GEOGRAPHIC INFORMATION SYSTEMS LIBRARIES, 1995 pdf

1: GIS and the Academic Library

32nd Clinic on Library Applications of Data Processing (). Edited by Linda C. Smith and Myke Gluck. Electronic technologies, including geographic information systems (GIS), are creating new ways of meeting the needs of library users of spatial and cartographic information. The 32nd Annual Clinic.

As GIS gain widespread acceptance as a research tool, the scholarly community looks to the library as the institution with both the skills to provide intellectual access to data and the technological expertise to guide them in their use. Librarians must be proactive in developing support and service mechanisms for geospatial data and GIS. This paper defines and discusses academic library support issues surrounding GIS and geospatial data. It proposes a model for levels of GIS support and decision-making. Geographic Information Systems GIS merge the classic principles of cartography and geography with modern information technology to create sophisticated, flexible, and powerful tools for spatial analysis, planning, and research. GIS are ubiquitous in fields such as natural resources, environmental studies, and urban and rural planning, but have expanded well beyond these domains. In recent years, GIS have become important research tools in the biological sciences, social sciences, and to a lesser degree in the humanities. There is almost no area of study in which a GIS cannot be used to further research. Though they offer limitless new possibilities for the faculty, staff, and students of the university, many academic libraries do not offer support for GIS. Still more lack strong organization of their GIS support. Geographic Information Systems have not yet attained their proper place among the mainstream support services of many libraries. Libraries charged with the support of academic programs, including instruction, research, and extension, where GIS technology can be used to further research and study, need to address GIS support services. Where pockets of GIS activity exist on a college campus, librarians should glean expertise in the design of services. Where other colleges and universities are setting the pace for GIS, by introducing innovative and practical solutions to GIS service issues, the library should follow. Where there are opportunities for collaboration with other institutions or agencies, librarians should aid in the advancement of spatial data standards, data sharing, and GIS services. This paper sets forth a model for the integration of GIS services into an academic library. It concentrates on the in-house support of spatial and attribute data. It presumes that a few key trends, evident in the recent maturation of GIS software, hardware, and data, will continue; that the explosive increase in GIS use will persist; and, that libraries will continue to play a vital role in providing access to spatial data and GIS services. A geographic information system combines hardware, software, data, and people to enable the capture, storage, retrieval, manipulation, and analysis of geographically-referenced data. Software varies from high-end, process-intensive GIS that run on a workstation to small and relatively simplistic packages that perform the basic functions associated with viewing and manipulating data. Like Web technology, GIS technology is still young and immature. A lack of industry standards for data, and metadata, analogous to the lack of organizational standards for Web-based resources, exists to the detriment of the end-user. Unlike the Web, GIS has passed the initial, awkward phase in which its software was prohibitively complex; its components difficult to grasp and use effectively. Much of the complexity and confusion surrounding GIS has disappeared. These standards will help provide uniformity of data structure and its consequent documentation. Understanding Spatial Data Spatial data contains the geographic locations, shapes, and other attributes e. Features are roads, boundaries, elevation, topography, hydrology, and any other entities that can be represented by either vector data or raster data. Points, lines, and polygons are known as vector data. Vector data are arranged in a series of ordered x,y coordinates. Points are often used to represent individual, non-intersecting features like buildings, light posts, or bus stops in large-scale coverages, or airports or cities in small-scale coverages. Lines are frequently used to represent roads, hydrology, and railroads while polygons most often represent land boundaries such as states, counties, school districts, or tax zones. Data attributes, or information describing a feature like the name, length, classification code, and address ranges of a street, are usually associated with the feature that represents them. In the case of a street, this is a line, or "arc" segment. Groups of cells arranged to represent a feature are called raster data. Raster data have a cellular

structure, in which rows and columns of cells are referenced in an x,y system, and each cell, or group of cells, represents the value s of that feature. Geographically-referenced digital photography orthophoto and remote sensing data airplane and satellite-gathered are usually represented by raster data. Raster data are also used in terrain and elevation modelling. This type of data is used heavily in the natural and environmental sciences. Because many diverse geographic features can be represented by geospatial data, and a multiplicity of methods exist for capturing, collecting, and storing information about these features, an alarming number of data formats, each carrying its own set of requirements for display and analysis, now exist. A lack of format standards has not helped to lessen the complexity of this problem. In contrast, USGS 1: The two types of data differ fundamentally with regard to data structure, display, and use. They require different software programs and human expertise to accomplish these tasks. Hunt and Joselyn describe the key characteristics of several nonproprietary data formats and discuss their use in a library setting. Attribute, or descriptive data describe the characteristics of a feature. Statistical data gathered from the decennial census is a good example of attribute data. While these census data do not contain the locations or shapes of features, they contain demographic and other statistics that can be linked to geographic areas, such as states, counties, or census block groups. These geographic areas can be represented in a GIS as polygons. One of the more common uses of GIS in libraries is joining census data aggregated at the county or sub-county level with a spatial data polygon coverage. Once this "join" is achieved, statistics can be represented by a graduated color, or other scheme, in visual, map form. It is necessary to know where and by whom GIS is being used within the university. If there are pockets of GIS activity on campus, what is the nature of the activity? Are there instruction programs for GIS? Is the activity largely research based? If so, what types of research are utilizing GIS? Who are the GIS experts among the faculty and staff? What support for GIS already exists? Inquiries into the nature of GIS activities should yield answers about the types of data that are sought after, utilized, and produced on campus. Is there a software type favored by the majority of local GIS users? It is also important to identify the roles of other campus departments. Depending on the level of campus activity, it may be useful to survey local, state, and national-level GIS programs. GIS are used heavily at all levels of government, primarily for planning, assessment, and management purposes. Local city and county governments often have an active GIS unit with whom collaboration will prove mutually beneficial. Often, local GIS units maintain collections of vitally important geospatial data describing features of the local area. Librarians will find there is high demand for locally-referenced geospatial data. These units will also own the collective expertise of full-time GIS professionals who are immersed in the subject and often eager to share their wisdom. Both state and federal government GIS activity involve creating digital datasets, establishing geospatial data clearinghouses, and standardizing spatial data transfer formats and metadata. Librarian staff should become familiar with USGS data products and standards. Among the USGS products are a number of "framework" datasets. Framework data, as defined by Federal Geographic Data Committee FGDC Framework Committee, are those data deemed to be among a core set of geospatial data which serve as a basemap, a set of basic geographic features, to which attribute data can be joined 2. Examples are transportation, hydrography, elevation, boundary, and cadastral data. The widespread availability of framework data will provide a strong foundation for the use of GIS in decision-making. FGDC metadata standards are fast becoming the norm for data access in libraries and other local repositories. Once this has been accomplished, the library should choose a model of data collection and public services to support the use of spatial data that will meet its needs. Or, recognizing the demand for a special set of services which meet the unique needs of the library, a new model should be developed. Several more questions should be answered before selecting an initial service model: Who will be using spatial data? How will users be using Geographic Information Systems? What spatial and attribute data does the library already own? What resources can the library reasonably support? What GIS expertise exists within the library? Invariably, the library serving an undergraduate institution will have a different set of requirements for data and software than a library supporting a research institution. It is unlikely that government-produced DLG, DEM, and DOQ datasets, which require resource-intensive conversion and processing prior to their display and use, will be practical solutions for everyday questions in the undergraduate library. Studies involving an expert-level GIS require users to ascend a steep learning curve and to understand geographic and cartographic

principles as well as data format issues. But the undergraduate library should not dismiss the idea of supporting GIS. Most of these are commercial, not government, products, containing basic sets of geographic features such as transportation, boundary, and hydrology data for United States counties. There are spatial data products to fit the needs of a diverse array of library settings. Most often, the selection of suitable hardware and software will be dictated by the nature of the data being provided. At one end, complex and raw data, requiring time-consuming conversion processing, necessitates the use of a high-end GIS. At the other end, preprocessed, user-friendly data may only require a desktop GIS or data viewer. The selection of GIS software will usually determine hardware and platform requirements. However, when cost, networking and other issues make the hardware platform of paramount importance, the number of possible GIS applications will be limited to the desired platform PC, Macintosh, UNIX. The selection of data, software, and hardware requires looking at all three simultaneously and considering essential support activities: Data Viewing Support Data viewing will address the potential mapping needs of many library users. Though most essential components of Geographic Information Systems are absent from this level, a user can quickly and easily create customized, professional looking maps. Many data viewers will provide text and marker labeling, as well as annotation capabilities and some query-based functions. Data viewers are functionally one-dimensional, but will satisfy users with one-dimensional needs. In most cases, a data viewer will lack the ability to capture or store new data. It will not allow for complex query or statistical and analytical processing of data inherent in the relational database management systems contained within intermediate or high-level systems.

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2: USF Libraries - Geographic Information Systems

Full text of "Geographic information systems and libraries: patrons, maps, and spatial information: [papers presented at the Clinic on Library Applications of Data Processing, April ,] / edited by Linda www.enganchecubano.com, Myke Gluck".

Abstract This paper summarizes the results of a survey of academic libraries in two consortia the Orbis Cascade Alliance and the Oberlin Group to determine the extent of Geographic Information Systems GIS implementation and characteristics of libraries that had implemented these services. Of the libraries surveyed, 31 had already implemented GIS services and an additional 15 were considering its implementation. There were significant differences in the implementation rate between public and private institutions. Average materials budget was also higher for those libraries that had implemented GIS than those that had not. Geographic Information Systems GIS has provided users with new ways to process, analyze, and present information, resulting in a new era of spatial information management. According to Wikipedia , GIS is a technology that "integrates, stores, edits, analyzes, and displays geographically-referenced information. The ability to display physical attributes so that they are associated with their spatial locations has changed not only the way in which the attributes can be viewed, but also the opportunities available for analyzing them and for creating new connections. This is particularly important for the university library, which serves as an information hub for the entire campus and must maintain an interdisciplinary collection that provides relevant information to all of its users, regardless of their academic discipline. Both authors of this article have an active interest in GIS, inspired by previous coursework and influenced by exposure to GIS in library settings. Currently, each of our libraries is either considering or offers some level of GIS, so both of us are interested in the possibilities and the pitfalls. By creating a dataset of the libraries in our consortia that are interested in GIS, we are establishing the basis for support and mutual collaboration on a broad scale. GIS is a natural example of how libraries are using existing and new data to help their users find information. It has been a reoccurring topic in librarianship for more than a decade, yet much of the discussion on this topic focuses solely on the complexity of implementing this service. With this focus in the literature, we were curious about the common characteristics of libraries that have chosen to implement this service. This article is the result of a survey of libraries in two academic library consortia, the Oberlin Group and the Orbis Cascade Alliance, to determine which libraries have implemented or are considering implementing GIS, and to identify similarities and differences between them. We examined characteristics such as size, materials budget and type of institution public or private. Literature Review Since the s a movement towards digitization has been underway in libraries worldwide Boisse and Larsgaard Digital access has not only made information easier to obtain, but it has also opened up new ways for using information often acquired as maps or tables that is already in library collections. GIS has been a good example of how libraries are using existing and new data to help their users find information. GIS began appearing in academic libraries during the s, but it truly began to be a part of library services when the census materials were given to depository libraries as TIGER Topologically Integrated Geographic Encoding and Referencing files. This was followed shortly by a variety of other government data that was distributed by other agencies as part of the depository program Abbott and Argentati Since that time, applications for and use of GIS has blossomed in academic libraries. GIS has moved from being a tool used mostly by map or document libraries, to being a tool that can be used by reference librarians to meet the needs of any number of disciplines. The adoption of GIS into regular library services has been slow in non-research libraries. This is partially due to the steep learning curve associated with much of the GIS software. From a usability perspective, it is much more labor intensive for the average user including librarians than books, maps or even text-based databases Abbot and Argentati, It is common for library patrons to use a resource that they have never used before, but the familiar interface of a book or map allows them to be somewhat self-sufficient. The same is true even of many text-based databases, which have similar interfaces to many typical Internet search engines. The intervention often goes beyond teaching techniques or providing a new direction for approaching the problem, as is likely to be the case with a

traditional reference source. It often will first involve explaining what GIS is, then teaching the user the basics of using the GIS software, helping the user to locate appropriate data and finally following through with technical expertise for manipulating the data and combining components to create a map. Until the last decade, hardware and training costs were often prohibitive for all but the largest research institutions. Some of the cost barriers have been reduced, due partially to efforts by industry leaders, such as Environmental Systems Research Institute ESRI , who have created inexpensive programs to make GIS accessible to schools and libraries Buckley and Phoenix ; Frazer The literature suggests that larger and well-funded institutions have been able to overcome these barriers by hiring full-time staff to work with students and faculty, and to collect data and data sources. Smaller schools have opted for either limited GIS services or no service at all. Since the appearance of the ARL report, there has been a notable decline in the discussion of GIS in library literature Martindale Particularly, there has been little discussion of the rates and kinds of implementation among libraries. Recent publications have focused more on uses for GIS and tips for GIS librarians without discussion of the kinds or number of libraries that are implementing it Martindale Until May , there was nothing in the literature quantifying or characterizing libraries that had implemented GIS. They did predict, based on the number of institutions planning to implement GIS, that the number of institutions offering GIS has the potential to double within years. Does your library or another library on your campus have computers with GIS software? If not, are there any considerations to bring GIS software into your library or another library on campus? We used two preexisting private e-mail lists for the survey, the Alliance Science e-mail list for the Orbis Cascade group alliance-science lists. The Alliance Science list consists of public and private institutions of various sizes, all of which are located in Oregon or Washington. The Oberlin Science e-mail list is composed entirely of private liberal arts colleges throughout the United States. Distribution of all institutions surveyed. Yellow indicates that the library is offering GIS; blue indicates that the library is not. The majority of the recipients were either science librarians or general reference librarians. Some institutions only offered general contact information. Several of the responders provided additional information, which was noted, but not necessarily incorporated in the discussion of the results. We collected additional information after the survey was complete to compare institutional characteristics: After entering all of the information into a series of Excel spreadsheets, statistical analysis t-test and Chi squared was done and charts were then created with the data. Results and Discussion Table 1. Results for both Orbis-Cascade and Oberlin surveys in Our overall survey results of institutions there was an overlap of 3 institutions between consortia show that 31 libraries have implemented GIS, 15 are considering GIS, and 57 have no plans to implement GIS Table 1. When compared to previous surveys, we found that there is a trend in libraries toward implementing GIS. While one of the consortia examined is located in the Pacific Northwest, the other is national and allowed us to examine the implementation trends by United States region. No significant difference was found between regions. There were noticeable differences between public and private institutions. Fifty percent of the public institutions surveyed indicated that they had implemented some form of GIS, while only six percent of the private institutions had, indicating that public institutions might be more likely to have implemented some form of GIS. This result could be skewed, however, as there were only 16 public institutions included in the survey, compared to 87 private institutions. Physical location is not a factor in regards to libraries providing GIS. Our statistics indicate that GIS implementation is roughly the same throughout the nation. Materials budget and library expenditure per student seem to have a strong influence on whether or not a library has implemented GIS; institutions that have large budgets are able to afford the purchase of GIS software and to pay for training and support Figure 2. The graph of institutional budgets below indicates that institutions with large budgets tend to be the ones that support GIS. Institutions with or without GIS according to their budget. Size and Carnegie classification also seem to be indicators of whether an institution is likely to have implemented GIS; they did not, however, necessarily follow an upward trend. Institutions surveyed by Carnegie classification. While our study covered a wider variety of institutions than those examined by Kinikin and Hench a , it is interesting to see how the numbers changed between our data gathering periods. There may be several variables influencing the larger percentage of institutions incorporating GIS in our study. One important variable may be the different Carnegie levels of the institutions that we studied. This

indicates that even though the follow-up group studied later by Kinikin and Hench b showed some attrition, the trend overall is still toward implementation. Another component that was not specifically addressed in our research and could have potential impact on the data was the consortium memberships of the institutions that we surveyed. Membership in a consortium typically allows increased purchasing power for libraries through pooled resources and may enable them to stretch their limited budget further. The large number of libraries with GIS in our survey might have GIS through consortia agreements, since our survey focused specifically on consortia groups. A comparison of GIS in libraries with and without consortium agreements may be an area for future study. Conclusion In summary, our findings indicate that GIS continues to be implemented in academic libraries, and this trend will continue. Physical location is not a factor in terms of libraries implementing GIS; this trend is occurring throughout the nation. Public colleges are far more likely to have GIS, as opposed to private colleges. As the library makes decisions to implement GIS, there are still potential barriers to overcome. Among these is a need for trained and experienced library staff. GIS is not geared toward novice users, and specialists are needed. Ongoing training is necessary to keep up with changing standards and technology. Regular use of existing software is essential to providing quality GIS service to library users; without practice these skills diminish over time Frazer Larger institutions are busier GIS service points, and may have greater need and ability to employ GIS specialists, but it is still important for smaller institutions to provide training to librarians that are taking on GIS as additional responsibilities. Since GIS is an expensive resource, not all institutions can afford it. In addition to GIS software that can cost several thousands of dollars, datasets for purchase can be pricey, and GIS training frequently costs a minimum of a few hundred dollars. Our surveys indicate that libraries with large budgets tend to have GIS. Institutions with smaller budgets must decide where GIS falls in their list of priorities, and consider the needs of their communities. It is not surprising that in this era of tightened library budgets that the value of GIS would be carefully considered, and that it would have to vie against other library needs. There needs to be more campus-wide understanding of GIS and the need for it. While we were conducting our survey, a number of conversations involved the description of GIS to other professional librarians. Clearly there is a community of information professionals who are unaware of GIS, let alone the potential use. While there may be little demand for GIS at these campuses, the information professionals should probably be aware of these resources. As the demand for visual information continues to rise, despite the various barriers, libraries will continue to implement GIS software and services. A new component of public services. The Journal of Academic Librarianship 21 4: Association of Research Libraries. GIS in academic libraries: Are geographic information systems GIS a feasible service option for non-research libraries?

3: What is GIS? | Geographic Information System Mapping Technology

Papers presented at a clinic on library applications of data processing held at the University of Illinois, the general theme being the problems encountered in electronic encoding, accessing and retrieval of spatial data.

4: A Smalltalk-based extension to traditional Geographic Information Systems - Digital Library

Geographic information systems and libraries: patrons, maps, and spatial information View Item Geographic information systems and libraries: patrons, maps, and spatial information: [papers presented at the Clinic on Library Applications of Data Processing, April ,].

5: Geographic Information Systems (GIS) | UTA Libraries

Electronic technologies, including geographic information systems (GIS), are creating new ways of meeting the needs of library users for spatial and cartographic information.

6: GIS and Data Lab now open in Rotch Library | MIT News

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Journal of Academic Librarianship, v21 n4 p Jul Provides an introduction to geographic information systems (GIS); reviews the use of GIS in libraries; and presents some challenges, strengths, and opportunities for libraries and GIS.

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Players guide to the high clans Souls of the brave : Bangladesh, India, and Pakistan Reason and religion Printer for win 7 Beaker domestic sites The field of relationships in supervision Maria Ellen Chiaia Take one and see Mt. Fujiyama, and other stories Black intellectuals and the dilemmas of race and class in Trinidad Socioeconomic characteristics of the Micmac in Nova Scotia The last Braganzas, and the First Republic Chinese Jump Rope with Other Glasnevin Cemetery, Dublin, 1832-1900 (Maynooth Studies in Local History) The Artscroll Weekday Siddur Irregular past tense worksheets Va pu kale kathakathan Landscape as Sacred Space Tintin secret of the unicorn book Gas turbine engine lubrication system The Christmas Foundation Html5 and css3 second edition sasha vodnik Combinatorics and computer science Magnetodynamic phenomena in the solar atmosphere Epithelial cell migration in response to EGF Reema Zeineldin and Laurie G. Hudson The discovery of America and the discovery of man Bureaucratic power, democracy and administrative democracy Integral logistics management Dictionary of Ancient Rabbis Third grade math in focus singapore math workbook The nature-study of plants Polynomial functions : combining power functions The drama of democracy Tales from the Vulgar Unicorn Confidence building stories for kids in Teaching science for all children Thomas kilmann conflict model Americas Far Eastern policy College physics knight The Person Formerly Known As You Elvis the Squirrel (Read-It! Chapter Books (Read-It! Chapter Books) The Routledge Philosophy Guidebook to Hegel and Philosophy of Right (Routledge Philosophy Guidebooks)