

## Map Library Users in an Academic Setting

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MAP LIBRARIANS HAVE TRADITIONALLY been most concerned with their materials. In recent years, however, this has begun to change. The user and the user's needs are receiving increased attention. This paper will review the literature concerning map library users and present profiles of map library users in an academic setting. The profiles are based on a recent survey of map library users at the University of Minnesota and on methodological assumptions about user groups. In an academic setting, the four main groups of users are: students, faculty, other institutions (business and government), and the general public.

It has been widely accepted that an item's use is the most valid measure of its worth to a library.<sup>1</sup> However, opinions vary as to whether studies of use should focus on the materials—on circulation, for example—or on the user and his or her behavior and needs. Critics of use studies (those that focus on materials) maintain that those studies tend to be largely quantitative, thereby ignoring important qualitative aspects of library use.<sup>2</sup>

According to one theory, studies of library users examine four basic components: (1) the person in need of information, (2) a set of problems dealing with the needs, (3) the ways in which the user meets these needs, and (4) the items of information that satisfy these needs.<sup>3</sup> These components can be applied in studying the user in a map library. The third component in particular, the way in which the user meets his needs, suggests the provision of reference service activities by the map librarian. Providing reference service to the user is a legitimate function of a

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map library. Throughout the history of libraries, efforts to assist users have had to compete with technical service functions for the librarian's time. This is equally true in map libraries. Few are staffed by more than one librarian, who may or may not be assisted by support personnel, and this situation will probably not change within the next decade. Thus, the amount of time spent in assisting a user must be determined by the individual situation.

### **The Map User in Library Literature**

Until the 1970s, map library literature reflected the profession's concern with technical service functions. The problems of organization, classification and cataloging received abundant coverage that provided much needed assistance to those looking for the best system of organization. Although references to the map user have not been absent in the literature, separate publications devoted to the map user and to map reference functions are a relatively recent phenomenon. It appears that the profession can now begin to ask: Who uses maps? How are maps used? The time has come for the map reference function to move from the periphery and become a central activity in a map library.

The literature shows that map librarians are aware of the great diversity of users and of their expectations and needs. Librarians realistically acknowledge that map libraries are used by a small percentage of the academic community.<sup>4</sup> Yet the greatest growth in map libraries has been in academic systems—an increase from 162 map libraries in 1954 to 297 in 1970.<sup>5</sup> Writers of articles about users fully acknowledge the need to promote effective use of cartographic materials and to educate users. They also lament the user's map illiteracy and general cartographic ethnocentricity.<sup>6</sup>

Published surveys about map users are still scarce. Those that do exist, together with articles on reference service, shed some light on the typical map user—or at least on the user as perceived by the map librarian. Most published surveys and articles are concerned with the user in an academic setting.<sup>7</sup> One of the best documented recent surveys was conducted at Southern Illinois University by Jean Ray. It is a quantitative survey based on circulation records which were analyzed for: the department affiliation and academic status of the borrower; the purpose for borrowing; and the area, subject matter and form of the items borrowed. Although use of a college or university map library depends on many variables, such as its proximity to the geography department, the projects students are involved in, and the time of year,

this survey provides interesting insights into map use. Ray, like others, found that map borrowers belong to a wide range of campus groups. The heaviest recorded use was by graduate students for research purposes; the heaviest geographical emphasis was on the local area; and the most frequently borrowed materials were aerial photographs and topographic maps.<sup>8</sup>

Ray does not indicate how the survey information will be further evaluated and implemented for the users' benefit, but she did point out that the low percentage of faculty use suggests the need for more effective public relations and improved liaison with the faculty.<sup>9</sup> Having determined who uses the map library and who doesn't, one then has the information needed to promote use where necessary, while continuing to give the best service to established users.

### **The Map User in Cartography Literature**

The map is considered the ultimate objective of the cartographer's activity;<sup>10</sup> but cartographers are also concerned with the user. During the past decade numerous articles on cartographic communication have appeared in professional journals of cartography. They differ from articles by map librarians in that they emphasize efficiency of map design, the cartographer's perceptions, and the design's impact on the map user. Map librarians and cartographers have similar basic concerns about the map user. Both recognize a wide variety of users with a considerable range of needs and competence in using maps. Both affirm that the cartographic information obtained from a map enriches the knowledge of the user, whether it is put into practical activity or processed into an idea.<sup>11</sup>

According to Hsu, the transmission of cartographic information has four elements: the real world, the cartographer's conception, the map, and the reader's perception.<sup>12</sup> Cartographers have designed innumerable models of communications systems depicting the relationships of those elements,<sup>13</sup> the least complicated of which is a model by Hsu depicting the four elements mentioned above. Hsu's model is shown in figure 1 and suggests the interfaces where the librarian may act as catalyst in the system.

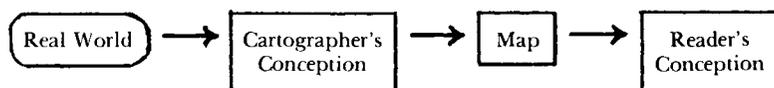


Figure 1. A Scheme of the Cartographic Communication System

Both cartographers and map publishers recognize the importance of the user's role in cartographic communication.<sup>14</sup> Surveys have been conducted to find out what the maps are used for and what opinions people have about them.<sup>15</sup>

The user's expectations, needs and map-reading skills are important considerations in map design. But despite efforts at all levels—in design, production and interpretation—the user's needs may still not be met. This idea, expressed many times in the literature, is summarized by Lloyd and Yehl: "A map reader obtains information from a map, organizes the information through his cognitive processes, and draws conclusions about the map's message, but he might not receive the exact message the cartographer intended to communicate."<sup>16</sup> Map librarians are well aware of this possibility as they bring to the user's attention a great assortment of maps on a particular topic. But not all map users are lucky enough to have the services of a map librarian—truly the missing link in the communication model for transmitting cartographic information.

With one exception, there is no mention in the cartographic literature of map libraries or librarians as possible links between the cartographer's conception and the user's expectations. The exception is L.M. Sebert, whose views on the importance of map libraries in atlas production are as follows:

Examples of the best in modern cartography should be available for study in our cartographic offices....The acquisition of such maps should not be haphazard but should be organized by a competent person whose job it is to keep in touch with cartographic progress on a worldwide basis....

Map librarians are a tremendous help in assisting in cartographic research. They are an excellent source of information on the use of maps—both in the quantitative sense of what maps are being used by the public, and the qualitative sense of how the maps are being used and what problems or difficulties the users are having with their maps.<sup>17</sup>

Map librarians are users themselves and represent many user groups as well. Through an awareness of their patrons' needs, they possess information of value to the map publisher and the cartographer. At this time, only a few government mapping agencies have recognized the collective voice and knowledge of map librarians, and even that is a fairly recent development.

### **The Map Librarian's Role in Providing Reference Service**

Rauchle characterizes the map library as follows: (1) an archive and repository, (2) a means of education, and (3) an instrument of research.<sup>18</sup> The academic map library serves all three of these functions; a sufficiently large research collection, all of it not in constant use, is an archive and an instrument of research. And, certainly, education is a primary activity of an academic map library.

The map librarian's role in this setting is to promote effective use of the materials in order to increase existing knowledge.<sup>19</sup> This means that the map librarian is instrumental in communicating cartographic knowledge. Winearls has outlined the steps in map reference service from the initial question to methods of assistance, including educating users to the services that a map librarian can and should offer.<sup>20</sup> In this procedure the map librarian must find out not only what the user needs, but also how well the user is able to interpret the materials.<sup>21</sup> The general opinion of those writing about map reference work is that the map librarian assists the user in reading, interpreting and creating maps.<sup>22</sup>

Map librarians speaking from experience with a variety of users acknowledge users' lack of map literacy. General observations indicate that the user frequently does not know which specific map he wants, nor is he aware of what materials exist. Since inquiries may range over all imaginable subjects on which maps provide information, it is extremely important to identify what the user is looking for.<sup>23</sup> Throughout the search process the librarian serves as a catalyst.

### **Map Users in an Academic Setting**

The primary function of the map library at the University of Minnesota is to support the instructional and research needs of the university's academic community. However, the library's collection and its services are also open to the general public. The function of the library suggests a grouping of users as faculty, student and nonuniversity users. The nonuniversity users are perceived as general public and personnel from businesses and government offices. The needs of both faculty and student groups are further seen as originating from the geography department, in contrast to needs from all other disciplines.

Actually, several possibilities exist for classifying library users. For example, comparisons could be made between the academic and the nonacademic or student and nonstudent users. Or, users could be typed

according to their need, for example, by required use and use by choice, in-room use and borrowing, and so forth. Users could also be typed according to observable levels of "map literacy": as layman; student or businessman; academic; and the knowledgeable user, as was demonstrated at the University of Toronto.<sup>24</sup>

A profile of map users in an academic setting is not difficult to develop. Certainly, most librarians can easily construct such profiles in their minds. Survey statistics only back up the assumptions in order to carry weight in administrative decisions. University of Minnesota map library users have been surveyed four times, in 1961, 1968, 1970, and 1980. Because these studies permit insight into patterns of use, they have been influential in collection development, aided in the organization of materials for more effective access, and led to improved handling of course assignments and reserves.

A survey of 500 voluntary participants (61 of whom were studying their own materials) was conducted for eight weeks during the 1980 winter quarter. All references to percentages of users and use in the following delineation are derived from this survey (see table 1). It was already known who the main user groups were and what category of materials were used. The survey's purpose was to reveal the ratio of student use to nonstudent use (and its subgroups), and to determine how the needs of these groups are currently met. In discussing map library users, it must be remembered that the term *map* encompasses different formats of cartographic materials—maps, atlases and aerial photographs.

As anticipated, the survey showed heavy student use (82 percent) of the map library, but use by faculty, business and government agencies was lower than anticipated. One likely explanation for the low figure for these groups is that these patrons, the faculty in particular, are reluctant to fill out survey forms. Also, as expected, a class assignment was the reason most frequently listed for using the map library (43 percent). Slightly over one-half of the participants indicated that the materials they used were maps, of which 57 percent were topographic maps of the United States. That the U.S. Geological Survey topographic maps constitute the highest proportion of total map use in the nation's map libraries is widely known.

Cartographic concepts, such as scale, coordinates, relief, contours, and projection, do not seem to occupy the patron's mind when in search of map information. The survey's attempt to probe users' awareness of these concepts in their search for maps resulted in the following: the most important concept was scale (45 percent of responses), followed by

TABLE 1  
MAP LIBRARY USE BASED ON A UNIVERSITY OF MINNESOTA SURVEY

	<i>Percentage Use</i>
<i>Users</i>	
University	86
Graduate students	11
Undergraduate students	68
Other	3
Faculty	2
Staff	2
Nonuniversity	14
General public	7
Businesses	1
Govt. agencies	1
Students	2
Other	3
<i>Reasons for Use</i>	
Class assignments	43
Research	17
Curiosity	16
Business/Govt.	3
Prep. for instruction	3
Other (recreation, genealogy)	18
<i>Materials Used</i>	
Maps	55
USGS topographic	57
Thematic	30
Foreign topographic	13
Monographs	38
Atlases	69
Gazetteers	10
Periodicals	9
Other (books, vert. file)	12
Aerial photographs	7
<i>Frequency of Use</i>	
First visit	32
Less than monthly	26
Monthly	28
Weekly	14
<i>Locating Method</i>	
Staff assistance	38
Browsing	24
Card catalog	18
Previous knowledge	16
Other	4

contours (32 percent), and then relief (24 percent); projection (13 percent) and latitude and longitude (11 percent) were judged least important. (Since more than one category was checked by some respondents, the percentages total over 100.)

According to the survey, the primary users are undergraduate students (68 percent) working on course assignments, using primarily topographic maps of the United States and Minnesota. These students are probably visiting the map library for the first time (32 percent of all users), and were informed about the library by instructors (48 percent). Only a few of the students have received prior map library orientation (20 percent), and many of them rely on the library staff for assistance in locating materials (38 percent of all users).

This profile of the largest user group is fairly representative of the academic year; however, the percentages represent only a specific moment in time and should not be taken as true of the entire year. A weakness of this survey is that it measures limited activities. The map's impact on the user, and the extent of knowledge gained from a single map, remains a matter between the user and the map.

### **The Student Map User**

The university's Twin Cities campus had the highest enrollment of any single campus in the nation during the 1979 fall quarter, when 63,715 students were registered. Undergraduates formed the largest group of students and also constituted the greatest proportion (68 percent) of map library users in the winter quarter of 1980. This is higher than in other large campus map libraries. The high percentage of undergraduate users may be explained by high enrollment figures in the introductory geography courses, which are traditionally taught with maps and with map assignments in the map library (see table 2). In the introductory course, basic map use and map-reading skills are introduced. These courses are by no means the only ones utilizing maps; however, other courses are taught less frequently during the academic year and have lower enrollments. It must be remembered that despite the high percentage of map needs generated by the geography courses, the users are not all geographers. Actually, the geography undergraduate majors constitute a minority (129) of a total of 2100 enrolled in the seven basic courses. The majority of the students come from a great variety of disciplines.

In using the map library, students either refer to specifically assigned maps and materials that have been placed on reserve, or select

TABLE 2  
 GEOGRAPHY COURSES WITH MORE THAN FIFTY STUDENTS  
 ENROLLED IN 1979-80, UNIVERSITY OF MINNESOTA

<i>Name of Course</i>	<i>Enrollment</i>
Human	567
Physical	552
U.S. and Canada	466
Twin Cities	217
Cartography	114
Minnesota	109
American cities	75
Total	2100

Source: Department of Geography, University of Minnesota.

maps for a geographical area of their choosing. Usually, students must go beyond the assigned maps and find other information that will enable them to complete the assignment successfully. This is an effective way of teaching the use of maps together with atlases, books and government documents in an attempt to break down the barriers between different formats of information, especially between book and nonbook materials. A typical assignment requires the use of U.S. Geological Survey (USGS) topographic quadrangles, from which the student must extract information. The cartographic symbols of the map must provide data about the natural features of the land and the cultural features upon it.

Through various map assignments in physical and human geography, the student is introduced to the symbolism of maps and to the concepts of latitude, longitude, scale, and contours. The objectives are to learn that maps may be richer in information than natural landscape, and that a wealth of information is communicated via various methods of symbolization. Map evaluation remains the specialty of the cartography student, who is urged to look critically at maps as objects of study, with emphasis on the use of areal symbols or any features of the design that are used to communicate a specific message to the reader. In disciplines other than geography, cartographic materials are used as support materials. The use of maps is usually taught by area, and the emphasis is on successful synthesis of information in different formats into a whole package of knowledge. Graduate students constitute 11 percent of users surveyed, and their use is perhaps the most difficult to describe. This group of map users comes from many disciplines,

although the geography graduate students dominate. They use maps much as professional geographers do (or the knowledgeable user, for that matter). Maps are used: (1) as direct means of communication, or (2) as illustrations that support verbal or written communication.<sup>25</sup>

The student's learning experience includes information from many sources, ranging from such basic tools as printed explanations of map symbols to frequent reference questions directed to the library staff. These range from questions about hachure marks representing elevations and depressions to inquiries about the "white areas" on topographic maps. The student also depends heavily on the librarian's suggestions for other sources of information, recommendations of other maps, and explanations of why there is no vegetation map of one state when one exists for another. During the intense search for information to complete the assignment, the student may not be aware of the cartographic excellence of the maps used.

Students' needs may be met with the minimal basic collection of materials. Their needs are not as influential in collection development as they are in the organization, location and accessibility of materials. Their needs also influence library hours and require staff time. Their special needs require availability of copy service, light tables, special map interpretive tools and handouts, the setting aside of reserve areas, the provision of signs, and so forth. Special aid is also given to the student user on an individual as well as a group basis in the form of map library orientation, particularly to students in the introductory geography courses. Generally, the bulk of reference work with students is routine and the librarian's attitude and helpfulness are more important than a depth of specialized knowledge. At this level the librarian plays an important role in the primary purpose of the institution: education.

### **The Faculty Map User**

Overall, the faculty constituted 2 percent of map library users at the time of the survey. Preparation for instruction accounts for 3 percent of the stated purpose for use reported. The geography faculty places an equal emphasis on visiting the map library for research and preparation for instruction. In comparison to undergraduate users, the geography faculty (twenty) and the small number of geography graduate students (seventy) go practically unnoticed in their use of the map library. One-third of the faculty use the library periodically, averaging three times a month. These faculty are usually involved in teaching the seven introductory courses mentioned before, in addition to teaching courses

## *Users*

in their area or subject specialization. The geography faculty's use of the map library is closely related to the mission of student instruction. Maps, when used in teaching, are part of broader concepts and ideas and are seldom the sole objects of study. Materials used by the geography faculty are primarily U.S. topographic maps and, secondly, thematic and state atlases.

Faculty members' use of maps fluctuates greatly with the projects they are engaged in. Some projects have spanned years, even a decade, during which the map facilities are used intensely, especially when the objective of research is atlas and map production. Among faculty members' contributions to the growth of cartographic knowledge are the following publications: Joseph E. Schwartzburg's *A Historical Atlas of South Asia* (University of Chicago Press, 1978); Ki-Suk Lee's *A Comparative Atlas of America's Great Cities: Twenty Metropolitan Regions* (Association of American Geographers, 1976); and John R. Borchert and Donald P. Yaeger's *An Atlas of Minnesota Resources and Settlement* (St. Paul, 1969). At times, the faculty coordinates a project for other agencies, e.g., one done jointly with the National Aeronautics and Space Administration and the Minnesota Department of Natural Resources, in which remote-sensing technology was applied to surface water hydrologic problems in Minnesota. The research results were used to map seasonal changes in open water.

Much of the typical map use by other faculty relates to specific countries or continents. A frequent request is for a large map or a wall map which is current, which has effective coloring for physical features, and, occasionally, which will include areas adjacent to the primary country. There seems to be a need for maps showing topical regions that extend across political boundaries. These maps are frequently needed for presentations in classrooms and conferences, for special television lectures, and for other occasions. Other types of faculty requests are for maps which can be used as bases of information and which can be added to from the faculty member's own research.

Frequent use, especially browsing, diminished when the map library was moved from its location adjacent to the geography department.<sup>26</sup> At that time it also ceased being a geography library. Even now, twelve years later, faculty members cite the "new location" as a reason for their infrequent visits to the map library. In addition, the majority of the geography faculty have their own map collections, just as they have issues of journals and books on topics of interest to them and in their areas of specialization. The department itself owns teaching sets, wall maps, and whatever is of continual usefulness in classroom instruction.

The “central location” theory as applied to the map library on the campus adversely affects departmental use in terms of unplanned visits and browsing. This also applies to other departments, such as geology, architecture, forestry, and agriculture, all of which are widely dispersed over the Twin Cities campuses. Since they are located considerable distances from the main library (and the map library), potential users from diverse disciplines are not as numerous as they may be on more compact campuses.

Faculty and graduate students alike come for a specific purpose, rather than to browse. Geologists, for example, frequently use the aerial photographs in the map library. Their use of the map collection is not noticeable, since the geology department has its own library which contains a map collection.

The faculty who do not use maps indicate that their interests are such that maps are not essential, but assert that this does not mean they do not like maps! The geography faculty’s perception of the map library is that its collections are comprehensive and definitely research-oriented. They affirm its value in the instructional programs, and have also expressed satisfaction with the existing public service to a diverse clientele. An outreach policy is seen as an extension of the teaching mission of the university. The overall consensus is that cartographic materials should be collected, no matter how often the faculty make use of them. It’s like money in the bank, as one geographer put it, saying that he feels secure because it is there and he may use it anytime he wants to. He stated he would never teach anywhere without a good map collection. However, a library does not exist by assurances alone. While the potential academic patrons have not yet discovered the map library resources, the nonuniversity people have.

### **The User from Outside the University Community**

A research library usually collects a large amount of material that is not directly required in teaching. The practice of acquisition of extra-curricular materials creates a diverse clientele and makes for a more interesting map library. These materials, whatever they may be—foreign topographic maps, supplementary materials, foreign gazetteers, area studies specialization—attract a small percentage of nonstudent, nonuniversity users. Their needs vary greatly, and their levels of map literacy and prior knowledge range from ignorance to expertise. These factors determine the amount of assistance and knowledge required from the library staff. The nonuniversity user group is highly hetero-

## *Users*

geneous and, indeed, the most challenging. Nonuniversity users constituted 14 percent of the users surveyed. One percent of users were from businesses, 1 percent were from governmental agencies, and 7 percent were public. These three groups were chosen for special scrutiny because they had been previously identified as users of telephone reference service.

A unique resource in the state of Minnesota, the map library collections and services are used freely by the community. The nonuniversity community is served by both telephone and in-library service. Measurement of telephone reference service over several years has indicated a high use of the map library from outside the university community—an indication in disagreement with the findings of the in-library survey. The 1978-79 telephone reference survey showed that 67 percent of service was conducted for the nonuniversity community. Of these calls, 45 percent were from the general public; 15 percent from businesses and government agencies; 7 percent were others (see table 3). In other words, the off-campus user telephones first to find out if the library has what is needed. An estimated 50 percent of telephone inquiries can be answered satisfactorily by telephone. These queries concern locations and distances of places—in fact, any statistical type of information. In contrast, a significant number of requests are impossible to handle over the telephone, and the patron must come in to follow up an inquiry. Into this category fall the questions that require looking at a map (either for information or for the actual visual experience), lengthy research questions, matters relating to the selection of the right kind of map, interpretation of a map legend, and numerous other inquiries.

A closer look at public, business and government use is provided by the following examples. At this time, the most easily identifiable map library use by the general public pertains to genealogy research. Genealogists use maps to gain a mental picture of the area from which their ancestors came. Genealogy research—in the form of telephone inquiries or personal visits—is reflected in the amount of use of the foreign gazetteers and the topographic maps of foreign countries. These tools are used for the purposes of determining the latitude and longitude of a place (if it is listed), and then pinpointing it on the topographic map. This procedure may lead to a number of surprises, such as the initial verification of the ancestral country when it was not known before, or changes in what was formerly assumed. Among the surprises adding to the difficulty of genealogy work could be several occurrences of a place name within a country, in which case the user must find more information from his original sources.

TABLE 3  
 SURVEY OF MAP LIBRARY USE BASED ON TELEPHONE REFERENCE SERVICE  
 UNIVERSITY OF MINNESOTA, 1978-79

	<i>Percentage</i>
<i>Users</i>	
University	26
Students	11
Staff and faculty	10
Campus libraries	5
Nonuniversity	67
General public	45
Businesses and agencies	15
Libraries	7
Unidentified	7
<i>Information Requested</i>	
Maps	38
Atlases and books	13
Aerial photographs	7
Other	
Location, distance	21
Ordering	8
Genealogy	4
Miscellaneous	9
<i>Sources of Information</i>	
Maps, atlases, dictionaries	26
Card catalog	19
Gazetteers	16
Map library catalogs	16
Staff knowledge	16
Referrals	7

The requests for map information in genealogy research are mainly for place. Consequently, the assistance offered to the users in this group emphasizes the materials available for a particular area. Reference assistance and user education are intertwined in an effort to inform the user and to create user self-reliance as much as possible. The user is taken step by step from the use of gazetteers to the location of maps, utilization of map indexes, retrieval of maps, and, finally, to the location of photocopiers. (All genealogy map use seems to end in photocopying!)

Among the special services to the genealogists are the individual instruction, group instruction (often through the local genealogical society), and telephone service of locating places (if easily found). This group's needs have definitely been determining factors in the organiza-

## *Users*

tion of materials within the library, and the ethnic backgrounds of the state's citizens have influenced collection development in a certain direction. Annual attempts have been made to back-order topographic map sheets for incomplete series of European countries that are in demand, such as Norway, Sweden, Finland, Germany, and Poland.

Businesses that use the map library repeatedly are aerial survey, consulting, and business development firms. These types of business rely on cartographic materials to provide some answers in their research or business undertakings. Others—local businesses, architectural firms, law firms, or realtors—occasionally check the spelling of a foreign place name or the location of a place in relation to another place, request the latitude and longitude of a place, ask for a recommendation of a map dealer, etc. These questions can be easily answered from gazetteers, map dealers' catalogs, and maps and atlases. Work with the frequent and regular users is interesting, because it is easy to become involved with their research needs. It is a pleasure to put one's knowledge—and most of all, the library's resources—to work and to have a chance to suggest materials for use, make referrals to outside sources, and thus help someone else do a good job. For example, a consulting firm which does urban planning, environmental studies and impact statements, waste disposal studies, and flood insurance research was contracted by the U.S. Army Corps of Engineers to do a study of the locks on the Mississippi River. However, this firm had not been informed of the river navigation maps prepared and published by the contracting agency!

Study of land use—past, present and future—is very popular, and is entirely interdisciplinary and interdepartmental in government agencies. This is true of research on the state's natural resources, as well. Cartographic materials play a very important and useful role in these studies. In order to manage land resources effectively, vast amounts of information on land resources must be collected. Throughout the 1960s various studies on lake shore development, state land holdings, and land use were begun. Later, the Minnesota Land Management Information System (MLMIS) was developed under the auspices of the State Planning Agency and the University of Minnesota Center for Urban and Regional Affairs. The purpose of the MLMIS was to provide extensive information to officials, planners and researchers in decision-making and policy formulation concerning the state's land and water.<sup>27</sup> The Minnesota Department of Natural Resources is an agency closely connected to these studies.

The needs of various agencies—federal, state and local—are met in varying degrees by the topographic maps and aerial photographs of

Minnesota, the latter promoted through a catalog of map library holdings jointly produced by the map library and the State Planning Agency. In a variety of local agencies, maps are important in public policy-making. Map librarians are well aware of the scarcity of thematic maps and atlases that cover individual states. Fortunately, in the last decade there have been great cartographic accomplishments on the state level.

Government agencies are important to the map library as users of its facilities and services, as well as producers of maps. Similar relationships exist with a variety of city and county planning departments, regional commissions, and nature conservancies which use materials about the state or any part of it. The interaction between the library and the agencies is further enhanced because the agencies are located in the Twin Cities metropolitan area in close proximity to the campus.

## Conclusion

The available evidence about map users in the academic library makes it possible to generalize by broadly classifying them as student, faculty and nonuniversity users. However, comparative utilization of surveys that go beyond these broad groups seem to have their limitations in interpretation. User profiles are dependent on a number of variables, and will be different in different libraries. An incompatibility of survey results is evident from the comparative study of map library use based on the University of Minnesota survey and estimates from eight other academic map libraries.

A summary of findings about the map user in an academic setting may be discussed within the framework of Burns's four basic components introduced earlier. These components help to define the user and the needs, solutions, and items of information that meet those needs:

1. There is diversity among the clientele, but the main person in need of information is the student, specifically, one enrolled in an introductory geography course. Other users are faculty, principally from the geography department. A third group of users comes from outside the university community and is identified as businesses, government agencies and the general public.
2. The problems relating to user needs stem mainly from the teaching mission of the university. The needs are related to learning experience and, specifically, to completion of assignments. Other needs pertain to research, instruction preparation, formulation of public policy, location of places, and map appreciation.

## *Users*

3. The user meets his or her needs in a number of ways: (1) by telephoning the map library for information, or (2) by personal visits to the library, where further steps lead the user closer to the desired information. These steps may be direct (the card catalog, special catalogs and indexes, or reserve sections), or they may require the librarian to act as catalyst in the search process. Collection development, organization of materials, user education, preparation of special access tools—all are part of services that help the user better meet his or her needs.
4. The cartographic materials and items of information that satisfy the needs are mainly topographic maps of the United States and materials of local and regional interest. Foreign topographic maps of selected countries are of interest to a small percentage of users, as are aerial photographs. The importance of these materials to the users, however, cannot be minimized.

Map reference service to the user at the University of Minnesota is difficult to measure in comparison to loan activities. Moreover, users' evaluation of the quality of library service is lacking. The survey, however, revealed satisfaction with the collection of materials: 75 percent were able to obtain materials or information they needed; 7 percent indicated that the materials were not collected or not found by the user; 18 percent did not respond.

That the map library was able to satisfy the needs of 75 percent of users speaks positively for the collection development policy—even though a librarian knows well that a small percentage of holdings account for a major share of the use. Nevertheless, feedback from the diverse users from the academic and nonacademic communities does not suggest any major problems in the present operation of the map library. Regardless of where or how information is obtained, it must be remembered that the library staff is an important resource in itself, and serves as a catalyst in the transfer of cartographic information.

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