for integrating digital data into a map library. At the moment, I have to admit that the services offered in ours do not extend much beyond the traditional functions, although, as a result of my investigations, I am now confident that I can make the proper decisions to improve our facilities.