

SURVEY OF THE WATER RESOURCES COLLECTION
AT THE JAMES H. ALBERTSON CENTER
FOR LEARNING RESOURCES

by

Carole J. Van Horn

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INTRODUCTION

The purpose of this project has been to survey the collection of the James H. Albertson Center for Learning Resources, University of Wisconsin-Stevens Point (LRC) pertaining to the Water Resources curriculum of the University's College of Natural Resources. The survey attempted to collect and organize information about the existing collection and to improve the collection by locating deficient areas. The subject areas covered are those defined in the foreword to Selected Water Resources Abstracts as "the water-related aspects of the life, physical, and social sciences, as well as related engineering and legal aspects of the characteristics, conservation, control, use or management of water". Special attention was given to management and engineering aspects since it was felt by water resources and library faculty that these areas needed the most upgrading.

Library science literature on collection evaluation, summarized by Otterson (1972) and Bonn (1974), defines several distinct methods for collection evaluation which appear frequently and are usually used in conjunction with one another. These are: compiling statistics, primarily on gross size of the collection; checking lists and bibliographies; applying standards related to the goals of the institution, including those related to accreditation; directly observing the collection, including getting a "feel" for it; obtaining user opinions and determining user satisfaction.

Each of the methods has shortcomings which have also been

widely discussed. What is agreed upon is the increasing need for better selection and evaluation procedures to meet the large amount of available information. It is not the purpose of this survey to produce a better or widely applicable technique for evaluation. A variety of techniques will be used to provide a base for future studies.

One of the major concerns of the LRC is to acquire a collection adequate for its own community of users. Needs are based primarily on the purpose or mission of the library and the university. Before looking at specific portions of the collection it is necessary to gain information on users and programs. Part of the select mission of the University of Wisconsin-Stevens Point is to provide undergraduate and graduate programs in natural resources. To support this mission the LRC must provide material in sufficient depth for graduate scholarship and faculty needs. In 1977 the College of Natural Resources had 1524 majors including eighty graduate students. Of these, 187 undergraduates and an unspecified number of the graduates were in the Water Resources program (Newman, 1977). According to computerized records in the University's Registration Office there were fourteen water courses offered with a total enrollment of over eight hundred students during the 1976-77 academic year. Nine courses with a total enrollment of over five hundred students were offered in the fall 1977 semester. In addition, courses in the Biology Department which are closely allied to the water program enrolled an additional eighty students per year.

METHODS

Collection statistics

The LRC shelf list file, which is arranged according to Library of Congress classification number, was used to count the number of water related titles. For this study a "title" is any item represented by a shelf list card, regardless of its format or location. Thus a film or transparency located in the Instructional Materials Center of the LRC was counted equally with a monograph in the general collection, or a set of abstracts in the Reference Collection. Volumes represent multiple copies of a title, or the number of volumes in a multivolume set. Titles with publication dates before 1970 were counted, since the age of a collection may be considered for evaluation purposes. Results of the count are summarized in Appendix A. In sections with small numbers of titles, authors and/or titles are listed with classification numbers. In the sections on environmental policy and natural resources, and on invertebrates the titles are selections, those directly related to water. The count totals 1475 titles and over 2400 volumes. It is important to remember that this does not include hundreds of federal and Wisconsin state publications since they are not represented in the shelf list. At this time there are no figures for other portions of the shelf list to compare this with; however, the figures may serve as a basis for surveys in other subject areas and for re-evaluation in the future. For instance, it will be possible to show the number or percentage of titles added per year in different subject areas.

Periodicals are an extremely important part of the LRC collection. The LRC currently receives more than sixty periodicals primarily for the support of Water Resources (Appendix B).

General circulation statistics

Since 1965 each time a book circulated from the LRC it had a due date stamped on the inside of the book cover, therefore it is possible to tell how many times a book has circulated since 1965 by counting the date stamps. Each book in stack areas for hydraulic engineering, environmental technology and sanitary engineering, water resources development, and hydrology was checked individually to see if it had circulated. Of 79 titles checked in hydraulic engineering, 61 titles (77 percent) had circulated at least once. Of 244 titles in the area of environmental technology and sanitary engineering, 213 (87 percent) have circulated. In water resources management, 53 of 66 (80 percent) have circulated, and in hydrology 76 of 102 (75 percent) have circulated. It is not possible to state with authority that this is average or better than average circulation. There are a few speculations by prominent librarians to suggest that it is better than average. Broadus (1977) cites Taube's conclusion in 1941 that "of all the books in the Library of Congress about half would not be used". Broadus also cites the conclusion of Fusler in 1973 that "the average frequency of use per title in a university research collection may be once in fifty years". Usage in the LRC is much higher since it is not primarily a research collection.

Reserve circulation statistics

Fifty-five percent of the LRC circulation is through the reserve area. When a book or folder of material circulates from Reserve a date is stamped on a book card. The cards when filled with date stamps are routinely saved and counted. During the first six weeks of the 1977-78 fall semester there were 101 filled cards (97 for books and four for folder material) for Limnology 481/681, and 302 filled cards (185 for books and 117 for folder material) for Introduction to Water Resources 180. Each card represents an average of thirteen circulations, thus there were over 5200 circulations or about ten circulations for each student enrolled in water resources courses for the semester. Since the total circulations per student per year for the entire LRC is thirty-seven, it is obvious that water students are making heavy use of LRC resources.

Interlibrary loan analysis

Interlibrary loan analysis has been used as a collection building tool (New and Ott, 1974). Interlibrary loan requests are an automatic record of the needs of users. Their analysis is particularly important now that the new copyright law will limit the number of times that a periodical title may be requested on interlibrary loan. For this study the titles of articles related to water requested 1975-76 and 1976-77 were examined and the periodical titles and the year requested were recorded. During 1975-76 there were 358 water related articles requested, eighteen percent of the total 1949 interlibrary loan requests for photocopied articles. In 1976-77 there were 342

requests, sixteen percent of the total. Requests for the two years are spread over 243 periodical titles; however, twenty-eight titles account for approximately half of the requests. These titles were divided into those requiring backfiles of titles currently received and those requiring new subscriptions. New and Ott (1974) suggested that any title requested more than four or five times in a year should be considered for purchase. Using this guideline, backfiles which should be considered for purchase are those for Journal of Animal Ecology, Journal of Experimental Biology, Journal of Ecology, Ecology, and Biological Bulletin. Since these are all general natural science periodicals, their purchase may be even more strongly recommended if other requests are totaled in addition to those related to water. At this time only Biological Bulletin has backfiles available on microfilm through regular library suppliers. Four other periodicals were requested frequently enough to be considered, but only older dates were requested indicating that a subscription is probably not needed. These periodicals are the Iowa State (College) Journal of Science, New Phytologist, Toronto University Studies, Biological Series and Report of the Freshwater Institute, Drottningholm, Sweden. Table 1 lists titles requested five or more times in either 1975-76 or 1976-77.

Table 1. Periodicals requested five or more times through interlibrary loan during 1975-76 and 1976-77.

Periodical title	Number of water related articles requested	
	1975-76	1976-77
1) American Microscopical Society. Transactions	6	2
2) American Society of Agricultural Engineers. Transactions	4	5
3) American Society of Civil Engineers. Journal of the Sanitary (Environmental) Engineering Division	18	27
4) American Society of Civil Engineers. Journal of the Hydraulics Division	0	6
5) Archiv fur Hydrobiologie	11	9
6) Bulletin of Environmental Contamination and Toxicology	1	9
7) Hydrobiologia	9	7
8) Oikos	5	3
9) Physiological Zoology	7	2
10) Water and Sewage Works	8	20

The LRC has started subscriptions to (1), (3), (5) and (10). Of the others, Hydrobiologia should have top priority for purchase; however, its subscription price of \$258/year is prohibitive at this time. If funds are available, backfiles of (3), (5) and (10) should be purchased.

A study by Graziano at Southern Illinois University found only four titles called for five or more times on interlibrary loan in a three year period in the Science Library Division

(New and Ott, 1974). The present investigation found thirteen titles in one small subject area requested five or more times in one or both of the years studied. This is more in line with the study at California State University, Fullerton (New and Ott, 1974) which found nineteen titles requested five or more times in a one year period. This kind of analysis should continue if a higher percentage of users are going to be satisfied without going through interlibrary loan. The LRC periodicals librarian and interlibrary loan librarian do continuously analyze requests to some extent, and are aware of frequently requested items.

Bibliographies

Checking bibliographies remains the most common method of surveying collections. The primary criticism of the method is that the bibliographies checked are not necessarily relevant to the library being evaluated. Concentration on different aspects of a subject varies between institutions and the availability of local documents may reduce the library's need to purchase in certain areas. For instance, since materials from the Water Resources Reference Services at the Water Resources Center of the University of Wisconsin-Madison are available for loan, many of their specialized materials would not have to be included in the LRC collection. Checking bibliographies does add another quantitative dimension to an evaluation as well as contributing to the elusive "feel" of the collection sometimes mentioned in surveys (Cassata and Dewey, 1969; Lopez, 1969).

Both basic bibliographies and special subject bibliographies were checked. Although sampling methods may be satisfactory for other surveys, it was possible this time to check every item on most of the lists. Books receiving reviews comprise a bibliography of sorts which is very useful for evaluation. Publishers catalogs are much less valuable for evaluation, but they can provide information on purchasing habits and interests of faculty and library personnel. Sources checked are listed in Appendix C.

Books for College Libraries (1975) and Guide to Reference Books (Sheehy, 1976) are considered basic book lists. Guide to Reference Material (Walford, 1973) is the British counterpart to Guide to Reference Books and is not as useful for the LRC. These three sources produced ten items which were considered for purchase.

"A bibliographic guide to water pollution" by Fogel (1976) has a thirty-seven item bibliography with material aimed at graduate and undergraduate students. The LRC owns twenty-six of these and it should consider adding the others.

The American Water Works Association produces an annual book list, Water Supply Library (American Water Works Association, 1972; 1973). The 1973-74 list is "a checklist of selected publications currently available, which should prove useful and valuable to the field". Since many, even most in some categories, are aimed at professionals in the field, they are not needed in the LRC collection. The percentages owned by the LRC in the various categories are: general information, 40%; engineering, 20%; hydrology, 32%; management, 22%; quality, 54%; resources, 42%; safety, 12%; treatment, 30%. Overall the

percentage is 35, 192 items of 595 in the LRC collection.

Sources of Information in Water Resources (Giefer, 1976) is a compilation of over eleven hundred titles useful for reference, of which at least 337 are currently available in the LRC. Over half of the citations are to federal or state publications. Since the probability of the LRC owning recent federal documents is high, and because locating hundreds of Superintendent of Documents numbers is so time consuming, it was not considered useful for evaluation purposes to locate each of these items. All titles of non-U.S. government publications were checked in the LRC card catalog. Call numbers were added to the citations for both government and non-government items as they were found, and they will continue to be added so that the information is accessible to potential users. The bibliography had a few general references which would be useful additions. In general, no special effort is needed to acquire additional titles.

Wastewater Management by Tchobanoglous, Smith and Crites (1976) includes "only those references that were felt to be the most useful to anyone who is initiating a literature search", particularly those that contain clear and concise coverage of a topic or consolidated the literature. It lists 193 titles, primarily periodical articles, technical reports, and collected papers. Major sources of information are the Journal of the Water Pollution Control Federation, Journal of the Environmental Engineering Division of the American Society of Civil Engineers, and publications of the U.S. Environmental Protection Agency. Since the LRC receives both journals and has a large percentage

of EPA publications, it would only require the purchase of the journal backfiles to cover the material. Wastewater Management also lists thirty-two texts and references dealing with basic concepts and principles. The LRC owns sixteen of these and four of the remaining are out of print. The LRC also receives twelve of twenty-two of the periodicals listed as valuable to workers in the field. Based on inclusion in this list and for reasons to be discussed later, the LRC should try to add the periodicals Public Works, Water, Air and Soil Pollution, and Water Pollution Control.

"Fish and fisheries literature resources" by Kelts and Bressler (1971) is "an attempt to bring together the more important literature resources of fish and fisheries for students, professors, research people, and the librarians who serve them". In general, LRC holdings of indexes and abstracts, general bibliographies, and directories are adequate. Some effort could be made to obtain more of the bibliographies on particular fish and on regional faunas. Many of those listed are publications of state and federal agencies and there may be a problem with availability at this time. Many of the items are geared toward marine fisheries and are not needed in the LRC collection.

Citation analyses are sometimes used as selection tools for libraries. The many problems with the technique are summarized by Broadus (1977). His general conclusion is that although citation analyses are not easy to interpret, they can have value for choosing material. Studies based on literature reviews are not "true" citation analyses according to Broadus since the references are not thought to have contributed to the

source paper. Nevertheless, the annual "Literature review" published in the Journal of the Water Pollution Control Federation was considered worth analyzing. The review for 1976 contains fifty-two bibliographies with a total of 6346 entries. Certain assumptions had to be made, since it was not possible in a reasonable length of time to check each entry. Since the LRC Documents Department has a high percentage of recent U.S. government publications, these were counted as "have". The possibility of the LRC owning National Technical Service Information reports or reports from private industries is very small, thus these were counted as "don't have". Some authors list abstract numbers with some, usually foreign language, citations. A separate count was kept of those items for which the LRC owns only an abstract source. Table 2 shows the percentages of items owned in each bibliography. The collection's relative strength in the different subject areas is clearly shown, although the percentages are accurate to only plus or minus several percentage points. The percentages are surprisingly high considering the scope of the bibliographies relative to the size of the LRC collection. The addition of a few key publications would change some percentages significantly. For instance, the addition of Water and Sewage Works and the Journal of the Environmental Engineering Division of the American Society of Civil Engineers would change the results of the bibliography for "Activated sludge" from 72 to 95 percent, and "Water reclamation and reuse" from 24 to 74 percent.

From the more than six thousand citations there are only about six monographs not owned by the LRC which contribute a

Table 2. Citation analysis of the Water Pollution Control Federation, "Literature review" 1976.

Subject of bibliography	Percentage of items owned by the LRC	Percentage owned, abstracts only, included
Nature and analysis of chemical species		
Inorganics	45	79
Water characteristics	80	89
Organics	55	-
Continuous monitoring, automated analysis and sampling procedures	54	76
Wastewater treatment		
Physical and chemical methods	45	64
Biological filters	32	42
Activated sludge	72	-
Lagoons and oxidation ponds	61	82
Detergents	33	85
Anaerobic processes	46	55
Sludge treatment, utilization, and disposal	30	-
Disinfection	69	-

Table 2. (continued)

Subject of bibliography	Percentage of items owned by the LRC	Percentage owned, abstracts only, included
Wastewater collection	24	74
Water reclamation and reuse	51	54
General principles, economics, and conferences	53	-
Urban runoff and combined sewer overflow	31	32
Instrumentation and automation of wastewater collection and treatment systems	58	-
Industrial wastes		
Meat, fish and poultry processing wastes	64	74
Fruit, vegetable, and grain processing wastes	28	-
Fermentation industry - sugar pharmaceuticals, corn	26	44
Paper and allied products	32	71
Agricultural wastes	54	-
Tannery waste management	7	-

Table 2. (continued)

Subject of bibliography	Percentage of items owned by the LRC	Percentage owned, abstracts only, included
Textile wastes	77	-
Coal and coal mine drainage	23	-
Steel industry wastes	4	44
Petroleum processing wastes	71	-
Plating and cyanide wastes	30	54
Solid wastes and water quality	40	-
Radioactive wastes	5	80
Dairy wastes	9	-
Chemicals and allied products	35	53
Water pollution		
Freshwater macroinvertebrates	56	77
Eutrophication	91	-
Microbiology of water	49	61
Bioassays - procedures and results	65	70
Microbiology of waste treatment	69	71
Microbiology - waterborne outbreaks	42	-

Table 2. (continued)

Subject of bibliography	Percentage of items owned by the LRC	Percentage owned, abstracts only, included
Microbiology - detection of bacterial pathogens and their occurrence	17	25
Microbiology - detection, occurrence and removal of viruses	52	-
Oxygen sag and stream purification	63	-
Pollution effects on surface waters and ground water	74	-
Aquatic sediments	60	-
Marine and estuarine pollution	49	-
Heavy metals and related trace elements	42	-
Thermal effects	41	43
Effects of pollution on freshwater fish	51	52
Mixing and transport	30	33
Administration		
Systems analysis	41	-
Economics	45	-
Law	8	-
Standards, administration and survey	44	51

significant number of citations. Important periodicals are Bulletin of Environmental Contamination and Toxicology, Journal of the Environmental Engineering Division of the American Society of Civil Engineers, Public Works, Water and Sewage Works, Water Pollution Control, and Water, Air and Soil Pollution.

Limnology (Wetzel, 1975) has a comprehensive sixty-four page bibliography. Each citation in the first thirty-three pages was checked against LRC holdings. The library has sixty-four percent of the items. The LRC has almost all of the monographs mentioned.

The periodical Choice is a major selection tool for many colleges and universities. Each issue of Choice from January 1970 thru May 1977 was checked for titles relating to the water curriculum. There are 148 titles which received at least fair reviews. These titles were checked against LRC holdings and eighty-one are found in the collection.

Other major sources of reviews for this subject area are Water Resources Bulletin, Transactions of the American Fisheries Society, and Science Books and Films. Recommended titles for the past several years were checked against LRC holdings and possible additions were noted. These titles were compared with those from Choice

Several publishers catalogs were checked to find out what part of their total offering are being purchased. Ann Arbor Science apparently publishes in areas of interest to our faculty. Twenty-three of forty titles under the topics of water chemistry and analysis, water and wastewater treatment, and land treatment and agriculture in their current catalog are already owned by

the LRC. Publications of the Water Information Center are also well represented. This publisher frequently reissues government publications and possible purchases have to be checked carefully to avoid duplication. Water Resources Publications in Fort Collins, Colorado is a relatively new publisher in the field. The publications appear to be both interesting and curriculum related; however, none have been purchased and none were reviewed in the several sources used in this study.

Direct examination of the collection

Directly examining the books in the general collection to check circulation was valuable for getting a "feel" for what is there. The following are subjective conclusions based on examining an admittedly small number of books. Books received by the LRC on a subscription basis, noticeably those from the United Nations and the Australian government, do not circulate. This is probably due to their specialized nature, but may be because potentially interested faculty are not aware that they are here. Popular works and general texts circulate better than collections of papers and symposia proceedings. This is not unexpected and may be worth remembering when setting priorities for purchase. Annual collections such as the Advances in ---- do not circulate. It may be wiser to purchase them on an individual basis, rather than to build a complete set.

RECOMMENDATIONS

Recommendations are divided into those for serials and those for monographs. Necessary serials are easier to identify based on interlibrary loan analysis. The following should be

added when funds are available:

<u>Hydrobiologia</u>	\$ 258/year
<u>Bulletin of Environmental Contamination and Toxicology</u>	\$ 98/year
	Total \$ 356/year

Based on the literature review and the list of periodicals suggested by Tchobanoglous, Smith and Crites (1976), the following would also be useful:

<u>Public Works</u>	\$ 15/year
<u>Water, Air, and Soil Pollution</u>	\$ 64/year
<u>Water Pollution Control</u>	\$ 25/year
	Total \$ 104/year

Two annuals which are frequently and highly recommended are Advances in Hydrosience and Water 19---. These would cost \$ 29/year and approximately \$ 20/year, respectively. Based on the examination of circulation they would not be expected to circulate, however. A new periodical Water Supply and Management at \$ 106/year should be watched and purchased if demand for it develops. Backfiles of Archiv fur Hydrobiologie, Journal of the Environmental Engineering Division of the American Society of Civil Engineers, and Water and Sewage Works could be good investments in the long run if interlibrary loan requests for them continue. Dates from previous loan requests indicate that backfiles would only be needed to 1965. For Water and Sewage Works the backfiles on microfilm would cost approximately \$250. Backfiles of the Journal of the Environmental Engineering Division of the ASCE are only available as part of the entire Proceedings of the Society. Backfiles from

1965-1973 would cost approximately \$300, and 1974-1977 about \$800. There is no information on the availability of backfiles of Archiv fur Hydrobiologie. This does not mean that they cannot be obtained. Further inquiries will have to be made.

Recommendations for monographs are less clear cut. Choice of titles was based on a combination of factors including number and strength of reviews, relevancy to the curriculum, strength of the collection in the subject area, and price of the item. The cost of purchasing eighty-one titles recommended by one or more sources would be approximately \$1300. This would provide good coverage of most subjects. It would add those books included in Books for College Libraries (1975), Guide to Reference Books (Sheehy, 1976), and Guide to Reference Material (Walford, 1973-), in the areas of hydrology and water management. Full bibliographic information for all possible purchases was placed on LRC order cards.

Three other major purchases merit individual consideration. First, water resources faculty should consider the need for Water Development and Management, proceedings of the United Nations Conference. The cost, \$600 for four volumes (450 for microfilm) is high, but it is advertised as an indispensable reference. A better purchase for now is the concise summary and analysis published separately for \$25. Another major purchase would be selected National Technical Information Service reports. These can be purchased on microfiche for selected subjects on a subscription basis. Although no count was kept, it would be fair to say that the "Literature review" (Water Pollution Control Federation, 1976) and Information Sources in

Water Resources (Giefer, 1976) cite enough NTIS reports to make them worth considering. The third major purchase would be a replacement package of missing books. All bibliographies were checked with the assumption that the LRC has all of the books that it says it has, and in many cases this is not true. Appendix C lists books missing during a 1977 inventory. These books are not available to patrons although they are still considered part of the collection. There are currently at least forty books missing from the SH (Fishing and fisheries) classification numbers. Should these be replaced, perhaps at the expense of new books? In most cases, probably not; however, some must be reordered or substitutes found, and this complicates the collection development process.

Several procedures could be used in the future to supplement existing selection methods. Annual or semiannual checks of reviews from several sources should be continued, perhaps by student assistants. The "Literature review" and the "Water supply library", or similar bibliographies as they are brought to the attention of the LRC should be scanned for significant titles. A continuing problem is the identification of relevant state and federal publications. Regular selection tools generally do not provide adequate coverage. Librarians can now get some help from Reference Services Review, a periodical which began in 1973. It published surveys and special features on government publications. It recently began a section on reference sources among National Technical Information Service reports selected from the NTIS publication Government Reports Announcement & Index. These bibliographies should be checked,

staff time permitting.

If the LRC can keep up with basic materials, the next step in collection development should be the acquisition of additional state publications. The acquisitions could be justified by the importance of the natural resources program to this campus. Logical choices are the publications of the states of Michigan, Minnesota, Illinois and Indiana. For instance, the University of Minnesota, and the University of Illinois at Urbana-Champaign each have actively publishing water resources research centers. Their publications are requested on interlibrary loan, although not enough to be purchased on that basis alone. Water Publications of State Agencies edited by Gerald Giefer and David Todd (1972; 1976) is very useful for selecting and ordering this type of material.

CONCLUSION

No criteria were established for rating the collection, thus a label of good or bad is still partially a matter of opinion. The high usage, both in the stacks and in the reserve area, and the small number of periodicals identified through the interlibrary loan analysis are encouraging signs. The collection contains high percentages of books reviewed by several periodicals and most of the standard works cited by special bibliographies. This is also encouraging. The suspected strength of the collection in limnology is borne out by a comparison of the citation checks. Over sixty percent of the citations from Wetzel (1975) are owned, compared to about forty-five percent from the "Literature review" (Water Pollution

Control Federation, 1976). This forty-five percent represents primarily periodical literature, but it is very close to the forty, fifty-four, and forty-three percents for general works and monographs on quality and resources respectively, from the "Water supply library 1973-74" (American Water Works Association, 1973). Whether these percentages are satisfactory and have anything to do with quality should be decided by the faculty. The noticeably lower percentages held in engineering and hydrology reflect the importance of these subjects in the curriculum, and materials should be added if graduate students or undergraduates with special projects and research papers are steered into these areas.

A problem with no immediate hope for solution is the barely adequate book budget. The percentage of books ordered of those reviewed in the Transactions of the American Fisheries Society dropped steadily between 1970 and 1976. A problem exists if this drop is due to budget limitations. A library no longer expects to keep up with the tremendous volume of material being published; however, the number of books involved in this area is small, perhaps less than ten per year. This small number together with the additional number of missing books can create a serious gap in the information available in a few years.

The evaluation of a library's collection is really an evaluation of its selection policy. The LRC selection policy is based on the assumption that the teaching faculty has the subject expertise and knowledge of the curriculum necessary to select appropriate materials. The assumption is valid as judged by the quality of that part of the collection examined during this study.

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Appendix A. Library of Congress classed materials in the LRC related to Water Resources as of September 1977.

GB - HYDROLOGY. WATER

113 titles - 178 volumes
(74 titles - 65 per cent pre 1970)

GC - OCEANOGRAPHY

119 titles - 159 volumes
(76 titles - 64 percent pre 1970)

H - SOCIAL SCIENCES (GENERAL)

H31.C514	Chicago. University, Dept. of Research paper. 1948- Geography	
no. 29	White, Gilbert Fowler	Human adjustments to floods. 1945.
no. 54	al-Khashab, W.H.	The water budget of the Tigris and Euphrates Basin. 1958
no. 56	Murphy, F. C.	Regulating flood-plain development. 1958.
no. 70	White, Gilbert Fowler	Paper on flood problems. 1961.
no. 75	Burton, Ian	Types of agricultural occupances of flood plains in the United States. 1962.
no. 78	Kates, Robert W.	Hazard and choice in perception of flood plain management. 1962.
no. 79	Hudson, J. W.	Irrigation water use in the Utah Valley, Utah. 1962.
no. 93	White, Gilbert Fowler	Choice of adjustment to floods. 1964.
no. 97	Bowden, L. W.	Diffusion of the decision to irrigate. 1965.
no. 98	Kates, Robert W.	Industrial flood losses. 1965.
no. 99	Roder, W.	The Sabi Valley irrigation projects. 1965.
no. 100	Sewell, W. R. D.	Water management and floods in the Fraser River Basin. 1965.
no. 107	Solzman, D. M.	Waterway industrial sites; a Chicago case study. 1966.
no. 115	Burton, Ian	The human ecology of coastal flood hazard in magalopolis. 1969.
no. 117	Wong, S. T.	Perception of choice and factors affecting industrial water supply decision in northeastern Illinois. 1969.
no. 121	Baumann, D. D.	The domestic use of domestic water supply reservoirs. 1969.
no. 125	Day, J. C.	Managing the lower Rio Grande. 1970.
no. 126	MacIver, Ian	Urban water supply alternatives. 1970.
no. 135	Johnson, James Francis	Renovated waste water. 1971.

HC - ECONOMIC HISTORY AND CONDITIONS

HC54.F54	Fisher, Joseph Lyman	World prospects for natural resources. 1964.
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HC55.B3	Barnett, Harold J.	Scarcity and growth; the economics of natural resource availability. 1963.
HC55.B43	Becht, J. Edwin	World resource management; key to civilizations and social achievement. 1975.
HC55.M8	Murphy, Earl Finbar	Governing nature. 1967.
HC55.P55		Planning for resource decisions. 1970.

ENVIRONMENTAL POLICY AND NATURAL RESOURCES - SELECTED TITLES

HC68.J32	Jackson, Wes	Man and the environment. 1971.
HC68.K57	Kneese, Allen V.	Economics and the environment. 1970.
HC79.E5C47 1974	Chen, Kan	Growth, policy; population, environment and beyond. 1974.
HC79.E5C65	Coomber, Nicholas H.	Evaluation of environmental intangibles. 1973.
HC79.E5E28		The economics of environmental quality. 1972.
HC79.E5M5	Millard, Reed	Clean air-clean water for tomorrow's world. 1972.
HC103.K4	Kerr, Robert S.	Land, wood, and water. 1960.
HC103.7.K78	Krutilla, John V.	The economics of natural environments. 1975.
HC103.7.W45 1966	Western Resources Conference, 8th, Colorado School of Mines, 1966.	Natural gas, coal, ground water; exploring new methods and techniques in resources research. 1967.
HC103.W6	Wisconsin Academy of Science, Arts and Letters	The natural resources of Northern Wisconsin; a Wisconsin Academy profile. 1964.
HC106.5.R48	Resources for the Future	Resources in America's future; patterns of requirements and availabilities, 1960-2000. 1966.
HC107.A17W33 1959	Western Resources Conference, 1st, University of Colorado, 1959.	Resource development; frontiers for research. 1960.
HC107.A123P552	Ackerman, Bruce A.	The uncertain search for environmental quality. 1974.
HC107.A172H4	Henderson, James Mitchell	National growth and economic change is the Upper Midwest. 1965.
HC110.E5C63 1974	Committee for Economic Development	More effective programs for a cleaner environment; a statement on national policy. 1974.
HC110.E5C65 1972	Conference on Environmental Impact Analysis, Green Bay, Wis., 1972.	Environmental impact analysis: Philosophy & methods; proceedings. 1972.

HD 1600-1741 - ECONOMIC HISTORY - UTILIZATION AND CULTURE OF SPECIAL CLASSES OF LANDS
(Use, exploitation, and conservation of water resources, irrigation, etc.)

66 titles - 177 volumes
(46 titles - 70 per cent pre 1970)

Appendix A. (continued)

HD9450.1.T4	1973	Technical Conference on Fishery Products, Tokyo, 1973.	Fishery products. 1974.
HD9451.F85			The future of the fishing industry of the United States. 1968.
HD9685.U5F32		Fabricant, Neil	Toward a rational power policy: energy, politics, and pollution; a report by the Environmental Protection Admin- istration of the City of New York. 1971.
HD9698.A1I6		International Atomic Energy Agency	Technical report series.
	no. 11		Application of isotope techniques in hydrology. 1962.
	no. 91		Guidebook on nuclear techniques in hydrology. 1968.
	no. 145		Tracer techniques in sediment transport. 1973.

HE - TRANSPORTATION AND COMMUNICATION

HE393.H8		Hull, William J.	The origin and development of the water- ways policy of the United States. 1967.
HE394.F6M44		Mermin, Samuel	The Fox-Wisconsin Rivers improvement; an historical study in legal institutions and political economy. 1968.
HE627.D5		Dimock, Marshall Edward	Developing America's waterways; admini- stration of the Inland Waterways Corporation. 1935.

HF - COMMERCE

HF5686.W3H39		Hay, Leon Edwards	Water utility accounting. 1970.
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HT 390-395 - REGIONAL PLANNING

HT391.I82		Isard, Walter	Ecologic-economic analysis for regional development. 1972.
HT393.F5C37		Carter, Luther J.	The Florida experience; land and water policy in a growth state. 1974.
HT393.W6G65			Golden Sands Resource Conservation and Development Project Plan. 1974.

KF - LAW OF THE UNITED STATESRIPARIAN RIGHTS

KF645.W3	7 vol.		Waters and water rights; a treatise on the law of waters and allied problems. 1967-1976.
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Appendix A. (continued)

POWER SUPPLY - ELECTRICITY

KF2125.A97	Association of the Bar of the City of New York.	Electricity and the environment; the reform of legal institutions; report. 1972.
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PUBLIC HEALTH (INCLUDING ENVIRONMENTAL POLLUTION)

Ref KF 3775.A6E55 v.1-3 KF3775.A7M58	Meyers, Charles J.	Environment regulation handbook. 1973- Selected legal and economic aspects of environmental protection. 1971.
KF3775.A7T8	Tucker, Edwin Wallace	Text, cases, problems on legal regula- tions of the environment. 1972.
KF3775.A75E55 KF3775.A95	Anderson, Frederick R.	Environment law. 1970. NEPA in the courts; a legal analysis of the environmental policy act. 1973.
KF3775.D6 KF3775.E54	Dolgin, Erica L. Enk, Gordon A.	Federal environmental law. 1974. Beyond NEPA; criteria for environmental impact review. 1973.
Ref KF3775.G7 v. 1-3 KF3775.L3 KF3775.M3 KF3775.R4 KF3775.Z9S55 KF3790.A2E5 KF3790.I93	Grad, Frank P. Landau, Norman J. Macdonald, James B. Teitze, Arnold W. Sloan, Irving J. Izaak Walton League of America.	Treatise on environmental law. 1975- The environmental law handbook. 1971. Environmental litigation. 1972. Environment law. 1972- Environment and the law. 1971. Environment law review. 1970- A citizen's guide to clean water. 1973.
KF3790.R68	Ross, William M.	Oil pollution as an international problem. 1973.

WATER RESOURCES. WATERSHEDS. RIVERS. LAKES. WATER COURSES

KF5551.J32 KF5568.M4	Jacobstein, J. Myron Meyers, Charles J.	Water law bibliography, 1847-1965. 1966. Water resources management; a coursebook in law and public policy. 1971.
KF5568.P3 KF5569.A1M5	Padelford, Norman Judson Michigan University. Law School. Legislative Research Center.	Public policy for the seas. 1970. Water resources and the law. 1958.
KF5569.D47	Dewsnup, Richard L.	Legal protection of instream water values. 1971.
KF5569.3.C64 KF5570.W35	Waite, G. Graham	The Common law of water. 1971. A four-state comparative analysis of public rights in water. 1967.

KFW - WISCONSIN LAW

KFW2756.M87	Murphy, Earl Finbar	Water purity; a study in legal control of natural resources. 1961.
KFW2846.W38		Water-use law and administration in Wisconsin. 1970.

Appendix A. (continued)

KFW.Z9S33	Scott, Walter Edwin	Water policy evolution in Wisconsin; protection of public trust. 1965.
KFW2846.Z9T64	Torkelson, William E.	What legislation has accomplished for protection of Wisconsin waters. 1964.
<u>Q - SCIENCE (GENERAL)</u>		
Ref Q185.E52		Encyclopedia of instrumentation and control. 1971.
<u>QD - CHEMISTRY</u>		
QD1.A355		Advances in chemistry series. 1950- Saline water conversion. 1960-1963. Equilibrium concepts in natural water systems. 1967.
no. 27, 38		
no. 67		
no. 73	American Chemical Society	Trace inorganics in water. 1968.
no. 105		Anaerobic biological treatment processes. 1971.
no. 106		Nonequilibrium systems in natural water chemistry. 1971.
no. 111		Fate of organic pesticides in aquatic environments. 1972.
<u>QD 142 - WATER ANALYSIS</u>		
QD142.A5	American Public Health Association	Standard methods for the examination of water and wastewater, including bottom sediment and sludges. 1976.
QD142.B8	Burrell, David C.	Atomic spectrometric analysis of heavy metal pollution in water. 1975.
IMC QD142.C4		Chemistry of water (Motion picture) 1960.
QD142.D78	Douglas, Ian	Field methods of water hardness determination. 1968.
QD142.G64	Golterman, H. L.	Methods for chemical analysis of fresh waters. 1969.
QD142.R3	Rainwater, Frank Hays	Methods for collection and analysis of water samples. 1960.
QD142.R735	Rubin, Alan J.	Aqueous-environmental chemistry of metals. 1976.
QD142.R75	Rudolfs Research Conference, 4th, Rutgers University, 1965.	Principles and applications of water chemistry; proceedings. 1967.
QD142.S8	Strickland, J. D. H.	A practical handbook of seawater analysis. 1968.
QD142.U5	U.S. Environmental Protection Agency. Water Quality Office.	Methods for chemical analysis of water and wastes. 1971.
QD142.W48 1974	Wilson, Anthony Leslie	The chemical analysis of water; general principles and techniques. 1974.

Appendix A. (continued)

QD169 - INORGANIC CHEMISTRY - WATER

- | | | |
|-------------------|-----------------------|--|
| QD169.W3D3 | Davis, Kenneth Sydney | Water; the mirror of science. 1961. |
| QD169.W3E35 | Eisenberg, David S. | The structure and properties of water. 1970. |
| QD169.W3F7 5 vol. | Franks, Felix | Water: a comprehensive treatise. 1972-75. |
| QD169.W3H67 | Horne, Ralph Albert | Water and aqueous solutions; structure, thermodynamics, and transport processes. 1972. |

QE 179-180 - GEOLOGY OF WISCONSIN

- | | | |
|-----------|--|---|
| QE179.A33 | Wisconsin. Geological and Natural History Survey | Information circular. 1955- |
| no. 3 | Drescher, William James | Ground water in Wisconsin. 1956. |
| no. 9 | Devaul, Robert Washburn | Trends in ground-water levels in Wisconsin through 1966. 1967. |
| no. 27 | Bouma, J. | Measurement of water movement in soil pedons above the water table. 1974. |

QE 571-599 - DYNAMIC AND STRUCTURAL GEOLOGY

- | | | |
|-----------|----------------------|--|
| QE581.H57 | Horton, Robert Elmer | Erosional development of streams and their drainage basins; hydrophysical approach to quantitative morphology. 1962. |
|-----------|----------------------|--|

QH 1-278 - NATURAL HISTORY (GENERAL)QH 87.3-100 - WETLANDS, WATER, AQUATIC BIOLOGY)

86 titles - 152 volumes
(62 titles - 72 per cent pre 1970)

QH 540-560 - ECOLOGY

(Biological productivity, ecology of aquatic environments)

43 titles - 60 volumes
(15 titles - 35 per cent pre 1970)

QK - BOTANYQK 102-105 - PHYTOGEOGRAPHY. AQUATIC FLORA

- | | | |
|----------|--------------------------|---|
| QK103.A7 | Arber, Agnes (Robertson) | Water plants; a study of aquatic angiosperms. 1963. |
| QK103.D3 | Dawson, Elmer Yale | Marine botany; an introduction. 1966. |

Appendix A. (continued)

QK105.F3	Fassett, Norman Carter	A manual of aquatic plants. 1940.
QK105.F3 1957	Fassett, Norman Carter	A manual of aquatic plants. 1957.
QK105.M8	Muenschler, Walter Conrad	Aquatic plants of the United States. 1948.
QK105.W37		Water plants of the world. 1974.

QK 564-581 - ALGAE

41 titles - 50 volumes
(30 titles - 73 per cent pre 1970)

QK 618 - MARINE FUNGI

QK618.J64	Johnson, Terry Walter	Fungi in oceans and estuaries. 1970.
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QK 621 - PHYCOMYCETES

QK621.ALS64	Sparrow, Frederick Kroeber	Aquatic Phycomycetes. 1960.
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QK 930 - PLANT ECOLOGY - WATER

QK930.S35	Sculthorpe, Cyril Duncan	The biology of aquatic vascular plants. 1967.
QK930.W66	Wood, Richard Dawson	Hydrobotanical methods. 1972.
QK933.B66	Boney, Arthur Donald	Phytoplankton. 1975.
QK935.S6 2 vol.	Smith, Gilbert Morgan	Phytoplankton of the inland lakes of Wisconsin. 1920-1924.

QL - ZOOLOGYQL 120-149 - GEOGRAPHICAL DISTRIBUTION. PHYSIOGRAPHIC DIVISIONS. WATER

27 titles - 36 volumes
(21 titles - 74 per cent pre 1970)

QL 362-600 - INVERTEBRATES (SELECTED TITLES)

QL362.5.G68	Gosner, Kenneth L.	Guide to identification of marine and estuarine invertebrates; Cape Hatteras to the Bay of Fundy. 1971.
QL368.D6W6	Wood, E. J. Ferguson	Dinoflagellates of the Caribbean Sea and adjacent areas. 1968.
QL391.H6S28	Sawyer, Roy T.	North American freshwater leeches, exclusive of the Piscicolidae, with a key to all species. 1972.
QL391.O4B74 1974	Brinkhurst, Ralph O.	Aquatic oligochaeta of the world. 1971.
QL415.W6B3 2 vol.	Baker, Frank Collins	The fresh water Mollusca of Wisconsin. 1928.

Appendix A. (continued)

- QL444.M33I57 1972 International Symposium on Freshwater crayfish. 1972.
Freshwater Crayfish, 1st.
Hinterthal, Austria, 1972.
- QL496.U75 Usinger, Robert Leslie Aquatic insects of California, with keys
to North American species. 1956.
- IMC QL505.3.E65M39 The mayfly; ecology of an aquatic insect
(Motion picture). 1973.
- QL513.E7N38 1972 Needham, James George The biology of mayflies; with a systema-
tic account of North American species.
1972.
- QL513.O2C6 Corbet, Philip S. The biology of dragonflies. 1962.
- QL513.O2N46 Needham, James George A manual of the dragonflies of North
America. 1954.
- QL513.O2W33 2 vols. Walker, Edmund Murton The Odonata of Canada and Alaska. 1953-
- QL530.2.A1F74 1975 Frison, Theodore Henry The stoneflies or Plecoptera of Illinois.
1975.

QL 614-639 - FISHES

206 titles - 284 volumes
143 - 67 per cent pre 1970

QR 48 - SANITARY MICROBIOLOGY

- QR48.F66 Finstein, Melvin Sumner Pollution microbiology; a laboratory
manual. 1972.
- QR48.M58 Mitchell, Ralph Water pollution microbiology. 1972.
- QR48.S94 Sykes, G. Microbial aspects of pollution. 1971.
- QR100.U54 United States-Japan Con- Effect of the ocean environment on
ference on Marine Micro- microbial activities; proceedings.
biology, 2nd., University 1974.
of Maryland, 1972.

QR 105-106 - AQUATIC MICROBIOLOGY

- QR105.P93 Prescott, Samuel Cate Water bacteriology with special refer-
ence to sanitary water analysis. 1946.
- QL105.R49513 1974 Rheinheimer, Gerhard Aquatic microbiology. 1974.
- QR105.R5713 Rodina, Antonina Gavrilovna Methods in aquatic microbiology. 1972.
- QR105.R78 1963 Rudolfs Research Confer- Principles and application in aquatic
ence, New Brunswick, N.J., microbiology; proceedings. 1964.
1963.
- QR105.S67 Sorokin, Ju I. Techniques for the assessment of micro-
bial production and decomposition in
fresh waters. 1972.
- QR105.T7 Transmission of viruses by the water
route. 1967.
- QR105.5.S9 1968 Symposium on Micro-organ- Micro-organic matter in water. 1969.
ic Matter in Water, San
Francisco, 1968.
- QR106.A38 v. 1 Advances in microbiology of the sea.
1968.

Appendix A. (continued)

QR106.M37		Marine and estuarine microbiology laboratory manual. 1975.
QR106.W6	Wood, E. J. Ferguson	Marine microbial ecology. 1965.
 <u>RA - PUBLIC HEALTH</u>		
RA8.A25	World Health Organization	Technical report series. 1950-
no. 420	World Health Organization	Community water supply. 1969.
RA565.S3 1972	Salvato, Joseph A.	Environmental engineering and sanitation. 1972.
RA565.W65	World Health Organization	Health hazards of the human environment. 1972.
RA566.C66 1975	Committee for the Working Conference on Principles of Protocols for Evaluating Chemicals in the Environment.	Principles for evaluating chemicals in the environment. 1975.
RA569.E5 1973	Eisenbud, Merril	Environmental radioactivity. 1963.
RA591.W65	World Health Organization	International standards for drinking water. 1971.
RA591.5.M3	McNeil, Donald R.	The fight for fluoridation. 1957.
RA591.5.S45	Shaw, James Headon	Fluoridation as a public health measure. 1954.
RA591.5.S8	Sutton, Phillip R. N.	Fluoridation; errors and omissions in experimental trials. 1960.
RA591.7.C68	Courtney, Phoebe	How dangerous is fluoridation. 1971.
RA591.7.M35	Maier, Franz J.	Fluoridation. 1972.
 <u>S - AGRICULTURE</u>		
S494.5.W3	Food and Agriculture Organization of the United Nations	Irrigation and drainage paper. 1971-
no. 19	Clarke, R. T.	Mathematical models in hydrology. 1973.
no. 21	Thomas, R. G.	Groundwater models. 1973.
no. 24	Doorenbos, J.	Crop water requirements. 1975.
no. 25	Dsatane, N. G.	Effective rainfall in irrigated agriculture. 1974.
no. 26	Kraatz, D. B.	Small hydraulic structures. 1975.
no. 28	Trafford, B. D.	Drainage testing. 1976.
no. 29	Ayers, R. S.	Water quality for agriculture. 1976.
S613.A7		Arid lands in perspective. 1969.
S613.C35	Cantor, Leonard Martin	A world geography of irrigation. 1970.
S613.H3	Hagan, Robert Mower	Irrigation of agricultural lands. 1967.
S613.I75	Israelsen, Orson Winso	Irrigation principles and practice. 1950.
S613.I75 1967	Israelsen, Orson Winso	Irrigation principles and practice. 1967.
S613.K48	King, Franklin Hiram	Irrigation and drainage. 1903.
S613.P34 1967	Panel on the Value of High Desalting in Agriculture, Vienna, 1967.	Value to agriculture of high-quality water from nuclear desalination. 1969.
S613.Y3	Yaron, Bruno	Arid zone irrigation. 1973.

Appendix A. (continued)

S616.W6W5	Wisconsin. Dept. of Natural Resources.	Water on the land. 1970.
S621.L8	Luthin, James N.	Drainage of agricultural lands. 1957.
S621.R6	Roe, Harry Burgess	Engineering and agricultural drainage. 1954.
S621.U64	United States. Soil Conservation Service	Drainage of agricultural land; a practical handbook for the planning, design, construction, and maintenance of agricultural drainage systems. 1973.
S623.B33	Beasley, Robert Patrick	Erosion and sediment control. 1972.
IMC S623.D47		Design and function of water control structures (Transparency)
IMC S623.L3		Land classification for watershed management (Transparency)
Ref S623.S63	Soil Conservation Society of America	Soil and water conservation glossary. 1952.
S623.U57	U.S. Soil Conservation Service	A manual on conservation of soil and water; handbook for professional agricultural workers. 1954.
IMC S623.W3		Water - a community problem (Slide)

SB - PLANT CULTURE AND HORTICULTURE

SB959.M8	Muirhead-Thomson, R. C.	Pesticides and freshwater fauna. 1971.
SB959.P3 1965	Panel on the Uses of Radioisotopes in the Detection of Pesticide Residues, Vienna, 1965.	Radioisotopes in the detection of pesticide residues. 1965.
SB959.S86 1971	Symposium on Pesticides, Ecology and Natural Resources Management, Washington State University, 1971.	Pesticides, ecology and natural resources management. 1971.
SB959.S87 1965	Symposium on Pesticides in the Environment and Their Effects on Wildlife, Abbots Ripton, Eng., 1965.	Pesticides in the environment and their effects on wildlife. 1965.

SH - FISH CULTURE AND FISHERIES

122 titles - 525 volumes
43 titles - 35 per cent pre 1970

SH - ANGLING

88 titles - 104 volumes
69 titles - 79 per cent pre 1970

Appendix A. (continued)

SK - HUNTING SPORTS (including hunting and fishing)

SK1.S57	Southeastern Association of Game and Fish Commissioners.	Proceedings. 1954-
SK45.W476	Western Association of State Game and Fish Commissioners.	Proceedings. 1970-
SK351.I5	International Association of Fish and Wildlife Agencies.	Proceedings. 1957-
SK351.N872	North American Wildlife and Natural Resources Conference	Transactions. 1937-

TA - ENGINEERING (GENERAL)

TA462.B88	Butler, George	Corrosion and its prevention in waters. 1966.
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TC - HYDRAULIC ENGINEERING

86 titles - 129 volumes
64 titles - 74 per cent pre 1970

TD 169-199 - ENVIRONMENTAL PROTECTION, ENVIRONMENTAL POLLUTION

85 titles - 109 volumes
12 titles - 14 per cent pre 1970

TD 200-500 - WATER SUPPLY FOR DOMESTIC AND INDUSTRIAL PURPOSES

137 titles - 189 volumes
66 titles - 48 per cent pre 1970

TD 501-780 - SEWAGE COLLECTION AND DISPOSAL SYSTEMS. SEWERAGE

28 titles - 44 volumes
5 titles - 18 per cent pre 1970

TK - ELECTRICAL ENGINEERING. ELECTRONICS. NUCLEAR ENGINEERING

TK1051.C6	Cootner, Paul H.	Water demand for steam electric generation; an economic projection model. 1965.
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TS - MANUFACTURERS

TS900.W23	Walker, Rodger	Pump selection; a consulting engineer's manual. 1973.
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Appendix A. (continued)

Z - BIBLIOGRAPHY

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|----------------------|--|---|
| Ref Z5853.P7S53 | Sinha, Evelyn | Coastal estuarine pollution, an annotated bibliography. 1970. |
| Z5971.D35 v. 1-2 | Dean, Bashford | A bibliography of fishes. 1916-1923. |
| Ref Z5971.F576 2v. | Food and Agricultural Organization of the United Nations Documentation Centre. | Fisheries: FAO publications and documents. 1969. |
| Z5971.S6 1972 | Sport Fishing Institute. | Bibliography of these on fisheries biology; a compilation of graduate these on fisheries biology and related subjects. 1st. suppl. 1959-71. 1953. |
| Ref Z5972.U52 | U.S. Fish and Wildlife Service | Fishery publication index, 1920-54. 1956. |
| Ref Z5972.U522 | U.S. Dept. of the Interior, Library. | A preliminary bibliography of the grass carp <i>ctenopharyngodon idella valenciennes</i> . 1969. |
| Ref Z5973.C3N3 | Nair, K.K. | Fish protein concentrate; a comprehensive bibliography. 1970. |
| Ref Z5973.F5U5 | U.S. Library of Congress. Science and Technology Division. Special Bibliography Section. | Index and list of titles, Fisheries Research Board of Canada and associated publications, 1900-1964. 1968. |
| Ref Z5974.C2C27 | Carter, Neal M. | Index and list of titles, Fisheries Research Board of Canada and associated publications, 1965-1972. 1973. |
| Ref Z5974.C2C27 1973 | Carter, Neal M. | Annotated bibliography on hydrology, (1951-54) and sedimentation (1950-54) United States and Canada. 1956. |
| Ref Z6004.P5A43 | American Geophysical Union | Isotope techniques in hydrology. 1977- Annotated bibliography on hydrology and sedimentation; United States and Canada, 1955-58. 1955- |
| Z6004.P5I7123 | | Metals as pollutants in air and water; an annotated bibliography. 1972. |
| Ref Z6004.P5U49 | U.S. Geological Survey | Water pollution control, sewage treatment, water treatment; selected biological references. 1963. |
| Ref Z7171.S55 | Sinha, Evelyn | Lake and river pollution; an annotated bibliography. 1971. |
| Z7173.W3I5 | Ingram, William Marcus | Detergents in water; a bibliography. 1971. |
| Ref Z7173.W3S5 | Sinha, Evelyn | Water pollution in the pulp and paper industry. 1972- |
| Ref Z7173.W3W37 | Water Information Center | Dictionary catalog of the Water Resources Center Archives, University of California, Berkeley. 1970. |
| Z7164.P2W352 | Weiner, Jack | Sources of information in water resources an annotated guide to printed materials. 1976. |
| Ref Z7935.C32 5 vol. | California. University. Water Resource Center. Archives | |
| Ref Z7935.G548 | Giefer, Gerald J. | |

Appendix A. (continued)

Ref Z7935.S56	Sloss, George J.	Water related environmental planning. 1973.
Ref Z7935.U5	U.S. Office of Water Resources Research	Bibliography of socio-economic aspects of water resources. 1966.
Ref A7935.V35	Van der Leeden, Frits	Ground water; a selected bibliography. 1971.
Ref Z7935.V35 1974	Van der Leeden, Fritz	Ground water; a selected bibliography. 1974.
Ref Z7935.W45	Wellisch, Hanan	Water Resources development, 1950-1965. 1967.
Ref Z7935.Z36	Zaporozec, Alexander	Bibliography and index of Wisconsin ground water, 1851-1972. 1974.

Appendix B. Current LRC periodical holdings related to Water Resources.

Acta hydrobiologica
1969-

American fish farmer and world aquaculture news
v.1, no.6-

American Fisheries Society. Transactions
v.1, 1872-

American Water Works Association. Journal
v.59, 1967-

Applied and environmental microbiology
v.31, 1976-
Formerly Applied microbiology

Applied microbiology
v.1, 1953-v.30, 1975
New title: Applied and environmental microbiology

Aquaculture
v.3, 1974-

Aquatic science and fisheries abstracts
v.6, 1976-

Bamidgeh; bulletin of fish culture in Israel
v.24, 1972-

Bulletin from your water managers
v.1, 1975-

California waterscape
v.7, no.4, 1976-

Canadian fish culturist
suspended with no.40 Feb. 1969

Clean air and water news
v.1, 1969-

Commercial fish farmer & aquaculture news
v.1, 1974-

Commercial fisheries abstract
v.11 no.3, 1958-

Commercial fisheries review
v.22, 1960-v.34 no.6, 1972
New title: Marine fisheries review

Appendix B. (continued)

Copeia

no.1, 1913-no.173, 1929
new series, 1930-

Environmental pollution
v.1, 1970-

Environmental science and technology
v.1, 1967-

Estuarine and coastal marine science
v.1, 1973-

Facets of freshwater
v.1 no.12, 1976-

Farm pond harvest
v.1, 1967-

Fisheries
v.1, 1976-

Fishery bulletin
v.1, 1882-

Fisheries Research Board of Canada. Journal
v.1, 1934-

Food fish situation and outlook
no.2, 1967-

Freshwater biology
v.1, 1971-

Frozen fish report
no.12, 1965-70 ceased

Ground water
v.5, 1967-

Hydrobiological journal
v.6, 1970-

Industrial water engineering
v.9 no.4, 1972-

Inland seas
v.11, 1955-

Institute for Research on Land and Water Resources, Newsletter
v.4, 1973-

Appendix B. (continued)

International Council for the Exploration of the Sea. Journal
du Conseil
v.34, 1971-

Journal of environmental management
v.4, 1976

Journal of environmental quality
v.1, 1972-

Journal of fish biology
v.1, 1969-

Journal of ichthyology
v.10, 1970

Journal of soil and water conservation
v.8, 1953-

Limnology and oceanography
v.1, 1956-

Limnos (Great Lakes Foundation)
v.3, 1970-

Marine fisheries review
v.34, 1972-
Formerly: Commercial fisheries review

Marine pollution bulletin
v.4 no.4, 1973-

Marine resource bulletin
v.8 no.2, 1976-

Michigan wastewater works news
v.1, 1972-

National fisherman
v.54, 1973-

Ontario fish and wildlife review
v.9, 1970-

Oregon commercial fisheries
v.6 no.4, 1975-

Progressive fish culturist
1937-41, 1947-

SFI (Sport Fishing Institute)
no.214, 1970-

Appendix B. (continued)

Selected water resources abstracts
v.1, 1968-

Sewage and industrial wastes
v.22, 1950-v.31, 1959
New title: Water Pollution Control Federation. Journal

Sewage works journal
v.21, 1949
Became Sewage and industrial wastes

Sport fishery abstracts
v.1, 1955-

Water and waste treatment
v.15, 1972-

Water and wastes engineering
v.5, 1968-

Water conditions in Wisconsin
1967-1971

Water control news
v.1 no.42, 1967-Dec. 1968
New title: Clean air and water news

Water in the news
1970-

Water Information Center. Research and development news
v.6, 1965-

Water newsletter
5 years only

Water pollution abstracts
v.45, 1972-v.46, 1973
ceased

Water Pollution Control Federation. Highlights
v.9 no.4, 1972-

Water Pollution Control Federation. Journal
v.32, 1960-
Formerly Sewage and industrial wastes

Water Research
v.3, 1969-

Water resources bulletin
v.6, 1970-

Appendix B. (continued)

Water resources research
v.1, 1965-

Water resources review
1972-

Water spectrum
v.1, 1969-

World fisheries abstracts
v.17 no.4, 1966-v.23 no.4, 1972
ceased

Miscellaneous UN publications

EIFAC technical paper

FAO fisheries report

FAO Fisheries technical paper

Fishery Committee for the Eastern Central Atlantic. CEEAF
statistical bulletin

FAO Fisheries study

FAO fishing manuals

General Fisheries Council for the Mediterranean. GFCM
statistical bulletin

General Fisheries Council for the Mediterranean. Session
report

New subscriptions - 1978

American Society of Civil Engineers. Environmental Engineering
Division. Journal

Archiv fur hydrobiologie

Water and sewage works

Appendix C. Sources used for evaluating LRC holdings related to the Water Resources program.

General sources

- Books for college libraries: a core collection of 40,000 titles. 1975. 2d ed. American Library Association, Chicago. 6 vols.
- Sheehy, E.P., comp. 1976. Guide to reference books. 9th ed. American Library Association, Chicago. 1015pp.
- Walford, A.J., ed. 1973-. Guide to reference material. 3d ed. Library Association, London. vol.1-

Special bibliographies

- American Water Works Association. 1972. Water supply library, 1971-1972: a comprehensive bibliography of some of the latest literature available in the water supply field. New York. 15pp.
- American Water Works Association. 1973. Water supply library 1973-1974: literature available to the water-supply field. New York. 13pp.
- Fogel, M.M. 1976. A bibliographic guide to water pollution. Choice 13(1):23-29.
- Giefer, G.J. 1976. Sources of information in water resources: an annotated guide to printed materials. Water Information Center, Port Washington, N.Y. 290pp.
- Kelts, L.I., and J. Bressler. 1971. Fish and fisheries resources: an annotated bibliography. Trans. Amer. Fish. Soc. 1971(2):403-422.
- Tchobanoglous, G., R. Smith and R. Crites. 1976. Wastewater management: a guide to information sources. Gale Research, Detroit. 202pp.
- Water Pollution Control Federation. 1976. Literature review. Jour. Water Poll. Control Fed. 48(6):997-1678.
- Wetzel, R.G. 1975. Limnology. Saunders, New York. pp.667-699.

Reviews

- American Fisheries Society. Transactions. 1970- to date.
- Choice; books for college libraries. 1970- to date.

Appendix C. (continued)

Science books and films. 1975- to date.

Water resources bulletin. 1970- to date.

Selected catalogs of publications

American Water Resources Association

Ann Arbor Science Publishers

Noyes Data Corporation

Water Information Center

Water Resources Publications

Appendix D. Water resources books missing from the LRC during a 1977 inventory.

GB701.N3	National Research Council. Committee on Water	Water and choice in the Colorado basin; an example of alternatives in water management. 1968.
GB705.W6H6 (missing 7 out of 12)	Holt, Charles Lee Roy	Geology and water resources of Portage County Wisconsin. 1965.
GB661.L5 (missing 1 out of 2)	Linsley, Ray K	Applied hydrology. 1949.
GB661.V53 (missing 1 out of 2)	Viessman, Warren	Introduction to hydrology. 1972.
GB665.J8 (missing 3 of 8)	Judy, Clark Henry	Water resources notes. 1973.
GB671.L39 1974 (missing 3 of 10)	Leopold, Luna Bergere	Water; a primer. 1974.
GB661.K5 1961	King, Thomason	Water; miracle of nature. 1961.
GB661.K813	Kuenen, Philip Henry	Realms of water; some aspects of its cycle in nature. 1963.
GB661.H25 1973 (missing 1 of 2)		Handbook on the principles of hydrology, with special emphasis directed to Canadian conditions in the discussions, applications, and presentations of data. 1973.
GB661.K37 (missing 1 of 3)	Kazmann, Raphael Gabriel	Modern hydrology. 1965.
GB906.D73	Drew, David P	Techniques for the tracing of subterranean drainage. 1969.
GB1005.D34 GB1205.I5 1971	Davis, Stanley Nelson International Symposium on River Ecology and the Impact of Man, University of Massachusetts, 1971	Hydrogeology. 1966. River ecology and man. 1972.
GB1205.S513	Shirley, Martha Lou	Deltas in their geologic framework. 1968.
SH34.C3C34 (missing 1 of 4)	Calhoun, Alexander J	Inland fisheries management. 1966.
SH36.H82	Hubbs, Carl Leavitt	The improvement of lakes for fishing; a method of fish management. 1938.

Appendix D. (continued)

SH151.L45	Lewis, Willia, Madison	Maintaining fishes for experimental and instructional purposes. 1963.
SH167.C35L43 (missing 1 of 2)	Lee, Jasper S	Commercial catfish farming. 1973.
SH159.D4 (missing 2 copies)	Davison, Verne Elbert	Homemade fishing; bass and trout waters you can build yourself. 1953.
SH159.L4 (missing 1 of 2)	Leitritz, Earl	Trout and salmon culture. 1969.
SH159.W5		Wisconsin farm fish ponds.
SH171.D52 v.1		Diseases of fishes. 1970.
SH333.N5513	Nikolskii, Georgii Vasilevich	Theory of fish population dynamics as the biological background for rational exploitation and management of fishery resources. 1969.
SH338.M5	Migdalski, Edward C	How to make fish mounts, and other fish trophies. 1960.
SH351.C4M3 (missing 1 of 2)	Mack, Jerry	Catfish farming handbook. 1972.
SH439.A585	Arnold, Richard	The anglers' handbook. 1967.
SH439.W75	Wrangles, Alan	Newnes complete guide to coarse fishing. 1967.
SH441.C8	Crowe, John	Modern ABC's of fresh water fishing. 1965.
SH441.M3	McCarthy, Eugene	Familiar fish, their habits and capture. 1900.
SH441.079	Orvis, Charles F	Fishing with fly; sketches by lovers of the art with illustrations of standard flies. 1967.
SH441.P2	Paine, Albert Bigelow	The tent dwellers. 1967.
SH448.P4 (missing 3 copies)	Peterson, Alvah	Fishing with natural insects. 1956.
SH451.S9 1973	Swisher, Doug	Selective trout. 1973.
SH456.A5	American Association for Health, Physical Education, and Recreation	Casting angling. 1958
SH456.D53 1972	Dick, H. Lenox H	The art & science of fly fishing. 1972.
SH456.F68	Fox, Charles Kunkel	Rising trout. 1967.

Appendix D. (continued)

SH459.L68	Lowrance Electronics Manufacturing Corp.	The fun of electronic fishing with the complete Fish Lo-k-tor operations manual. 1967.
SH459.S7	Smith, Onnie Warren	Casting tackle and methods. 1920.
SH462.M5	Migdalski, Edward C	Angler's guide to the fresh water sport fishes of North America. 1962.
SH464.N6H6	Holm, Don	Pacific North! Sea trails for the sportsman on the North Pacific rim. 1969.
SH495.H3 (missing 2 of 7)	Harlan, James R	Iowa fish and fishing. 1956.
SH677.M52	Mills, A.R.	Lord suffer me to catch a fish. 1967.
SH681.H53	Henshall, James Alexander	Book of the black bass. 1923.
SH685.B7	Bridges, Antony	Modern salmon fishing. 1969.
SH687.B38	Bates, Joseph D	Trout waters and how to fish them. 1949.
SH687.086	Ovington, Ray	Tactics on trout. 1969.
SH691.C3G5	Gibbinson, James Arthur	Carp. 1968.
SH691.P6L5	Lincoln, Robert Page	The pike family. 1953.
SH691.P6S5	Smith, Onnie Warren	The book of the pike. 1922.
SH691.P6W4	Weed, Alfred Cleveland	Pike, pickeral, and muskalonge. 1927.
TC175.U3 (missing 5 of 10)	U.S. Bureau of Reclamation	Water measurement manual. 1967.
TD172.5.S95 1968	Symposium on the Global Effects of Environmental Pollution, Dallas, 1968	Global effects of environmental pol- lution. 1970.
TD174.H34	Hamblin, Lynette Kaye	Pollution; the world crisis. 1972.
TD174.T87 (missing 2 copies)	Turk, Amos	Ecology, pollution, environment. 1972.
TD176.7.E47		The environmental crisis; man's struggle to live with himself. 1970.
TD180.D4	Degler, Stanley E	Federal pollution control programs; water, air, and solid wastes. 1970.
TD180.T4 1966	Technological Transfer- ence Symposium, 1st, Washington, D.C., 1966	Ecological technology, space-earth-sea. 1967.
TD223.A4 (missing 1 of 10)	U.S. Federal Water Pol- lution Control Admini- stration	Biology of water pol- lution. 1967.

Appendix D. (continued)

TD223.P4 (missing 1 of 2)	Pettyjohn, Wayne A	Water quality in a stressed environment; readings in environmental hydrology. 1972.
TD345.H57	Hoover, Charles Potter	Water supply and treatment. 1970.
TD351.T63 (missing 1 of 2 copies)	Todd, David Keith	The water encyclopedia; a compendium of useful information on water resources. 1970.
TD355.W6	Wolman, Abel	Water, health, and society. 1969.
TD365.T4	Tebbutt, T.H.Y.	Principles of water quality control. 1971.
TD365.T5	Thomann, Robert Valentine	Systems analysis and water quality management. 1972.
TD370.J47 1969	Jerusalem International Conference on Water Quality and Pollution Research, 1969	Development in water quality research; proceedings. 1970.
TD380.H5 1971 (missing 1 of 2)	Hem, John David	Study and interpretation of the chemical characteristics of natural water. 1970.
TD420.G67	Grava, Sigurd	Urban planning aspects of water pollution control. 1969.
TD420.R39	Renn, Charles Easterday	A study of water quality. 1968.
TD423.M27	Mancy, Khalil H	Instrumental analysis for water pollution control 1971.
TD425.M33 (missing 1 of 4)	McKee, Jack Edward	Water quality criteria. 1963.
TD479.P6	Popkin, Roy	Desalination; water for the world's future. 1968.
TD741.I5613	Imhoff, Karl	Disposal of sewage and other waterborne wastes. 1971.
TD745.B57	Bolton, R.L.	Sewage treatment; basic principles and trends. 1971.
TD745.C8 (missing 1 of 2)	Culp, Russell L	Advanced wastewater treatment. 1971.
TD764.V4	Velz, Clarence J	Applied stream sanitation. 1970.