



**CLEAR ANNUAL REPORT
NO. 11**

**ANNUAL REPORT
OF THE
LAKE ERIE PROGRAMS
AT
THE OHIO STATE UNIVERSITY
1980-1981**

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

**COLLEGE OF BIOLOGICAL SCIENCES
AND
GRADUATE SCHOOL
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO**

OCTOBER 1981



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 1980-1981 Annual Report of the Lake Erie Programs at The Ohio State University. All three components have again been extremely successful in fulfilling their missions, even in this period of economic adversity.

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,



Charles E. Herdendorf
Director

CEH/g-ls

cc: William Collins

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Put-in-Bay, Ohio 43456
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PROGRAM DEVELOPMENTS

LAKE ERIE PROGRAMS
AT
THE OHIO STATE UNIVERSITY

The Ohio State University has fostered a program of Lake Erie research and education for over 85 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.

Fourteen advanced courses were offered at Stone Laboratory by the Departments of Botany, Entomology, Microbiology and Zoology during Summer Quarter 1981 (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 1980 included 35 graduate, 47 undergraduate, and 6 continuing education and 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 1981 (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 29 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 1981 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 five 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 1981, with 17 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 80 marine advisory service functions were conducted at the mainland locations, reaching a direct audience of over 300,000 (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 eleven-year history of CLEAR, approximately \$8 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 1980-1981, the Center coordinated 58 sponsored research projects with a commitment of \$3.7 million (Table 9). A total of 52 faculty and 36 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 Associate Directors 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, four graduate degrees were awarded to students participating in Lake Erie research projects by cooperating academic departments (Table 11). Lake Erie research projects resulted in 66 presentations at scientific meetings (Table 12) and

42 publications (Table 13). CLEAR, in cooperation with the International Association for Great Lakes Research, hosted the 24th Conference on Great Lakes Research in Columbus in May 1981. Over 300 scientists attended this conference to hear over 150 papers on various aspects of aquatic science. In the past eleven years, the Center has produced 224 Technical Reports, a list of which is presented in Table 14. The University committees providing guidance to the Lake Erie Programs are indicated in Table 15.

TABLES

TABLE I
COURSE OFFERINGS AT F. T. STONE LABORATORY
SUMMER 1981

First Term

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.

Entomology 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. N.W. Britt.

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.

Botany 610 FIELD BOTANY

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

Microbiology 692-W MICROBIOLOGICAL ASPECTS OF WATER POLLUTION

Methods of study and roles played by microorganisms as pollutants, as indicators of pollution, and as agents involved in the removal of pollutants. Dr. C.I. Randles.

Zoology 611 ANIMAL PARASITOLOGY

Emphasis on the parasites infesting freshwater vertebrates, including field and laboratory experiences, host examination, and techniques dealing with staining, fixing, and mounting of specimens. Dr. J.L. Crites.

Zoology 621 ICHTHYOLOGY

Study of the distribution and classification of fishes which includes methods of identification, collection, and preservation. Dr. T.M. Berra.

Second Term

Entomology 612 AQUATIC ENTOMOLOGY

Designed for preparation in the teaching of biology or for research on aquatic resources; taxonomy and ecology of immature and adult aquatic insects are emphasized. Dr. N.W. Britt.

Zoology 692 HERPETOLOGY

Local species of reptiles and amphibians, their habits, life histories, ecology, and classification. Inst. R. Funk.

Zoology 653 FISH ECOLOGY

Field and laboratory studies of life histories and interspecific relationships of fishes and of the various factors influencing their abundance. Dr. F.J. Margraf, Jr.

Botany 611 HIGHER 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.

Microbiology 622 PHYSIOLOGY AND ECOLOGY OF AQUATIC MICRO-ORGANISMS

The nature and significance of major physiological processes in aquatic systems, with particular attention to those in planktonic and benthic microorganisms, including effects of pollutants. Dr. C.I. Randles.

Zoology 612 INVERTEBRATE ZOOLOGY

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

Biology 494 (undergraduate) and Biology 594 (graduate) THE BIOLOGY OF LAKE ERIE

Biological aspects of Lake Erie with studies including taxonomy and ecology of phytoplankton, zooplankton and benthic organisms. Offered by the University of Akron with guest lectures by Stone Laboratory faculty and staff. Dr. John Olive.

TABLE 2

ROSTER OF FRANZ THEODORE STONE LABORATORY
COURSE AND RESEARCH STUDENTS, SUMMER 1981

	<u>Name</u>	<u>Major</u>	<u>Rank</u>	<u>Institution</u>
1)	Charles Armbrust	Wildlife Management	Senior	Ohio State University
2)	Brad Ault	Fisheries Management	Senior	Ohio State University
3)	Ronald Baker	Science Education	M. S.	Ohio State University
4)	Hussain Bakir	Biology	M. S.	Northeast Missouri State
5)	Angela Barnett	Microbiology	Senior	Ohio State University
6)	Roger Bartels	Zoology	Senior	Ohio State University
7)	Stephen Bennett	Zoology	M. S.	Ohio State University
8)	William Binnie	Zoology	Senior	Miami University
9)	Lulu Bowe	Geology	Program 60	Ohio State Univeristy
10)	Douglas Brewer	Biology	Senior	Bowling Green State University
11)	Kerry Brown	Science Education	Ph.D.	Ohio State University
12)	George Buddell III	Biology	Senior	Northern Kentucky University
13)	Neva Carlson	Environmental Biology	Ph.D.	Ohio State University
14)	Yen-Jen Chen	Botany	Senior	Ohio State University
15)	Catherine Conwell	Science Education	Ph.D.	Ohio State University
16)	James B. Cotner, Jr.	Aquatic Ecology	M. S.	Kent State University
17)	Carl Crozier	Botany	M. S.	Ohio State University
18)	Stanley Dannemiller	Zoology	Senior	Ohio State University
19)	Nancy Daugherty	Microbiology	Senior	Ohio State University
20)	Joel Davis	Environmental Biology	M. S.	Ohio State University
21)	Wayne Davis	Environmental Biology	M. S.	Ohio State University
22)	Laura Dorsey	Zoology	Senior	Ohio State University
23)	Margaret Farragher	Zoology	CED	Ohio State University
24)	Tim Filkill	Biology	Undergraduate	University of Akron
25)	Dean Fowler	Fisheries Management	Junior	Ohio State University
26)	Wally Frlich	Biology	Undergraduate	University of Akron
27)	Robert Gatewood	Environmental Biology	Ph.D.	Ohio State University
28)	John George	Science Education	M. S.	Ohio State University
29)	Theresa Gordon	Zoology	M. S.	Ohio State University
30)	Jeff Gray	Biology	Undergraduate	University of Akron

	<u>Name</u>	<u>Major</u>	<u>Rank</u>	<u>Institution</u>
31)	Rosanna Gusler	Wildlife Management	Senior	Ohio State University
32)	Mark Harrell	Science Education	M. S.	Ohio State University
33)	Gregory Heinrichs	Microbiology	Junior	Ohio State University
34)	Martha Holovack	Biology	Senior	Urbana College
35)	Michael Hubbell	Zoology	M. S.	Ohio State University
36)	Joan Hug	Biology	Undergraduate	University of Akron
37)	Pam Joseph	Zoology	Senior	Ohio State University
38)	Sami Kakish	Biology	Undergraduate	University of Akron
39)	Rosmarie Kelly	Zoology	M. S.	Ohio State University
40)	Daniel Kenney	Fisheries Management	Senior	Ohio State University
41)	Richard King	Zoology	M. S.	Purdue University (CIC)
42)	John Kishton	Biology	Undergraduate	University of Akron
43)	Carey Knight	Fisheries Management	Senior	Ohio State University
44)	Thomas Kohan	Fisheries Management	Senior	Ohio State University
45)	James Kooser	Zoology	Senior	Kent State University
46)	Diane Kostyshyn	Microbiology	Senior	Ohio State University
47)	Mary Kunkle	Biology	Undergraduate	University of Akron
48)	Donald Les	Botany	Ph.D.	Ohio State University
49)	Richard Lorenz	Environmental Biology	M. S.	Ohio State University
50)	Robert Lull	Zoology	CED	Ohio State University
51)	Dave McShaffrey	Biology	M. S.	University of Akron
52)	John Mergo	Zoology	Ph.D.	Ohio State University
53)	Greg Merkle	Zoology	CED	Ohio State University
54)	John Mizera	Environmental Biology	Ph.D.	Ohio State University
55)	Mark Monaco	Fisheries Management	Senior	Ohio State University
56)	Clark Morgan	Biology	Undergraduate	University of Akron
57)	Ben Morrison	Biology	Undergraduate	University of Akron
58)	Margaret Morrison	Environmental Biology	M. S.	Ohio State University
59)	Perry Mostov	Biology	Junior	Ohio State University
60)	Tracy Murray	Fisheries Management	Senior	Ohio State University

<u>Name</u>	<u>Major</u>	<u>Rank</u>	<u>Institution</u>
61) Steve Nesterak	Biological Engineering	Junior	Cornell University
62) Stephen Nichols	Entomology	M. S.	Ohio State University
63) William Norman	Fisheries Management	Senior	Ohio State University
64) Tom Novitsky	Biology	Undergraduate	University of Akron
65) Elizabeth Obara	Environmental Biology	Ph.D.	Ohio State University
66) Marilyn Prindle	Biology	Undergraduate	University of Akron
67) Robin Reash	Environmental Biology	Ph.D.	Ohio State University
68) Audrey Rush	Zoology	M. S.	Ohio State University
69) Martha Sajatovic	Zoology	Senior	Ohio State University
70) Mark Sanders	Biology	Undergraduate	University of Akron
71) Theresa Schutte	Environmental Biology	M. S.	Ohio State University
72) Tanya Shenk	Zoology	Senior	Ohio State University
73) Dale Soltis	Botany	Senior	Ohio State University
74) Frances Spofford	Zoology	Program 60	Ohio State University
75) John Spofford	Zoology	Program 60	Ohio State University
76) Mark Springer	Biology	Undergraduate	University of Akron
77) Patricia Steane	Zoology	Senior	Ohio State University
78) Barb Stiver	Environmental Biology	M. S.	Ohio State University
79) Katherine Suorsa	Biology	Senior	Westminster College
80) Marilyn Sword	Environmental Biology	M. S.	Ohio State University
81) John Tertuliani	Fisheries Management	Senior	Ohio State University
82) David Thrush	Zoology	M. S.	Ohio State University
83) James Tomko	Environmental Biology	M. S.	Ohio State University
84) C. J. Washington	Biology	M. S.	Bowling Green State University
85) Charles Withrow	Zoology	Ph.D.	Ohio State University
86) Daniel Wojta	Zoology	Senior	Ohio State University
87) Douglas Wynn	Science Education	M. A.	Ohio State University
88) Tom Zablotny	Fisheries Management	Senior	Ohio State University

TABLE 3
GUEST LECTURE SERIES AT F.T. STONE LABORATORY
SUMMER 1981

FIRST TERM

- 25 June Interpreting the Geology of the Erie Islands. Jane L. Forsyth, Department of Geology, Bowling Green State University.
- 2 July History of Lake Erie Fish Populations over the Past Two Centuries. Milton B. Trautman, Professor Emeritus of Zoology, The Ohio State University.
- 9 July Wildfire, Prescribed Burning and Natural Selection in the New Jersey Pine Barrens, or, Smokey the Bear vs. Charles Darwin. Ralph Boerner, Department of Botany, The Ohio State University.
- 16 July Capture, Transportation and Maintaining Marine Mammals. Neal L. Gray, Curator of Marine Mammals, Oceana, Cedar Point Amusement Park, Sandusky, Ohio.

SECOND TERM

- 30 July What is the Economic Future of the Lake Erie Basin? Henry L. Hunker, Department of Geography and School of Public Administration, The Ohio State University.
- 3 August A Biologist Looks at East Africa. Barry D. Valentine, Department of Zoology, The Ohio State University.
- 6 August Field Ecology vs. Lab Ecology: Or, Don't Bring Those Muddy Boots Into the Lab. Andrew M. White, Department of Biology, John Carroll University, Cleveland.
- 13 August Sex and the Single Snake. Richard Funk, Department of Zoology, The Ohio State University.

TABLE 4

WORKSHOPS CONDUCTED AT F.T. STONE LABORATORY
1980-1981

<u>DATE</u>	<u>GROUP</u>	<u>LEADER</u>	<u>PARTICIPANTS</u>	<u>DESCRIPTION</u>
July 21, 1980	Maumee Valley Girl Scout Council	Ms. Pat Ruskowski	40	Conservation Problems and Resource Conflicts at Lake Erie; Tour of Gibraltar Island
July 23, 1980	Sandusky Bay Kiwanis	Mr. Robert Santos	23	Resources Usage Conflicts at Lake Erie
August 2-3, 1980	Coastal Wetlands Workshop (at Old Woman Creek)	Dr. David Klarer	189	The Usage of Estuaries and Marshes by Lake Erie Fishes
Aug. 11, 1980	Ottawa YCC	Ms. Diane DeYonker	31	Conservation Problems and Resource Conflicts at Lake Erie
August 14, 1980	Old Woman Creek Staff	Dr. David Klarer	7	Tour of Research Facilities, Hatchery, Movie
August 16, 1980	Sandusky 4-H	Mr. Dennis McManamon	7	Tour of Research Facilities, Hatchery, Lecture
Sept. 8-10, 1980	Power Plant Biology Workshop	Drs. Reutter/Carey	5	Research Methodology Workshop

TABLE 4 CONT.

<u>DATE</u>	<u>GROUP</u>	<u>LEADER</u>	<u>PARTICIPANTS</u>	<u>DESCRIPTION</u>
Sept. 19-21, 1980	University of Dayton	Dr. Kelley Williams	20	Limnology Workshop
Sept. 20, 1980	Heidelberg College	Dr. Ken Krieger	7	Aquatic Biology Workshop
Oct. 1-3, 1980	Westerville Middle School	Mr. Ned Mosher	26	Aquatic Biology Workshop
Oct. 3-5, 1980	OSU Plankton Class	Dr. David Culver	13	Plankton Workshop
Oct. 4-5, 1980	Central Ohio Sierra Club	Dr. Dwight Billman	18	Lake Erie Resources Workshop
April 23-24, 1981	Hocking Technical College	Mr. Steve Yarsa	27	Commercial Fishing Workshop
May 7-8, 1981	University of Akron	Dr. John Olive	15	Limnology Workshop
May 8-10, 1981	Bowling Green State University Environmental Interest Group	Mr. Tom Mislán	10	Lake Erie Resources Seminar
May 9, 1981	Erie County Board of Education	Ms. Sandy Krieger/ Mr. Fred Snyder	42	Teacher Training Workshop

TABLE 4 CONT.

<u>DATE</u>	<u>GROUP</u>	<u>LEADER</u>	<u>PARTICIPANTS</u>	<u>DESCRIPTION</u>
May 11-15, 1981	New Albany Middle School	Mr. George Tomich	85	Aquatic Biology Workshop
May 15-16, 1981	O.S.U. Department of Zoology	Dr. David Culver	36	Limnology Workshop
May 16-17, 1981	O.S.U. Department of Horticulture	Dr. Gail Nonnecke	22	Island Region Agricultural Tour
May 17-19, 1981	Northern Kentucky University	Dr. Tom Rambo	13	Ornithology Workshop
May 20-24, 1981	Bloom-Carroll High School	Ms. Diane Gabriel	29	Aquatic Biology Workshop
May 26-28, 1981	Ohio Outdoor Journalists	Mr. Fred Snyder	20	Fisheries Workshop
June 1-3, 1981	Mansfield City Schools	Ms. Pat Edwards	35	Aquatic Biology Workshop
June 7, 1981	Ottawa County OSU Alumni	Mr. Carl Ruff	60	Annual Meeting
June 11-14, 1981	Erie County Board of Education	Ms. Sandy Krieger Ms. Ann Allendorf	36	Aquatic Workshop for Gifted Students

TABLE 4 CONT.

<u>DATE</u>	<u>GROUP</u>	<u>LEADER</u>	<u>PARTICIPANTS</u>	<u>DESCRIPTION</u>
June 17-19, 1981	Ohio Division of Wildlife	Mr. Clayton Lakes	35	In-Service Education
July 8-9, 1981	Coop. Extension Service	Dr. Jeffrey Reutter	10	Administrative Program Overview
July 11, 1981	Cleveland Museum of Natural History	Mr. Mark Monaco	30	Lake Erie Program Overview
July 30, 1981	Marion Power Squadron	Mr. Mark Monaco	20	Lake Erie Program Overview

TABLE 5

FACULTY AND STAFF OF FRANZ THEODORE STONE LABORATORY
SUMMER 1981

Administration

<u>Name</u>	<u>Title</u>
1. Herdendorf, Charles E.	Director
2. Stuckey, Ronald L.	Associate Director of Instruction
3. Monaco, Mark E.	Laboratory Manager
4. Franks, Jo Ann	Administrative Assistant
5. Rusch, Pamela J.	Secretary (Put-in-Bay)
6. Harper, Mary L.	Secretary (Columbus)
7. White, Kristina I.	Business Manager (Columbus)

Teaching Faculty

<u>Name</u>	<u>Title</u>	<u>Department and University</u>
1. Britt, N. Wilson	Professor	Entomology (OSU)
2. Berra, Tim M.	Assoc. Professor	Zoology (OSU)
3. Boerner, Ralph E. J.	Asst. Professor	Botany (OSU)
4. Carey, Walter E.	Assoc. Professor	Zoology (OSU)
5. Cooper, C. Lawrence	Adj. Asst. Professor	Zoology (OSU)
6. Funk, Richard	Instructor	Zoology (OSU)
7. Herdendorf, Charles E.	Professor	Zoology (OSU)
8. Margraf, F. Joseph	Asst. Professor	Zoology (OSU)
9. Randles, Chester I.	Professor	Microbiology (OSU)
10. Stuckey, Ronald A.	Professor	Botany (OSU)
11. Thieret, John W.	Professor	Biology (N. Ky. St. College)
12. Valentine, Barry D.	Professor	Zoology (OSU)

Resident Faculty and Visiting Scientists

<u>Name</u>	<u>Title</u>	<u>Department and University</u>
1. Adams, Donald	Assoc. Professor	Chemistry (Wright State)
2. Baker, Carl	Supervisor	ODW, Lake Erie Fisheries Unit
3. Bartolotta, Robert	Biologist	Biology (John Carroll Univ.)
4. Baumann, Paul	Leader	USFWS, CNFRL Field Research Station
5. Beatty, Joe	Assoc. Professor	Biology (Southern Illinois)
6. Bedford, Keith	Assoc. Professor	Civ. Eng. (OSU)
7. Butorin, N. V.	Limnologist	Union Soviet Socialist Republic

TABLE 5 CONT.

<u>Name</u>	<u>Title</u>	<u>Department and University</u>
8. Crites, John	Chairperson	Zoology (OSU)
9. Culver, David	Asst. Professor	Zoology (OSU)
10. Forsyth, Jane	Professor	Geology (BGSU)
11. Hobbs, Horton	Assoc. Professor	Biology (Wittenburg College)
12. Johnson, David	Asst. Professor	Natural Resources (OSU)
13. Klarer, David	Limnologist	ODNR, Natural Areas
14. Kalas, Len	Biologist	Canada Centre for Inland Waters
15. Lakes, Clayton	Supervisor	ODW, Fish Production
16. Miskimen, Mildred	Adj. Assoc. Prof. (Ret.)	Zoology (OSU)
17. Olive, John	Professor	Biology (Univ. of Akron)
18. Putnam, Loren S.	Professor	Zoology (OSU)
19. Rambo, Tom	Asst. Professor	Biology (N. Kentucky Univ.)
20. Reese, Karen	Editor/Biologist	Ohio Biological Survey
21. Romaneko, V. I.	Limnologist	Union Soviet Socialist Republics
22. Reynolds, W. Anne	Provost	Ohio State University
23. Schmitt, William	Education Coordinator	COSI
24. Scholl, Russell	Asst. Chief	Ohio Div. of Wildlife
25. Svanks, Karlis	Assoc. Professor (Emer.)	Chemical Eng. (OSU)
26. Tevetora, Ye. A.	Mathematician	Union Soviet Socialist Republics
27. Thompson, Ralph	Asst. Professor	Botany
28. Wasilk, Jennifer	Biologist	Toledo Edison Company
29. Williams, Kelly	Assoc. Professor	Biology (Univ. of Dayton)
30. Wright, Eugene	Biologist	ODNR, Natural Areas

Graduate Associates

<u>Name</u>	<u>Responsibility</u>
1. Crozier, Carl	Laboratory Stock Room
2. Davis, Joel	Zoology Courses
3. Hubbell, Michael	Research Fellow
4. Kelly, Rosmarie	Zoology Courses
5. Les, Donald	Botany Course
6. Mergo, John	Research Laboratory
7. Monaco, Mark	Laboratory Manager
8. Nichols, Stephen	Entomology Classes
9. Tomko, James	Logistics/Transportation
10. Thrush, David	Research Laboratory

TABLE 5 CONT.

Student Assistants

<u>Name</u>	<u>Responsibility</u>
1. Armbrust, Charles	Residence Buildings
2. Ault, Brad	Food Service
3. Knight, Carey	Research Laboratory
4. Kostyshyn, Diane	Food Service
5. Mostov, Perry	Residence Buildings
6. Schutte, Theresa	Library
7. Soltis, Dale	Botany Course
8. Tertuliani, John	Research Laboratory
9. Withrow, Charles	Bookstore

Laboratory Staff

<u>Name</u>	<u>Title</u>
1. Carlson, Norman	Maintenance Assistant
2. Estice, Robert	Supervisor of Dining Hall
3. Luecke, Timothy	Supervisor of Physical Facilities
4. Montgomery, George	Cook
5. Nitchman, Mark	Research Vessel Operator
6. Sweeney, Craig	Maintenance Assistant
7. Wilhelm, Mark	Maintenance Assistant
8. Williams, Chester	Cook

R/V Hydra Staff

1. Bartish, Timothy	Graduate Research Associate
2. Brohl, Helen	Research Assistant
3. Fay, Laura	Chief Scientist
4. Keeler, Gordon	Research Assistant
5. Ladd, Paul	Captain
6. Letterhos, Julie	Research Technician

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.
- 1918 Professor Raymond C. Osburn named third director of the Lake Laboratory upon the retirement of Professor Osborn. Professor Frederick H. Kreckler served as acting director from 1918 to 1925 and as assistant director from 1926 to 1936.
- 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. Kreckler, 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 31-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 65-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.

TABLE 7
DEVELOPMENT OF THE OHIO SEA GRANT PROGRAM 1977-1981

YEAR PROGRAM COMPONENT	1977-1978	1978-1979	1979-1980	1980-1981	1981-1982
PROGRAM MANAGEMENT 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 (\$20,000-\$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 (\$32,100-\$60,800) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter</p> <p>Development of the Ohio Sea Grant Program (\$20,800-0) Dr. Charles E. Herdendorf Dr. Jeffrey M. Reutter</p>
RESEARCH		<p>Development of Markets and Methods of Marketing Freshwater Drum and Other Underutilized Species (\$47,807-\$4,460) Dr. Jeffrey M. Reutter Russell L. Scholl</p>	<p>Market Development for Underutilized Lake Erie Fish Species Including New Packaging Techniques (\$28,400-\$2,200) Dr. Jeffrey M. Reutter Michael T. Metcalf</p> <p>Preliminary Development of an Operational Lake Erie Storm Surge Flood Forecasting Program (\$26,600-\$16,300) Dr. Keith W. Bedford</p> <p>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</p>	<p>Lake Erie Storm Surge Forecasting: Model Intercomparison of Western Basin Effects (\$26,000-\$13,800) Dr. Keith W. Bedford</p> <p>Economic Value of Ohio's Lake Erie Fisheries (\$27,000-\$9,500) Dr. Leroy J. Hushak Dr. Fred H. Hitzhusen</p> <p>Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds (\$12,000-\$4,700) Dr. David A. Culver</p> <p>Lake Erie Public Information Through Radio Broadcasting (\$11,500-\$7,800) Dr. Rosanne W. Fortner</p> <p>Chemical Characterization of the Antitumor Factor in the Clam <i>Mercenaria m.</i> (\$18,000-\$10,581) Dr. Derek Horton</p>	<p>Economic Value of Ohio's Lake Erie Fisheries (\$25,000-\$12,900) Dr. Leroy J. Hushak Dr. Douglas D. Southgate</p> <p>Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds (\$10,700-\$2,000) Dr. David A. Culver Dr. C. Susan Munch</p> <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-\$12,200) 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. Threen</p>

TABLE 7 CONT.

YEAR PROGRAM COMPONENT	1977-1978	1978-1979	1979-1980	1980-1981	1981-1982
RESEARCH					<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 (\$8,700-\$3,100) Dr. Thomas A. Saliga</p>
EDUCATION	<p>Development of Supplemental Curriculum Materials Relating to Ocean Study (\$36,894-\$12,515) Dr. Victor J. Mayer</p>	<p>Oceanic Education Activities for Great Lakes Schools (\$33,708-\$16,949) Dr. Victor J. Mayer</p>	<p>Oceanic Education Activities for Great Lakes Schools (\$36,900-\$7,800) Dr. Victor J. Mayer</p>	<p>Marine and Great Lakes Education: An Infusion Program for Ohio Schools (\$37,000-\$28,000) Dr. Victor J. Mayer Dr. John H. Hug</p> <p>The Development and Implementation of a Curriculum for the Study of Marine Technology (\$15,000-\$28,500) William E. Brewer (BGSU)</p> <p>Coastal Engineering Curriculum Development (\$1,500-\$0) Dr. Keith W. Bedford</p>	<p>Marine and Great Lakes Education: An Infusion Program for Ohio Schools (\$39,000-\$32,400) Dr. Victor J. Mayer Dr. John H. Hug Dr. Rosanne W. Fortner</p> <p>Ohio Sea Grant Education Office (\$1,000-\$4,100) Dr. Victor J. Mayer</p> <p>Great Lakes Information Through Museum Programming (\$5,100-\$9,900)^C Dr. Rosanne W. Fortner William C. Schmitt (COSI)</p>

TABLE 7 CONT.

PROGRAM COMPONENT \ YEAR	1977-1978	1978-1979	1979-1980	1980-1981	1981-1982
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 Publication and Distribution of The Fishes of Ohio, 2nd Edition by MILTON S. Trautman (\$12,000-\$0) Dr. Charles E. Hurdendorf Maldon A. Kefauver Great Lakes Network (\$6,000-\$3,100) Dr. Jeffrey M. Reutter Dr. Charles E. Hurdendorf	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 Development of Audio-Visual Presentations for the Ohio Sea Grant Advisory Services Program (\$3,000-\$1,500) ^c Dr. Henry L. Hunker
TOTAL FEDERAL DOLLARS	\$36,894	\$121,842	\$186,000	\$295,000	\$336,000
INDIRECT COSTS	\$12,320	\$ 29,935	\$ 40,904	\$ 75,358	\$ 80,414
NUMBER OF PROJECTS	1	4	8	10	17
NUMBER OF INVESTIGATORS ^d	1	5	10	14	30
NUMBER OF GRA'S	2	3	6	11	10

^aProjects listed side by side are continuations of the same effort. Dollar values in parenthesis 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 midway 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 1980-1981

DATE	GROUP OR AUDIENCE	NUMBER OF ATTENDEES AND SPEAKER	TOPIC
July 15, 1980	Stuffton YCC	30 Fred Snyder	Conservation Problems and Resource Conflicts at Lake Erie
July 23, 1980	Sandusky Bay Kiwanis	23 Fred Snyder	Resource Usage Conflicts at Lake Erie
July 28-29, 1980	Great Lakes Sea Grant Advisory Program Leaders	7 Jeff Reutter	Joint Activities Between the five Great Lakes Programs
August 2-3, 1980	Coastal Wetlands Workshop (at Old Woman Creek)	189 Fred Snyder	The Usage of Estuaries and Marshes by Lake Erie Fishes
August 11, 1980	Ottawa YCC	31 Fred Snyder	Conservation Problems and Resource Conflicts at Lake Erie
September 16, 1980	Oak Harbor Rotary	20 Fred Snyder	The Ohio Sea Grant Program
September 19, 1980	Ottawa Youth Conservation Day (Ottawa Refuge)	595 Fred Snyder	Lake and Marsh Ecology Discussions
September 25, 1980	Mayfield High School	50 Fred Snyder	Lake Erie Water Quality
October 3, 1980	Baldwin-Wallace College (at Old Woman Creek)	7 Fred Snyder	Lecture on Lake Erie Water Quality and Fisheries; Seining in the estuary
October 7, 1980	Decade of Decision - Toledo	Fred Snyder	Panel Discussion of Lake Erie Research and Problems
October 28, 1980	Berlin-Milan Middle School	150 Fred Snyder	Lake Erie's Fisheries
November 13, 1980	Sohio Management Club (Toledo)	75 Walt Carey & Jeff Reutter	Nuclear Power and Fishery Resources of Lake Erie
November 19, 1980	Berlin-Milan Middle School	47 Fred Snyder	CLEAR movie; Lake Erie Discussion
December 5, 1980	Awareness '80 Program for Lorain County Cooperative Extension Service (Avon Lake, Ohio)	200+ Dave Kelch	Ohio Sea Grant: Purpose, History, Accomplishments (seeking public input)
December 10, 1980	Berlin-Milan Middle School	45 Fred Snyder	CLEAR movie; Lake Erie Discussion
Dec. 15, 17, and 19, 1980	Hunter Safety Course in Lorain County - General Public	45 Dave Kelch	Hunter Safety: Hypothermia, Water Safety and Waterfowl
December 17, 1980	Fremont Area Home Ec Agents	11 Fred Snyder	Fish Preparation
Dec. 21-22, 1980	Hunter Safety Course in Lorain County - General Public	39 Dave Kelch	Hunter Safety: Hypothermia, Water Safety and Waterfowl
January 7, 1981	Berlin-Milan Middle School	20 Fred Snyder	CLEAR movie; Lake Erie Discussion
January 8, 1981	Lorain County Extension Advisory Committee (Elyria)	21 Dave Kelch	Ohio Sea Grant: History, Accomplishments and Goals (seeking public input)
January 8, 1981	Columbus Power Squadron	125 Walt Carey, Jeff Reutter & Gail McComann	Nuclear Power and Fishery Resources of Lake Erie
January 16, 1981	Lorain County Community College - Administrative Staff	6 Dave Kelch	Ohio Sea Grant: History, Accomplishments and Goals (seeking public input)
January 20, 1981	ODNR, Division of Wildlife District 3 (Akron)	6 Dave Kelch	Ohio Sea Grant: History, Accomplishments and Goals (seeking public input)
January 23, 1981	Wooster Area Extension Agents (Wooster)	25 Dave Kelch	Ohio Sea Grant: History, Accomplishments and Goals (seeking public input)
January 30, 1981	Port Clinton Fish Co.	3 Dave Kelch	Freshwater Drum Marketing
February 7, 1981	Ohio Fish Producers Association (Sandusky)	20 Fred Snyder & Dave Kelch	Freshwater Drum Marketing
February 9, 1981	Ohio Fish Producers Association (Sandusky)	15 Fred Snyder & Dave Kelch	Free Public Health Care for Seafarers
Feb. 7-15, 1981	Columbus Sport Show	50,000 Jeff Reutter, Charles Herdendorf, Mark Barnes, Dave Kelch, Fred Snyder, Margaret Holland & Bill Snyder	Ohio Sea Grant Booth
February 17, 1981	BGSU Outdoor Education Class	16 Fred Snyder	Lecture on Outdoor Education Opportunities
February 20, 1981	Ohio Wildlife Management Association	200 Jeff Reutter & Charles Herdendorf	Poster Session on Sea Grant
February 23, 1981	Elyria Public Service Week	Open Dave Kelch	Ohio Sea Grant
February 25, 1981	Toledo Ag. Ed. Center	11 Fred Snyder	Lecture on Water Quality, Fisheries and Fish Identification
February 27, 1981	Sportfishermen in Fremont	20 Fred Snyder	The Lake Erie Walleye Fishery
February 28, 1981	Annual Meeting of League of Ohio Sportsmen	250 Jeff Reutter	OSU's Lake Erie Program
March 2, 1981	Made 5 five-minute programs for WKYC-TV Channel 3 in Cleveland, to be aired 3/9 to 3/13/81	Thousands Dave Kelch	General Sea Grant Information; Publications available; Drum Handling and Preparation; Fish Filleting and Cooking
March 3, 1981	Annual Banquet Black River Chapter of Isaac Walton League	Dave Kelch	Difference between Conservation, Preservation, and Non-use, and how this relates to Freshwater Drums in Lake Erie
March 4, 1981	Lake County Extension Advisory Committee	8 Frank Lichtkoppler	Ohio Sea Grant
March 5, 1981	Lake Erie Sport Fishermen's Association - Monthly Meeting	25 Fred Snyder & Dave Kelch	Sea Grant Programs for Sport Fishermen; Artificial Reefs and Fishing the Central Basin
March 6, 1981	Clay High School Vo-Ag	11 Fred Snyder	Fish Identification

TABLE 8 CONT.

DATE	GROUP OR AUDIENCE	NUMBER OF ATTENDEES AND SPEAKER	TOPIC
March 8, 1981	Lake Erie Charterboat Association	150 Fred Snyder	Propose 1981-82 Activities with the Association
March 10, 1981	District V Vo-Ag Fish Judging Contest	31 Fred Snyder	Competition in Fish Identification and Pond Management
March 11, 1981	Cuyahoga County West Side 4-H Team Leaders	17 Dave Kelch	Lake Erie Fishery Resources and Cleaning and Cooking
March 12, 1981	Ashtabula County Extension Advisory Committee	20 Frank Lichtkoppler	Ohio Sea Grant
March 12, 1981	Outdoor Education Classes at Elyria High School	36 Dave Kelch	Lake Erie Fishery Resources
March 13, 1981	Canfield Area Extension Agents	30 Frank Lichtkoppler	Ohio Sea Grant
March 18, 1981	Radio Station "WFUN" Ashtabula	? Frank Lichtkoppler	Ohio Sea Grant
March 20-29, 1981	American and Canadian Outdoor, Travel and Sport Show (Cleveland)	200,000 Fred Snyder, Dave Kelch, Frank Lichtkoppler, Jeff Reutter & Ed Herdendorf	Ohio Sea Grant Booth with Lawrence the Lake Trout, Information on all Lake Erie Program Activities; Filleting and Cooking Demonstrations
March 23, 1981	Toledo Schools Career Day	66 Fred Snyder	Counseling on Aquatic Science Careers
March 30, 1981	Mentor Marsh Board (Mentor)	12 Frank Lichtkoppler	Research and Education Efforts in Marshes
April 2, 1981	Board of Lake Erie Sport Fishermen's Association	34 Dave Kelch	Sport vs. Commercial Fishing
April 3, 1981	Beaver Creek Boat Club (Lorain)	49 Dave Kelch	Ohio Sea Grant; Cold Water Drowning
April 6, 1981	Three Radio Tapes for "WFUN" Ashtabula	? Frank Lichtkoppler	Ohio Sea Grant; Erosion; Lake Erie Research
April 8, 1981	Lakeside Homemaker Club	14 Fred Snyder	Fish Handling and Preparation
April 9, 1981	Lorain County Soil Conservation Service and Coop Ext. Service (Vermilion)	29 Dave Kelch	Fish Preparation
April 10, 1981	Vermilion Fish and Game Association	175 Dave Kelch	Ohio Sea Grant
April 11, 1981	FFA State Competition	45 Fred Snyder	Fish Identification and Pond Management Contest
April 17, 1981	Fly Rod Benders Club (Elyria)	27 Dave Kelch	OSU Lake Erie Research
April 21, 1981	Cuyahoga County Cooperative Extension Groups	21 Dave Kelch	Hands-on Fish Cleaning Workshop
April 23, 1981	St. Johns Church	75 Fred Snyder	Ohio Sea Grant Program
April 24, 1981	Taped 30-minute radio talk on "WEOL" (Elyria)	? Dave Kelch	Sea Grant and Lake Erie Research
April 24, 1981	University of Akron	? Fred Snyder	Ohio Sea Grant Program
April 27, 1981	Margaretta Junior High School	48 Fred Snyder	Counseling on Aquatic Science Careers
April 28, 1981	Port Clinton Fish Co. and Kai-Can of Columbus	8 Dave Kelch & Fred Snyder	Rendering Facilities for Fish
May 6, 1981	4-H Aquatic Ecology Camp - Ashtabula County	150 Frank Lichtkoppler	Workshop on Aquatic Ecology
May 8-9, 1981	Educators from Erie County Board of Education	40 Fred Snyder	Workshop on the Use of Sea Grant Aquatic Education Materials
May 12, 1981	4-H Aquatic Ecology Camp - Ashtabula County	80 Frank Lichtkoppler	Workshop on Aquatic Ecology
May 13, 1981	Vermilion Middle School 7th and 8th Grades	47 Dave Kelch	Careers in Aquatics
May 14, 1981	Goodyear Hunting and Fishing Club (Akron)	137 Dave Kelch	Sea Grant and Lake Erie
May 16, 1981	Holden Arboretum - General Public (Lake County)	325 Frank Lichtkoppler	Career Day
May 18, 1981	Made five Lake Erie Radio Tapes at Station "WFUN" in Ashtabula	? Frank Lichtkoppler	Lake Erie and Erosion
May 23-24, 1981	Lake Erie Charter Boat Association Pro-Am Walleye Tournament	2000 Fred Snyder, Dave Kelch & Frank Lichtkoppler	Judging
June 3, 1981	General Public - Low Income Group	26 Dave Kelch	Fish Filleting and Cooking
June 4, 1981	Made six Lake Erie Radio Tapes for Station "WFUN" in Ashtabula	? Frank Lichtkoppler	Lake Erie and The Ohio State University
June 5, 1981	4-H Aquatic Ecology Camp - Ashtabula County	150 Frank Lichtkoppler	Aquatic Ecology
June 12-13, 1981	Lake Erie Marine Trades Association Tournament at Cedar Point	2000 Dave Kelch, Fred Snyder, Frank Lichtkoppler, Jeff Reutter and Mark Barnes	Judging
June 18, 1981	General Public at Port Clinton Fish Co.'s Retail Outlet (Toledo)	27 Dave Kelch	Recipes for Freshwater Drum
June 18, 1981	Ashtabula County Extension Advisory Committee	20 Frank Lichtkoppler	Sea Grant Activities
June 19, 1981	Beaver Creek Boat Club (Lorain)	35 Dave Kelch	Lake Erie Walleye

TABLE 8 CONT.

DATE	GROUP OR AUDIENCE	NUMBER OF ATTENDEES AND SPEAKER	TOPIC
June 23, 1981	KXVC-TV Channel 3 in Cleveland	7 Dave Kelch	Took them on Charter Boat and made 10 five-minute films on Lake Erie Charter Fishing to be aired in August
June 23, 1981	Cenfield Area Sea Grant Advisory Committee	15 Frank Lichtkoppler	Sea Grant Work in Northeastern Ohio
June 24-25, 1981	Cuyahoga County 4-H Camp at Kelley's Island	90 Dave Kelch	Aquatic Ecology
June 27, 1981	League of Ohio Sportsmen's Walleye Tournament	5000 Jeff Reutter, Dave Kelch, Fred Snyder, Mark Barnes & Bill Snyder	Judging
June 29, 1981	Lorain County 4-H Camp at Kelley's Island	37 Dave Kelch	Aquatic Ecology
July 9, 1981	Lorain County Residents	123 Dave Kelch, Fred Snyder & Jeff Reutter	Walleye Fishing Clinic - Where, when, how to catch them; Fish Senses; Fish Preparation
July 10, 1981	General Public at Port Clinton Fish Co.'s Toledo Outlet	53 Dave Kelch	Freshwater Drum Recipes
July 11, 1981	Great Lakes Sport Fishing Council	22 Fred Snyder & Dave Kelch	Ohio Sea Grant
July 14, 1981	4-H Camp Conger	25 Fred Snyder	Aquatic Ecology Field Trip
July 14, 1981	Meidelberg YCC	40 Fred Snyder	Lake Erie Resources Problems
July 15, 1981	4-H Camp Conger	26 Fred Snyder	Aquatic Ecology Field Trip
July 15, 1981	TV 35 (Elyria)	7 Dave Kelch	Fish Preparation
July 18, 1981	Old Woman Creek Wetlands Workshop	22 Fred Snyder	Fish Production in Lake Erie Estuaries
July 21, 1981	Six Radio Tapes "WFUN" in Ashtabula	7 Frank Lichtkoppler	Lake Erie
July 22, 1981	Fairport Harbor Rod and Reel Club	10 Frank Lichtkoppler	Lake Erie and Sea Grant
July 30, 1981	Wellington, Ohio Kiwanis Club	24 Dave Kelch	Ohio Sea Grant and Lake Erie
August 4, 1981	4-H Camp at Kelley's Island	146 Fred Snyder	Aquatic Biology and Geological History Presentations

TABLE 9
LAKE ERIE/SEA GRANT RESEARCH PROJECTS

● **A Shoreline Inventory of the Lake Erie Shoreline and Selected Reaches of Navigable Rivers in the State of Ohio**

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

Sponsor: U.S. Army Corps of Engineers, Buffalo District

Grant No.: DACW49-78-C-0051

OSURF No.: 711138

Project Period and Budget: May 16, 1978 to December 1, 1980
\$147,547 (sponsor)

Objective: Data will be gathered and collated on all structures along the shoreline and certain navigable reaches of the tributary rivers of Lake Erie on which the Corps of Engineers does not presently have records. The sponsor will be provided with copies of aerial video tapes gathered during the original survey.

●Limnological Investigations of Water Quality and Fish Larvae in Lake Erie.

Principal Investigator: Charles E. Herdendorf, CLEAR

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

Grant No.: R-804612-03-0

OSURF Nos.: 711230 and 713933

Project Period and Budget: June 15, 1978 to November 30, 1981
\$292,216 (sponsor)
\$ 19,730 (OSU cost-sharing)

Objective: The Ohio State University, Center for Lake Erie Area Research (CLEAR), plans to conduct studies of (1) water quality, particularly nutrients/oxygen relationships, in the western and central basins of Lake Erie and (2) fish larvae in the western basin and Sandusky Bay. This study is a continuation of a comprehensive study of the status of eutrophication in Lake Erie now being completed by CLEAR in support of an assessment of the effectiveness of nutrient control programs (USEPA Grant No. R-802543). A subproject of this grant deals with population estimates of fish larvae in western Lake Erie. Data generated by these studies also forms the base of deterministic models now under development by USEPA, Large Lakes Research Station, Grosse Ile, Michigan.

● Organochlorine Contaminant Levels in Edible and Inedible Portions of Selected Lake Erie Fishes.

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

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

Grant No.: 14-16-0009-78-74

OSURF No.: 711572

Project Period and Budget: September 22, 1978 to June 30, 1980
\$24,369 (sponsor)
\$ 5,747 (OSU cost-sharing)

Objectives: The objectives of this project will be to determine the relationship between residues of PCBS and chlorinated hydrocarbon pesticides in edible portions and whole body of selected Lake Erie fish species, to determine changes in this relationship from juvenile to adult life history stages, and to rank representative species of major fish families in Lake Erie according to their levels of bioaccumulation of chlorinated hydrocarbons in edible and inedible portions.

●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)
\$142,985 (OSU 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.

● Biological Studies for Two Highway Projects in Northeastern Ohio
(STA/MAH/COL-62/14A and CUY/GEA-422-18.4/0.00-3.19)

Principal Investigator: Charles E. Herdendorf, CLEAR

Sponsor: Ohio Department of Transportation

Contract No.: 3191

OSURF Nos.: 711986 and 711987

Project Period and Budget: April 1, 1979 and June 30, 1980
\$83,667 (sponsor)
\$13,944 (OSU cost-sharing)

Objective: The purpose of these studies is to delineate and identify general habitat types in each of the two project areas and to develop more intensive data on the natural characteristics of wetlands in each of the two project areas to enable the Ohio Department of Transportation, the Federal Highway Administration, and other concerned agencies to evaluate the potential impacts of the projects on the wetlands.

●Yellow Perch Parasite Research - 1

Principal Investigator: John L. Crites, Zoology and
Jeffrey M. Reutter, CLEAR

Sponsor: U.S. Department of Commerce, National Marine Fisheries Service
and Ohio Department of Natural Resources, Division of Wildlife

Grant No.: 3-298-R-2, Agreement, 6/13/79

OSURF No.: 712138

Project Period and Budget: July 1, 1979 to June 30, 1980
\$16,500 (sponsor)
\$ 5,500 (OSU cost-sharing)

Objective: This study is designed to document the incidence of infection of yellow perch in the central and western basins of Lake Erie with the nematode parasite Eustrongylides tubifex. The impact of the parasite on these populations will be documented and management recommendations to minimize this impact will be investigated.

● Ohio Sea Grant Program 1979-1980

Principal Investigator: Charles E. Herdendorf, CLEAR

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

Grant No.: NA79AA-D-00120

OSURF Nos.: 712332-712338 and 712473

Project Period and Budget: September 1, 1979 to August 31, 1981
\$186,000 (sponsor)
\$105,000 (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.

● **Limnological Studies to Determine the Nearshore Chemical, Physical and Biological Water Quality of Western Lake Erie from Huron, Ohio to the Detroit River**

Principal Investigator: Charles E. Herdendorf, CLEAR

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

Contract No.: 68-01-5881

OSURF No.: 712362

Project Period and Budget: August 28, 1979 to June 30, 1981
\$439,757 (sponsor)

Objective: The nearshore surveillance program for Lake Erie is designed to: 1) Quantify water quality problems in terms of severity, area or volume extent, frequency, duration, and source. 2) Monitor local and whole lake response to abatement measures and to identify emerging problems. 3) Determine the cause-effect relationship between water quality and waste inputs in order to develop appropriate remedial/preventative actions and predictions of the rate and extent of local/whole lake responses to alternative abatement proposals.

● **Operational Aquatic Ecology Monitoring Program for the Davis-Besse Nuclear Power Station**

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

Sponsors: Toledo Edison Company and Cleveland Electric Illuminating Company

Contract No.: 46980

OSURF Nos.: 712598 (on-campus) and 712599 (off-campus)

Project Period and Budget: January 1, 1980 to June 30, 1982
\$284,633 (sponsor)

Objective: This project will conduct an operational aquatic ecology monitoring program for the Davis-Besse Nuclear Power Station, Unit No. 1. This program is designed to comply with the Environmental Technical Specifications for this facility.

●Pre-College Teacher Development

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

Sponsor: National Science Foundation

Grant No.: SPI-8000189

OSURF No.: 712669

Project Period and Budget: February 1, 1980 to March 31, 1981
\$12,989 (sponsor)

Objective: This workshop is planned for the purpose of developing public understanding of our water resources, their uses, and possible problems. Participants will learn about the physical and biological characteristics of Lake Erie, its influence on the local environment, on the history and economy of the State of Ohio, and the importance of the oceans on the life and commerce of our country.

● Technical Assessment of the Lake Erie Intensive Study

Principal Investigator: Charles E. Herdendorf, CLEAR

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

Grant No.: R00551601

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

Project Period and Budget: March 1, 1980 to February 28, 1982
\$305,484 (sponsor)
\$ 23,883 (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.

● Fisheries Food Service Survey

Principal Investigator: Jeffrey M. Reutter, CLEAR

Sponsor: National Fisheries Institute

Contract No.: Letter, 2/29/80

OSURF No.: 712771

Project Period and Budget: February 1, 1981 to March 31, 1981
\$4,000 (sponsor)

Objective: The Ohio State University Sea Grant Program proposes to conduct a mail, telephone, and personal interview survey of restaurants in six (6) cities in the United States. This project was requested by the National Fisheries Institute, Inc. The results of the survey will assist them in determining current nationwide buying patterns or trends.

● Yellow Perch Parasite Research - 2

Principal Investigator: John L. Crites, Zoology and
Jeffrey M. Reutter, CLEAR

Sponsor: U.S. Department of Commerce, National Marine Fisheries Service,
and Ohio Department of Natural Resources, Division of Wildlife

Grant No.: 3-398-R-3

OSURF No.: 712898 (on-campus) and 712899 (off-campus)

Project Period and Budget: July 1, 1980 to June 30, 1982
\$42,366 (sponsor)
\$20,647 (OSU cost-sharing)

Objective: This study is designed to document the incidence of infection of yellow perch in the central and western basins of Lake Erie with the nematode parasite Eustrongylides tubifex. The impact of the parasite on these populations will be documented and management recommendations to minimize this impact will be investigated.

● 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.: CR 807623-01-0

OSURF No.: 712962

Project Period and Budget: June 12, 1980 to June 11, 1982
\$49,880 (sponsor)
\$ 2,625 (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.

● 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 July 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.

● Lake Erie Monitoring Program: Main Lake Water Quality and Cladophora - 1

Principal Investigators: Charles E. Herdendorf, CLEAR and
Robert C. Stiefel, Civil Engineering

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

Grant No.: R005555-01

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

Project Period and Budget: July 1, 1980 to December 31, 1981
\$191,677 (sponsor)
\$ 10,088 (OSU cost-sharing)

Objective: This monitoring program will focus on the water quality of the
main lake and abundance of the green algae, Cladophora, in the
nearshore waters.

● Ohio Sea Grant Program 1980-1981

Principal Investigator: Charles E. Herdendorf, 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

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

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

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

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**

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

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

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

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

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

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

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

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.

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.

● Lake Erie as an Industrial and Commercial Resource to the Greater Cleveland Area

Principal Investigators: Jeffrey M. Reutter, CLEAR

Sponsor: Greater Cleveland Growth Association

OSURF No.: 713593

Project Period and Budget: February 1, 1981 to March 15, 1981
\$1,987 (sponsor)
\$ 374 (OSU cost-sharing)

Objective: This project will develop a brief executive report documenting the industrial and commercial value of Lake Erie, specifically Cuyahoga County and the six counties which surround it -- Greater Cleveland. The report will quantify values whenever possible, but avoid an overly technical dialogue. It will be highly factual, documenting both the positive and the negative values of the lake, and be written in a form easily comprehended by the layman.

● 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 No.: 713694 (on campus) and 713695 (off campus)

Project Period and Budget: April 1, 1981 to March 31, 1982
\$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).

● Lake Erie Monitoring Program: Main Lake Water Quality and Cladophora - 2

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.: R005555-02

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

Project Period and Budget: July 1, 1981 to December 31, 1982
\$226,105 (sponsor)
\$ 19,958 (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

Principal Investigator: Charles E. Herdendorf, CLEAR

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

Grant No.: NAB1AA-D-00095

OSURF Nos.: 714066-714082

Project Period and Budget: September 1, 1981 to August 31, 1982
\$336,000 (sponsor)
\$232,500 (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

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 August 31, 1982
\$32,100 (sponsor)
\$60,800 (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

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 August 31, 1982
\$20,800 (sponsor)

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.

●Aquaculture in Ohio: Zooplankton Productivity in Fish Hatchery Ponds

Principal Investigators: David Culver, Zoology and
Charles E. Herdendorf, CLEAR

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 August 31, 1982
\$10,700 (sponsor)
\$ 2,000 (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

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

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

Grant No.: NA81AA-D-00095

OSURF No.: 714069

Project Period and Budget: September 1, 1981 to August 31, 1982
\$10,000 (sponsor)
\$ 6,000 (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

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

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 August 31, 1982
\$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

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 August 31, 1982
\$25,000 (sponsor)
\$12,900 (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

Principal Investigators: Cameron Thraen, Agricultural Economics
and Charles E. Herdendorf, CLEAR

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 August 31, 1982
\$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**

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 August 31, 1982
\$30,000 (sponsor)
\$15,500 (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

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

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 August 31, 1982
\$10,000 (sponsor)
\$ 6,000 (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 physicochemical, 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 physicochemical 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

Principal Investigators: Thomas Seliga, Electrical Engineering
and Charles E. Herdendorf, CLEAR

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 August 31, 1982
\$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

Principal Investigators: Victor J. Mayer, Science-Math Education
and Charles E. Herdendorf, CLEAR

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 August 31, 1982
\$1,000 (sponsor)
\$4,100 (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

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 August 31, 1982
\$39,000 (sponsor)
\$32,400 (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

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.: 714079

Project Period and Budget: September 1, 1981 to August 31, 1982
\$20,916 (sponsor)
\$36,854 (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)

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 August 31, 1982
\$38,345 (sponsor)
\$ 9,750 (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)

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

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

Grant No.: NAB1AA-D-00095

OSURF No.: 714081

Project Period and Budget: September 1, 1981 to August 31, 1982
\$34,615 (sponsor)
\$13,946 (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)

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 August 31, 1982
\$36,124 (sponsor)
\$14,072 (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

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 August 31, 1982
\$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.

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. Walter Carey	Associate Director, CLEAR
3. Ronald Stuckey	Associate Director, Stone Laboratory
4. Jeffrey Reutter	Associate Director, Sea Grant
5. Jo Ann Franks	Office Manager, Lake Erie Program
6. Barry Apgear	Coordinator, Sea Grant/Ohio Department of Natural Resources
7. Mark Barnes	Coordinator, Fisheries Laboratories
8. Keith Bedford	Coordinator, Sea Grant Engineering
9. C. L. Cooper	Coordinator, Technical Assessment Team
10. Laura Fay	Chief Scientist, R/V <u>Hydra</u>
11. John Hug	Coordinator, Sea Grant/Ohio Department of Education
12. Paul Ladd	Coordinator, Research Vessels
13. Victor Mayer	Coordinator, Sea Grant Education Office
14. John Mizera	Coordinator, Computer Facilities
15. Mark Monaco	Manager, Stone Laboratory
16. David Rathke	Coordinator, Plankton/Water Quality Laboratory
17. P. R. Thomas	Coordinator, Sea Grant/Ohio Cooperative Extension Service
18. Kristina White	Business Officer, Lake Erie Program

TABLE 10 CONT.

Faculty

	<u>Name</u>	<u>Department</u>	<u>Institution</u>	<u>Principal RF Project(s)</u>
1.	Robert Anderhalt	Geology	BGSU	714070
2.	David Baker	Biology	Heidelberg	712765
3.	Mark Barnes	Zoology/CLEAR	OSU	711986, 714075
4.	Keith Bedford	Civil Engineering	OSU	711846, 712962, 713208, 714073
5.	Robert Brodkey	Chemical Engineering	OSU	714073
6.	William Brewer	Construction Technology	BGSU	713213
7.	N. W. Britt	Entomology	OSU	711230
8.	Walter Carey	Nuclear Engineering	OSU	713207
9.	Robert Carline	Zoology	OSU	711572, 713076, 713694
10.	John Crites	Zoology	OSU	712138, 712898
11.	Charles Cole	Natural Resources	OSU	714069
12.	C. L. Cooper	Zoology/CLEAR	OSU	711230, 712765
13.	David Culver	Zoology	OSU	713210, 714068
14.	Patrick Dugan	Microbiology	OSU	712362
15.	Rosanne Fortner	Natural Resources	OSU	713211, 713212, 714078
16.	Charles Herdendorf	Geology/Zoology/CLEAR	OSU	711230, 712332, 712765, 712362, 713207, 714065, 714066
17.	Frederick Hitzhusen	Agricultural Economics	OSU	713209, 714071
18.	Derek Horton	Chemistry	OSU	713512
19.	John Hug	Environmental Education	Ohio Dept. Educ.	713212, 714078
20.	Henry Hunker	Geography	OSU	714067
21.	Leroy Hushak	Agricultural Economics	OSU	713209, 714071
22.	Raymond Jezerinac	Zoology	OSU	711986
23.	David Johnson	Natural Resources	OSU	714074
24.	Weldon Kefauver	University Press	OSU	712338
25.	David Kelch	Ohio Coop. Ext. Ser.	OSU	713223, 714081

TABLE 10 CONT.

	<u>Name</u>	<u>Department</u>	<u>Institution</u>	<u>Principal RF Project(s)</u>
26.	Frank Lichtkoppler	Ohio Coop. Ext. Ser.	OSU	713224, 714082
27.	F. J. Margraf	Zoology	OSU	713694
28.	Victor Mayer	Science-Math Education	OSU	712669, 713212, 714078
29.	William Mattox	Division of Water	Ohio Dept. Nat. Res.	711846
30.	Charles Moore	Civil Engineering	OSU	712962
31.	C. S. Munch	Biology	Hiram	714067, 714068
32.	Tony Peterle	Zoology	OSU	711572, 713076, 713694
33.	Jeffrey Reutter	Zoology/Nat. Res./CLEAR	OSU	712598, 712771, 713215, 714079
34.	Peter Richards	Biology	Heidelberg	712765
35.	Alan Rubin	Civil Engineering	OSU	712362
36.	Russell Scholl	Div. Wildlife	Ohio Dept. Nat. Res.	712332, 713207
37.	Thomas Seliga	Electrical Engineering	OSU	714076
38.	Fredrick Snyder	Ohio Coop. Ext. Ser.	OSU	713222, 714080
39.	Douglas Southgate	Agricultural Economics	OSU	713209, 714071
40.	Kenneth Stanley	Geology	OSU	713207
41.	Robert Stiefel	Civil Engineering	OSU	713078
42.	Thomas Stockdale	Natural Resources	OSU	714069
44.	Karlis Svanks	Chemical Engineering	OSU	711230
45.	Robert Sykes	Civil Engineering	OSU	712765
46.	Paul Thomas	Ohio Coop. Ext. Ser.	OSU	713216
47.	Cameron Thrane	Agricultural Economics	OSU	714072, 714064
48.	Vijay Varadan	Engineering Mechanics	OSU	714073
49.	Lester Walters	Geology	BGSU	712362
50.	Kenneth Wenner	Natural Resources	OSU	713207
51.	Richard Wright	History	BGSU	714067
52.	T. H. Wu	Civil Engineering	OSU	714067

TABLE 10 CONT.

Office and Technical Staff

	<u>Name</u>	<u>Title</u>	<u>Project</u>
1.	Gary Arico	Research Assistant	714065
2.	Helen Brohl	Research Assistant	714065
3.	Deborah Downey	Technical Typist	712765
4.	Daniel Fisher	Research Assistant	714065
5.	Gordon Keeler	Research Assistant	714065
6.	Julie Letterhos	Research Assistant	713050
7.	Michael McCullough	Research Associate	713209
8.	Ole Mols	Research Associate	713512
9.	Pamela Rusch	Technical Typist	711230
10.	Patricia Steane	Librarian	712765
11.	Ginger-lyn Summer	Technical Typist	713050

Graduate Students

	<u>Name</u>	<u>Status</u>	<u>Department</u>	<u>Institution</u>	<u>Project</u>
1.	Debra Ambrow	M.S.	Natural Resources	OSU	311007
2.	Kofi Apraaka	Ph.D.	Agricultural Economics	OSU	713210
3.	Timothy Bartish	M.S.	Environmental Biology	OSU	714065
4.	Helen Brohl	M.S.	Environmental Biology	OSU	714065
5.	Brian Burby	M.S.	Environmental Biology	OSU	711230
6.	Diane Cantrell	M.S.	Science-Math Education	OSU	713212
7.	Neva Carlson	Ph.D.	Environmental Biology	OSU	712765
8.	Kuo-Pin Chen	Ph.D.	Civil Engineering	OSU	712765
9.	Bruce Cotie	M.S.	Construction Technology	BGSU	713512
10.	Joel Davis	M.S.	Environmental Biology	OSU	GTA-Zoology

TABLE 10 CONT.

	<u>Name</u>	<u>Status</u>	<u>Department</u>	<u>Institution</u>	<u>Project</u>
11.	Wayne Davis	Ph.D.	Zoology	OSU	711230
12.	James Dingman	Ph.D.	Civil Engineering	OSU	713208
13.	Daniel Eikenberry	M.S.	Natural Resources	OSU	713211
14.	Carolyn Farnsworth	Ph.D.	Science-Math Education	OSU	713212
15.	Robert Gatewood	Ph.D.	Environmental Biology	OSU	GTA-Botany
16.	Theresa Gordon	M.S.	Zoology	OSU	GTA-Zoology
17.	Margaret Holland	M.S.	Journalism	OSU	713207
18.	Rosmarie Kelley	M.S.	Zoology	OSU	GTA-Zoology
19.	Daniel Lindsey	M.S.	Civil Engineering	OSU	711846
20.	Richard Lorenz	M.S.	Environmental Biology	OSU	713078
21.	Gail McConnon	M.S.	Natural Resources	OSU	713207
22.	John Mergo	Ph.D.	Zoology	OSU	712899
23.	John Mizera	Ph.D.	Environmental Biology	OSU	712765
24.	Norman Reichenbach	M.S.	Zoology	OSU	712334
25.	Audrey Rush	M.S.	Zoology	OSU	714065
26.	Nancy Sergi-Gott	M.S.	Natural Resources	OSU	Work Studies
27.	Stanley Stavinski	M.S.	Chemistry	OSU	713512
28.	Barbara Stiver	M.S.	Environmental Biology	OSU	GTA-Botany
29.	James Tomko	M.S.	Botany	OSU	GTA-Botany
30.	Ralph Vaga	M.S.	Zoology	OSU	714068
31.	Robert Van Evera	M.S.	Civil Engineering	OSU	711846
32.	Jane M. Winslow	M.S.	Agricultural Economics	OSU	713210
33.	Charles Withrow	Ph.D.	Zoology	OSU	GTA-Zoology

TABLE 10 CONT.

Undergraduate Students

	<u>Name</u>	<u>Department</u>	<u>Institution</u>	<u>Project</u>
1.	Erik Bugge	Natural Resources	OSU	713211
2.	Thomas Campana	Computer Sciences	OSU	712765
3.	Dreux Dorsey	Electrical Engineering	OSU	711230
4.	John Hageman	Natural Resources	OSU	714065
5.	Sandra Heileman	Biology	OSU	711230
6.	Suzanne Hessler	Statistics	OSU	713933
7.	Pamela Joseph	Zoology	OSU	714065
8.	Cheryl Kimerline	Natural Resources	OSU	713933
9.	Mark Monaco	Natural Resources	OSU	714065
10.	John Morrill	Zoology	OSU	713210
11.	Lou Ann Mucciarone	Accounting	OSU	713933
12.	Martha Schmidt	Natural Resources	OSU	713211
13.	Bryan Sieling	Natural Resources	OSU	713211
14.	William Snyder	Natural Resources	OSU	713933
15.	Dale Soltis	Botany	OSU	713933
16.	Karen Stiefel	Graphic Arts	Columbus Institute of Art	713207

TABLE 11
GRADUATE DEGREES AWARDED
1980-1981

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.

Doctor of Philosophy

<u>Graduate</u>	<u>Department</u>	<u>Advisor(s)</u>	<u>Research Topic</u>
Powell, Ross	Geology	K. O. Stanley	Sedimentary Facies associated with Glacial Deposition in Glacial Bay, Alaska

Master of Science

<u>Graduate</u>	<u>Department</u>	<u>Advisor(s)</u>	<u>Research Topic</u>
Burby, Brian G.	Environmental Biology	C. E. Herdendorf	Toxic Organic Substances in Fish from Lake Erie Tributary Mouths
McConnon, Gail	Natural Resources	K. A. Wenner	Environmental Factors Influencing the Location of Marinas in Western Lake Erie
Mizera, John	Natural Resources	C. E. Herdendorf	Distribution and Entrainment of Larval Fishes in Western and Central Lake Erie

TABLE 12
PRESENTATIONS
1980-1981

- Bedford, K. "Great Lakes Storm Surge Flood Forecasting." National Symposium on Stormwater Management in Coastal Areas, ASCE, Virginia Polytech., Blacksburg, VA. June 19-20, 1980.
- Bedford, Keith W. "Spectra Preservation Capabilities of Great Lakes Transport Models." International Association for Hydraulic Research Conference on Predictive Ability of Surface Water Flow and Transport Models, University of California, Berkeley. August 1980.
- Bedford, Keith W. "Coastal Erosion: An Engineering or Social Problem." ASCE Central Ohio Section Meetings. November 1980.
- Bedford, Keith W., Robert Brodkey, and Hedy Valizadeh. "A Review of Coherent Turbulent Structures and its Relation to Sediment Resuspension." International Association for Great Lakes Research, 24th Annual Conference, Columbus, Ohio. April 27-30, 1981.
- Bedford, Keith W., Robert M. Sykes, and Charles Libicki. "Advective Storm Water Transport and Quality Models for Great Lakes Tributaries." International Association for Great Lakes Research, 24th Conference, Columbus, Ohio. April 27-30, 1981.
- Breier, Donald L., Theresa Gordon, C. Lawrence Cooper, and Charles E. Herdendorf. "Growth and Mortality Studies of Larval Yellow Perch (Perca flavescens) from the Locust Point Area of Western Lake Erie." The Ohio Academy of Science Annual Meeting, College of Wooster, Wooster, Ohio. April 25, 1981.
- Burby, Brian G. and Mark D. Barnes. "Concentration and Uptake Rates of Organochlorine Contaminants in Fishes from the Mouths of Lake Erie Tributaries." 42nd Midwest Fish and Wildlife Conference, St. Paul, Minnesota. December 7-10, 1980.
- Burby, Brian G. and Mark D. Barnes. "Organochlorine Contaminant Concentrations and Uptake Rates in Fishes in Lake Erie Tributary Mouths." Twenty-First Ohio Fish and Wildlife Conference, Columbus, Ohio. February 20, 1981.
- Burby, Brian G., Mark D. Barnes and Charles E. Herdendorf. "Organochlorine Contaminant Concentrations in Fishes from Lake Erie Tributary Mouths." International Association of Great Lakes Research, 24th Annual Conference, Columbus, Ohio. April 27-30, 1981. (Poster presentation)
- Burby, Brian G., Mark D. Barnes and Charles E. Herdendorf. "Uptake Rates of Organochlorine Contaminants by Fishes in Lake Erie Tributary Mouths." International Association for Great Lakes Research, 24th Annual Conference, Columbus, Ohio. April 27-30, 1981.

- Carey, Walter E., Patricia B. Herdendorf, and Jeffrey M. Reutter. "Nearshore Primary Productivity in Southeastern Lake Erie, 1975-1979." International Association for Great Lakes Research, 24th Annual Conference, Columbus, Ohio. April 27-30, 1981.
- Carlson, Neva M. and David Rockwell. "Concentrations of Metals in Lake Erie Water and Sediments, 1978-1979." International Association for Great Lakes Research, 24th Annual Conference, Columbus, Ohio. April 27-30, 1981.
- Carter, Charles H. and Donald Guy Jr. "Annual and Seasonal Erosion Rates in the Wave Erosion Zone of Lake Erie Near Vermilion, Ohio." International Association for Great Lakes Research, 24th Conference, Columbus, Ohio. April 27-30, 1981.
- Crites, John L. "Parasites of Ohio Fishes." Ohio Outdoor Journalists Workshop. May 27, 1981.
- Crites, John L. and Reid Jilek. "Differentiation and Identification of the North American Species of Spinitectus Fourment, 1883, by Scanning Electron Microscopy." International Association for Great Lakes Research, 24th Conference, Columbus, Ohio. April 27-30, 1981. (Poster presentation)
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