

CLEAR ANNUAL REPORT NO. 13



ANNUAL REPORT OF THE LAKE
ERIE PROGRAMS

at

THE OHIO STATE UNIVERSITY
1982 - 1983

CENTER FOR LAKE ERIE AREA RESEARCH
FRANZ THEODORE STONE LABORATORY
OHIO SEA GRANT PROGRAM

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COLLEGE OF BIOLOGICAL SCIENCES
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OFFICE FOR RESEARCH AND GRADUATE STUDIES
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO

SEPTEMBER 1983



The Ohio State University

Center for Lake Erie Area Research
Franz Theodore Stone Laboratory
Ohio Sea Grant Program

College of Biological Sciences
484 West 12th Avenue
Columbus, Ohio 43210

Phone 614 422-8949

Dr. Patrick R. Dugan, Dean
College of Biological Sciences
The Ohio State University
Columbus, Ohio 43210

Dear Dean Dugan:

I am pleased to transmit with this letter the 1982-1983 Annual Report of the Lake Erie Programs at The Ohio State University. All three components, CLEAR, Sea Grant and Stone Lab, have again been successful in fulfilling their missions.

I appreciate the continued support of the College of Biological Sciences during the past year. As this new academic year begins, I look forward to continued improvements.

Sincerely,

A handwritten signature in cursive script that reads "Charles E. Herdendorf".

Charles E. Herdendorf
Director

CEH/g-ls

cc: William J. Collins

Field Station Address:
Put-in-Bay, Ohio 43456
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LAKE ERIE PROGRAMS
AT
THE OHIO STATE UNIVERSITY

The Ohio State University has fostered a program of Lake Erie research and education for 87 years. In 1895, the University opened a Lake Laboratory in Sandusky, Ohio. To accommodate a growing interest in aquatic sciences, the program was moved to Put-in-Bay, Ohio where the Franz Theodore Stone Laboratory was dedicated on Gibraltar Island in 1929. With the goal of expanding research opportunities, the Center for Lake Erie Area Research (CLEAR) was created in 1970 with facilities at Stone Laboratory and on the Columbus Campus. As a member of a national network, the Ohio Sea Grant Program was established in 1977 within the university to support instruction, research and advisory services directed toward the wise utilization of Great Lakes and marine resources. Today, all three components (Stone Laboratory, CLEAR and Sea Grant) are administered by the Center for Lake Erie Area Research as the Lake Erie Programs within the College of Biological Sciences.

Franz Theodore Stone Laboratory

Lake Erie facilities include the Franz Theodore Stone Laboratory located on Gibraltar Island and other satellite buildings on South Bass Island and at Port Clinton. Courses of instruction are offered here which are designed to provide students with a blend of classroom, laboratory, and field experience unavailable at an inland campus. Subject matter includes a comprehensive review of the body of knowledge pertaining to freshwater systems, particularly large lakes. The goals of programs at Stone Laboratory include:

1. To provide the facilities and logistical support necessary for the effective presentation of courses designed to offer a blend of classroom, laboratory, and field experience unavailable at an inland campus.
2. To provide the facilities and logistical support required for research projects on Lake Erie and its coastal zone.
3. To promote a balanced curriculum in the aquatic and environmental sciences which utilizes the unique setting of the laboratory.
4. To promote individual and multidisciplinary research projects which utilize the facilities and setting of the laboratory.
5. To foster close relationships between the instructional and research programs to the mutual benefit of each activity.
6. To maintain a current library on subjects related to instructional and research topics at the laboratory.
7. To collect routine environmental data in the vicinity of the laboratory and maintain records of these observations.

8. To provide facilities for workshops, seminars, and other group meetings and field trips.
9. To serve as a public information center for information relating to Lake Erie.
10. To preserve segments of the Lake Erie shoreline in a natural state for educational and research purposes.

Ten advanced courses were offered at Stone Laboratory by the Departments of Botany, Entomology, and Zoology during Summer Quarter 1983 (Table 1). In addition, Individual Studies and Thesis/Dissertation Research were offered for advanced students and an introductory Aquatic Ecology course was presented in conjunction with the University of Akron. Enrollment for 1983 included 30 graduate and continuing education students, 29 undergraduate students, and 2 Program 60 students (Table 2).

An integral part of the Stone Laboratory curriculum is the Guest Lecture Series. Topics are selected to enhance the classroom instruction. Guest speakers from several institutions presented lectures in 1983 (Table 3). Funds for the off-campus speakers were graciously provided by the Graduate School.

In addition to the regular instructional program offered each summer, many workshops and group field studies are conducted at Stone Laboratory in the spring and fall. This year 36 such events took place at the laboratory, many of them conducted by faculty associated with the Lake Erie Programs (Table 4). All workshops held at Stone Laboratory are coordinated by the Ohio Sea Grant Advisory Service. The faculty and staff of Stone Laboratory in 1983 is presented in Table 5. Important milestones in the development of University facilities at Lake Erie are listed in Table 6.

Ohio Sea Grant Program

The overall objective of the Ohio Sea Grant Program is to enhance development and improve management of state and regional aquatic resources. The program seeks the wise utilization of marine and aquatic resources, particularly those resources associated with the Great Lakes, to enhance the quality of life in Ohio and our surrounding states. This mission is being implemented through comprehensive research, education and advisory service programs. To accomplish this, support and resources are being provided to the university community in order to: 1) research Great Lakes problems and to develop critically-needed information while maintaining the highest level of academic excellence; 2) establish a statewide Sea Grant advisory services network to transfer this and other information to government, industry and the general public; and 3) continue to build understanding and appreciation for marine and aquatic resource values and to provide career training for marine technologists among the people of Ohio through education programs.

Results obtained through ongoing research and development projects will be transmitted to industry, agencies and the general public through appropriate publications and other media in a timely fashion. Special information, advisory and education programs will be conducted to move these findings rapidly to various users and to create awareness and involvement on the part of institutions and the general public in Great Lakes problems and opportunities.

In the six years that the Ohio Sea Grant Program has been in existence, it has successfully addressed its objectives in research, education and advisory services within the University community and in the context of the State of Ohio and the Great Lakes Region. Table 7 traces the history of the Ohio Sea Grant Program from its inception in 1977, with a single education project, to 1983, with 14 projects embracing all three components of the program.

One of the most valuable recent accomplishments has been the development of a link between the Sea Grant Advisory Service and Ohio Cooperative Extension Service which resulted in the placement of a Sea Grant Agent in the following cities along the Lake Erie shoreline: Fremont, Elyria and Painesville. These agents, each working in an 8 to 10 county area, take research results to industries and other audiences where they are needed. This is accomplished through news releases, seminars, radio and T.V. spots and workshops, many of which have been conducted at Stone Laboratory (Table 4). In addition, over 219 marine advisory service functions were conducted at the mainland locations, reaching a direct audience of over one million citizens (Table 8).

Center for Lake Erie Area Research

The coordinating unit of the Programs is the Center for Lake Erie Area Research (CLEAR) which serves the University as a focal point for action directed toward solutions of scientific and engineering problems of the lake as well as societal and economic conditions of the adjacent coastal zone. CLEAR's objective is to encourage and promote individual and multidisciplinary research on all aspects of Lake Erie. The center coordinates sponsored research in several major areas of man's concern, contemporary examples of which are: 1) food resources from the lake, 2) energy generation facilities and energy conservation, 3) mineral resources from the lake basin, 4) water quality, 5) coastal zone management, 6) shore erosion control, and 7) lake-related recreation. The research phase of the Lake Erie Program is closely linked to instruction by providing students with financial support and stimulating topics for thesis, dissertation, and other individual study efforts.

In the twelve-year history of CLEAR, approximately \$10 million of sponsored research has been conducted by the Center. Major federal agencies which have supported Lake Erie research include: 1) U.S. Environmental Protection Agency, 2) U.S. Department of Interior -Fish and Wildlife Service, and Office of Water Resources and Technology, 3) U.S. Department of Commerce, NOAA - Office of Sea Grant, Office of Coastal Zone Management, and National Marine Fisheries Service, 4) U.S. Army Corps of Engineers, and 5) National Aeronautical and Space Administration.

During the period 1982-1983, the Center coordinated 48 sponsored research projects with a commitment of \$2.2 million (Table 9). A total of 47 faculty and 33 graduate students actively participated in these projects. In addition to these investigators, CLEAR has technical staff including post-graduate research associates, research assistants and undergraduate students. The Center is administered by a Director and Assistant Director with funds provided by the Graduate School and the College of Biological Sciences (Table 10).

The Lake Erie Programs are non-degree-granting units of the University. However, 15 graduate degrees were awarded to students participating in Lake Erie research projects by cooperating academic departments (Table 11). Lake Erie researchers made 47 presentations at scientific meetings (Table 12), organized 30

Limnolunch presentations (Table 13), and prepared 49 manuscripts for publication (Table 14). In the past twelve years, the Center has produced 279 technical reports (Table 15). A list of publications produced by the Ohio Sea Grant Program (Table 16) and the Franz Theodore Stone Laboratory (Table 17) are also included in this report. The University committees providing guidance to the Lake Erie Program are indicated in Table 18.

TABLES

TABLE 1
 COURSE OFFERINGS AT F. T. STONE LABORATORY
 SUMMER 1983

First Term

Botany 610 FIELD BOTANY

Collection, preservation, field and laboratory identification, and local distribution of plants of the major groups. Dr. R.L. Stuckey and Dr. J.W. Thieret

Botany 620 COMMUNITY ECOLOGY AND ECOSYSTEMS

A qualitative and descriptive approach to the establishment, development, succession, and dynamics of plant communities and their interrelations with historic, climatic, soil, and biotic factors. Dr. R.E.J. Boerner.

Zoology 621 ICHTHYOLOGY

Study of the distribution and classification of fishes which includes methods of identification, collection, and preservation. Dr. R.F. Jezerinac.

Zoology 624 ADVANCED ORNITHOLOGY

Topics include instinctive behavior in the life of birds, the breeding cycle, social relations, territory, ecology, characteristics of population, and techniques in field study of birds. Dr. L.S. Putnam.

Zoology 651 FIELD ZOOLOGY

Field and laboratory identification of aquatic and terrestrial vertebrates and invertebrates of the region, in relation to habitats occupied. Dr. B. D. Valentine.

Zoology 652 LIMNOLOGY

Study of physical, geological, chemical and biological factors influencing freshwater life; field and laboratory techniques for determining lake morphometry, chemistry and biological productivity are emphasized. Dr. C.E. Herdendorf.

TABLE 1 CONTINUED

Second TermEntomology 611 FIELD ENTOMOLOGY

Deals primarily with collecting, identification, and field methods; field trips are made to various islands of Lake Erie and the mainland. Dr. C.C. King.

Botany 611 AQUATIC PLANTS

Aquatic plants, other than the algae of Great Lakes region; field and laboratory work on their identification, and ecological and geographical relations. Dr. R.L. Stuckey.

Zoology 612 INVERTEBRATE ZOOLOGY

The collection and identification of invertebrate animals, development of methods of classification, and use of keys. Dr. D.A. Culver.

Zoology 653 FISH ECOLOGY

Field and laboratory studies of behavioral and interspecific relationships of fishes and of the various biotic and environmental factors influencing their abundance. Dr. J.M. Reutter.

TABLE 2

ROSTER OF FRANZ THEODORE STONE LABORATORY
 COURSE AND RESEARCH STUDENTS, SUMMER 1983

<u>Name</u>	<u>Major</u>	<u>Rank</u>	<u>Institution</u>
1. Martin L. Bailey	Biology	Junior	Ohio State University
2. Dennis Berberick	Biology	M.S.	University of Akron
3. Sirinimit Boonyuen	Environmental Biology	M.S.	Ohio State University
4. Lulu M. Bowe	Zoology	Post graduate	Ohio State University
5. Thomas B. Bridgeman	Zoology	Junior	Miami University
6. Matthew W. Brown	Fisheries Management	Senior	Ohio State University
7. Christopher J. Cooper	Biology	Junior	Wittenberg University
8. Joel L. Davis	Entomology	M. S.	Ohio State University
9. Barbara L. Duersh	Zoology	M.S.	Ohio State University
10. Ralph E. Dewalt	Biology	Senior	Hiram College
11. Jo Ellen Dremann	Biology	M.S.	University of Akron
12. Sheri Englehart	Biology	Senior	University of Akron
13. Martin S. Fisher	Zoology	Sophomore	Miami University
14. Janet Gammell	Biology	M.S.	University of Akron
15. Kevin L. Ganger	Entomology	Junior	Ohio State University
16. Jerald M. Gerber	Fisheries Management	Junior	Ohio State University
17. Dale A. Goodman	Psychology	Senior	Ohio State University
18. Janet S. Heffelfinger	Science Education	Ph.D.	Ohio State University
19. Sandra E. Herdendorf	Education	B.S.	Ohio State University
20. Jamie L. Huston	Biology	M.S.	Akron University
21. Steven J. Hoyda	Zoology	Senior	Ohio State University
22. Lisa A. Keller	Zoology	Senior	Ohio State University
23. Rosmarie Kelly	Zoology	M. S.	Ohio State University
24. Mark L. King	Biology	Senior	Ohio State University
25. Gary Klein	Biology	Post graduate	University of Akron
26. Kurt R. Knebusch	Environmental Communications	M.S.	Ohio State University
27. Martha A. Koch	Environmental Interpretation	Senior	Ohio State University
28. Mark R. Laing	Zoology	Senior	Ohio State University

TABLE 2 CONTINUED

<u>Name</u>	<u>Major</u>	<u>Rank</u>	<u>Institution</u>
29. Becky Leedy	Biology	Post graduate	University of Akron
30. Sheryl A. Martin	Zoology	Senior	Ohio State University
31. Robert McClain	Biology	Post graduate	University of Akron
32. Sherri L. McClarren	Zoology	M.S.	Ohio State University
33. Dave McShaffery	Biology	M. S.	University of Akron
34. Sr. Jane A. Molinaro	Science Education	Ph.D.	Ohio State University
35. Mark Monaco	Environmental Biology	M.S.	Ohio State University
36. Monica R. Nees	Natural Resources	Ph.D.	Ohio State University
37. Patricia L. Niehm	Zoology	Senior	Ohio State University
38. Jeffrey J. Nicholson	Wildlife Management	Junior	Ohio State University
39. Elizabeth M. Obara	Environmental Education	Ph.D.	Ohio State University
40. Menekse B. Oktener	Zoology	Junior	Ohio State University
41. Jay R. Osborne	Zoology	Junior	Ohio State University
42. James Parker	Biology	M.S.	University of Akron
43. Allan Paul	Natural Resources	Junior	Kent State University
44. Dennis Peltola	Biology	Post graduate	University of Akron
45. Mary Jane Richey	Biology	Junior	Bowling Green State University
46. Alan J. Riemer	Zoology	M.S.	Ohio State University
47. Susan Roberts	Biology	Post graduate	University of Akron
48. James W. Satola	Zoology	Senior	Ohio State University
49. Valerie L. Scheutzow	Biology	Junior	Bowling Green State University
50. Julie A. Schubert	Biology	Junior	College of Wooster
51. Carol E. Siegley	Civil Engineering	M.S.	Ohio State University
52. Lorraine L. Simon	Zoology	Sophomore	Ohio State University
53. Alison A. Smith	Biology	Senior	Ohio State University
54. Rebecca E. Stricklin	Environmental Education	Ph.D.	University of Cincinnati
55. Scott E. Subler	Biology	M.S.	Penn State University
56. Bruce K. Trauben	Environmental Biology	M.S.	Ohio State University
57. Carol Tveekren	Biology	M.S.	University of Akron
58. Jennifer B. Ward	Aquatic Ecology	M.S.	Kent State University
59. C. J. Washington	Environmental Biology	M. S.	Ohio State University
60. Lawrence S. Wehr	Fisheries Management	Senior	Ohio State University
61. Sandra M. Yawetz	Biology	Junior	Ohio State University

TABLE 3

F.T. STONE LABORATORY
GUEST LECTURE SERIES
SUMMER 1983FIRST TERM

- 23 June Interpreting the Geology of the Erie Islands. Jane L. Forsyth, Department of Geology, Bowling Green State University.
- 30 June The Muskeg and I: Exploring for Plants in Canada's Northwest Territories. John W. Thieret, Department of Biological Sciences, Northern Kentucky University.
- 7 July Mechanisms of Persistence and Regeneration in Plant Communities. Katharine L. Gross, Department of Botany, The Ohio State University.
- 14 July Factors Affecting the Stability and Settability of Bacteria and Other Fine Particles in Water. Alan J. Rubin, Department of Civil Engineering and Water Resources Center, The Ohio State University.
- 19 July History of Lake Erie Fish Populations Over the Past Two Centuries. Milton B. Trautman, Professor Emeritus of Zoology, The Ohio State University.

SECOND TERM

- 28 July Innerspace -- The Cave Ecosystem. Horton H. Hobbs, III, Department of Biology, Wittenberg University.
- 4 August New Approaches to Studying Old Problems in Plants. Daniel J. Crawford, Department of Botany, The Ohio State University.
- 11 August Diel Migrations of Prey Fishes: A Predator Avoidance Strategy. Michael R. Ross, Department of Forestry and Wildlife Management, University of Massachusetts.
- 18 August The Cellular Basis of Plant Responses to Gravity. Michael L. Evans, Department of Botany, The Ohio State University.

Program supported in part by the Graduate School, The Ohio State University and The Friends of Stone Laboratory.

TABLE 4

WORKSHOPS CONDUCTED AT F.T. STONE LABORATORY
1982-1983

<u>DATE</u>	<u>GROUP</u>	<u>LEADER</u>	<u>PARTICIPANTS</u>	<u>DESCRIPTION</u>
Sept. 4-6, 1982	OSU Agricultural Economics	Mr. Fred Hitzhusen	12	Retreat
Sept. 7-10, 1982	Center of Science and Industry	Mr. Bill Schmitt	10	Retreat
Sept. 9-10, 1982	Mayfield City Schools	Mr. Dick Johnson	27	Aquatic Biology Workshop
Sept. 10-12, 1982	Bexley City Schools	Ms. Marge Peterson	24	Aquatic Biology Workshop
Sept. 17-18, 1982	Ohio Sea Grant Program	Dr. Rosanne Fortner	8	Sea Grant Conference
Sept. 18-19, 1982	Kimpton Middle School	Mr. James Parker	30	Aquatic Biology Workshop
Sept. 24-26, 1982	University of Dayton	Dr. Albert J. Burky	14	Biology Workshop
Sept. 26-28, 1982	IUC Legislative Representatives	Mr. William Napier	12	Retreat
Oct. 1-3, 1982	OSU Limnology Class	Dr. David Culver	11	Limnology Workshop
Oct. 8-9, 1982	Sandusky City Schools	Mr. Fred Snyder	14	Aquatic Biology Workshop
Oct. 17-18, 1982	OSU Botany Class	Dr. Ralph Boerner	13	

TABLE 4 (CONTINUED)

<u>DATE</u>	<u>GROUP</u>	<u>LEADER</u>	<u>PARTICIPANTS</u>	<u>DESCRIPTION</u>
Oct. 28-29, 1982	Great Lakes Marine Sanctuaries	Dr. Al Beeton	5	Selection Committee Meeting
April 28, 1983	Hocking Technical College	Mr. Steve Yarsa	24	Aquatic Ecology Workshop
May 2-3, 1983	Sandusky High School	Mr. Kevin Lutz	24	Aquatic Ecology Workshop
May 4-5, 1983	Mills School	Mr. Park Schaefer	83	Aquatic Ecology Workshop
May 5-6, 1983	University of Akron	Dr. John Olive	15	Aquatic Ecology Workshop
May 6-7, 1983	Ohio State University Limnology Class	Dr. David Culver	23	Aquatic Ecology Workshop
May 7-8, 1983	Harmon School	Ms. Eileen Kutinsky	17	Aquatic Ecology Workshop
May 9, 1983	Lake High School	Mr. Dave Kocher	30	Advisory Educational Workshop
May 10, 1983	Islander's Day at Gibraltar		60	Special Event in connection with local Chamber of Commerce
May 15, 1983	Ohio State University Geology Class	Dr. Larry Krissek	14	Aquatic Ecology Workshop
May 11-15, 1983	Bloom Carrol High School	Ms. Diane Gabriel	35	Aquatic Ecology Workshop
May 16-17, 1983	Bogart School	Ms. Catherine Lange	107	Aquatic Ecology Workshop

TABLE 4 (CONTINUED)

<u>DATE</u>	<u>GROUP</u>	<u>LEADER</u>	<u>PARTICIPANTS</u>	<u>DESCRIPTION</u>
May 18-19, 1983	Mills School	Mr. Park Schaefer	84	Aquatic Ecology Workshop
May 20, 1983	Start High School	Ms. Catherine Canelli	20	Aquatic Ecology Workshop
May 20-22, 1983	Westerville City Schools	Mr. Ned Mosher	35	Aquatic Ecology Workshop
May 22-24, 1983	Northern Kentucky University	Dr. Thomas Rambo	15	Aquatic Ecology Workshop
May 23-27, 1983	New Albany School	Mr. Don Miller	97	Aquatic Ecology Workshop
May 27-30, 1983		Mr. John Wilson	12	Retreat
May 31, 1983	Jefferson Elementary School	Mr. William Pope	59	Aquatic Ecology Workshop
June 2, 1983	Montessori School	Mr. John Fowler	36	Advisory Educational Workshop
June 4, 1983	Kent State University	Dr. M.L. Ferguson	42	Advisory Educational Workshop
June 10-12, 1983	Erie County Board of Education	Sandy Krieger	38	Aquatic Ecology Workshop
June 17-18, 1983	Ohio Sea Grant Program	Mr. Jack Waldock and Dr. Jeff Reutter	70	Congressional Day on Lake Erie
July 10, 1983	Kent State University Oceanography Class	Dr. Virginia Sand	11	Aquatic Ecology Workshop
Aug. 6, 1983	Kent State University	Dr. M.L. Ferguson	35	Advisory Educational Workshop

TABLE 5
 FACULTY AND STAFF OF FRANZ THEODORE STONE LABORATORY
 SUMMER 1983

Administration

<u>Name</u>	<u>Title</u>
1. Herdendorf, Charles E.	Director
2. Stuckey, Ronald L.	Associate Director of Instruction
3. Reutter, Jeffrey M.	Associate Director - Facilities and Development
4. Monaco, Mark E.	Laboratory Manager
5. Damon, Jo Ann	Administrative Assistant
6. Wilson, Andrea M.	Secretary (Put-in-Bay)
7. McDonald, Sherry	Secretary (Columbus)
8. Laszlo, Kristina I.	Business Manager (Columbus)
9. Janeves, Betty L.	Communicator

Teaching Faculty

<u>Name</u>	<u>Title</u>	<u>Department and University</u>
1. Boerner, Ralph E. J.	Asst. Professor	Botany (OSU)
2. Culver, David A.	Assoc. Professor	Zoology (OSU)
3. Herdendorf, Charles E.	Professor	Zoology (OSU)
4. Jezerinac, Raymond F.	Instructor	Zoology (OSU-Newark)
5. King, Charles C.	Professor	Entomology (OSU)
6. Putnam, Loren S.	Professor	Zoology (OSU)
7. Reutter, Jeffrey M.	Adj. Asst. Professor	Zoology and Natural Resources (OSU)
8. Stuckey, Ronald L.	Professor	Botany (OSU)
9. Thieret, John W.	Professor	Biological Sciences (NKU)
10. Valentine, Barry D.	Professor	Zoology (OSU)

Resident Faculty and Visiting Scientists

<u>Name</u>	<u>Title</u>	<u>Department and University</u>
1. Beatty, Joseph A.	Assoc. Professor	Biology (Southern Illinois)
2. Bedford, Keith W.	Assoc. Professor	Civil Engineering (OSU)
3. Beeton, Alfred M.	Director	Great Lakes Marine Waters Center (U. of Mich.)
4. Carey, Walter E.	Assoc. Professor	Mechanical Engineering and Zoology (OSU)
5. Carline, Robert F.	Adj. Asst. Professor	Natural Resources and Zoology (OSU)
6. Celeste, Richard F.	Governor	State of Ohio

TABLE 5 (CONTINUED)

<u>Name</u>	<u>Title</u>	<u>Department and University</u>
7. Crites, John	Chairperson and Professor	Zoology (OSU)
8. Forsyth, Jane	Professor	Geology (BGSU)
9. Fortner, Rosanne	Professor	Environmental Education (OSU)
10. Gatherum, Gordon E.	Assoc. Dean	Agriculture and Home Economics (OSU)
11. Greenstein, Julius S.	Dean	OSU-Newark Regional Campus
12. Holland, Ruth	Research Associate	Great Lakes Marine Waters Center (U. of Mich.)
13. Houseknect, Sharon K.	Asst. Professor	Sociology (OSU)
14. Hushak, Leroy J.	Professor	Agriculture Economics and OARDC (OSU)
15. Kinney, Edward	Fisheries Biologist (Ret.)	U.S. Fish and Wildlife Service
16. Lakes, Clayton	Supervisor	ODW, Fish Production
17. Margraf, Joseph	Asst. Professor	Zoology (OSU)
18. Mayer, Victor J.	Professor	Geology & Mineralogy and Science-Math Education (OSU)
19. Miskimen, Mildred	Adj. Assoc. Prof. (Ret.)	Zoology (OSU)
20. Olive, John	Professor	Biology (Univ. of Akron)
21. Pfister, Robert M.	Chairperson and Professor	Microbiology (OSU)
22. Pringle, James S.	Botanist	Royal Botanical Gardens (Ontario, Canada)
23. Rambo, Thomas	Asst. Professor	Biology (NKU)
24. Reese, Karen	Editor/Biologist	Ohio Biological Survey
25. Sullivan, Carl	Director	American Fisheries Society
26. Svanks, Karlis	Assoc. Professor (Emer.)	Chemical Eng. (OSU)
27. Trautman, Milton B.	Professor (Emer.)	Zoology (OSU)

Graduate Associates

<u>Name</u>	<u>Responsibility</u>
1. Boonyuen, Sirinimit	Laboratory Office
2. Davis, Joel	Entomology Course
3. Heffelfinger, Janet	Library Assistant
4. Kelly, Rosmarie	Supplies
5. Monaco, Mark E.	Laboratory Manager
6. Obara, Elizabeth	Bookstore
7. Siegley, Carol	Laboratory Assistant
8. Trauben, Bruce	Laboratory Assistant
9. Ward, Jennifer	Laboratory Office and Botany Courses

TABLE 5 (CONTINUED)

Student Assistants

<u>Name</u>
1. Ganger, Kevin
2. Gerber, Mike
3. Nicholson, Jeffrey
4. Simon, Lorraine

Responsibility

Transportation/Housing
 Transportation/Housing
 Food Service
 Food Service

Laboratory Staff

<u>Name</u>
1. Boyles, Tip
2. Duff, Allen
3. Estice, Robert
4. Luecke, Timothy
5. Montgomery, George
6. Wilhelm, Mark

Title

Maintenance Assistant
 Research Vessel Operator
 Supervisor of Dining Hall
 Supervisor of Physical Facilities
 Cook
 Maintenance Assistant

R/V Hydra Staff

<u>Name</u>
1. Arico, Gary
2. Bartish, Timothy
3. Fay, Laura
4. Keeler, Gordon
5. Ladd, Paul
6. Letterhos, Julie
7. Rathke, David

Title

Research Technician
 Graduate Research Associate
 Chief Scientist
 Research Assistant
 Captain
 Research Technician
 Research Associate

TABLE 6

MILESTONES IN THE HISTORY OF THE
FRANZ THEODORE STONE LABORATORY
THE OHIO STATE UNIVERSITY

Date

- 1895 Professor David S. Kellicott, Chairman of the Department of Zoology and Entomology, presented a proposal to the University to establish a field station for the study of biology at Lake Erie. University approved the project and appropriated \$350 for the construction of a second floor on the State Fish Hatchery in Sandusky.
- 1896 Professor David S. Kellicott named the first director of the Lake Laboratory and operated the laboratory for special studies during the summer.
- 1899 Professor Herbert C. Osborn named the second director upon the death of Professor Kellicott.
- 1900 First courses offered at the Lake Laboratory.
- 1903 University obtained a 50-year lease for property on Sandusky Bay at Cedar Point, erected a frame building at a cost of \$3,387 and moved the Lake Laboratory to this new site.
- 1918 Lake Laboratory moved to upper story of State Fish Hatchery at Put-in-Bay on South Bass Island. A lot adjacent to the hatchery was purchased by the University.
- 1925 Mr. Julius F. Stone, Chairman of the Board of Trustees, acquired Gibraltar Island in Put-in-Bay harbor from the Jay Cooke family and presented it to the University. In accepting the gift, the name of the laboratory was changed to the Franz Theodore Stone Laboratory in honor of Mr. Stone's father.
- 1926 Laboratory moved to Gibraltar Island and utilized buildings then on the island, Cooke Castle (1865) and Barney Cottage (1907). Construction program, which included a new laboratory building, dining hall and two housing units, Stone Cottage and Gibraltar House, initiated in 1926 and completed in 1930.
- 1928 Contribution No. 1, "Periodic Oscillations in Lake Erie," by Dr. F. H. Kreeker, of a new series of papers published by Stone Laboratory. Contributions Nos. 2 through 13 published from 1929 to 1974.
- 1929 Formal dedication of the Franz Theodore Stone Laboratory.

- 1934 President George W. Rightmire appointed an Advisory Committee to study the laboratory and plan for future development. The committee recommended expansion of the laboratory's activities into multi-disciplinary studies, year-round operation and appointment of a full-time director.
- 1936 Professor Dwight M. DeLong named the fourth director, the first to be appointed as a full-time position. Professor Thomas H. Langlois served as assistant director from 1936 to 1938.
- 1938 Professor Thomas H. Langlois named the fifth director upon the resignation of Professor DeLong.
- 1938 Franz Theodore Stone Laboratory established as a regular department of the University, assigned to the President's Division. Full-time faculty positions for a fisheries biologist and a limnologist were approved; Drs. Charles F. Walker and David C. Chandler were appointed.
- 1938 Peach Point Cottage was purchased by Mr. Julius F. Stone and donated to the laboratory for use as faculty housing.
- 1939 Professor Milton B. Trautman joined the staff of the laboratory.
- 1940 Federal Fish Hatchery on Peach Point, South Bass Island, transferred to the University; facility included the main hatchery building (converted to principal research building of the laboratory), superintendent's residence (converted to laboratory office and library) and a shop building.
- 1940 Mr. Julius F. Stone donated a two-acre woodlot on Peach Point to the laboratory.
- 1947 Laboratory purchased 37-foot steel research boat, the Bio-Lab.
- 1951 Name changed to the Franz Theodore Stone Institute of Hydrobiology.
- 1953 Laboratory purchased 30-foot passenger boat, the Gibraltar II.
- 1955 Laboratory became a program of the Natural Resources Institute, College of Agriculture and Home Economics; renamed Franz Theodore Stone Laboratory. Year-round research program suspended.
- 1955 Professor Loren S. Putnam named the sixth director upon the resignation of Professor Langlois.
- 1964 Bequest of Professor Mary D. Rogick permitted the purchase of two faculty housing units, Sycamore Cottage and Rogick Cottage, on Peach Point.
- 1966 Administration of Stone Laboratory transferred to the new College of Biological Sciences.
- 1966 Jay Cooke Home (Cooke Castle) designated a Registered National Historic Landmark by U.S. Department of the Interior, National Park Service.

- 1967 Hydrospheric Sciences Committee recommended establishment of a research center at Lake Erie.
- 1970 Coast Guard Lighthouse on the south point of South Bass Island transferred to University (converted to radiobiology laboratory and faculty housing unit).
- 1971 Center for Lake Erie Area Research established with facilities at Stone Laboratory.
- 1973 Summer instructional program suspended. President's Task Force on Stone Laboratory recommended continuation of research and instruction at the Lake Erie field station.
- 1973 Professor Charles E. Herdendorf named the seventh director upon the retirement of Professor Putnam.
- 1973 Lease agreement negotiated with the U.S. Environmental Protection Agency for the 63-foot research vessel Hydra to be docked at Stone Laboratory.
- 1974 Summer instructional program and year-round research staff reinstated at Stone Laboratory.
- 1977 Ohio Sea Grant Program established with projects at Stone Laboratory.
- 1980 Celebration of 50th Anniversary of Stone Laboratory on Gibraltar Island.
- 1981 First Meeting of the Friends of Stone Laboratory, a group of alumni and friends of the Laboratory concerned with contributing to and preserving its high academic quality.
- 1982 Second meeting of the Friends of Stone Laboratory; By-laws approved and first Board of Directors elected.
- 1982 Ohio State University Board of Trustees hold summer meeting at Stone Laboratory; Ohio General Assembly provides \$950,000 for capital improvements at Stone Laboratory.
- 1983 Final plans approved for new residence hall, renovations to Stone Laboratory building and construction of a wastewater treatment plant; Scholarship Endowment established by Friends of Stone Laboratory.

TABLE 7
DEVELOPMENT OF THE OHIO SEA GRANT PROGRAM 1977-1983

PROGRAM COMPONENT	1977-1978	1978-1979	1979-1980	1980-1981	1981-1982	1982-1983
PROGRAM AND DEVELOPMENT	<p>Development of the Core Administration for the Ohio Sea Grant Program (\$0-\$36,837) Dr. Charles E. Herdendorf</p>	<p>Administration and Management of the Ohio Sea Grant Program (\$70,000-\$51,500) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter</p>	<p>Administration and Development of the Ohio Sea Grant Program (\$41,500-\$76,700) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter</p>	<p>Administration of the Ohio Sea Grant Program (\$12,100-\$88,800) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter</p>	<p>Administration of the Ohio Sea Grant Program (\$67,300-\$76,500) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter</p>	<p>Development of the Ohio Sea Grant Program (\$20,600-0)</p>

RESEARCH

Development of Markets and Methods of Marketing Freshwater Drum and Other Underutilized Species (\$47,807-\$4,460)
Dr. Jeffrey M. Reutter
Russell L. Scholl

Market Development for Underutilized Lake Erie Fish Species including New Packaging Techniques (\$28,400-\$2,700)
Dr. Jeffrey M. Reutter
Michael T. Metcalf

Preliminary Development of an Operational Lake Erie Storm Surge Flood Forecasting Program (\$26,600-\$16,300)
Dr. Keith W. Bedford

Lake Erie Storm Surge Forecasting: Model Intercomparison of Western Basin Effects (\$26,000-\$13,800)
Dr. Keith W. Bedford

The Life Cycle, Transmission and Pathology of *Fustrongylides tubifex*, a Common Metastode Parasite of Yellow Perch and Waterfowl in Lake Erie (\$8,600-\$4,100)
Dr. John L. Crites

Economic Value of Ohio's Lake Erie Fisheries (\$27,000-\$9,500)
Dr. Leroy J. Hushak
Dr. Fred H. Hitzhusen

Economic Value of Ohio's Lake Erie Fisheries (\$25,000-\$12,900)
Dr. Leroy J. Hushak
Dr. Douglas D. Southgate

Economic Value of Ohio's Lake Erie Fisheries (\$26,000-\$13,170)
Dr. Leroy J. Hushak
Dr. Douglas D. Southgate

Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds (\$12,000-\$4,700)
Dr. David A. Culver

Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds (\$10,700-\$2,000)
Dr. David A. Culver
Dr. C. Susan Munch

Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds (\$7,800-\$4,800)
Dr. David A. Culver
Dr. C. Susan Munch

Lake Erie Public Information Through Radio Broadcasting (\$11,500-\$7,800)
Dr. Rosanne W. Fortner

Chemical Characterization of the Antitumor Factor in the Clam *Mercenaria m* (\$18,000-\$10,561)
Dr. Derek Horton

TABLE 7 CONT.

PROGRAM COMPONENT	YEAR	1977-1978	1978-1979	1980-1981	1981-1982	1982-1983
PROGRAM MANAGEMENT AND DEVELOPMENT		Development of the Core Administration for the Ohio Sea Grant Program (\$50-\$36,837) Dr. Charles E. Herdendorf	Administration and Management of the Ohio Sea Grant Program (\$20,000-\$51,500) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter	Administration and Development of the Ohio Sea Grant Program (\$41,500-\$76,700) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter	Administration of the Ohio Sea Grant Program (\$32,100-\$60,800) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter	Administration of the Ohio Sea Grant Program (\$62,300-\$76,500) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter
					Development of the Ohio Sea Grant Program (\$20,800-0)	Development of the Ohio Sea Grant Program (\$20,600-0)
RESEARCH		Development of Markets and Methods of Marketing Freshwater Drum and Other Underutilized Species (\$47,807-\$4,460) Dr. Jeffrey M. Reutter Russell L. Scholl	Market Development for Underutilized Lake Erie Fish Species including New Packaging Techniques (\$28,400-\$2,700) Dr. Jeffrey M. Reutter Michael T. Metcalf	Lake Erie Storm Surge Forecasting: Model Intercomparison of Western Basin Effects (\$26,000-\$13,800) Dr. Keith W. Redford		
			Preliminary Development of an Operational Lake Erie Storm Surge Flood Forecasting Program (\$26,600-\$16,300) Dr. Keith W. Redford			
			The Life Cycle, Transmission and Pathology of <i>Eustrongylides tubifex</i> , a common Nematode Parasite of Yellow Perch and Waterfowl in Lake Erie (\$8,600-\$4,100) Dr. John L. Crites			
				Economic Value of Ohio's Lake Erie Fisheries (\$27,000-\$9,500) Dr. Leroy J. Hushak Dr. Fred H. Hitzhusen	Economic Value of Ohio's Lake Erie Fisheries (\$25,000-\$12,900) Dr. Leroy J. Hushak Dr. Douglas D. Southgate	Economic Value of Ohio's Lake Erie Fisheries (\$26,000-\$13,100) Dr. Leroy J. Hushak Dr. Douglas D. Southgate
				Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds (\$12,000-\$4,700) Dr. David A. Culver	Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds (\$10,700-\$7,000) Dr. David A. Culver Dr. C. Susan Munch	Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds (\$7,600-\$4,800) Dr. David A. Culver Dr. C. Susan Munch
				Lake Erie Public Information Through Radio Broadcasting (\$11,500-\$7,800) Dr. Rosanne W. Fortner		
				Chemical Characterization of the Antitumor Factor in the Clam <i>Mercenaria m</i> (\$18,000-\$10,561) Dr. Derek Horton		

TABLE 7 CONT.

YEAR PROGRAM REPORT	1977-1978	1978-1979	1979-1980	1980-1981	1981-1982	1982-1983
RESEARCH						
					<p>Aquaculture in Ohio: Culturing Fathead Minnows for Bait (\$10,000-\$6,000) Dr. David L. Johnson Dr. Charles F. Cole Thomas P. Stockdale</p> <p>Evaluation of Sand Resources in Western Lake Erie (\$10,000-\$12,000) Dr. Lester J. Walters (BGSU)/Dr. Robert W. Anderhalt (BGSU)</p> <p>Description and Analytical Marketing Study of Ohio's Lake Erie Commercial Fishery (\$8,700-\$2,900) Dr. Cameron S. Thraen</p> <p>Portrait of the Bass Islands: A Handbook of Architecture and History (\$5,000-\$4,800)^c Theodore J. Ligibel (BGSU) Dr. Richard J. Wright (BGSU)</p> <p>Coherent Turbulent Structures in the Benthic Boundary Layer; Phase I: Development of an Ultrasonic Transducer for Direct Profiling of Sediment Concentration and Grain Size Distribution (\$30,000-\$15,500) Dr. Keith W. Bedford</p> <p>Reliability of Foundations for Offshore Structures and its Relation to Decision Criteria (\$8,200-\$4,100)^c Dr. Tien H. Wu</p> <p>Fish Community Structure, Movements, and Reproduction in Controlled and Uncontrolled Lake Erie Marshes (\$10,000-\$6,000) Dr. David L. Johnson Dr. Mark D. Barnes Dr. Charles F. Cole</p> <p>Summer Storm Studies Over Western Lake Erie and its Coastal Drainage Basin (\$8,708-\$3,100) Dr. Thomas A. Seliga</p>	<p>Aquaculture in Ohio: Culturing Fathead Minnows for Bait (\$12,800-\$8,800) Thomas P. Stockdale Dr. Charles F. Cole Dr. David L. Johnson</p> <p>The Analysis and Mitigation of Lake Erie Flooding Effects (\$30,000-\$16,900) Dr. Keith W. Bedford Dr. Robert S. Brodkey Dr. Rambil S. Sandhu Dr. Vasandara V. Varadan Dr. Vijay K. Varadan</p> <p>Site Exploration for Foundations of Offshore Structures (\$7,000-\$3,500) Dr. Tien H. Wu</p> <p>Fish Community Structure, Movements, and Reproduction in Controlled and Uncontrolled Lake Erie Marshes (\$20,000-\$3,300) Dr. Mark D. Barnes</p>

TABLE 7 CONT.

YEAR	1977-1978	1978-1979	1979-1980	1980-1981	1981-1982	1982-1983
PROGRAM COMPONENT						
ADVISORY SERVICE	Development of the Ohio Sea Grant Extension Program (\$40,327-\$9,570) Dr. Jeffrey M. Reutter Russell L. Scholl (ODNR)	Development of the Ohio Sea Grant Extension Program (\$47,500-\$19,500) Dr. Jeffrey M. Reutter Dr. Paul R. Thomas	Development of the Ohio Sea Grant Extension Program (\$17,000-\$0) Dr. Charles E. Herdendorf Weldon A. Kefauver Great Lakes Network (\$6,000-\$3,100) Dr. Jeffrey M. Reutter Dr. Charles E. Herdendorf	Ohio Sea Grant Advisory Service (\$123,500-\$85,200) Dr. Jeffrey M. Reutter Dr. Paul R. Thomas	Ohio Sea Grant Advisory Service (\$130,000-\$74,600) Dr. Jeffrey M. Reutter Dr. Paul R. Thomas	Ohio Sea Grant Advisory Service (\$148,300-\$72,800) Dr. Jeffrey M. Reutter Dr. Paul R. Thomas
TOTAL FEDERAL DOLLARS	\$36,894	\$121,842	\$186,000	\$295,000	\$365,900	\$401,000
INDIRECT COSTS	\$12,320	\$ 29,935	\$ 40,904	\$ 75,358	\$ 86,009	\$93,578
NUMBER OF PROJECTS	1	4	8	10	18	12
NUMBER OF INVESTIGATORS ^a	1	5	10	14	30	22
NUMBER OF GRANTS	2	3	6	11	11	9

^aProjects listed side by side are continuations of the same effort. Dollar values in parentheses are the federal grant total on the left followed by the non-federal match on the right.

^bThis project is not included in the total because it was added to the grant subsidy through the year.

^cThese projects are being funded out of the discretionary fund and are not included in the total.

^dDoes not include graduate and undergraduate students.

TABLE 8

SEA GRANT ADVISORY SERVICE FUNCTIONS 1982-1983

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
Sept. 1, 1982	Radio Station WOBL-Oberlin	Thousands	D. Kelch	Salmon and Trout Clinic
Sept. 2, 1982	ARES, Inc.	7	F. Snyder J. Reutter	Firing Range Usage
Sept. 3, 1982	TV 35-Elyria	Thousands	D. Kelch	Sea Grant and Salmon Fishing
Sept. 7, 1982	Cuyahoga County Sportsfishermen	192	D. Kelch	Salmon and Trout Clinic
Sept. 8, 1982	Lake County Sportsfishermen	225	F. Lichtkoppler F. Snyder	Salmon and Trout Clinic
Sept. 9, 1982	Fremont Area 4-H Agents	9	F. Snyder	Proposed Aquaculture Project
Sept. 10-12, 1982	Bexley Junior High School	32	F. Snyder	Aquatic Biology Workshop
Sept. 15, 1982	Ashtabula County Sportsfishermen	155	F. Lichtkoppler F. Snyder	Salmon and Trout Clinic
Sept. 17, 1982	Ottawa County 5th Grade	550	F. Snyder	Marsh Conservation Tour

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF		TOPIC
		ATTENDEES	SPEAKERS	
Sept. 17-18, 1982	Education Leadership Team	10	R. Fortner V. Mayer	Proposal Development
Sept. 19, 1982	Northeast Ohio Coastal Residents	26	F. Lichtkoppler	Waves and Beaches/Beach Walk
Sept. 21, 1982	Port Clinton Rotary	36	F. Snyder	Bait Market Development
Sept. 21-23, 1982	Farm Science Review	300	J. Reutter	Seafood Utilization Tour
Sept. 22, 1982	Talkback Radio Show-WFUN	10,000	F. Lichtkoppler	Coastal Drive-it-Yourself
Sept. 23, 1982	TV 35-Elyria	Thousands	D. Kelch	Sea Grant Information
Sept. 23, 1982	Camp Perry Range Officials	5	F. Snyder	Firing Range Usage
Sept. 25, 1982	WJW Radio-Cleveland	Thousands	D. Kelch	Lake Erie Discussion with D'Arcy Egan
Sept. 25, 1982	Isaac Walton League and General Public	85	F. Snyder	Sea Grant Exhibit
Sept. 28-Oct. 1, 1982		75	D. Rathke	Diatom Systematics & Ecology
Sept. 29, 1982	Mayfield Junior High School	39	D. Kelch F. Snyder	Aquatic Biology Workshop

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
Oct. 1, 1982	Charter Fishermen	10	F. Snyder	Improvement of Toussaint Harbor
Oct. 3, 1982	Northeast Ohio Coastal Residents	150	F. Lichtkoppler	Drive-it-Yourself Tour
Oct. 5, 1982	WOBL Radio-Oberlin	Thousands	D. Kelch	Lake Erie
Oct. 5, 1982	Vermilion Lion's Club	46	D. Kelch	Sea Grant
Oct. 5, 1982	Lorain County Waterfront Hunters Association	26	D. Kelch	Safety and Steel Shot
Oct. 5, 1982	Isaac Walton League	6	F. Snyder	Tournament Planning
Oct. 7, 1982	Westlake Sportsmen's Club	43	D. Kelch	Lake Erie
Oct. 7, 1982	WPVL Radio-5 tapes	25,000	F. Lichtkoppler	Sea Grant Update
Oct. 7, 1982	Ashtabula County Extension Advisory Committee	15	F. Lichtkoppler	Sea Grant Update
Oct. 8, 1982	Lorain County Teachers	300+	D. Kelch	Marine Education
Oct. 8-9, 1982	Sandusky Teachers	12	V. Mayer R. Fortner	Marine and Aquatic Awareness Workshop

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
Oct. 8-9, 1982	Sandusky Teachers	14	F. Snyder	Aquatic Education Workshop
Oct. 11, 1982	Camp Terry Officials	6	F. Snyder	Firing Range Warning Tests
Oct. 12, 1982	Sandusky County 5th Grade	375	F. Snyder	County Conservation Tour
Oct. 13, 1982	Lorain County Hunters	56	F. Snyder	Waterfowl Hunting and Safety
Oct. 13, 1982	Marion Power Squadron	43	F. Snyder	Bait Market Development
Oct. 14, 1982	Northeast Ohio Coastal Property Owners	7	F. Lichtkoppler	Coastal Erosion
Oct. 14, 1982	New Sea Grant Advisory Program Committee	9	J. Reutter	Ways to Save Money on Research Projects
Oct. 14-15, 1982	Municipal Officials	40	F. Lichtkoppler C.E. Herdendorf	Coastal Erosion
Oct. 20, 1982	Ohio Cooperative Extension Agents	18	D. Kelch F. Lichtkoppler F. Snyder J. Reutter	Lake Erie Fish Utilization
Oct. 22, 1982	General Public- Erie County	Hundreds	F. Snyder	Congressional Breakfast

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
Oct. 27, 1982	Lorain and Cuyahoga County Hunters	135	D. Kelch	3 Safety Clinics
Oct. 28, 1982	Coastal Property Owners	7	F. Lichtkoppeler	Waves and Beaches
Oct. 29, 1982	Northeast Ohio School Teachers	38	F. Lichtkoppeler	Lake Erie
Oct. 29-30, 1982	Akron Area Teachers	44	R. Fortner V. Mayer	Marine and Aquatic Awareness Workshop
Oct. 30, 1982	Northeast Ohio School Teachers	38	F. Lichtkoppeler	Know Your Local Fish
Nov. 18-19, 1982	Zanesville Area Teachers	35	R. Fortner V. Mayer	Marine & Aquatic Awareness Workshops
Dec. 7-8, 1982	Lorain Area Teachers	30	R. Fortner V. Mayer	Marine & Aquatic Awareness Workshops
Jan. 13-14, 1983	Toledo Area Teachers	60	R. Fortner V. Mayer	Marine & Aquatic Awareness Workshop
Jan. 26, 1983	ODNR/Wildlife	20	L. Hushak	Lake Erie Fishery Economics
Jan. 26-28, 1983	Great Lakes Network	12	V. Mayer R. Fortner	Proposal Development

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
Feb. 11-12, 1983	Dayton Area Teachers	64	R. Fortner V. Mayer	Marine & Aquatic Awareness Workshop
Feb. 15, 1983	League of Women Voters Eastlake Chapter	20	L. Fay	Lake Erie: Past & Present
Feb. 16, 1983	Breckenridge Senior Citizen Community Center	25	L. Fay	Lake Erie on the Rocks
Feb. 17, 1983	Hilliard Teachers	25	V. Mayer R. Fortner	Inservice Workshop
Feb. 28, 1983	Lorain County Economic Development Committee	15	D. Kelch	Shoreline Development
March 1, 1983	Muskies, Inc. Cleveland Chapter	41	D. Kelch	Lake Erie/Sea Grant
March 2, 1983	Vermilion Port Authority & Mayor	16	D. Kelch	Fishing Accesses, Boat Launches
March 4, 1983	Polish Fisherman's Club-Lorain	53	D. Kelch	Artificial Reefs
March 7, 1983	Reef Committee	12	D. Kelch F. Snyder F. Lichtkoppler	Artificial Reefs

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
March 7, 1983	Artificial Reef Committee/Tom Wasson	17	D. Kelch	Artificial Reefs
March 8, 1983	Great Lakes Tomorrow	35	F. Lichtkoppler	Lake Erie Resources
March 8, 1983	Vermillion Fish and Game Assoc.	125	D. Kelch	Lake Erie, Artificial Reefs and Ecology
March 8, 1983	Public-Ottawa County	75	F. Snyder	Lake Erie Walleye Clinic
March 9, 1983	TV-43, Lorain	Thousands	D. Kelch	PSA, Artificial Reefs
March 9, 1983	Ducks Unlimited Lorain County Chapter	15	D. Kelch	Waterfowl, Lake Erie
March 10, 1983	Elyria High School	72	D. Kelch	Career Day: Outdoor Jobs
March 10, 1983	Defiance Area/4-H Agents	9	F. Snyder	Sea Grant 4-H Programs
March 10, 1983	John Sulpizio, Lorain Port Authority Director	4	D. Kelch	Artificial Reefs
March 10-11, 1983	Portsmouth Area Teachers	32	R. Fortner V. Mayer	Marine and Aquatic Awareness Workshop
March 11, 1983	Sandusky Elementary Teachers	16	F. Snyder	Sea Grant Education Programs

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
March 11, 1983	Lorain County Economic Development Committee	12	D. Kelch	Shoreline Development: When, Where and How
March 12, 1983	Western Basin Charter Boat Association	34	F. Snyder	Western Basin Update
March 12, 1983	General Public	72	F. Lichtkoppler	Hazardous Wastes
March 15, 1983	General Public	35	F. Lichtkoppler D. Kelch F. Snyder J. Reutter	Lake Erie Fishing
March 15, 1983	Lake Erie Fishing Clinic	60	D. Kelch	Fish Lake Erie
March 17, 1983	Fairport R&R Assoc.	138	F. Lichtkoppler	Lake Erie Fishing
March 18, 1983	Cleveland Sports Show	Thousands	D. Kelch F. Lichtkoppler	Lake Erie
March 18-27, 1983	Cleveland Sports and Outdoors Show	Thousands	D. Kelch	Sea Grant Exhibit
March 18-27, 1983	Cleveland Sports Show	Thousands	F. Snyder D. Kelch J. Reutter F. Lichtkoppler	Ohio Sea Grant Program

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
March 19, 1983	Public-Toledo Mall Show	2000	F. Snyder	Ohio Sea Grant Program
March 19-Apr. 27, 1983	Cleveland Sports Show	100,000	D. Kelch F. Snyder J. Reutter F. Lichtkoppler	Lake Erie
March 20, 1983	3 Area Sea Grant Advisory Committee Meeting	40	D. Kelch	Sea Grant Programs
March 20, 1983	Tri-Area Sea Grant Advisory Meeting	30	C.E. Herdendorf J. Reutter Staff	Advisory Committee
March 23, 1983	Lorain County Economic Development Committee	129	D. Kelch	Artificial Reefs
March 25, 1983	Corps of Engineers Survey Team	6	F. Lichtkoppler	Lake Erie Coast Erosion Bottom Mapping
March 29, 1983	Artificial Reef Subcommittee	6	F. Lichtkoppler	Artificial Reef
March 30, 1983	Radio WFUN/GPSA's	36,000	F. Lichtkoppler	Lake Erie Natural Resources
March 30, 1983	Public/Sandusky Co.	58	F. Snyder	Lake Erie Walleye Clinic

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
March 30, 1983	OSU Faculty, Students	10	R. Fortner	Sea Grant Education Program
March 30, 1983	Avon Lake Boat Club	75	D. Kelch	Artificial Reefs
April 6, 1983	Coastal Property Owners	18	F. Lichtkoppler	Coastal Erosion
April 6, 1983	Port Clinton Fish Co. Commercial Fishermen	12	D. Kelch	Fish Marketing
April 6, 1983	Public/Henry County	128	F. Snyder	Lake Erie Walleye Clinic
April 7, 1983	Coastal Property Owners	20	F. Lichtkoppler	Coastal Erosion
April 7, 1983	Lorain Co. Extension Advisory Committee	20	D. Kelch	Sea Grant Update
April 7, 1983	Tape 5 PSA's	25,000	F. Lichtkoppler	Lake Erie
April 8, 1983	Extension Agents	30	F. Lichtkoppler	Sea Grant Programs
April 8, 1983	Lorain County Economic Development Committee	14	D. Kelch	Shoreline Development
April 9, 1983	General Public	31	F. Lichtkoppler	Beach Walk Coastal Erosion

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
April 11, 1983	WELW Radio	5,000	F. Lichtkoppler	Lake Erie is Alive
April 12, 1983	Sheffield Lake City Planners and Mayor	8	D. Kelch	Boat Ramp: Fishing Pier Plans
April 13, 1983	Toastmasters	12	F. Lichtkoppler	Hazardous Waste Management
April 13, 1983	Public/Williams County	43	F. Snyder	Lake Erie Walleye Clinic
April 13, 1983	TV 43-Lorain/Cleveland Thousands		D. Kelch	PSA-Lake Erie Fishing
April 14, 1983	WFUN-6 PSA's	48,000	F. Lichtkoppler	Lake Erie Topics
April 14, 1983	Ashtabula Extension Advisory Committee	15	F. Lichtkoppler	Sea Grant Programs
April 14, 1983	Jefferson Rotary	36	F. Lichtkoppler	Lake Erie Resources
April 14, 1983	Jefferson Rotary	36	F. Lichtkoppler	Lake Erie Resources
April 14, 1983	Knox County - CES	102	D. Kelch	Fish Preparation & Handling Presentation
April 16, 1983	Charter Captains Workshop	170	F. Lichtkoppler	Salmon Fishing/N.E. Ohio
April 16, 1983	Ohio Charter Captains	180	F. Snyder D. Kelch, F. Lichtkoppler J. Reutter	Business Management Seminar

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
April 16, 1983	Lake Erie Charter Captain's Conference-Sandusky	180	D. Kelch	Break-Even Analysis
April 18-21, 1983	Great Lakes Sea Grant Network Conference-MI	50	D. Kelch	Sea Grant Programming
April 22, 1983	General Public	36	F. Lichtkoppler	Fishing Lake Erie
April 23, 1983	Lake Erie Coast Guard Cleveland	75	D. Kelch	Boating Course/Sea Grant
April 23, 1983	Ohio Academy of Sciences	40	F. Snyder	Estuary Fish Communities
April 25, 1983	Lorain County Economic Development Committee Bus Tour	48	D. Kelch	Lake Erie Sport Fishery
April 27, 1983	OSU Students & Faculty	12	F. Snyder	Lake Erie Fish Management
April 27, 1983	Lorain County Economic Development Committee	10	D. Kelch	Lake Erie Travel & Tourism
April 27, 1983	Lake Erie Coast Guard-Cleveland	75	D. Kelch	Lake Erie/Sea Grant Publications
April 28, 1983	Hocking Tech. Students	26	F. Snyder	Commercial Fishing

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
April 28, 1983	Painesville Township Trustees	10	F. Lichtkoppler	Sand Dredging Coastal Erosion
April 28, 1983	Commercial Gill Net Fishermen-Lorain	11	D. Kelch	Problems with Fishery: Catch Rates
May 1, 1983	Lindy-Little Joe Fishing Team	10	D. Kelch	Lake Erie Fish Tagging
May 2, 1983	Port Clinton Fish Co. Commercial Fishermen	6	D. Kelch	Market Development
May 3, 1983	Sea Grant Site Visit-Columbus	90	D. Kelch	Fish Preparation: Freshwater Drum
May 3-4, 1983	Site Visit	25	F. Lichtkoppler	Coastal Erosion
May 5, 1983	Old Woman Creek Aquatic Program-Lorain	35	D. Kelch	Aquatic Education
May 5, 1983	WJW A.M. 850 Radio-Cleveland	Thousands	D. Kelch	All Outdoors Program: Lake Erie Fishing
May 6, 1983	Nugent Canal Yacht Club	38	F. Snyder	Lake Erie Walleye Clinic
May 6, 1983	Sea Grant Advisory Services Association	5	D. Kelch	Conference Call

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF		TOPIC
		ATTENDEES	SPEAKERS	
May 7, 1983	N.W. Ohio Teachers	18	F. Snyder	Lake Erie Education Resources
May 7, 1983	Harmon School, Cleveland, Put-in-Bay Bio-Lab	34	D. Kelch	Aquatic Education
May 9, 1983	Artificial Reef Committee	12	F. Lichtkoppler	Artificial Reefs
May 9, 1983	Lorain City Council	105	D. Kelch	Lake Erie Erosion
May 10, 1983	Oak Harbor Rotary	29	F. Snyder	Ohio's Crawfish Bait Market
May 10, 1983	Willoughby City Council	12	F. Lichtkoppler	Coastal Erosion
May 11, 1983	Port Clinton	7	D. Kelch F. Snyder	Fish Tagging Program for Cystic Fibrosis
May 12, 1983	Coastal Property Owners	10	F. Lichtkoppler	Coastal Erosion
May 13, 1983	Lima North High School	31	F. Snyder	Natural History of Lake Erie Islands
May 14, 1983	Willoughby City Council	2	F. Lichtkoppler	Coastal Erosion
May 16-25, 1983	Lindy Little Joe Fish Tagging	25	D. Kelch	Lake Erie Promotion

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
May 16-27, 1983	WKYC-TV 3/Cleveland	Thousands	D. Kelch	Lake Erie Fishing
May 17, 1983	Ohio Geological Survey	3	F. Lichtkoppler	Sand Mapping Coastal Erosion
May 17, 1983	Artificial Reef Sub-Committee and Tom Wasson	15	D. Kelch	Artificial Reef
May 18, 1983	Lake County Advisory Committee	22	F. Lichtkoppler	Lake Erie
May 18, 1983	Detroit & Windsor TV Stations	Thousands	F. Snyder	Walleye Tagging Press Conferences
May 19, 1983	Shoreline Erosion Committee	25	D. Kelch	Erosion Programs
May 19, 1983	5 PSA's WPUL	25,000	F. Lichtkoppler	Lake Erie Topics
May 20, 1983	Vic Mayer & Rosanne Fortner	3	F. Lichtkoppler	Coastal Tour: Coastal Erosion
May 23, 1983	WJWK-TV	Thousands	F. Snyder	Walleye Tagging Activities
May 24, 1983	WTVG-TV	Thousands	F. Snyder	Walleye Tagging Activities
May 25, 1983	Cleveland Yacht Club	90	D. Kelch	Sea Grant, Lake Erie, Artificial Reefs & Fishing

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF		TOPIC
		ATTENDEES	SPEAKERS	
May 25, 1983	WTVG-TV	Thousands	F. Snyder	Sea Grant, Lake Erie, Artificial Reefs & Fishing
May 25, 1983	Great Lakes Commission	31	F. Lichtkoppler	Lake Erie Commerce
May 26, 1983	Public Meeting, Lorain City Hall	82	D. Kelch	Artificial Reefs Presentation
May 26, 1983	Great Lakes Commission	31	F. Lichtkoppler	Artificial Reefs Presentation
May 27-29, 1983	LECBA Pro-Am Walleye Tournament	500	D. Kelch	Catch and Release, Congressional Day & Fish Measuring
May 28-29, 1983	Pro Am	Hundreds	F. Lichtkoppler F. Snyder	Walleye Fishing
May 28-29, 1983	Lake Erie Charter Boat Ass'n Tournament	Hundreds	F. Snyder D. Kelch F. Lichtkoppler	Tournament Judging
June 1, 1983	Geneva 6th Grade Schools	209	F. Lichtkoppler	Lake Erie Ecology
June 1, 1983	WTVG-TV	Thousands	F. Snyder	Lake Erie Firing Range
June 1-3, 1983	Artificial Reef Conference, MSU, East Lansing	150	D. Kelch	Ohio's Artificial Reef Program

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
June 2, 1983	Madison School 6th Grade	183	F. Lichtkoppler	Pond/Lake Ecology
June 2, 1983	Fremont Area Extension Agents	19	F. Snyder	Lake Erie's Sport Fishery
June 3, 1983	N.W. Ohio Curriculum Directors	28	F. Snyder	Lake Erie Education Resources
June 4, 1983	Izaak Walton Tournament	Hundreds	F. Snyder	Tournament Judging
June 6-7, 1983	Lake Erie Open	Hundreds	D. Kelch F. Lichtkoppler F. Snyder	Walleye Fishing
June 6-7, 1983	American Walleye Assoc. Tournament	Hundreds	D. Kelch F. Lichtkoppler F. Snyder	Tournament Judging
June 9, 1983	Public Sport-Fishing Clinic, Lorain Community College	65	D. Kelch	Special Techniques: Downriggers, Depth Finders
June 9, 1983	5 PSA's - MPUL	25,000	F. Lichtkoppler	Lake Erie
June 9, 1983	Painesville Township Trustees	3	F. Lichtkoppler	Lake Erie Section III: Coast Erosion Study

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
June 10, 1983	Westlake Sportsman Club	58	D. Kelch	Artificial Reefs: Economic Values
June 13, 1983	IJC	35	F. Lichtkoppler	Great Lakes Diversions
June 13, 1983	N.E. Ohio Fishing Club	20	F. Lichtkoppler	Lake Erie Walleye
June 14, 1983	Public Sportfishing Clinic	75	D. Kelch	Walleye Fishing: When, Where and How
June 14, 1983	9 PSA's, WFUN	54,000	F. Lichtkoppler	Lake Erie
June 14, 1983	Sandusky Exchange Club	37	F. Snyder	Sea Grant Advisory Service
June 14, 1983	Sandusky Boat Club	42	F. Snyder	Lake Erie's Walleye Clinic
June 15, 1983	Walleye Fishing Clinic	80	D. Kelch	Lake Erie Walleye: When, Where and How
June 15, 1983	General Public, Lake County	65	F. Lichtkoppler D. Kelch	Walleye in Lake Erie
June 17-18, 1983	Congressional Day	75	Staff	Lake Erie Economic Development
June 17-18, 1983	Congressional Reps and Aides	70	Staff	Values of Lake Erie

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
June 21, 1983	General Public, Ashtabula County	110	F. Lichtkoppeler F. Snyder	Walleye in Lake Erie
June 21, 1983	General Public, Ashtabula County	98	F. Lichtkoppeler F. Snyder	Lake Erie Walleye Clinic
June 22, 1983	Toledo Area Teachers	24	F. Snyder	Ohio Sea Grant Program
June 22, 1983	Elmore Kiwanis	32	F. Snyder	Ohio Sea Grant Program
June 23, 1983	American Walleye Assoc., Cleveland Westside Chapter	29	D. Kelch	Walleye, Artificial Reefs
June 23, 1983	Fremont Area 4-H Members	28	F. Snyder	Making Fishing Lures
June 30, 1983	WFRO Radio	Thousands	F. Snyder	Lake Erie Fisheries
July 6, 1983	WRQC-FM 96	Thousands	D. Kelch	Sea Grant, Lake Erie and Artificial Reefs
July 6, 1983	Sheffield Lake Small Business Assoc.	29	D. Kelch	Artificial Reefs, Boat Ramps, Lake Erie & Economic Value
July 6, 1983	Toledo 4-H Members	25	F. Snyder	Fishing & Lure Making
July 7, 1983	WJW-AM 850	Thousands	D. Kelch	All Outdoors Program, Sea Grant & Artificial Reefs

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF		TOPIC
		ATTENDEES	SPEAKERS	
July 7, 14 & 28, 1983	Upper Arlington Senior Citizens	25	R. Fortner F. Snyder	The World of Water
July 7, 1983	6th Grade Students, Huron County	30	F. Lichtkoppler	Marsh Ecology
July 11, 1983	Kelleys Island 4-H Camp	35	D. Kelch	Youth Aquatic Education
July 14, 1983	4-H Members	31	F. Snyder	Stream Ecology
July 16, 1983	4-H Members	30	F. Lichtkoppler	4-H Fishing Projects: Judging
July 16, 1983	Kelleys Island 4-H Camps	29	D. Kelch	Youth Aquatic Education
July 19, 1983	Staff	5	F. Lichtkoppler et al.	<u>Twine Line</u> , Sea Grant Program
July 19, 1983	Sea Grant Advisory Committee	8	F. Lichtkoppler J. Reutter	Sea Grant Program
July 19, 1983	Artificial Reef Sub-Committee	6	D. Kelch	Artificial Reef Program
July 20, 1983	Lorain and Cuyahoga County Marinas & Fishing Piers	240	D. Kelch	Distribute Sea Grant Fact Sheets

TABLE 8 (CONTINUED)

DATE	GROUP OR AUDIENCE	NO. OF ATTENDEES	SPEAKERS	TOPIC
July 21, 1983	Sheffield Lake City Officials, Dr. Herdendorf	6	D. Kelch	Planning for Boat Launch, Fishing Piers
July 21, 1983	General Public, Ashtabula County	110	F. Lichtkoppler F. Snyder	Walleye in Lake Erie
July 21, 1983	Tape - WPUL 5 PSA's	25,000	F. Lichtkoppler	Lake Erie
July 21, 1983	High Rollers Coastal Tour	20	F. Lichtkoppler	Coastal Erosion/Lake Erie
July 21, 1983	Fairport R & R Assoc.	125	F. Lichtkoppler	Lake Erie Economics/ Artificial Reefs
July 22, 1983	TV 43 Lorain	Thousands	D. Kelch	PSA Sport Fishing, Artificial Reefs
July 22, 1983	Ottawa County Fair	87	F. Snyder	Lake Erie Fishing Methods
July 26, 1983	Statewide Artificial Reef Comm.-Elyria	13	D. Kelch	Artificial Reef Planning
July 27, 1983	Lorain County Travel & Tourism Commission	56	D. Kelch	Presentation: Artificial Reefs, Boat Launch, Piers
July 28, 1983	Cuyahoga County Marinas & Fishing Piers	110	D. Kelch	Distribution of Sea Grant Fact Sheets
August 22-28, 1983	Lorain County Fair	Thousands	D. Kelch	Sea Grant Display & Publications
August 30, 1983	Elyria Rotary Club	50	D. Kelch	Sea Grant, Salmon Fishing

TABLE 9

RESEARCH PROJECTS

This table lists research projects focusing on Lake Erie and other marine and aquatic topics coordinated by the Center for Lake Erie Area Research or the Ohio Sea Grant Program. The table also includes research projects dealing with Lake Erie that are being administered by other programs within the University (such projects list the name of the appropriate administrative unit).

INDEX

Project No.	Title	PI	Sponsor	Page
711846	Great Lake Seiche-Affected River Mouths	K. Bedford/ C. Herdendorf	OWRT	49
712765/713050/ 714628	Technical Assessment Lake Erie Intensive Study	C. Herdendorf	USEPA	50
712962/714869/ 714452	Lake Erie Sediment Resuspension and Transport	K. Bedford/ C. Moore	USEPA	51
713076	Forage by Walleye and Yellow Perch in Lake Erie	T. Peterle/ R. Carline	USFWS	52
713207-713216/ 713222-713224 713512	Ohio Sea Grant Program 1980-1981	C. Herdendorf/ J. Reutter	NOAA	53
713207	Ohio Sea Grant Admin. and Development	C. Herdendorf/ J. Reutter	NOAA	54
713208	Lake Erie Storm Surge Forecasting	K. Bedford	NOAA	55
713209	Economics of Lake Erie Fishery	L. Hushak	NOAA	56
713210	Zooplankton Productivity in Fish Hatchery Ponds	D. Culver	NOAA	57
713211	Lake Erie Information Radio Broadcasting	R. Fortner	NOAA	58

TABLE 9 (CONTINUED)

Project No.	Title	PI	Sponsor	Page
713212	Marine and Great Lakes Education	V. Mayer/ J. Hug	NOAA	59
713213	Marine Technology Curriculum	W. Brewer	NOAA	60
713214	Coastal Engineering Curriculum	K. Bedford	NOAA	61
713215/713216	Ohio Sea Grant Advisory Service	J. Reutter	NOAA	62
713222	Ohio Sea Grant Agent - Fremont	J. Reutter/ P. Thomas	NOAA	63
713223	Ohio Sea Grant Agent - Elyria	J. Reutter/ P. Thomas	NOAA	64
713224	Ohio Sea Grant Agent - Painesville	J. Reutter/ P. Thomas	NOAA	65
713512	Antitumor Factor in Clams	D. Horton	NOAA	66
713694	White Perch in Lake Erie	T. Peterle/ J. Margraf	USFWS	67
713078/713478	Lake Erie Water Quality and <u>Cladophora</u>	C. Herdendorf/ R. Stiefel	USEPA	68
714066-714082/ 714207/714224/ 714350/714820/ 715054/715055	Ohio Sea Grant Program 1981-1982 and 1982-1983	C. Herdendorf/ J. Reutter	NOAA	69
714066	Ohio Sea Grant Administration	C. Herdendorf/ J. Reutter	NOAA	70
714067	Ohio Sea Grant Development	C. Herdendorf/ J. Reutter	NOAA	71
714068	Zooplankton Productivity in Fish Hatchery Ponds	D. Culver	NOAA	72

TABLE 9 (CONTINUED)

Project No.	Title	PI	Sponsor	Page
714069/714820	Culturing Fathead Minnows	T. Stockdale/ C. Cole	NOAA	73
714070	Sand Resources in Lake Erie	R. Anderhalt	NOAA	74
714071	Economics of Lake Erie Fishery	L. Hushak/ D. Southgate	NOAA	75
714072	Marketing of Lake Erie Fish	C. Thraen	NOAA	76
714073	Development of Ultrasonic Transducer	K. Bedford/ V. Varadan/ R. Brodkey	NOAA	77
714074/714075	Fish Community in Lake Erie Marshes	D. Johnson/ M. Barnes	NOAA	78
714076	Summer Storms over Western Lake Erie	T. Seliga	NOAA	79
714077	Ohio Sea Grant Education Office	V. Mayer	NOAA	80
714078	Marine and Great Lakes Education	V. Mayer/ R. Fortner	NOAA	81
714079	Ohio Sea Grant Advisory Service	J. Reutter/ P. Thomas	NOAA	82
714080	Ohio Sea Grant Agent - Fremont	J. Reutter/ P. Thomas	NOAA	83
714081	Ohio Sea Grant Agent - Elyria	J. Reutter/ P. Thomas	NOAA	84
714082	Ohio Sea Grant Agent - Painesville	J. Reutter/ P. Thomas	NOAA	85
714207	Great Lakes Museum Programming	R. Fortner	NOAA	86
714224	Foundations of Offshore Structures	T. Wu	NOAA	87

TABLE 9 (CONTINUED)

Project No.	Title	PI	Sponsor	Page
714350	Ohio Sea Grant Internship	J. Reutter/ C. Herdendorf	NOAA	88
714377/714387	Acid Deposition in Aquatic Systems	C. Herdendorf/ M. Barnes	DAQDA	89
714535	Environmental Evaluation of Lake Erie Power Plants	J. Reutter	TECO	90
715054	Ohio Sea Grant Internship	J. Reutter/ C. Herdendorf	NOAA	88
715055	Ohio Sea Grant Internship	J. Reutter/ C. Herdendorf	NOAA	88
715056	Programming for Graphic Interpretation of Water Quality Data	L. Fay/ C. Herdendorf/ J. Reutter	NOAA	91
715188	Parasites of Fishes of Old Woman Creek National Estuarine Sanctuary	J. Crites/ C. Herdendorf	NOAA	92
715212	Lake Erie Recreatonal Planning Guide	C. Herdendorf	NOAA	93
715333/715334	Acid Deposition Monitoring Program for Western Lake Erie	C. Herdendorf/ A. Wilson	USEPA	94
715459/715460	Effects of Toxic Substances on Growth, Survival and Pathology of Larval Fishes in the River Raisin Estuary, Michigan, Lake Erie	C. Herdendorf/ M. Barnes/ L. Fay	USEPA	95

Transport Properties of the Great Lakes Seiche-Affected River Mouths

Principal Investigators: Keith Bedford, Civil Engineering and
Charles E. Herdendorf, CLEAR

Sponsor: U. S. Department of Interior, Office of Water Research and
Technology

Grant No.: 14-34-0001-9128

OSURF No.: 711846

Project Period and Budget: March 1, 1979 to September 30, 1982
\$120,476 (sponsor)
\$110,385 (OSU cost-sharing)
\$ 32,600 (ODNR cost-sharing)

Objective: The research objective is to determine the detailed flow physics of the transport disruptions, and the best analytical methodology to measure and empirically quantify these episodes. This will be done by the following sequence of steps: 1) A suitable river mouth site with vigorous seiche activity will be chosen. 2) Wind, stage elevation, velocity temperature, conductivity, and bedform profiles will be continuously monitored, and the data spectrally analyzed to delineate relevant time and length scales. 3) Nondimensional analysis, spectral theory and filtration theory. 4) Verified model will be used to further identify processes, readjust the sampling regimen and generate transport patterns for a variety of loading conditions. 5) Model output will be used to synthesize an empirical representation of the seiche episode for use as input into water management models.

Technical Assessment of the Lake Erie Intensive Study

Principal Investigators: Charles E. Herdendorf, C. Lawrence Cooper,
Laura A. Fay and David E. Rathke, CLEAR

Sponsor: U. S. Environmental Protection Agency, Great Lakes National
Program Office, Region V, Chicago

Grant No.: R00551601

OSURF Nos.: 712765 (on-campus), 713050 (off-campus) and 714628

Project Period and Budget: March 1, 1980 to September 30, 1983
\$358,878 (sponsor)
\$27,245 (OSU cost-sharing)

Objective: The general objectives of the Lake Erie intensive study are to provide information for detailed assessments of tributary, nearshore and main lake water quality. The intensive study is designed to identify emerging problem areas, to detect changes in water quality on a broad geographic basis, and to provide information necessary for trend analyses. A technical assessment team will be established to coordinate the implementation of the Lake Erie Surveillance Plan and preparation of an assessment report to the International Joint Commission.

Lake Erie Sediment Resuspension and Transport Mechanisms: Nearshore Vertical Profiles and Flux Rates

Principal Investigators: Keith W. Bedford and Charles A. Moore,
Civil Engineering

Sponsor: U. S. Environmental Protection Agency, Large Lakes Research Station, Grosse Ile, Michigan

Grant No.: GR 807623-01-0

OSURF Nos.: 712962, 714869 (on campus) and 714452 (off-campus)

Project Period and Budget: June 12, 1980 to March 31, 1983
\$69,880 (sponsor)
\$ 4,290 (OSU cost-sharing)

Objective: With the objective of identifying and rationalizing sediment resuspension processes in the Great Lakes, an ultrasonic sediment profilometer for measuring vertical concentration profiles of muds, silts and clays will be constructed and used to study the nearshore of the Central Basin of Lake Erie to develop a preliminary delineation of mechanisms, patterns and rates involved.

The ultrasonic sediment profilometer constructed during the first year of this project will be calibrated and used to collect a series of data from seiche and wind wave events. The data will be analyzed to develop a quantitative description of the resuspension process.

Administrative Unit: Civil Engineering

Forage Utilization by Walleye and Yellow Perch in Western Lake Erie

Principal Investigators: Tony J. Peterle and Robert F. Carline,
Zoology

Sponsor: U. S. Department of the Interior, Fish and Wildlife Service

Grant No.: 14-16-0009-80-034

OSURF No.: 713076

Project Period and Budget: July 22, 1980 to October 31, 1982
\$16,830 (sponsor)
\$ 1,504 (OSU cost-sharing)

Objective: This study is designed to document utilization of forage species by walleye and yellow perch in western Lake Erie and to relate this utilization to relative abundance and sizes of available forage species.

Administrative Unit: Zoology

Ohio Sea Grant Program 1980-1981

Principal Investigator: Charles E. Herdendorf and Jeffrey M. Reutter,
CLEAR

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA80AA-D-00103

OSURF Nos.: 713207-713216, 713222-713224 and 713512

Project Period and Budget: September 1, 1980 to August 31, 1982
\$295,000 (sponsor)
\$254,200 (OSU cost-sharing)

Objective: The overall objective of the Ohio Sea Grant Program is to enhance development, and improve management of state and regional aquatic resources. The program seeks the wise utilization of marine and aquatic resources, particularly those resources associated with the Great Lakes, to enhance the quality of life in Ohio and our surrounding states. This mission is being implemented through comprehensive research, education and advisory service programs. To accomplish this, support and resources are being provided to the university community in order to: 1) research Great Lakes problems and to develop critically-needed information while maintaining the highest level of academic excellence; 2) establish a statewide Sea Grant advisory services network to transfer this and other information to government, industry and the general public; and 3) continue to build understanding and appreciation for marine and aquatic resource values and to provide career training for marine technologists among the people of Ohio through education programs.

Results obtained through ongoing research and development projects will be transmitted to industry, agencies and the general public through appropriate publications and other media in a timely fashion.

Special information, advisory and education programs will be conducted to move these findings rapidly to various users and to create awareness and involvement on the part of institutions and the general public in Great Lakes problems and opportunities.

The Ohio Sea Grant Program will continue the process of delineating needs and priorities for future research, education and advisory programs which will serve as the basis for development of future programs focused on the real needs and vital problems of the state and region.

The Ohio Sea Grant Program has been successful in addressing its stated objectives in research, education and advisory services within the university community and in the context of the State of Ohio and the Great Lakes Region.

Administration and Development of the Ohio Sea Grant Program - M/P-1

Principal Investigators: Charles E. Herdendorf and
Jeffrey M. Reutter, CLEAR

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713207

Project Period and Budget: September 1, 1980 to August 31, 1982
\$39,467 (sponsor)
\$76,669 (OSU cost-sharing)

Objective: The continuing and proposed goals of the program administration office are: (1) to provide management of Ohio Sea Grant Program activities by exercising sound administrative and fiscal control; (2) to provide leadership in the development and coordination of program proposals; (3) to establish advisory councils to assist in problem identification, long-range planning, coordination, and scientific direction of the Program; (4) to provide program-wide communication, business and logistic services; (5) to serve as the contact point with the National Sea Grant Program, federal and state agencies, other state programs and other institutions of higher learning, and to act as a focal point for collaboration with other organizations; and (6) to explore new applications of research, education and advisory services within the Ohio Sea Grant mission.

Lake Erie Storm Surge Forecasting: Model Intercomparison of Western Basin Effects - R/EM-1

Principal Investigator: Keith W. Bedford, Civil Engineering

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713208

Project Period and Budget: September 1, 1980 to August 31, 1982
\$26,038 (sponsor)
\$13,774 (OSU cost-sharing)

Objective: As is well known, extremely damaging Lake Erie floods called storm surge occur during the passage of large storms over the lake. In order to help reduce potential damages, operational storm surge forecasting strategies are being developed. Since a variety of competing forecasting strategies exist, a study is now underway to intercompare these models in order to select the optimal formulation. As a result of this study, it is now known that storm winds from the northeast cause particularly serious western basin flooding and the models, as currently structured, are poor in predicting this event. The objective of this research is to continue and refine the intercomparison initiated in this year's study by concentrating on the ability of the models to predict the aggravated western basin response. Based upon this intercomparison the structural improvements required to improve the forecasts will be identified and implemented in the operational forecasting model.

Economic Value of Ohio's Lake Erie Fisheries - R/ME-1

Principal Investigators: Leroy J. Hushak and Frederick H. Hitzhusen,
Agricultural Economics

Sponsor: National Oceanic and Atmospheric Administration

Grant No.: NA80AA-D-00103

OSURF No.: 713209

Project Period and Budget: September 1, 1980 to August 31, 1982
\$27,021 (sponsor)
\$ 9,521 (OSU cost-sharing)

Objective: This project will (1) determine the annual economic value of Ohio's Lake Erie fishery resource generated by the major user groups: sport fishermen, commercial fishing industry, charter fishing industry, and bait dealers; (2) estimate the value of (demand for) sport fishing on Lake Erie, and the relationships between fishing days as the unit of measurement, the value per fishing day, and sport fishing catch per fishing day; and (3) examine the implications of alternative distributions of income and of ownership rights or entitlements for management of the Lake Erie resource.

Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds - R/A-1

Principal Investigator: David A. Culver, Zoology

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713210

Project Period and Budget: September 1, 1980 to August 31, 1982
\$11,999 (sponsor)
\$ 4,673 (OSU cost-sharing)

Objective: This project will: (1) determine the seasonal variation in the rate of production of zooplankton in fish rearing ponds in response to changing the amounts and timing of additions of inorganic fertilizer, chopped hay, alfalfa meal, and brewer's yeast; (2) determine the effect of fish predation on the structure and dynamics of the zooplankton community under the modifications of the normal management procedure outlined above; (3) determine whether target species of zooplankton were indeed stimulated by the management modifications and whether the fish utilize these species as anticipated; (4) determine the degree to which the manipulations change the relative productivity of algae and how this affects zooplankton productivity; and (5) determine the relative importance of bacteria and yeast as compared to algae on the growth of zooplankton, particularly those species identified to be important food organisms for the larval fish being raised.

Lake Erie Public Information Through Radio Broadcasting - R/SP-1

Principal Investigator: Rosanne W. Fortner, Natural Resources

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713211

Project Period and Budget: September 1, 1980 to August 31, 1982
\$11,499 (sponsor)
\$ 7,834 (OSU cost-sharing)

Objective: This project should serve to increase public knowledge about Lake Erie by: (1) developing and broadcasting by radio a series of public service announcements about the lake; and (2) making available to listeners the printed and illustrated scripts as resource materials. The research portion of the study will: (1) indicate the feasibility of designing an ongoing informational radio series originating with Ohio Sea Grant; and (2) measure audience contact levels, interest, optimum broadcast time and message effect from this study for incorporation directly into program design.

Marine and Great Lakes Education: An Infusion Program for Ohio Schools - E/AID-1

Principal Investigators: Victor J. Mayer, Science-Math Education
and John Hug, Ohio Department of Education

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713212

Project Period and Budget: September 1, 1980 to August 31, 1982
\$38,972 (sponsor)
\$27,958 (OSU cost-sharing)

Objective: This project is comprised of two components: (A) Awareness components, which will (1) create an awareness of marine and aquatic education among Ohio school administrators, supervisors and teachers; (2) disseminate examples of curriculum materials available in marine and aquatic education; and (3) create awareness of marine and aquatic education among selected educators in Ohio colleges and universities. (B) Implementation components, which will (1) assist teachers to effectively use available curriculum materials and teaching methods; (2) help teachers acquire appropriate background information in marine and aquatic topics; (3) provide teachers with marine and aquatic experiences through field trips; and (4) assist administrators and teachers in redesigning curricula to infuse marine and aquatic education.

The Development and Implementation of a Curriculum for the Study of Marine Technology - T/CD-1

Principal Investigator: William E. Brewer, Construction Technology,
Bowling Green State University

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713213

Project Period and Budget: September 1, 1980 to August 31, 1982
\$15,000 (sponsor)
\$28,546 (OSU cost-sharing)

Objective: This project plans the development of an industry-related curriculum in Marine Technology. This would be a four-year degree program and would encompass all aspects of the marine field: environmental, transportation, recreation and construction.

Coastal Engineering Curriculum Development - E/CD-1

Principal Investigator: Keith W. Bedford, Civil Engineering

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713214

Project Period and Budget: September 1, 1980 to August 31, 1982
\$1,498 (sponsor)

Objective: Lake Erie's 400 miles of shoreline is crucial to the economic health of the State of Ohio and its citizens. The proper use of the shoreline often requires planning, design and construction which is done by professional engineers trained in the use of up-to-date problem-solving techniques. Because there is no accredited curriculum in Ohio or the lower Great Lakes that offers coastal engineering instruction, a graduate program is being implemented in such instruction. This project seeks to purchase and develop materials necessary to finish the basic implementation of the new graduate program. These items include completing the libraries' holdings of basic texts and conference proceedings, preliminary development of a Lake Erie-based engineering case study library, and the creation and distribution of information about the program.

Ohio Sea Grant Advisory Service - A/EP-1

Principal Investigators: Jeffrey M. Reutter, CLEAR and
Riley S. Dougan and Paul R. Thomas,
Ohio Coop. Extension Service

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713215 and 713216

Project Period and Budget: September 1, 1980 to August 31, 1982
\$30,419 (sponsor)
\$60,538 (OSU cost-sharing)

Objective: The overall objective of Ohio Sea Grant Advisory Service is to act as the public interface for the program, disseminating research results and other critical information to user groups, and transmitting public sentiment, needs and concerns to program management for future program development. As part of this objective, this year's objectives are: (1) to develop educational and informative materials to meet the needs of user groups, disseminate research results, and increase utilization of valuable lake resources while eliminating and/or reducing environmental degradation; (2) to increase the capabilities of the program to interact effectively with well-established audiences and to meet the needs and further develop recently identified user groups; and (3) to implement a linkage with Ohio Cooperative Extension Service (OCES) and thereby provide a more equitable distribution of effort and services to all lake counties and user groups.

Ohio Sea Grant Advisory Service - Fremont - A/EP-1

Principal Investigators: Jeffrey M. Reutter, CLEAR and
Paul R. Thomas, Ohio Coop. Extension Service

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713222

Project Period and Budget: September 1, 1980 to August 31, 1982
\$33,609 (sponsor)
\$ 8,230 (OSU cost-sharing)

Objective: The overall objective of Ohio Sea Grant Advisory Service is to act as the public interface for the program, disseminating research results and other critical information to user groups, and transmitting public sentiment, needs and concerns to program management for future program development. As part of this objective, this year's objectives are: (1) to develop educational and informative materials to meet the needs of user groups, disseminate research results, and increase utilization of valuable lake resources while eliminating and/or reducing environmental degradation; (2) to increase the capabilities of the program to interact effectively with well-established audiences and to meet the needs and further develop recently identified user groups; and (3) to implement a linkage with Ohio Cooperative Extension Service (OCES) and thereby provide a more equitable distribution of effort and services to all lake counties and user groups.

Ohio Sea Grant Advisory Service - Elyria - A/EP-1

Principal Investigators: Jeffrey M. Reutter, CLEAR and
Paul R. Thomas, Ohio Coop. Extension Service

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713223

Project Period and Budget: September 1, 1980 to August 31, 1982
\$29,739 (sponsor)
\$ 8,230 (OSU cost-sharing)

Objective: The overall objective of Ohio Sea Grant Advisory Service is to act as the public interface for the program, disseminating research results and other critical information to user groups, and transmitting public sentiment, needs and concerns to program management for future program development. As part of this objective, this year's objectives are: (1) to develop educational and informative materials to meet the needs of user groups, disseminate research results, and increase utilization of valuable lake resources while eliminating and/or reducing environmental degradation; (2) to increase the capabilities of the program to interact effectively with well-established audiences and to meet the needs and further develop recently identified user groups; and (3) to implement a linkage with Ohio Cooperative Extension Service (OCES) and thereby provide a more equitable distribution of effort and services to all lake counties and user groups.

Ohio Sea Grant Advisory Service - Painesville - A/EP-1

Principal Investigators: Jeffrey M. Reutter, CLEAR and
Paul R. Thomas, Ohio Coop. Extension Service

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713224

Project Period and Budget: September 1, 1980 to August 31, 1982
\$29,739 (sponsor)
\$ 8,227 (OSU cost-sharing)

Objective: The overall objective of Ohio Sea Grant Advisory Service is to act as the public interface for the program, disseminating research results and other critical information to user groups, and transmitting public sentiment, needs and concerns to program management for future program development. As part of this objective, this year's objectives are: (1) to develop educational and informative materials to meet the needs of user groups, disseminate research results, and increase utilization of valuable lake resources while eliminating and/or reducing environmental degradation; (2) to increase the capabilities of the program to interact effectively with well-established audiences and to meet the needs and further develop recently identified user groups; and (3) to implement a linkage with Ohio Cooperative Extension Service (OCES) and thereby provide a more equitable distribution of effort and services to all lake counties and user groups.

Chemical Characterization of the Antitumor Factor in the Clam Mercenaria m.
- R/MB-1

Principal Investigator: Derek Horton, Chemistry

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA80AA-D-00103

OSURF No.: 713512

Project Period and Budget: December 1, 1980 to August 31, 1982
\$18,000 (sponsor)
\$10,561 (OSU cost-sharing)

Objective: Aqueous extracts of the clam Mercenaria mercenaria and related molluscs, that display in vivo and in vitro antitumor activity, are to be fractionated to permit isolation in the pure state of the antitumor principle or principles.

Status and Population Dynamics of White Perch (Morone Americana) in Lake Erie

Principal Investigators: Tony J. Peterle, J. Margraf and Robert F. Carline, Zoology

Sponsor: U. S. Department of the Interior, Fish and Wildlife Service

Grant No.: 14-16-0009-81-030

OSURF Nos.: 713694 (on campus) and 713695 (off campus)

Project Period and Budget: April 1, 1981 to December 31, 1983
\$26,900 (sponsor)
\$ 749 (OSU cost-sharing)

Objective: The objectives of the study will be (1) to determine, via food habits analysis, the role of white perch in the Lake Erie fish community with major emphasis on assessing competitive and predatory interactions with walleye, yellow perch and white bass; and (2) to determine basic population dynamics parameters of this species (e.g., growth, mortality, age structure).

Administrative Unit: Zoology

Lake Erie Monitoring Program: Main Lake Water Quality and Cladophora

Principal Investigators: Charles E. Herdendorf, CLEAR and
Robert C. Stiefel, Civil Engineering/
Water Resources Center

Sponsor: U. S. Environmental Protection Agency, Great Lakes National
Program Office, Region V, Chicago

Grant No.: R005555-01, 02, and 03

OSURF Nos.: 713078, 714064 (on-campus) and 713478, 714065 (off-campus)

Project Period and Budget: July 1, 1981 to June 30, 1983
\$379,541 (sponsor)
\$ 34,700 (OSU cost-sharing)

Objective: This project continues the water quality monitoring program for western and central Lake Erie established by the International Joint Commission under Canada/United States Great Lakes Water Quality Agreement. Monthly water quality cruises will be conducted to determine concentration and quantities of nutrients, including phosphorus, nitrogen and silica, at 50 stations. Concentrations and hypolimnetic depletion rates of oxygen will also be measured as well as numerous other limnological parameters. The objective of the Cladophora growth study is to determine the usefulness of this alga as an indicator of eutrophication by monitoring its nutrient uptake, growth rates, biomass, and distribution at representative sites in western Lake Erie. Also, as part of this project an acid deposition study will be conducted by monitoring wet and dry deposition at a station on South Bass Island throughout the study period.

Ohio Sea Grant Program 1981-1982 and 1982-1983

Principal Investigator: Charles E. Herdendorf and Jeffrey M. Reutter,
CLEAR

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF Nos.: 714066-714082, 714207, 714224, 714350, 714820, 715054 and
715055

Project Period and Budget: September 1, 1981 to December 31, 1983
\$794,900 (sponsor)
\$369,450 (OSU cost-sharing)

Objective: The overall objective of the Ohio Sea Grant Program is to enhance development, and improve management of state and regional aquatic resources. The program seeks the wise utilization of marine and aquatic resources, particularly those resources associated with the Great Lakes, to enhance the quality of life in Ohio and our surrounding states. This mission is being implemented through comprehensive research, education and advisory service programs. To accomplish this, support and resources are being provided to the university community in order to: 1) research Great Lakes problems and to develop critically-needed information while maintaining the highest level of academic excellence; 2) establish a statewide Sea Grant advisory services network to transfer this and other information to government, industry and the general public; and 3) continue to build understanding and appreciation for marine and aquatic resource values and to provide career training for marine technologists among the people of Ohio through education programs.

Results obtained through ongoing research and development projects will be transmitted to industry, agencies and the general public through appropriate publications and other media in a timely fashion.

Special information, advisory and education programs will be conducted to move these findings rapidly to various users and to create awareness and involvement on the part of institutions and the general public in Great Lakes problems and opportunities.

The Ohio Sea Grant Program will continue the process of delineating needs and priorities for future research, education and advisory programs which will serve as the basis for development of future programs focused on the real needs and vital problems of the state and region.

The Ohio Sea Grant Program has been successful in addressing its stated objectives in research, education and advisory services within the university community and in the context of the State of Ohio and the Great Lakes Region.

Administration of the Ohio Sea Grant Program - M/P-1

Principal Investigators: Charles E. Herdendorf and
Jeffrey M. Reutter, CLEAR

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714066

Project Period and Budget: September 1, 1981 to December 31, 1983
\$ 94,400 (sponsor)
\$137,264 (OSU cost-sharing)

Objective: The continuing and proposed management goals of the program administration office are: (1) to provide management of Ohio Sea Grant Program activities by exercising sound administrative and fiscal control; (2) to provide program-wide communication, business and logistic services; (3) to serve as the contact point with the National Sea Grant Program, federal and state agencies, other state programs and other institutions of higher learning; to act as a focal point for collaboration with other organizations; (4) to provide leadership in the development and coordination of program proposals; and (5) to establish advisory councils to assist in problem identification, long-range planning, coordination, and scientific direction of the Program.

Development of the Ohio Sea Grant Program - M/D-1

Principal Investigators: Charles E. Herdendorf and
Jeffrey M. Reutter, CLEAR

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714067

Project Period and Budget: September 1, 1981 to December 31, 1983
\$28,100 (sponsor)
\$ 4,000 (Hiram College cost-sharing)

Objective: The continuing and proposed developmental goals of the program administration office are: (1) to provide management of Ohio Sea Grant Program activities by exercising sound administrative and fiscal control; (2) to provide leadership in the development and coordination of program proposals; (3) to establish advisory councils to assist in problem identification, long-range planning, coordination, and scientific direction of the Program; (4) to serve as the contact point with the National Sea Grant Program, federal and state agencies, other state programs and other institutions of higher learning; and (5) to explore new applications of research, education and advisory services within the Ohio Sea Grant mission.

Subproject at Hiram College is related to Sea Grant project R/A-1 and deals with phytoplankton productivity in fish hatchery ponds.

Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds -
R/A-1

Principal Investigators: David Culver, Zoology

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714068

Project Period and Budget: September 1, 1981 to December 31, 1983
\$18,300 (sponsor)
\$ 6,795 (OSU cost-sharing)

Objective: This project will: (1) examine the seasonal variation in zooplankton productivity of the rearing ponds and assess the impact of zooplankton productivity on the yield of fish from the ponds; (2) examine the effect of fish predation on the structure and dynamics of the zooplankton community; (3) examine the selectivity of the fish fry, i.e. do fish feed selectively on zooplankton in terms of species and size, and does this change with the age and size of the fish?; (4) examine the effect of algal productivity on zooplankton productivity both in terms of total phytoplankton production as well as individual species production; (5) examine the effect of bacteria and yeast, as compared to algae, on the growth of zooplankton; (6) use the above information to model carbon flux through the pond ecosystem to determine the amounts of algal, bacterial, and zooplankton production required to support the fish; and (7) determine the optimal amounts and timing of hay, yeast, alfalfa meal, and inorganic nutrient additions to maximize zooplankton production, and test these optimal amounts and timings by altering the numbers of fish stocked at above and below supportable levels.

Aquaculture in Ohio: Culturing Fathead Minnows for Bait in Ohio - R/A-2

Principal Investigators: Thomas Stockdale, Charles Cole, and
David Johnson, Natural Resources

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF Nos.: 714069 (on-campus) and 714820 (off-campus)

Project Period and Budget: September 1, 1981 to December 31, 1983
\$22,800 (sponsor)
\$14,771 (OSU cost-sharing)

Objective: This project will: (1) locate cooperators and identify characteristics of six ponds to be evaluated beginning May 1982; (2) determine rates of production for monocultures of fathead minnows in typical Ohio farm ponds; and (3) evaluate aeration and supplemental feeding as techniques for increasing production of fathead minnow monocultures in Ohio farm ponds.

Evaluation of Sand Resources in Western Lake Erie - R/MR-1

Principal Investigators: Robert Anderhalt, Geology,
Bowling Green State University and
Charles E. Herdendorf, CLEAR

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714070

Project Period and Budget: September 1, 1981 to December 31, 1983
\$10,000 (sponsor)
\$12,200 (OSU cost-sharing)

Objective: This project will: (1) determine the mineralogical, textural and chemical character of the sand deposits in western Lake Erie; (2) evaluate the suitability for using the sand for the glass industry; and (3) estimate the potential reserves in the sand body between Monroe, Michigan and West Sister Island, Ohio, in western Lake Erie.

Economic Value of Ohio's Lake Erie Fisheries - R/ME-1

Principal Investigators: Leroy Hushak and Douglas Southgate,
Agricultural Economics

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714071

Project Period and Budget: September 1, 1981 to December 31, 1983
\$51,100 (sponsor)
\$25,953 (OSU cost-sharing)

Objective: This project will: (1) determine the annual economic value of Ohio's Lake Erie sport and commercial fisheries; (2) estimate the value of (demand for) sport fishing on Lake Erie, based on the relationship between fishing days, the value per fishing day, and sport fishing catch rates; and (3) examine the implications of alternative distributions of income and of ownership rights or entitlements for management of the Lake Erie resource.

A Description and Analytical Marketing Study of Ohio's Lake Erie Commercial Fishery - R/ME-2

Principal Investigators: Cameron Thraen, Agricultural Economics

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714072

Project Period and Budget: September 1, 1981 to December 31, 1983
\$8,700 (sponsor)
\$2,900 (OSU cost-sharing)

Objective: This project will improve the ability of industry, professional organizations and those public agencies responsible for the management of the Ohio Lake Erie commercial fishery to understand the current structure and potential value of that fishery. The specific objective of this study is: To describe and characterize in an organized manner the economic market structure of the Ohio Lake Erie commercial fishery. The emphasis of the study will be directed toward a descriptive assessment of the Ohio Lake Erie fresh fish commercial market with special emphasis on the economic position of the Ohio commercial fishery relative to that of the Canadian commercial fishery established in Ontario, Canada.

Coherent Turbulent Structures in the Benthic Boundary Layer; Phase 1:
Development of an Ultrasonic Transducer for Direct Profiling of Sediment
Concentration and Grain Size Distribution - R/OE-1

Principal Investigators: Keith Bedford, Civil Engineering;
Vijay Varadan, Engineering Mechanics; and
Robert Brodkey, Chemical Engineering

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714073

Project Period and Budget: September 1, 1981 to December 31, 1983
\$62,740 (sponsor)
\$32,436 (OSU cost-sharing)

Objective: Managing the effects of resuspended sediment-associated toxic substances in the Great Lakes requires rational resuspension parameterizations. Descriptions do exist but are empirical, site-specific, and contain too much scatter because they are based upon the traditional steady boundary layer viewpoint. A decade's research in laboratory and industrial turbulence has demonstrated that boundary layers consist of coherent structures of bursts which are very short disruptive events with high shear separated by longer periods of calm. It is desirable to introduce this viewpoint to the collection and analysis of resuspension data, yet to do so requires vertical profiles of sediment concentration and grain size distribution. Ultrasonic transducers can be used for such measurements, but they require such excessive in situ calibration as to render them useless. The overall objective of this program is to introduce the coherent turbulent structures viewpoint to the parameterization of resuspension. The first year's objective is the development of a three-frequency ultrasonic transceiver to directly measure mass concentration and grain size distribution profiles.

Fish Community Structure, Movements and Reproduction in Controlled and Uncontrolled Lake Erie Marshes - R/ER-1

Principal Investigators: David Johnson, Natural Resources, Mark Barnes, CLEAR, and Charles Cole, Natural Resources

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA81AA-D-00095

OSURF Nos.: 714074 (on-campus) and 714075 (off-campus)

Project Period and Budget: September 1, 1981 to December 31, 1983
\$30,000 (sponsor)
\$ 9,281 (OSU cost-sharing)

Objective: The long-term objectives of a research program addressing the information needs regarding associations of fishes and Lake Erie marshes are: (1) quantify fish community structure, movements, and reproduction in Lake Erie marshes and assess the importance of the marshes to Lake Erie's fish communities; (2) quantify and compare the physiochemical, vegetational, and structural characteristics of Lake Erie marshes and relate to their use by and importance to fish populations; and (3) develop frameworks for evaluation of Lake Erie marshes based on their importance to fish populations and develop management strategies to improve these marshes as habitats for fishes of commercial, recreational, and prey value. The objectives of the first year's research are: (1) quantify seasonal population structure, movements, and reproduction of brown bullhead, a commercial species, and white crappie, a recreational species, in a controlled marsh; (2) quantify major seasonal physiochemical variables in this marsh and attempt to relate to use of the marsh by these two species; and (3) review, analyze and compile a written summary of current Lake Erie marsh uses and management practices.

Summer Storm Studies Over Western Lake Erie and Its Coastal Drainage Basin
- R/EM-2

Principal Investigators: Thomas Seliga, Electrical Engineering

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714076

Project Period and Budget: September 1, 1981 to December 31, 1983
\$8,700 (sponsor)
\$3,100 (OSU cost-sharing)

Objective: The main objective of this research program is to determine the feasibility of employing a combined Doppler and dual polarization meteorological radar(s) to investigate storms over western Lake Erie and its coastal region. It is anticipated that this objective will require a continuing long-term effort, culminating in a summer observational program designed to test concepts and goals developed during the first year's research effort.

Ohio Sea Grant Education Office - E/OE-1

Principal Investigators: Victor J. Mayer, Science-Math Education

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714077

Project Period and Budget: September 1, 1981 to December 31, 1983
\$ 6,100 (sponsor)
\$11,164 (OSU cost-sharing)

Objective: The Ohio Sea Grant Education Coordinator will: (1) serve on the executive committee of the Ohio Sea Grant Program; (2) coordinate education-related projects and activities within the Ohio Sea Grant Program; and (3) develop long-range Sea Grant education plans for Ohio.

Marine and Great Lakes Education: An Infusion Program for Ohio Schools
- E/AID-1

Principal Investigators: Victor J. Mayer, Science-Math Education and
Rosanne Fortner, Natural Resources

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714078

Project Period and Budget: September 1, 1981 to December 31, 1983
\$71,600 (sponsor)
\$71,437 (OSU cost-sharing)

Objective: Awareness Components: (1) create an awareness of marine and aquatic education among Ohio school administrators, supervisors, and teachers; (2) disseminate examples of curriculum materials available in marine and aquatic education; and (3) create awareness of marine and aquatic education among selected educators in Ohio colleges and universities. Implementation Components: (1) assist teachers to effectively use available curriculum materials and teaching methods; (2) help teachers acquire appropriate background information in marine and aquatic topics; and (3) assist administrators and teachers in re-designing curricula to infuse marine and aquatic education.

Ohio Sea Grant Advisory Service - A/EP-1

Principal Investigators: Jeffrey M. Reutter, CLEAR and
P. R. Thomas, OCES

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714079

Project Period and Budget: September 1, 1981 to December 31, 1983
\$52,856 (sponsor)
\$66,510 (OSU cost-sharing)

Objective: The goal of the Advisory Service is to maximize benefits from Lake Erie, the other Great Lakes and the oceans. Part of this goal is to increase utilization of the Lake Erie resources and reduce wastage, thereby creating new jobs and stimulating the economy of the area. To reach this goal, the objectives for the program are: (1) to increase public awareness of Ohio Sea Grant, i.e. what it is, what it does, how the public can interact with the program and what Sea Grant can do for them; (2) to increase public awareness of Lake Erie and our aquatic resources and their recreational, commercial and industrial values and uses; (3) to provide Lake Erie user groups with information capable of making their Lake Erie interactions more enjoyable or profitable (recreation or business); (4) through education and enhanced awareness, to increase utilization of those portions of the Lake Erie resources which are currently underutilized, thereby creating new industries, businesses and jobs, and stimulating the economy; and (5) to assist shore owners with erosion and flooding problems.

Ohio Sea Grant Advisory Service (Extension Program-Fremont) - A/EP-1

Principal Investigators: Jeffrey M. Reutter, CLEAR and
Paul Thomas, Coop. Extension Service

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714080

Project Period and Budget: September 1, 1981 to December 31, 1983
\$78,121 (sponsor)
\$20,958 (OSU cost-sharing)

Objective: The goal of the Advisory Service is to maximize benefits from Lake Erie, the other Great Lakes and the oceans. Part of this goal is to increase utilization of the Lake Erie resources and reduce wastage, thereby creating new jobs and stimulating the economy of the area. To reach this goal, the objectives for the program are: (1) to increase public awareness of Ohio Sea Grant, i.e. what it is, what it does, how the public can interact with the program and what Sea Grant can do for them; (2) to increase public awareness of Lake Erie and our aquatic resources and their recreational, commercial and industrial values and uses; (3) to provide Lake Erie user groups with information capable of making their Lake Erie interactions more enjoyable or profitable (recreation or business); (4) through education and enhanced awareness, to increase utilization of those portions of the Lake Erie resources which are currently underutilized, thereby creating new industries, businesses and jobs, and stimulating the economy; and (5) to assist shore owners with erosion and flooding problems.

Ohio Sea Grant Program (Extension Program-Elyria) - A/EP-1

Principal Investigators: Jeffrey M. Reutter, CLEAR and
Paul Thomas, Coop. Extension Service

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714081

Project Period and Budget: September 1, 1981 to December 31, 1983
\$72,355 (sponsor)
\$30,263 (OSU cost-sharing)

Objective: The goal of the Advisory Service is to maximize benefits from Lake Erie, the other Great Lakes and the oceans. Part of this goal is to increase utilization of the Lake Erie resources and reduce wastage, thereby creating new jobs and stimulating the economy of the area. To reach this goal, the objectives for the program are: (1) to increase public awareness of Ohio Sea Grant, i.e. what it is, what it does, how the public can interact with the program and what Sea Grant can do for them; (2) to increase public awareness of Lake Erie and our aquatic resources and their recreational, commercial and industrial values and uses; (3) to provide Lake Erie user groups with information capable of making their Lake Erie interactions more enjoyable or profitable (recreation or business); (4) through education and enhanced awareness, to increase utilization of those portions of the Lake Erie resources which are currently underutilized, thereby creating new industries, businesses and jobs, and stimulating the economy; and (5) to assist shore owners with erosion and flooding problems.

Ohio Sea Grant Advisory Service (Extension Program-Painesville) - A/EPA-1

Principal Investigators: Jeffrey M. Reutter, CLEAR and
Paul Thomas, Coop. Extension Service

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714082

Project Period and Budget: September 1, 1981 to December 31, 1983
\$75,568 (sponsor)
\$29,720 (OSU cost-sharing)

Objective: The goal of the Advisory Service is to maximize benefits from Lake Erie, the other Great Lakes and the oceans. Part of this goal is to increase utilization of the Lake Erie resources and reduce wastage, thereby creating new jobs and stimulating the economy of the area. To reach this goal, the objectives for the program are: (1) to increase public awareness of Ohio Sea Grant, i.e. what it is, what it does, how the public can interact with the program and what Sea Grant can do for them; (2) to increase public awareness of Lake Erie and our aquatic resources and their recreational, commercial and industrial values and uses; (3) to provide Lake Erie user groups with information capable of making their Lake Erie interactions more enjoyable or profitable (recreation or business); (4) through education and enhanced awareness, to increase utilization of those portions of the Lake Erie resources which are currently underutilized, thereby creating new industries, businesses and jobs, and stimulating the economy; and (5) to assist shore owners with erosion and flooding problems.

Great Lakes Information Through Museum Programming - E/MP-1

Principal Investigators: Rosanne Fortner, Natural Resources and
William Schmitt, Center for Science and Industry

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714207

Project Period and Budget: September 1, 1981 to December 31, 1983
\$5,100 (sponsor)
\$9,900 (OSU cost-sharing)

Objective: This project should serve to increase public knowledge about the Great Lakes by: (1) providing content and materials for development of a museum program about the Great Lakes; and (2) establishing within the general public an awareness of the importance of the Great Lakes as a resource. The research portion of the study will (1) evaluate the effect of the program on museum visitors: percentage of visitors reached, amount of knowledge gained, and relationships of knowledge gain to visitor characteristics; and (2) indicate the feasibility of using museum resources to a greater extent for dissemination of information on Great Lakes issues.

Site Exploration for Foundations of Offshore Structures - R/OE-2

Principal Investigator: Tien H. Wu, Civil Engineering

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea Grant

Grant No. NA81AA-D-00095

OSURF No.: 714224

Project Period and Budget: November 1, 1981 to December 31, 1983
\$15,200 (sponsor)
\$ 7,807 (OSU cost-sharing)

Objective: This project will: (1) develop a stochastic model to represent the random stratification in sea floor sediments. The Poisson lines model will be tried first; (2) use the stratification model and Bayes' theorem to estimate uncertainty about material type, given the data or observations from a number of boreholes or soundings. This will lead to a probability contour map which describes the probability of encountering a given material at a particular location; and (3) use the probability contour map to estimate the uncertainty about the bearing capacity of an offshore structure, taking into account the uncertainty on strength for any given material type.

Ohio Sea Grant Internship Program - E/I-1 and E/I-2

Principal Investigators: Jeffrey M. Reutter and Charles E. Herdendorf,
CLEAR

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 714350, 715054 and 715055

Project Period and Budget: February 1, 1982 to December 31, 1983
\$85,900 (sponsor)

Objective: The Ohio Sea Grant Internship provides support to a graduate student on an internship in Washington, D.C. gaining valuable first-hand experience of our nation's government by working on the staff of a Congressional or Senate subcommittee or on the staff of a congressperson or senator dealing with marine affairs. The 1982 fellowship was awarded to Brian Burby, a doctoral student in the Environmental Biology Program. The 1983 fellowships were awarded to Timothy Bartish, a master of science student in the Environmental Biology Program and Helen Brohl, a master of science student in the School of Natural Resources.

Review and Analysis of Past and Current Research Relating to the Effect of Acid Deposition on Aquatic Systems

Principal Investigators: Charles E. Herdendorf and Mark D. Barnes, CLEAR

Sponsor: Ohio Air Quality Development Authority

Grant No. GRT DTD 4-16-82

OSURF Nos.: 714377 and 714387

Project Period and Budget: March 1 to November 30, 1982
\$10,000 (sponsor)
\$2,247 (OSU cost-sharing)

Objective: The proposed research will conduct a critical review and analysis of past and current research relating to the effects of acid deposition on aquatic systems.

Toledo Edison Environmental Report Preparation and Evaluation

Principal Investigator: Jeffrey M. Reutter, CLEAR

Sponsor: The Toledo Edison Company

Grant No.: LTR DTD 4-23-82

OSURF No.: 714535

Project Period and Budget: May 1, 1982 to August 31, 1982
\$4,455.55 (sponsor)

Objective: Preparation of an environmental report which evaluates the impact of Toledo Edison Company power plants on the ecology of western Lake Erie.

Programming for Graphic Interpretation of Water Quality Data - R/ER-2

Principal Investigators: Laura A. Fay, Charles E. Herdendorf, and
Jeffrey M. Reutter, CLEAR

Sponsor: National Oceanic and Atmospheric Administration, Office of Sea
Grant

Grant No.: NA81AA-D-00095

OSURF No.: 715056

Project Period and Budget: April 1, 1983 to December 31, 1983
\$3,302 (sponsor)
\$1,320 (OSU cost-sharing)

Objective: To develop the computer software needed to integrate and interpret Lake Erie water quality data in a graphic format. Specifically, the program is designed to construct isopleths for the contouring of total phosphorus, chlorophyll a, nitrate plus nitrite, temperature, dissolved oxygen and hypolimnion thickness. Its initial use will be on 13 years (1970-1982) of water quality data collected by the Center for Lake Erie Area Research and the Canada Centre for Inland Waters.

Parasites of Fishes of Old Woman Creek National Estuarine Sanctuary

Principal Investigators: John L. Crites, Zoology, and
Charles E. Herdendorf, CLEAR

Sponsor: Ohio Department of Natural Resources/NOAA, Office of Coastal
Zone Management

Grant No.: AGR DTD 12-30-82

OSURF No.: 715188

Project Period and Budget: July 1, 1983 to June 30, 1984
\$ 9,986 (sponsor)
\$20, 862 (OSU cost-sharing)

Objective: The long-term effort of this research is to discern the distribution and abundance of parasites in the 28 species of fish known to occur in the Old Woman Creek Estuary. Coupled with basic fisheries studies and environmental data, the population dynamics of each species and the extent of community interactions in the ecosystem could be elucidated in a manner currently unknown.

Lake Erie Recreational Planning Guide

Principal Investigator: Charles E. Herdendorf, CLEAR

Sponsor: National Oceanic & Atmospheric Administration, Great Lakes
Environmental Research Laboratory

Grant No.: NA83RAC00031

OSURF No.: 715212

Project Period and Budget: March 1, 1983 to February 29, 1984
\$16,600 (sponsor)

Objective: To prepare an atlas which is descriptive of conditions, processes, and both natural and man-developed features of the coastal and offshore areas of Lake Erie.

Acid Deposition Monitoring Program for Western Lake Erie

Principal Investigators: Charles E. Herdendorf and Andrea Wilson, CLEAR

Sponsor: U.S. Environmental Protection Agency

Grant No.: R005555-03

OSURF Nos.: 715333 (on-campus) and 715334 (off-campus)

Project Period and Budget: July 1, 1983 to June 30, 1984

\$4,273 (sponsor)

\$ 795 (OSU cost-sharing)

Objective: This effort seeks to continue a long-term monitoring program in the western basin of Lake Erie. The continued monitoring of acid rainfall deposition is an important component in establishing long-term environmental records that aid in evaluating management strategies.

Effects of Toxic Substances on Growth, Survival and Pathology of Larval Fishes in the River Raisin Estuary, Michigan, Lake Erie

Principal Investigators: Charles E. Herdendorf, Mark D. Barnes and
Laura A. Fay, CLEAR

Sponsor: U.S. Environmental Protection Agency

Grant No.: CR81080-01-0

OSURF Nos.: 715459 (on-campus) and 715460 (off-campus)

Project Period and Budget: June 27, 1983 to June 26, 1985
\$29,988 (sponsor)
\$ 6,101 (OSU cost-sharing)

Objective: Estuaries are important spawning and nursery areas for Lake Erie fish populations, yet they receive heavier loadings of toxic substances than open lake areas. This represents a potential threat to growth, survival, and health of fish larvae and ultimately to recruitment to offshore adult stocks. We propose to participate in a multi-disciplinary research effort to determine effects of toxic substances on organisms and ecosystems of the River Raisin at Monroe, Michigan. Our objectives are to identify fish larvae present, determine spatiotemporal differences in density, species composition, growth, and mortality rates, and relate to exposure/dose patterns of toxic substances.

TABLE 10

PARTICIPANTS IN LAKE ERIE/SEA GRANT PROJECTS

Program Administration and Coordination

<u>Name</u>	<u>Responsibility</u>
1. Charles Herdendorf	Director, CLEAR, Stone Laboratory, Sea Grant
2. Jeffrey Reutter	Associate Director, Sea Grant and Stone Laboratory; Assistant Director, CLEAR
3. Jo Ann Damon	Office Manager, Lake Erie Program
4. Mark D. Barnes	Coordinator, Fisheries Laboratory
5. Keith Bedford	Coordinator, Sea Grant Coastal Engineering
6. C. Lawrence Cooper	Coordinator, Technical Assessment Team
7. David A. Culver	Coordinator, Sea Grant Living Resources
8. Laura Fay	Chief Scientist, R/V <u>Hydra</u>
9. Rosanne W. Fortner	Coordinator, Sea Grant Education Office
10. Leroy Hushak	Coordinator, Sea Grant Socio-economics
11. John Hug	Coordinator, Sea Grant/Ohio Department of Education
12. Betty Lee Janeves	Communicator, Sea Grant
13. Paul Ladd	Coordinator, Research Vessels
14. Kristina Laszlo	Business Officer, Lake Erie Program
15. Victor Mayer	Coordinator, Sea Grant Education Office
16. John Mizera	Coordinator, Computer Facilities
17. Mark Monaco	Manager, Stone Laboratory
18. David Rathke	Coordinator, Plankton/Water Quality Laboratory
19. Karen Reese	Editor, Ohio Biological Survey/Friends of Stone Lab
20. Ginger-lyn Summer	Word Processing Coordinator
21. P. R. Thomas	Coordinator, Sea Grant/Ohio Cooperative Extension Service

Faculty

<u>Name</u>	<u>Institution</u>	<u>Department</u>
1. Robert Anderhalt	BGSU	Geology
2. Lawrence G. Anderson	OSU	Ohio Coop. Ext. Svc.
3. Barry Apgear	ODNR	Fish Management
4. Mark Barnes	OSU	Zoology/CLEAR
5. Keith Bedford	OSU	Civil Engineering
6. Robert Brodkey	OSU	Chemical Engineering
7. William Brewer	BGSU	Construction Technology
8. Walter Carey	OSU	Mechanical Engineering/Zoology
9. John Crites	OSU	Zoology
10. Charles Cole	OSU	Natural Resources

TABLE 10 (CONTINUED)

Faculty (continued)

	<u>Name</u>	<u>Institution</u>	<u>Department</u>
11.	Robert E. Cox	OSU	Ohio Coop. Ext. Svc.
12.	David Culver	OSU	Zoology
13.	Sally K. Ebling	OSU	Ohio Coop. Ext. Svc.
14.	Rosanne Fortner	OSU	Natural Resources
15.	Charles L. Hastings	OSU	Ohio Coop. Ext. Svc.
16.	Charles Herdendorf	OSU	Geology/Zoology/Natural Resources/CLEAR
17.	Derek Horton	OSU	Chemistry
18.	Henry Hunker	OSU	Geography
19.	Leroy Hushak	OSU	Agricultural Economics
20.	David Johnson	OSU	Natural Resources
21.	David Kelch	OSU	Ohio Coop. Ext. Svc./Sea Grant
22.	Frank Lichtkoppler	OSU	Ohio Coop. Ext. Svc./Sea Grant
23.	Timothy Lloyd	OAC	Research & Development
24.	Jerry W. Long	OSU	Ohio Coop. Ext. Svc.
25.	John Lyon	OSU	Civil Engineering
26.	Victor Mayer	OSU	Science-Math Education
27.	Thomas J. McDonough	OSU	Ohio Coop. Ext. Svc.
28.	C. S. Munch	Hiram	Biology
29.	Patrick Mullen	OSU	English
30.	John P. Parker	OSU	Ohio Coop. Ext. Svc.
31.	David Rathke	OSU	Zoology/CLEAR
32.	Jeffrey Reutter	OSU	Zoology/Nat. Res./CLEAR
33.	Ranbir Sandhu	OSU	Civil Engineering
34.	Raymond Schindler	OSU	Ohio Coop. Ext. Svc.
35.	Thomas Seliga	OSU	Electrical Engineering
36.	William Schmitt	COSI	Education
37.	Russell Scholl	ODNR	Div. Wildlife
38.	Frederic Snyder	OSU	Ohio Coop. Ext. Svc./Sea Grant
39.	Douglas Southgate	OSU	Agricultural Economics
40.	Thomas Stockdale	OSU	Natural Resources
41.	Paul Thomas	OSU	Ohio Coop. Ext. Svc.
42.	Cameron Thraen	OSU	Agricultural Economics
43.	Milton Trautman	OSU	Zoology
44.	Vasundara Varadan	OSU	Engineering Mechanics
45.	Vijay Varadan	OSU	Engineering Mechanics
46.	Kenneth Wenner	OSU	Natural Resources
47.	Richard Wright	BGSU	History
48.	Tien H. Wu	OSU	Civil Engineering

TABLE 10 (CONTINUED)

Office and Technical Staff

	<u>Name</u>	<u>Title</u>
1.	Gary Arico	Research Assistant
2.	Helen Brohl	Research Assistant
3.	Daniel Fisher	Research Assistant
4.	Agypong Gyekye	Research Associate
5.	Gordon Keeler	Research Assistant
6.	Barbara Kohl	Technical Typist
7.	P.H.W.S. Kulatilake	Senior Research Associate
8.	Julie Letterhos	Research Assistant
9.	Joan Little	Technical Typist
10.	Patricia Steane	Librarian
11.	Ginger-lyn Summer	Technical Typist

Graduate Students

	<u>Name</u>	<u>Status</u>	<u>Department</u>	<u>Institution</u>
1.	Kofi Apraku	Ph.D.	Agricultural Economics	OSU
2.	Timothy Bartish	M.S.	Environmental Biology	OSU
3.	Sirinimit Boonyuen	M.S.	Environmental Biology	OSU
4.	Helen Brohl	M.S.	Environmental Biology	OSU
5.	Brian Burby	M.S.	Environmental Biology	OSU
6.	Neva Carlson	Ph.D.	Environmental Biology	OSU
7.	Kuo-Pin Chen	Ph.D.	Civil Engineering	OSU
8.	Wayne Davis	Ph.D.	Zoology	OSU
9.	Katherine Dillingham	M.S.	Zoology	OSU
10.	James Dingman	Ph.D.	Civil Engineering	OSU
11.	Nilima Dutta	M.S.	Agricultural Economics	OSU
12.	Theresa Gordon	M.S.	Zoology	OSU
13.	Agyapong Gykye	Ph.D.	Agricultural Economics	OSU
14.	Jan Hefflefinger	M.S.	Education	OSU
15.	Robert Hubbell	M.S.	Zoology	OSU
16.	Judy Ann Kauffeld	M.S.	Natural Resources	OSU
17.	Rosmarie Kelly	M.S.	Zoology	OSU
18.	Andrew W. Kendall	M.S.	Natural Resources	OSU
19.	Kurt Knebusch	M.S.	Natural Resources	OSU
20.	In-mo Lee	M.S.	Civil Engineering	OSU
21.	John Mergo	Ph.D.	Zoology	OSU
22.	Mark Monaco	M.S.	Environmental Biology	OSU
23.	Elizabeth Narcisi	M.S.	Zoology	OSU

TABLE 10 (CONTINUED)

Graduate Students (continued)

	<u>Name</u>	<u>Status</u>	<u>Department</u>	<u>Institution</u>
24.	John C. Potter	Ph.D.	Civil Engineering	OSU
25.	Padma Rao	Ph.D.	Agricultural Economics	OSU
26.	Norman Reichenbach	M.S.	Zoology	OSU
27.	Audrey Rush	M.S.	Zoology	OSU
28.	Nancy Sergi-Gott	M.S.	Environmental Biology	OSU
29.	Jeffrey Stamper	M.S.	Zoology	OSU
30.	Barbara Stiver	M.S.	Environmental Biology	OSU
31.	Ralph Vaga	Ph.D.	Zoology	OSU
32.	Robert Van Evera	M.S.	Civil Engineering	OSU
33.	Yu-Chang Wu	M.S.	Computer Science	OSU

Undergraduate Students

	<u>Name</u>	<u>Department</u>	<u>Institution</u>
1.	Sue Abbeti	Industrial Design	OSU
2.	Mike Bailey	Agronomy	OSU
3.	Cindy Basic	Industrial Design	OSU
4.	Jay Garland	Zoology	OSU
5.	John Hageman	Natural Resources	OSU
6.	Pamela Joseph	Zoology	OSU
7.	Cheryl Kimerline	Natural Resources	OSU
8.	Lou Ann Mucciarone	Accounting	OSU
9.	William Snyder	Natural Resources	OSU
10.	Dale Soltis	Botany	OSU
11.	Nathan Torn	Industrial Design	OSU

TABLE 11
GRADUATE DEGREES AWARDED
1982-1983

The Lake Erie Programs are non-degree-granting units of the University. The degrees listed below were awarded by academic departments to students who participated in Lake Erie/Sea Grant related research projects.

Master of Science

<u>Graduate</u>	<u>Department</u>	<u>Advisor(s)</u>	<u>Research Topic</u>
Bartish, Timothy	Environmental Biology	C.E. Herdendorf D. Rathke	Western Basin of Lake Erie
Buchanan, David	Geology and Mineralogy	C.E. Herdendorf G.D. McKenzie	Erosion, Transport and Deposition of Sediments in Old Woman Creek Estuary, Lake Erie, Ohio
Dutta, Nilima	Ag. Econ. & Rural Soc.	L. Hushak	Economic Value of Lake Erie Central Basin
Gordon, Theresa C.	Zoology	C.E. Herdendorf	Instantaneous Growth Rates and Distribution of Larval Fish in the Vicinity of Locust Point, Western Lake Erie
Hefflefinger, Jan	Education	V.J. Mayer	Plan B: Evaluation of 4 OEAGLS for 7th Grade Science
Kauffeld, Judy Ann	Natural Res.	R.W. Fortner	Newspaper Communications Acid Deposition in Five North American Dailies 1979-1982
Kendall, Andrew W.	Natural Res.	T.M. Stockdale	Aquaculture in Ohio
Narcisi, Elizabeth	Zoology	P. Pappas	Parasitology
Nichols, Stephen W.	Entomology	C. Triplehorn	Internal Female Genitalia of the Genus <u>Omophron</u> (Coleoptera, Carabidae) with Special Reference to the Taxonomy Phylogenetic Usefulness of the Oursal Conduit
Reichenbach, Norman G.	Entomology	G. Stairs	Energy Use and the Life Histories of Synoptic Species of Garter Snakes

TABLE 11 (CONTINUED)

Master of Science (continued)

Rush, Audrey A.	Zoology	C.E. Herdendorf	Water Quality Trends at Two Nearshore Stations in Western Lake Erie
Schmidt, Thomas	Microbiology	C.I. Randles	The Uptake of Petroleum-Derived Hydrocarbons by Sea Grasses
Steiver, Barbara	Environmental Biology	R.L. Stuckey D. Rathke	Phytoplankton Vertical Migration

Doctor of Philosophy

<u>Graduate</u>	<u>Department</u>	<u>Advisor(s)</u>	<u>Research Topic</u>
Apraku, Kofi	Ag. Econ. & Rural Soc.	L. Hushak	Economic Impact of Lake Erie
Potter, John C.	Civil Engineering	T.H. Wu	Modeling and Updating Site Characterization for Risk Analysis of Offshore Structures

TABLE 12
PRESENTATIONS
1982-1983

- Bedford, K. "Spectro Characteristics of Lake Circulation and Transport Models." Conference on Refined Modeling of Flows, International Association of Hydraulic Researchers, Paris, France. September, 1982.
- Brodkey, R. "Coherent Structure Analyses by Image Processing." American Society of Mechanical Engineers, Annual Meeting, Phoenix. November 19, 1982.
- Chilton, E.W. "A Comparison of Macroscopic Invertebrates Living in Bangia Atropurpurea and Cladophora Glomerata Beds in Lake Erie." Ohio Academy of Science. April 23, 1983.
- Deehr, R., B. Owen, and F.L. Snyder. "Preliminary Investigations of the Use of Old Woman Creek Estuary by Lake Erie Fishes." Ohio Academy of Science. April 23, 1983.
- Fay, L.A. "Lake Erie, Past and Present." League of Women Voters, Eastlake Chapter. February 15, 1983.
- Fay, L.A. "Lake Erie on the Rocks." Breckenridge Seniors Community Center. February 16, 1983.
- Forsyth, J.L. "The Columbus Cuesta in North-Central Ohio." Ohio Academy of Science. April 23, 1983.
- Fortner, R.W. "Evaluation of a Nonformal Museum Program for Adult Environmental Education." Ohio Academy of Science, 92nd Annual Meeting, Columbus, Ohio. April 23, 1983.
- Fortner, R.W. "A Museum Program for Great Lakes Education." National Marine Education Association Annual Convention, Portland, Maine. August 5, 1983.
- Fuller, J. "Subbottom Sediments from the Southwestern Part of the Central Basin, Lake Erie." Ohio Academy of Science. April 23, 1983.
- Herdendorf, C.E. "Environmental Improvements in Lake Erie During the Past Decade." Oceans '82, Session 17, Great Lakes Pollution-Past, Present and Future, Conference of Marine Technology Society and IEEE Council on Ocean Engineering, Washington, D.C. September 22, 1982.
- Herdendorf, C.E. "Geology of Lake Erie." U.S. Army Corps of Engineers Workshop on Shore Erosion, Painesville, Ohio. October 13, 1982.

- Hummon, W.D. and S. Boonyuen. "The Lake Hope Mine Drainage Abatement Project: Results of Reciprocal Colonization Experiments in the Field." Ohio Academy of Science. April 23, 1983.
- Johnson, D.L. "Commercial Culture of Bait Fishes in a Lake Erie Marsh." Coastal Resources Regional Workshop, East Lansing. November 13, 1982.
- Johnson, D.L. "Artificial Habitat: Effects of Structural Characteristics on Harvest and Fish Selection." 44th Midwest Fish and Wildlife Conference, Des Moines, Iowa. 1982.
- Johnson, D.L. "Fish Use of Artificial Structure in an Ohio Reservoir." Tri State Fisheries Conference, Huntington, West Virginia. 1983.
- Kelly, R., J.L. Crites and C.T. Singley. "Surface Morphology and Ultrastructure of the First-Stage Larvae of a Philometra sp. (Nematoda:Philometridae) from Freshwater Drum, Aplodinotus Grunniens." Ohio Academy of Science. April 23, 1983.
- Klarer, D.M. "A Survey of Phytoplankton in Old Woman Creek Estuary." Ohio Academy of Science. April 23, 1983.
- Knight, R.L., F.J. Margraf and R.F. Carline. "Predation by Walleye and Yellow Perch on Forage Fishes in Western Lake Erie." Ohio Fish and Wildlife Conference, Columbus, Ohio.
- Lyons, J. "Use of Sea Sat and Shuttle Radar Imagery for the Examination of Coastal and Offshore Features." American Society of Photogrammetry, Eastern Great Lakes Region Annual Meeting. November 5, 1982.
- Mayer, V.J. "A Model Program for Implementing Marine and Aquatic Education on a Statewide Basis." National Marine Educational Association, Portland, Maine. August 3, 1983.
- McKay, L. and F. Rabalais. "Cellular Reactions in the Lungs of Neonatal Thymectomized Guinea Pigs (Cavia Procellus) Infected with Parascaris Equorum." Ohio Academy of Science. April 23, 1983.
- Mergo, J.C. Jr., J.L. Crites, and C.T. Singley. "Clamp Wall Ultrastructure of Microcotyle Spinicirrus (Monogenea)." Ohio Academy of Science. April 23, 1983.
- Munch, C.S., D.A. Culver and R.M. Vaga. "Evidence for Size-Selective Grazing of Phytoplankton by Zooplankton in Fish Hatchery Ponds." International Limnological Congress, Lyon, France. August 20, 1983.
- Munch, C.S. "Influence of Filamentous Algal Abundance on the Competition Between Bosmina and Daphnia." International Limnological Congress, Lyon, France. August 20, 1983.

- Niederhofer, R. "Edwin L. Moseley, Internationally Known Naturalist, As Viewed By Those Who Knew Him." Ohio Academy of Science. April 23, 1983.
- Owen, B., R. Deehr, and F.L. Snyder. "Comparative Food Habits of Young White Perch (Morone Americana (Gmelin)) and White Bass (Morone Chrysops (Rafinesque)) in Old Woman Creek Estuary." Ohio Academy of Science. April 23, 1983.
- Parland, W.K. and P.C. Baumann. "Histopathology of Fish Livers Exposed to Carcinogens." Ohio Academy of Science. April 23, 1983.
- Reutter, J.M. "Stone Laboratory and the Revitalization of Lake Erie." Oak Park Conservation Club, Columbus, Ohio. March 8, 1983.
- Reutter, J.M. "Lake Erie is Alive and Well." "Fishin' Ohio" TV show, March 14, 1983.
- Reutter, J.M. "Where, When and How to Fish in Lake Erie." Sea Grant Fishing Clinic, Logan, Ohio. March 15, 1983.
- Reutter, J.M. "Ohio Sea Grant Booth." Cleveland Sport Show, March 18-27, 1983.
- Reutter, J.M. "Sea Grant in Action on Lake Erie." Joint meeting of Sea Grant Advisory Committees, Bond Court Hotel, Cleveland, Ohio. March 20, 1983.
- Reutter, J.M. "Lake Erie: Water Quality and Fisheries." Oberlin College, Oberlin, Ohio. April 14, 1983.
- Reutter, J.M. "Walleye Movements in Lake Erie." Ohio Charter Captains Conference, Sandusky, Ohio. April 16, 1983.
- Reutter, J.M. "Research PLanning in the Great Lakes Region." Great Lakes Sea Grant Agent Technical Training Conference. April 18-21, 1983.
- Reutter, J.M. "Advisory Service Planning in the Great Lakes Region." Great Lakes Sea Grant Agent Technical Training Conference. April 18-21, 1983.
- Reutter, J.M. Site Visit Presentations, Columbus, Ohio. May 3-5, 1983.
- Reutter, J.M. "Artificial Reefs in Lake Erie." Lorain City Hall Public Meeting. May 26, 1983.
- Reutter, J.M. Conference Coordinator, 2nd Congressional Day on Lake Erie. June 17-18, 1983.
- Reutter, J.M. "Lake Erie: Yesterday and Today." Upper Arlington Senior Citizens, Upper Arlington Library. July 21, 1983.
- Stamper, J.D. and G.D. Schmidt. "A Survey of Cestodes from the Cliff Swallow in Colorado." Ohio Academy of Science. April 23, 1983.

- Stiver, B.L. "Phytoplankton Distribution in Central Lake Erie." Ohio Academy of Science. April 23, 1983.
- Stuckey, R.L. "Edwin Lincoln Moseley's Contributions to Science." Ohio Academy of Science. April 23, 1983.
- Thoma, R.F. and R.F. Jezerinac. "An Illustrated Key to the Members of the Genera Cambarus and Fallincombarus (Decapod: Cambaridae)." Ohio Academy of Science, annual meeting, Columbus, Ohio. April 24, 1983.
- Vaga, R.M. "Competition Between Daphnia and Bosmina as a Function of Fish Predation and Algal Standing Crop." American Society of Limnology and Oceanography, St. John's Newfoundland, June 1983.
- Vaga, R.M. and C.S. Munch. "Effect of Size-selective Fish Predation on the Reproductive Output of Cladocera in Hatchery Ponds." International Limnological Congress, Lyon, France. August 20, 1983.

TABLE 13

LIMNOLUNCH PRESENTATIONS
1982-1983

LIMNOLUNCH is an informal seminar series held every Wednesday noon in the Faculty Lounge of the Biological Sciences Building. Topics for discussion include limnology, fisheries science, oceanography, water resources engineering and other facets of marine and aquatic sciences. During 1982 and 1983 the presentations were arranged and coordinated by Laura A. Fay, Research Associate, Center for Lake Erie Area Research.

1982

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| September 22 | "Lake Erie Fisheries Management"--Carl Baker, Lake Erie Fisheries Unit, Division of Wildlife, ODNR |
| September 29 | "Basics of Industrial Waste Water Treatment"--Dr. Robert Stiefel, Director and Professor, Water Resources Center, OSU |
| October 6 | "The Economic Value of Private Boat Fishing on Lake Erie"--Dr. Leroy Hushak, Professor, Department of Agricultural Economics & Rural Sociology, OSU |
| October 13 | "Water Transshipment Out of the Great Lakes"--Dr. Earl Murphy, Professor, College of Law |
| October 20 | "Research Program at the National Fishery Laboratory"--Dr. Donald Hales, Assistant Director, LaCrosse NFRL, USFWS |
| October 27 | "Fish Selection of Artificial Structure Based on Interstitial Size and Water Depth in an Open Reservoir"--Debbie Ambrow, Graduate Research Associate, School of Natural Resources, OSU |
| November 3 | "Habitat Preservation Role of Ecological Services, U.S. Fish and Wildlife Service"--Lynwood McClean, Ohio Office, U.S. Fish and Wildlife Service |
| November 10 | "The White Perch in Lake Erie: The Ecology of an Invading Species"--Jeffrey Schaeffer, Graduate Research Associate, Ohio Cooperative Fishery Research Unit, OSU |
| November 17 | "Lake Erie History and Ships"--James Barry, Director, Ohioana Library |
| November 24 | "The Biology of Water Supply and Treatment"--Richard Lorenz, Water Research Laboratory, Columbus Division of Water |

TABLE 13 (CONTINUED)

1983

- January 5 Movies: "The Gifts," a 250-year look at pollution in the United States; and "Aging of Lakes," perspectives on natural aging versus cultural eutrophication
- January 12 Stone Lab Slide Show
- January 19 "Patterns of Pesticide Transport in Sandusky River and Sandusky Bay," Dr. Peter Richards, Heidelberg College
- January 26 "Constantine Rafinesque: His Life and Times," Dr. David Stansbery, Zoology Museum
- February 2 "The Role of Foreign Fisheries Observers," Martha Mather, Department of Zoology, OSU
- February 9 "Elevated Selenium Levels in Bluegill and Their Effect on Reproductive Success," Bob Gillespie, Department of Zoology, OSU
- February 16 "Ohio's Fish Hatchery Program," Clayton Lakes, Fish Hatchery Supervisor, State of Ohio
- February 23 "Invasion of Some Foreign Aquatic Vascular Plants into Western Lake Erie," Dr. Ronald Stuckey, Department of Botany, OSU
- March 2 Film: "Water Resources in Ohio's Heritage"
- March 9 "The Methodology and Application of Electrophoretic Techniques to Aquatic Systems Utilizing Data for Clams, Shad, Darters, and Catfish," Dr. Sheldon Guttman, Department of Zoology, Miami University
- March 30 "Lake Erie Education in the Schools," Dr. Rosanne Fortner and Dr. Vic Mayer, School of Natural Resources, OSU
- April 6 "An Overview of the Concerns of the Ohio Environmental Council: Confessions of an Environmentalist Extremist," Steve Sedam, Ohio Environmental Council
- April 13 "Marine Conservation in the Galapagos Islands," Ian Frost, Department of Zoology, OSU

TABLE 13 (CONTINUED)

April 20	"Effects of Zooplankton on Fish Year Class Strength in Lake Erie," Dr. David Culver, Department of Zoology, OSU
April 27	"Public Perceptions of Management Problems and Research Needs on Western Lake Erie," Fred Snyder, Ohio Sea Grant Agent
May 4	"Improving Water Quality in Agricultural Watersheds of Ohio --OEPA's Approach," Dan Kush, Ohio Environmental Protection Agency
May 11	Films: "Geology of the Great Lakes Basin" and "Environmental Problems in the Great Lakes Basin"
May 18	"A Brief Introduction to the Ohio Alliance," Jane Haynes, Executive Director, The Ohio Alliance for Environmental Education "Conservation Tillage in the 80's," Dick Rush, District Conservationist, USDA Soil Conservation Service, Columbus Field Office
May 25	"Predictive Indices of Fish Populations and Community Traits in Reservoirs," Dr. Carline, Ohio Cooperative Fishery Research Unit, OSU
June 1	"Newspaper Communications About Acid Deposition in 5 North American Dailies, 1979-1982," Judy Kauffeld, Environmental Education

TABLE 14
PUBLICATIONS

- Apraku, K.K. 1983. Economic impact of the Lake Erie fishery and other Lake Erie industries: an input-output model of the northern Ohio regional economy. Unpublished Ph.D. dissertation, The Ohio State University.
- Auer, M.T. 1982. Ecology of filamentous algae. Special issue, J. Great Lakes Res. 8(1):1-237.
- Barnes, M.D. and D.L. Rice. 1982. Eastern sand darter, Ammocrypta pellucida (Putnam), in Hocking River and Federal Creek, Athens County, Ohio. Ohio J. Science.
- Barnes, M.D. 1982. Lake Erie intensive study: fisheries status and response to water quality. Great Lakes Fish Comm. Tech. Rept.
- Bedford, K. and J.S. Dingman. 1982. Model intercomparison of Lake Erie storm surge resonance predictions. In Applying Research to Hydraulic Practice, E. Smith (ed.), ASCE Hyd. Division Proc.
- Bedford, K., M. Prater, and J.S. Dingman. 1980. Great Lakes storm surge forecasting methods. In symposium on Urban Stormwater Management in Coastal Areas, C. Kuo (ed.), ASCE Hydr. Div.
- Cooper, C.L., J.J. Mizera and C.E. Herdendorf. 1982. Distribution, abundance and entrainment of larval fishes in the western and central basins of Lake Erie. U.S. Environmental Protection Agency, Environmental Research Laboratory--Duluth, PS-804612. 149 p.
- Cooper, C.L., W.C. Bartholomew, C.E. Herdendorf, J.M. Reutter, and F.L. Snyder. 1981. Limnetic larval fish of the Maumee and Sandusky river estuaries. J. Great Lakes Res. 7(1):51-54.
- Crites, J.L. and R. Jilek. 1981. Histopathology of Spinitectus carolini (Spirurida: Nematoda) in the intestines of the common bluegill, Lepomis macrochirus. J. Wildlife Disease.
- Dingman, J.S. and K. Bedford. 1983. The Lake Erie response to 26 January 1978 cyclone. Submitted to Journal of Geophysical Research.
- Eisen, S. 1981. Characteristics of anchor parasites from fishes of north pond, Kelley's Island, Ohio. Ohio J. Sci. 81(4):180-181.
- Fay, L.A., G.R. Arico and J.A. Letterhos. 1983. 1982 Open lake water quality conditions for Lake Erie. CLEAR Tech. Rept. no. 274.

- Fortner, R.W. and V.J. Mayer. Ohio students' knowledge and attitudes about the oceans and Great Lakes. Ohio J. Sci. (in press).
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TABLE 16
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 Part II Fossil-Fueled Plants. Robert H. Essenhigh
 Part III Nuclear-Fueled Plants. Walter E. Carey
 Part IV Aquatic Biology. Jeffrey M. Reutter
 Part V Compliance with Regulations. William J. Miller
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 Is it a White Bass or a White Perch? Fred L. Snyder. 1 p. OHSU-FS-5-79.
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Volume 1, Number 1	Spring 1979
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Volume 1, Number 3	Autumn 1979
Volume 2, Number 2	should have been Volume 2, Number 1
	Spring/Summer 1980
Volume 2, Number 2	Fall/Winter 1980

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Volume 1, Number 1	January 1979
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Volume 1, Number 3	July 1979
Volume 1, Number 4	September 1979
Volume 1, Number 5	November 1979
Volume 2, Number 1	February 1980
Volume 2, Number 2	April 1980
Volume 2, Number 3	June 1980
Volume 2, Number 4	October 1980
Volume 2, Number 5	December 1980
Volume 3, Number 1	February 1981
Volume 3, Number 2	April 1981
Volume 3, Number 3	June 1981
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Volume 1, Number 3	Summer 1979
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Volume 2, Number 2	Winter 1980
Volume 2, Number 3	Spring 1980
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Volume 4, Number 4	Autumn 1982

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- Oil Spill! OHSU-EP-12.
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TABLE 17

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1. Kreckler, F.H. 1928. Periodic oscillations in Lake Erie. Ohio State University, F.T. Stone Laboratory Contrib. No. 1. 22 p.
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3. Ewers, L.A. 1930. The larval development of freshwater Copepoda. Ohio State University, F.T. Stone Laboratory Contrib. No. 3. 43 p.
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6. Tiffany, L.H. 1934. The plankton algae of the west end of Lake Erie. Ohio State University, F.T. Stone Laboratory Contrib. No. 6. 112 p.
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TABLE 18
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Jeffrey M. Reutter

Student Recruitment (Ad Hoc) Committee:

Jeffrey M. Reutter, Chairperson
T. Richard Fisher