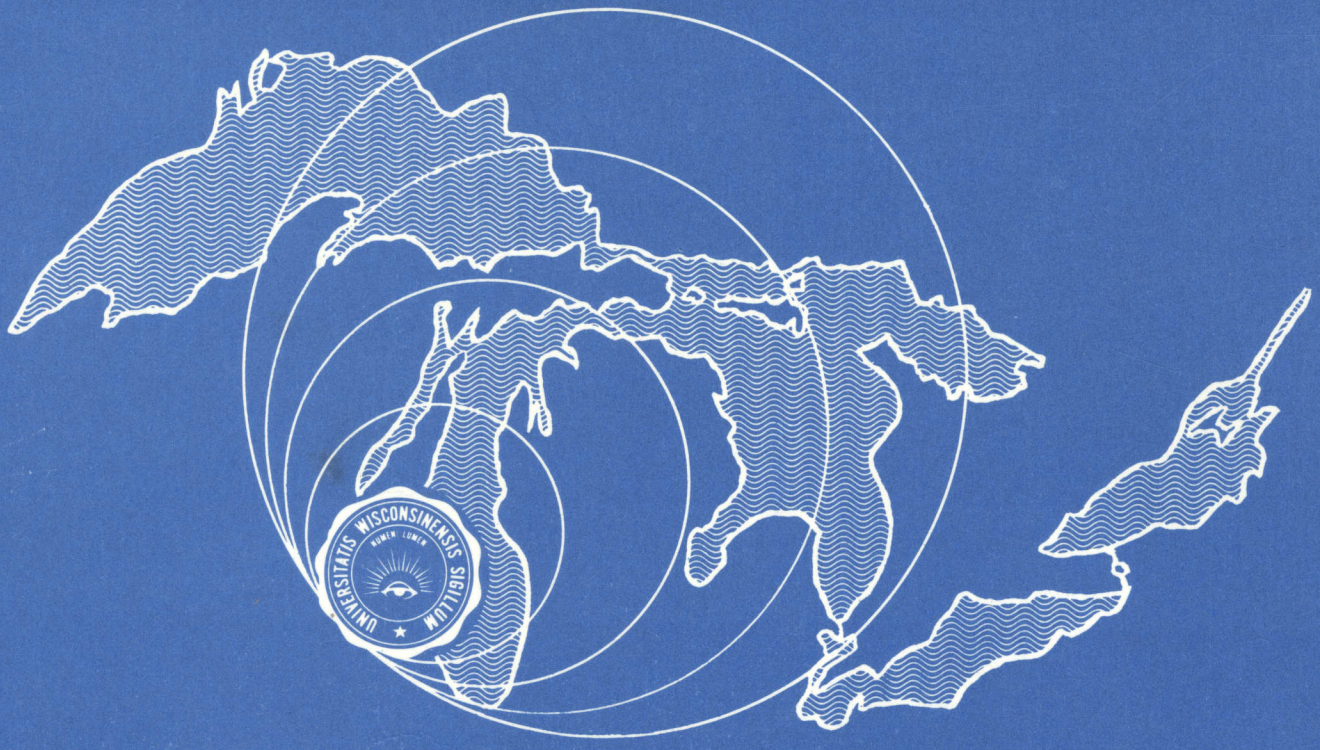
THE UNIVERSITY OF WISCONSIN – MILWAUKEE

CENTER FOR GREAT LAKES STUDIES



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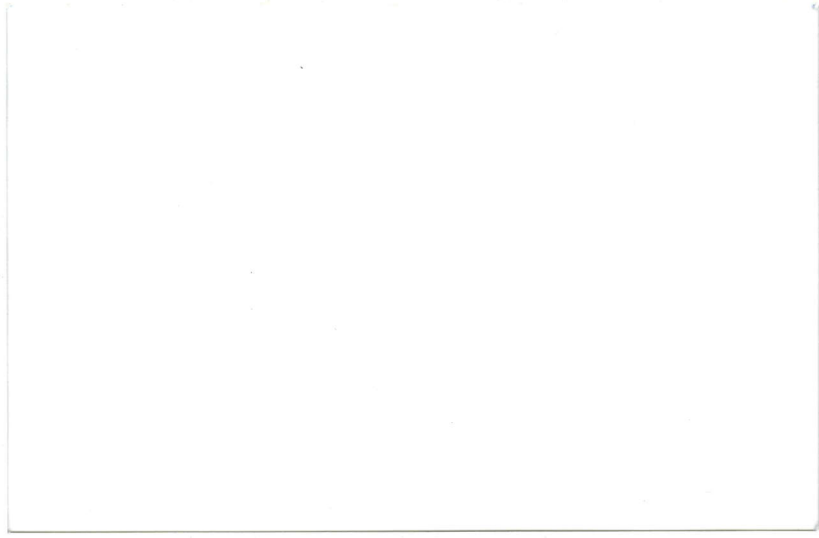

Center for Great Lakes Studies
University of Wisconsin-Milwaukee
Milwaukee, Wisconsin 53201

THE CASE FOR A GREAT LAKES STUDIES FACILITY AT THE UNIVERSITY OF WISCONSIN-MILWAUKEE

20 May 1969

C. H. Mortimer

A memorandum, with separate appendices, prepared for submission to The Coordinating Council for Higher Education.

TABLE OF CONTENTS

LIST OF APPENDICES
(Attached as a Separate Package)

Appendix

1. The Great Lakes: General Characteristics; Multiple Uses; University Involvement .

2. Organization of the Marine (and Great Lakes) Studies Program of the University of Wisconsin.

3. The Center for Great Lakes Studies at the University of Wisconsin-Milwaukee. (article for "Limnos.")

4. Center for Great Lakes Studies: History, Aims, Organization, Staff, Facilities and Research Programs, 1968-1969.

5. Undergraduate and Graduate Training: Courses Available to Students Associated with the Center for Great Lakes Studies at UWM.

6. Grants and Contracts to UWM Faculty Associated with the Center for Great Lakes Studies.

7. Special Report No. 1: Internal waves and associated currents observed in Lake Michigan during the summer of 1963, by C. H. Mortimer.

8. Special Report No. 5: Future general cargo traffic and terminal requirements at the Port of Milwaukee, by E. Schenker.

9. Collected Reprints, Center for Great Lakes Studies.

10. A Plan for a Fast Workboat.

THE CASE FOR A GREAT LAKES STUDIES FACILITY AT THE UNIVERSITY OF WISCONSIN-MILWAUKEE

INTRODUCTION

A new building has been approved, for the 1969-70 biennium, to house the activities of the Center for Great Lakes Studies at UWM. State funding (at $1 million ?) is contingent on a federal contribution and on a review of the proposed UWM location by the Coordinating Council for Higher Education. Questions have been asked--in the Joint Finance Committee, for example--why the building should be in Milwaukee and not in Green Bay or elsewhere.

This memorandum sets out, briefly but with ten supporting appendices, substantial justifications for the choice of Milwaukee. These are based, first, on the past performance and future potentialities of the Center for Great Lakes Studies program at UWM, second, on the qualifications and international reputation of those who are building that program, third, on the considerable geographic advantages of Milwaukee harbor as a Lake Michigan research and training base and, fourth, on anticipated developments in national marine (including Great Lakes) programs.

From many viewpoints, the Great Lakes form part of the coastal zone. Recent reviews of national marine programs and policies recognize that problems arising from conflicting multiple use of the Lakes are closely similar to those in coastal marine areas. University involvement is growing (Appendix 1[1]).

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[1]Appendix 1: "The Great Lakes: General Characteristics; Multiple Uses; University Involvement.

University of Wisconsin Marine Program

It is natural, therefore, that the University of Wisconsin's developing marine program includes educational and research activities on the Great Lakes. The organization and structure of that program is outlined in Appendix 2[2]. University activities on the Lakes were strengthened and focused by the establishment, in its present form in 1966, of the Center for Great Lakes Studies at UWM. Work on the Lakes also forms part of the effort of the Marine Studies Center in Madison (established in 1968); and the same will be true of the College of Environmental Sciences now being set up at Green Bay.

Sea Grant Program

Opportunities for all-university training and research on the Great Lakes and the prior establishment of the Center for Great Lakes Studies at UWM were the main reasons why the University of Wisconsin, an inland university, was among the first six colleges to be awarded an institutional Sea Grant in 1968. Subject to sufficient matching funds being available, we expect this to be a continuing and expanding program ($650,000 was requested for 1969-70 from the NSF). It must be made clear, however, that the mission of the Sea Grant Program is restricted. It is to promote, through educational and advisory programs and through research, the development and exploitation of marine (including Great Lakes) resources, i.e., the emphasis will be laid more on applied natural and social sciences than on basic studies. Therefore, important though its stimulating and supporting role will be, the Sea Grant Program will form only

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[2] Appendix 2: Organization of the Marine (and Great Lakes) Studies Program of the University of Wisconsin.

one component of the whole university's effort in the marine and Great Lakes field. This effort is reviewed and guided, at the all-university policy level by a Council for Marine Studies, and at the (working) faculty level by an all-university Committee for Oceanography and by campus committees (see Appendix 2).

THE CENTER FOR GREAT LAKES STUDIES: ITS PRESENT STAFF, FACILITIES, AND PROGRAMS

The establishment of the Center on the Milwaukee campus was carefully considered and well supported. Planning started in 1963 (at which time the writer was consulted); activities began on a small scale in 1964 (Dr. E. Towle in charge); and the present growth phase was started in 1966 with the arrival of Dr. A. M. Beeton and the writer. The present scale of financial support, for operations and equipment (not including space charges) totaled approximately $182,000 from university sources and $110,000 from outside grants and contracts in 1968-69.

A general and illustrated account of the activities of faculty, staff, and students associated with the Center is given in Appendix 3[3]; and more detailed information, including biographical summaries of the principal participating faculty members, are given in Appendix 4.[4] The mission of the Center is to contribute, through research and education, to better understanding of the physical, chemical, biological and social processes which influence the Great Lakes and their drainage basins.

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[3] Appendix 3: The Center for Great Lakes Studies at the University of Wisconsin-Milwaukee.

[4] Appendix 4: Center for Great Lakes Studies: History, Aims, Organization, Staff, Facilities and Research Programs, 1968-1969.

Education

The Center, backed by the facilities of a growing university campus and of a major port, can offer excellent opportunities to students at UWM for training in the concepts and techniques of limnology, oceanography, and water resource development and management. Timetable planning and moderate expenditure on transport will make these facilities also available to undergraduate and graduate students from other campuses. With the present and future facilities (outlined in the next section) faculty and students will increasingly use Lake Michigan as a laboratory and a training ground.

The Center was deliberately organized, not as a separate institute, but as a multi-disciplinary, interdepartmental and (where appropriate) an all-university or interuniversity research facility. Relevant undergraduate and graduate courses are taught (see Appendix 5[5]) not separately in the Center, but in a number of departments, for example: limnology and fisheries (zoology department); algology and urban ecology (botany department); oceanography and sedimentology (geological sciences department); water resources (geography department); urban developmental policies (urban affairs department) and fluid dynamics (mathematics department). Center faculty members and associates take a major share of the teaching in these fields, working in a variety of departments, through the channels of part-time appointments, teaching assignments, special seminars and lectures, and, above all, supervision of graduate research. Students wishing to work in the Center for the M.S. or PhD degrees must, therefore, first be accepted by the Graduate School and the appropriate department. In this way, faculty isolation is avoided, and a continued flow of students is assured.

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[5] Appendix 5: Undergraduate and Graduate Training: Courses Available to Students associated with the Center for Great Lakes Studies at UWM.

The Center organization and activities was recently favorably reviewed by the North Central Accreditation Team, and reference is made to their forthcoming report.

Since the start of the Center in 1966, three students have received M.S. degrees for work carried out in the Center and three more will graduate in June of 1969. Seven students have undertaken work towards the PhD degree under the supervision of Drs. Mortimer Beeton, and Blum through the Madison and UWM Graduate Schools. One of Beeton's students will receive his PhD in June, 1969; another has a National Science Foundation Doctoral Fellowship. A total of ten students applied for advanced degree work through the Center for 1969-70.

Research

Some of the research projects now under way are described in Appendices 3 and 4; others are indicated by tabs in Appendix 6[6] which, incidentally, indicates the range and widespread participation by universities and other agencies in Great Lakes research (a similar national annual directory is published to cover the Canadian effort). Graduate students participate in many of the listed projects. The following additional projects will, we anticipate, be carried out with grant support during 1969-70:

C. H. Mortimer and N.S. Heaps. Exploration and theoretical study of circulation in large basins, gulfs and estuaries.

C. H. Mortimer and U. Zimmermann. Mechanisms controlling water quality and mass exchange in Lake Michigan: Phase I: Development of equipment for routine chemical sampling and analysis from moving vessels.

A. M. Beeton and J. Gannon. The role of Cyclops bicuspidatus in the trophic ecology of Lake Michigan.

A. M. Beeton. Inshore and offshore differences in nutrients and plankton and their significance in eutrophication of Lake Michigan.

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[6]Appendix 6: Grants and Contracts to UWM Faculty associated with the Center for Great Lakes Studies.

G. L. Roderick. Engineering characteristics of bottom sediments.

J. N. Ong, and R. G. Gilliland. Corrosion studies of materials of construction in reducing sediments.

D. A. Salamone (with W. A. Strang, Madison). The application of a conceptual systems model to determine the economic impact of Lake Michigan on the recreation industry in Door County, Wisconsin.

H. C. Brockel. A proposal for an evaluation of lands created by disposal of dredging spoils in the Great Lakes basin and along coastal seaboard areas.

The UWM entries in Appendix 6 and the above list of projects demonstrate the growing involvement with Great Lakes and marine-related studies on the UWM campus, for which the Center forms a coordinating focus.§ That such a program has been set in motion in under three years, and has involved a variety of departments, is a solid justification for future development based on demonstrated competence at Milwaukee.

Publications

Further demonstration is provided by publications. The Center issues Special Reports from time to time, usually to provide accounts of work in progress or completed, which are too detailed for acceptance by professional journals. The first six issues are listed below and, as examples, two of them are attached as appendices 7 and 8.

Mortimer, C. H. 1968. Internal waves and associated currents observed in Lake Michigan during the summer of 1963. Special Report No. 1, 24 p. 120 figs.

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§ Extra-mural grants to Center-associated faculty during 1968-69 made up 18% of the total grants to UWM faculty.

Schenker, E. 1968. Effects of containerization on Great Lakes ports. Special Rept. No. 2; 45 p, 18 tables, 3 appendices.

Abstracts, Eleventh Conference on Great Lakes Research, April 1968. Special Report No. 3; 83 p., 91 abstracts.

Fee, E. J. 1968. Digital computer programs for the Defant method of seiche analysis. Special Report No. 4; 27 pages, 4 appendices 3 figs.

Schenker, E. 1968. Future general cargo traffic and terminal requirements at the Port of Milwaukee. Special Rept. No. 5, 13 p.

Fee, E. J. 1969. Digital computer programs for spectral analysis of time series. Special Report No. 6, 16 p., 3 appendices, 1 fig.

Additional contract reports are issued from time to time, for example, "Investigation of treatability and effect on biota of dredged materials from selected Great Lakes harbors" by A. M. Beeton and G. Rohlich, under contract with the U.S. Army Corps of Engineers (1968, 252 p.).

The main purpose of the Special Report series is to record collections of data in identifiable form, or to fulfill the terms of contracts, or to make the working details of a particular technique available to other users. However, a piece of research cannot be regarded as complete until the principal results have been published in a professional journal. A list of thirty such publications, describing work carried out wholly or mainly in the Center, is given in Appendix 9,[7] with corresponding Contribution Numbers noted.

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[7] Appendix 9: Collected Reprints, Center for Great Lakes Studies.

Leading Faculty Members

Perhaps the principal justifications for the provision of a Lake Michigan research facility at UWM are the experience and achievements of the principal participating faculty members already assembled there (biographical details in Appendix 4).

Clifford H. Mortimer

The Director, Clifford H. Mortimer, is a native of Somerset, England, and was educated at the University of Manchester (B.Sc., 1932; D.Sc. 1946) and Berlin (Dr. phil. 1935). Apart from service with the Royal Naval Scientific Service during World War II, Mortimer's main work has been done, as a researcher and administrator, in the fields of limnology and oceanography, first with the Freshwater Biological Association in the English Lake District and then as director (1956-66) of the Millport Laboratory of the Scottish Marine Biological Association. His research interst in the physics of the Great Lakes was nourished during a number of visits to the University of Wisconsin over the past sixteen years, including a Brittingham Visiting Professorship on the Madison campus, 1962-63. His appointment as director of the Center for Great Lakes Studies on the Milwaukee campus, and to the rank of Distinguished Professor in the Department of Zoology, dates from 1966. He serves as chairman of the All-University Council for Marine Studies.

Mortimer is a world leader in the field of physical limnology and also has wide experience in the chemistry and biology of lakes and in biological oceanography. He was elected as a Fellow of the Royal Society of London in 1958, as Vice-president of the Freshwater Biological Association in 1966, and as Vice-president of the American Society for Limnology and Oceanography in 1968. He was awarded the Naumann Medal of the International Association of Limnology in 1965.

Alfred M. Beeton

Alfred M. Beeton, associate director (for biology) was educated at the University of Michigan (PhD 1958) and, after various academic appointments and service with the Institute for Fisheries Research, Michigan Conservation Department, he became chief of the Environmental Research Program at the Ann Arbor laboratory of the U.S. Fish and Wildlife Service (U.S. Bureau of Commercial Fisheries). In that capacity he conducted a number of important research cruises on the Great Lakes, including some of the most comprehensive studies to date of plankton and water quality. On two occasions he was called upon to review, in India, Pakistan, and Israel, fishery research programs sponsored by the Bureau's Foreign Currency Program.

In 1966, Beeton was appointed Professor of Zoology at UWM and Associate Director of the Center for Great Lakes Studies. His presence at UWM has attracted a number of graduate students. He was program chairman of the Eleventh Conference on Great Lakes Research, held in Milwaukee in 1968, and has served as consultant to numerous public bodies. For example, he was appointed a member of the Board of Consultants to the U.S. Army Corps of Engineers on effects of dredging activities on the pollution in the Great Lakes. Recently he was elected chairman of the Research Advisory Council to the Wisconsin Department of Natural Resources.

Beeton is the foremost specialist on the chemistry and biology of the Lakes, in particular on the effects of pollution and chemical enrichment (eutrophication). He has served as Treasurer of the American Society of Limnology and Oceanography since 1962 and was a founding member of the Board of Directors of the International Association for Great Lakes Research. He served on organizing committees for the National Academy of Sciences' "International Eutrophication Symposium" (Madison, 1967) and the American Chemical Society's symposium on "The Chemistry of the Great Lakes" (Minneapolis 1969).

Eric Schenker

Associate Director (for socio-economic studies) Eric Schenker was educated at City College of New York, University of Tennessee, and University of Florida (PhD 1957). After various academic appointments, Schenker joined the Department of Economics at UWM, rising to full Professor in 1965 and Associate Dean (for Social Sciences) in the College of Letters and Science.

Schenker is internationally known as a transportation economist. His research was carried out in the Highway Traffic Research Center, Michigan State University; in the Agency for International Development, Nigeria; and in the U.S. Army Transportation Movement and Control Center. Marine transportation has become his special field. He has served as a member of the Milwaukee Board of Harbor Commissioners since 1960 (chairman 1963-66) and is the author of "The Port of Milwaukee: An Economic Review: (University of Wisconsin Press, 1967).

Harry C. Brockel

Harry C. Brockel was appointed as Lecturer in the Center for Great Lakes Studies at UWM in 1969 after forty years' service with the Milwaukee Board of Harbor Commissioners in various capacities (Port Director, 1942-1968). He achieved an outstanding reputation not only in the Great Lakes shipping field, but also internationally. He is a past president of the American Association for Port Authorities, was elected as the first President of the International Association of Great Lakes Ports. He holds various state and federal appointments and directorships in many technical and professional groups. He is a member of the Advisory Board, St. Lawrence Seaway Development Corporation (presidential appointment) and as a member of the National Defense Executive Reserve as Federal Controller (in a standby capacity)

for the U.S. Ports of Great Lakes/St. Lawrence River. He is former chairman of the advisory committee, Great Lakes Pilotage Administration, and has recently been appointed to serve on the Port and Cargo Systems Committee of the Marine Transportation Research Board of the National Research Council.

As one who was largely instrumental in building up the modern port of Milwaukee and who was a leader in the long legislative struggle to achieve the building of the St. Lawrence Seaway, Brockel brings a wealth of experience and will strengthen the Center's activities in the socio-economic field. He will undertake research and lecture in maritime affairs and port development.

Other faculty members who (with their students) are associated with the Center are listed as project investigators in Appendix 6 and under the heading "Research" above. They also include

John L. Blum, Associate Dean of Sciences of the College of Letters and Science, and Professor of Botany
Carroll R. Norden, Associate Professor, Department of Zoology
R. Gordon Pirie, Associate Professor, Department of Geology
Thomas D. Crocker, Assistant Professor, Department of Economics
Norman P. Lasca, Assistant Professor, Department of Geology
Howard J. Pincus, Professor, Department of Geology
Leonard P. Levine, Associate Profesor, College of Applied Science and Engineering
Ralph Grunewald, Assistant Professor, Department of Botany
Calvin O. Huber, Associate Professor, Department of Chemistry

PROGRAM GROWTH AND NEW FACILITIES

Existing facilities are briefly described in Appendices 3 and 4. These are scattered among various campus and off-campus locations; and part of the justification of a new building is that presently dispersed educational and research activities shall be brought together in an integrated facility with immediate access to Lake Michigan, thereby liberating much-needed space on the main campus. The other part of the justification is based on an anticipated increase of participation by faculty and students. First, however, the question of "sea-going" facilities will be considered.

The Center's present 28 ft. motor launch is entirely inadequate to serve numerous programs now in progress; and these could not be carried out were it not for generous help from the research vessels of the University of Michigan; from the 'Harbor Seagull", Port of Milwaukee; from the U.S. Coast Guard; and from three railroad companies operating car ferries on Lake Michigan.

Full scale oceanographic research vessels are needed on the Great Lakes, but university budgets and university staff are not well-equipped to acquire and maintain large ships of, say, over 100 ft. in length. Such a Great Lakes regional research fleet should, in the writer's view, be provided and operated by an appropriately funded federal agency, for example the U.S. Coast Guard.

Fast Workboat Needed

The Center is, however, conscious of the need for a fast workboat of about 75 ft. in length, capable of carrying out all but the heaviest oceanographic operations in Lake Michigan in most weather and of transporting student classes for practical training and research "at sea." Speed, if obtainable at reasonable cost, would be advantageous not only

in saving valuable time, but also in quasi-synoptic studies of our main working area (the central reaches of Lake Michigan) to be integrated with the car ferry observations (see page 17, Appendix 3 and Fig. 1, Appendix 10. A design study now in progress (initial exploration in Appendix 10[8]) ereviews possible versions of fast workboats; and it appears that the choice will fall on a modification of a well-tried design (the Crewboat) now used in large numbers by the oil industry to ferry men and materials quickly from small harbors to oil drilling platforms one hundred miles or so offshore. Part-provision for construction and equipping such a workboat was included, as a single capital item of $260,000, in the University's proposed budget for the 1969-71 biennium, but as far as the writer is aware, this item did not survive subsequent review. The design study is approaching completion, however, and it will include the results of practical experience with this type of vessel, using portable oceanographic equipment, on Lake Michigan next fall.

New Building

Specifications for the new building, approved for the 1969-71 biennium, are being drawn up by a Planning Committee. The plan is based upon a 1972 projection of faculty and student participation in a variety of activities, as outlined in the following two tables. The plan is for an integrated facility on Lake Michigan with a dock and service area for a small research vessel, also specialized laboratories and services, teaching space for graduates and undergraduates (including space for processing and study of materials brought in from the Lake), aquaria, library, and offices.

Three potential sites are under review, all in the northern part of Milwaukee harbor with waterfrontage and with ready access to the Lake. The prime site is less than 10 minutes' drive from the main campus

[8] Appendix 10: A Plan for a Fast Workboat.

and would make use of federal land to be declared surplus in 1970. As this is a unique site, the 1969-71 timing provides a non-recurring opportunity which must not be lost.

TABLE 1.--Personnel participating in the work of the Center for Great Lakes Studies.

	Actual, May 1969	Projected, Sept. 1972
	Persons	
Academic Staff:		
Faculty, full-time (or nearly so)	2	4
Visiting Professors	1	1
Faculty, substantial part-time	2	6
Research Associates	1	3
Post Doctoral Fellows	1	3
SUBTOTAL	7	17
Students:		
Graduate students, mainly supported by and working in the Center	5	15
Graduate students supported by other agencies and working full-time in tthe Center	1	3
Graduate students working part-time with the Center facilities, a larger number expressed as full-time equivalents	2	5
Undergraduates	*	**
SUBTOTAL	8	23

* Lectures, demonstrations, orientation cruises for UWM students and students from other universities and high schools.

**Anticipated large increase in participation by students from UWM and other campuses and high schools in orientation cruises, collections and study of Lake material, and lecture-demonstrations.

Table 1, continued

	(1969)	(1972)
Supporting Staff (Civil Service & Others)		
Administrative	3	5
Construction and drafting services	2	3
Vessel services	1	4
Student help (full-time equivalent)	2	5
Research assistants	0	3
SUBTOTAL	8	20
TOTAL PERSONNEL	23	60

TABLE 2. --Great Lakes Studies Building and Dock, envisaged as a two story structure, with the following functions.

Ground Floor, Section A (vessel and field operations base)

Vessel dock, equipment store, and offices
Maintenance and storage of small boats and vehicles
Construction shop and stores (restricted to specialist staff)
General machine shop and work space available to students, under supervision
Assembly and large work area (for assembling equipment built in shops or brought in from outside) with direct access to:
Service area, linking vessel, shop, labs, and stores.

Ground Floor, Section B (aquaria, "wet" laboratories, controlled environments)

"Wet" laboratories, for sorting and study of Lake materials
Experimental and teaching aquaria
Fisheries laboratory, including holding and controlled environment tanks
Space for numerous experimental controlled-environment chambers
Underwater engineering and testing laboratory, including diving equipment maintenance
Storage for biological materials, inflammable materials, and radioactive wastes.

Table 2, continued

Second Floor: In addition to faculty, staff, and student office space and storerooms, the following facilities are planned:

Physical laboratory (hydrography and meteorology)
Chemical and water analysis laboratory
Laboratories for general limnology, plankton studies, microbiology, and sedimentology
Laboratory equipped for the use and measurement of radioactive materials
Small, general purpose laboratories for temporary allocation to staff, students and visitors
Special serfices for the above laboratories (algal culture, autoclaves, photographic, electronics workshop)
Drawing office; general drafting and chart room, the latter for use by students
Computing and data-processing room
General workrooms for students and student help
Library and conference room
Seminar rooms for teaching and special demonstrations, i.e., preparation for review of field trips and orientation cruises on the Lake.

GEOGRAPHICAL REASONS FOR THE CHOICE OF MILWAUKEE

UWM is seen, by the Regents and the Coordinating Committee for Higher Education, as Wisconsin's urban university. Milwaukee lies at the heart of a metropolitan region and transportation network. As a Lake City and a Lake Port, it interfaces with Lake Michigan and encounters all of the resources and constraints--connected with water supply, waste disposal, recreation, shoreline development, maritime affairs, and the associated problems in engineering and decision-making--which are common to Great Lakes cities and to the region as a whole. UWM is, therefore, particularly favourably placed for the study of these resources and constraints, in an urban context and with Lake Michigan and its hinterland as a laboratory and as a full-scale training ground in the

concepts and techniques of oceanography and environmental planning. These are fields into which students are clamouring to enter; and it is in their best interests to plan for that entry to be closely linked to the facilities and intellectual climate of a major university campus and to a field training program of adequate scale and which can claim national recognition.

Southern Lake Michigan is also a national resource under increasing threat of serious deterioration. Through research and education the University of Wisconsin has made and will make notable contributions to the study and restoration of that resource. The best single step which the University can now take, toward furthering that mission and attracting outside support (see next section), is a concentration of present limited resources of manpower and funds into a building of functional and architectural merit on the Milwaukee lakefront, integrated with Lake-going facilities and with the adjacent campus. This facility has the following points in its favor:

1. It is close to a campus, with library, computer, and other facilities. It is not, therefore, an outlying field station but a "sea-going" extension of the campus, which faculty and students can readily make use of.

2. It is within thirty-five miles of three state campuses (Parkside, Waukesha, West Bend) and is within eighty miles of four others (Madison, Manitowoc, Oshkosh and Whitewater). With sensible schedule planning and inexpensive bus transport, a Lake Michigan facility in Milwaukee harbor can be very widely used for training and research.

3. It is in a sheltered harbor but has easy access to the Lake. The facilities of a modern port and a versatile engineering industry are nearby. Unlike smaller Lake Michigan ports, particularly on the eastern side, work out of Milwaukee harbor can continue during the greater part of most winters.

4. It is at the focus of the ferry routes of three companies, whose vessels are being used as all-year "research vessels of opportunity", under no-cost agreements already negotiated with the companies.

5. It is strategically placed as a vessel and research base (and as an airport) for inter-university Lake Michigan programs for the kind forecast in the next section.

OPPORTUNITIES FOR LINKS WITH STATE AND NATIONAL PROGRAMS

Wisconsin state government and state agencies--in common with those of other Lake states deeply concerned at the deterioration of water resources and environmental quality--are in transition from concern to action (for example, Outdoor Resources Action Plan 200). The federal government also--to judge from the deliberations of various boards and commissions--is closely examining its water resources and marine programs. Three emerging factors are relevant to the question of the siting of a Wisconsin Great Lakes research facility:

(i) It is recognized that too little attention has been paid to the resources and problems of the coastal zone;

(ii) The Great Lakes have now become firmly entrenched in the (federal) definition of the coastal zone;

(iii) The Southern part of Lake Michigan and the whole of Lake Erie are recognized as major national problem areas, both actual and potential in the light of predicted population trends.

For example, the [Stratton] Commission on Marine Science, Engineering and Resources, reporting in "Our Nation and the Sea", January 1969, recommends an "adequate level of institutional support for broad program purposes" and concludes that "the nation lacks well-established and well-equipped research centers to investigate the problems

of estuaries and the coastal zone." The Commission recommends, therefore, the establishment of a small group of geographically distributed laboratories, designated as University - National Laboratories, the direct management of which "should be assigned to universities with a strong interest and demonstrated competence in marine affairs. Under guidelines established by the Federal Government, the University-National Laboratories would have formal provisions for making their facilities available to outside investigators and for exchange of advice and assistance with other nearby institutions.

"The relationship between the Federal Government and each university could vary from laboratory to laboratory, and the facilities and programs of the University-National Laboratories need not be identical either in size or form. The number, size, and scope of such major centers depend on the priorities ultimately assigned to various elements of the national ocean effort, the availability of funds in competition with other needs, the willingness of major universities to commit themselves to such programs, and other factors. The laboratories would include, but not be restricted to, the presently acknowledged leaders. Certainly, University-National Laboratories will be needed on the Atlantic, Pacific, and Gulf Coasts, the Great Lakes, in the Arctic and in the Mid-Pacific." [the writer's underlining]

Recognizing further that the first priority must be given to curbing inflow of pollutants to seriously damaged waters, the Commission also urges exploration of the feasibility of water quality restoration in the Great Lakes. "Although careful analysis must precede financial commitment of such great magnitude, the Commission concludes that the national importance of the Great Lakes warrants testing the feasibility of restoration techniques. The knowledge obtained from a pilot program would be applicable to many fresh water bodies and to seriously polluted estuaries."

What part will the University of Wisconsin play?

If the Commission's proposals, or others like them, are implemented, the federal government will look for major universities with "st rong interest and demonstrated competence" and willingness "to commit themselves to such programs." Willingness will be defined in terms of past and future matching support, including the establishment of such visible facilities as a Lake Michigan research and training base; and competence will be defined in terms of the reputation, published output, previous grant awards, and ongoing programs of participating faculty members, as well as student involvement, potentials for training and the location and growth potential of the base facilities.

My conclusion is, therefore, that the strongest card which the University of Wisconsin can play--in competition or in collaboration with other Great Lakes universities for federal funding of projects or of a coastal zone laboratory--is a demonstration of courses of action which would: (a) support and strengthen the team of leaders which are already putting the Center for Great Lakes Studies at UWM on the national and international "map"§; and (b) the establishment of an integrated research and training facility for operation on Lake Michigan. The geographical arguments for a Milwaukee location have been outlined in the previous section. No other Wisconsin site can hold a candle to it; and it was for this reason that the writer--again changing his metaphor--burned many boats to come to Milwaukee. That was an act of faith which others, taking a broad view, must surely support.

Center for Great Lakes Studies
University of Wisconsin-Milwaukee

C. H. Mortimer, Director
20 May 1969

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§An example was the choice of Milwaukee as the site of the 11th Conference on Great Lakes Research, 1968, sponsored by the International Association for Great Lakes Research and attended by 562 persons.