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DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1102
HUTCHINSON AND WOLD—GEOLOGICAL AND GEOPHYSICAL
DATA SOURCES, LAKE ERIE
SHEET 1 OF 3

LAKE ERIE SEISMICS

Anderson, T.W., and Lewis, C.F.M., 1975, Acoustic profiling and sediment coring in Lake Ontario, Lake Erie and Georgian Bay: Geological Survey of Canada Paper 75-1, pt. A, p. 373-376.

Coakley, J.P., 1972, Nearshore sediment studies in western Lake Erie, in Proceedings Fifteenth Conference on Great Lakes Research, Madison, Wisc., 1972: International Association for Great Lakes Research, p. 335-343.

Hartley, B.F., 1961, Bottom sediments in the island area of Lake Erie: Ohio Dept. of Natural Resources, Division of Shore Erosion, Technical Report no. 9, 22 p.

Hobson, G.D., Berendsdorf, C.E., and Lewis, C.F.M., 1969, High resolution reflection seismic survey in Western Lake Erie, in Proceedings Twelfth Conference on Great Lakes Research, Ann Arbor, Mich., 1969: International Association for Great Lakes Research, p. 210-224.

Morgan, N.A., 1964, Geophysical studies in Lake Erie by shallow marine seismic methods: Toronto, Canada, Univ. of Toronto, unpublished Ph.D. thesis, 139p.

Rukavina, N.A., and St. Jacques, D.A., 1971, Lake Erie nearshore sediments, Port Stanley to Nanticoke Point, Ontario, in Proceedings Fourteenth Conference on Great Lakes Research, Toronto, Canada, 1971: International Association for Great Lakes Research, p. 387-393.

St. Jacques, D.A., and Rukavina, N.A., 1973, Lake Erie nearshore sediments, Nanticoke Point to Port Burwell, Ontario, in Proceedings Sixteenth Conference on Great Lakes Research, Toronto, Ohio, 1973: International Association for Great Lakes Research, p. 434-457.

Wall, N.R., 1968, A sub-bottom reflection survey in the Central Basin of Lake Erie: Geological Society of America Bulletin, v. 79, p. 91-106.

Williams, S.J., 1978, Written communication: unpublished high-resolution seismic data on file at Dept. of the Army, Coastal Engineering Research Center, Fort Belvoir, Va.

LAKE ERIE GENERAL

Anderson, D.T., 1964, Geophysical research on the Great Lakes, in Research Report no. 35: Ontario Department of Lands and Forests, Toronto, Canada, 39p.

Beeton, A.M., 1965, Eutrophication of the St. Lawrence Great Lakes: Limnology and Oceanography, v. 10, p. 240-254.

Benson, R.H., and MacDonald, R.D., 1963, Post glacial (Holocene) ostracodes from Lake Erie: Univ. of Kansas paleontological contributions, Arthropoda, Art. 4, p. 1-24.

Callender, E., 1968, Manganese: the discovery of a new mineral resource in the Great Lakes: Limnos, v. 1, p. 23-27.

Chapman, L.J., and Putnam, D.F., 1966, The physiography of southern Ontario: (2nd ed.), Toronto, Canada, Univ. of Toronto Press, 386p.

Coakley, 1976, The formation and evolution of Point Pelee, Western Lake Erie: Canadian Journal of Earth Sciences, v. 13, p. 136-144.

Dreimanis, A., Karrow, P.F., and Terasmae, J., 1972, Quaternary stratigraphy and geomorphology of the eastern Great Lakes region of southern Ontario: International Geological Congress, 24th, Montreal, Canada, Field Excursion A61, 79p.

Dreimanis, A., and Goldthwait, R.P., 1973, Wisconsin glaciation in the Huron, Erie and Ontario lobes: Geological Society America Memoir 136, p. 71-106

Dreimanis, A., and Karrow, P.F., 1972, Glacial history of the Great Lakes-St. Lawrence region, the classification of the Wisconsin(an) stage and its correlatives: International Geological Congress, 24th, Montreal, Canada, Section 12, p. 5-15.

Duane, D.B., 1967, Characteristics of the sediment load in the St. Charles River, in Proceedings Tenth Conference on Great Lakes Research, Toronto, Canada, 1967: International Association for Great Lakes Research, p. 115-132.

Edil, T.B., and Vallym, L.L., 1970, Shoreline erosion and landslides in the Great Lakes, an Advisory Report: Madison, Wisc., Univ. of Wisc. Sea Grant College.

Farrand, W.R., 1962, Postglacial uplift in North America: American Journal of Science, v. 260, p. 181-199.

Flaher, M., 1922, Geology of Kelleys Island, Ohio: Columbus, Ohio, Ohio State Univ., unpublished thesis, 60p.

Flint, R.F., 1971, Glacial and Quaternary geology: New York, N.Y., John Wiley, 892p.

Gilbert, G.K., 1893, Geology of West Sister Island: Geological Survey of Ohio, vol. 1, rev. 1, p. 339-345.

Gilbert, G.K., 1897, Recent earth movements in the Great Lakes region: U.S. Geological Survey Annual Report (1896-1897), p. 597-647.

Harss, W.E., Bukata, R.P., and Leul, K.K., 1976, Methods for recording Great Lakes shoreline change: Geoscience Canada, v. 3, p. 174-184.

Hough, J.L., 1953, Revision of the Stiptoning stage of the Great Lakes: Illinois Academy of Science Transactions, v. 46, p. 133-141.

Hough, J.L., 1958, Geology of the Great Lakes: Urbana, Ill., Univ. of Ill. Press, 313p.

Hough, J.L., 1963a, Geological and sedimentary characteristics of the freshwater environment, in Proceedings Sixth Conference on Great Lakes Research, Ann Arbor, Mich., 1963: Univ. of Mich. Great Lakes Research Division, Publication no. 10, p. 134-139.

Hough, J.L., 1963b, The prehistoric Great Lakes of North America: American Scientist, v. 51, p. 84-109.

Hough, J.L., 1966, Correlation of glacial lake stages in the Huron, Erie and Michigan basins: Journal of Geology, v. 74, p. 62-77.

Kindle, E.M., 1917, Geology of Pelee and adjacent Islands: Ontario Dept. Mines 42nd Annual Rept., pt. 7, p. 1-22; Ontario Dept. Mines 43th Annual Rept., pt. 7, p. 75-114.

Kunkle, G.R., 1963, Lake Tpatlanti, a probable Late Pleistocene low-lake stage in the Erie basin: Journal of Geology, v. 71, p. 72-75.

Leverett, F., and Taylor, F.B., 1915, The Pleistocene of Indiana and Michigan and the history of the Great Lakes: U.S. Geological Survey Monograph 53, 529 p.

Lewis, C.F.M., and Anderson, T.W., 1976, Basin deposits, a record of longterm coastal evolution (recession) in the Great Lakes?, in Workshop on Great Lakes Coastal Erosion and Sedimentation, Proceedings, Burlington, Canada, 1976: Canada Centre for Inland Waters, p. 109-115.

MacLean, W.F., 1961, Postglacial uplift in the Great Lakes region: Univ. of Mich. Great Lakes Research Division Special Report 14, 23a p.

MacLean, W.F., 1963, Modern pseudo-upwarping around Lake Erie, in Proceedings Sixth Conference on Great Lakes Research, Ann Arbor, Mich., 1963: Univ. of Mich. Great Lakes Research Division, Publication no. 10, p. 158-168.

Maher, L.J., Jr., 1963, Ephedra pollen in late glacial and postglacial sediments of the Great Lakes region and its probable significance [abs.]: Geological Society of America Special Paper 73, p. 202.

Mandelbaum, H., 1966, Sedimentation in the St. Clair River Delta, in Proceedings Ninth Conference on Great Lakes Research, Chicago, Ill., 1966: Univ. of Mich. Great Lakes Research Division, Publication no. 15, p. 192-202.

Mohr, R.B., 1951, The geology of the Base Islands: Columbus, Ohio, Ohio State Univ., unpublished M.S. thesis, 62p.

Norman, B.A., 1970, Late Wisconsin Ice marginal changes in the Erie Lobe area and comparison with late Weichselian sequence of Southern Scandinavia [abs.]: Geological Society America, Abstracts with Programs, v. 2, no. 7, p. 731-732.

Mortimer, C.H., 1971, Chemical exchanges between sediments and water in the Great Lakes-speculations on probable regulatory mechanisms: Limnology and Oceanography, v. 16, p. 387-404.

Mosley, E.L., 1905, Formation of Sandusky Bay and Cedar Point: Proceedings Ohio State Academy of Science, v. 4, p. 179-238.

Striegs, J.O., 1968, The distribution of iron in lake sediments: Transactions of the Wisconsin Academy of Science, Arts and Letters, v. 55, p. 153-184.

Twenhael, D.C., 1966, Runoff characteristics in the Great Lakes basins, in Proceedings Eleventh Conference on Great Lakes Research, Milwaukee, Wisc., 1968: International Association for Great Lakes Research, p. 326-359.

Pincus, H.J., 1954, Geology of the Lake Erie basin, with emphasis on contemporary processes [abs.], in Symposium on Geophysics and Geodesy: Bulletin of Geodesy, no. 31, p. 73-74.

Pincus, H.J., ed., 1962, Great Lakes basin- a symposium, Chicago, 1959: American Association for the Advancement of Science, Publication no. 71, 308p.

Pincus, H.J. and Garrison, G., 1950, Lake Erie geological research program [abs.]: Geological Society of America Bulletin, v. 61, p. 1571.

Powers, C.F., Jones, D.L., Handinger, P.C., and Ayers, J.C., 1960, Applitcations of data collected along shore to conditions in Lake Erie, in Proceedings Fifth Conference on Great Lakes Research, Ann Arbor, Mich., 1960: Univ. of Mich. Great Lakes Research Division, 78p.

Powers, C.F., and Robertson, A., 1966, The aging Great Lakes: Scientific American, v. 215, no. 5, p. 94-104.

Prest, V.K., 1970, Quaternary geology of Canada, in Douglas, R.J.W., ed., Geology and economic minerals of Canada: (5th ed.), Geological Survey of Canada Economic Geology Rept. 1, p. 675-764.

Quigley, R.M., and Twet, D.R., 1968, Stability of Lake Erie north shore bluffs, in Proceedings Eleventh Conference Great Lakes Research, Milwaukee, Wisc., 1968: International Association for Great Lakes Research, p. 230-238.

Raphael, C.N., Zeworski, E., Ojale, C.F., and Turner, D.S., 1974, Future dredging quantities in the Great Lakes: U.S. Environmental Protection Agency Ecological Research Series, EPA-660/4-74-029.

Shepard, F.P., 1937, Origin of the Great Lakes basins: Journal of Geology, v. 45, p. 76-88.

Sly, P.G., 1970, Submersible operations in Georgian Bay and Lake Erie, 1970 [abs.]: Geological Society of America, Abstracts with Programs, v. 2, no 7., p. 686.

Sly, P.G., 1973, Sediment processes in the Great Lakes, in Fluvial Processes and sedimentation, Proceedings Hydrological Symposium, Edmonton, Canada, 1973: Natural Resource Council of Canada Subcommittee on Hydrology, p. 464-482.

Sly, P.G., 1976, Lake Erie and its basin: Journal of the Fisheries Research Board of Canada, v. 33, p. 355-370.

Sly, P.G., and Lewis, C.F.M., 1972, The Great Lakes of Canada, Quaternary geology and limnology: International Geological Congress, 24th, Montreal, Canada, Field Excursion A43, 93p.

Sly, P.G., and Thomas, R.L., 1974, Review of geological research as it relates to an understanding of Great Lakes limnology: Journal of the Fisheries Research Board of Canada, v. 31, p. 795-823.

Smith, C.G., 1960, Diamonds in the Great Lakes, a geological enigma: Canadian Mining Journal, v. 81, no. 7, p. 51-52.

Stevenson, A.S., and Benninghoff, W.S., 1969, Late post-glacial rise of Lake Erie and changes in vegetation on the Nanmee Lake plain, in Proceedings Twelfth Conference Great Lakes Research, Ann Arbor, Mich., 1969: International Association for Great Lakes Research, p. 347-350.

Sutherland, J.C., 1968, Mineral-water equilibrium, Great Lakes+ alumino silicates: Syracuse, N.Y., Univ. of Syracuse, unpublished Ph.D. thesis, 104p.

Sutherland, J.C., 1969, Mineral stability and mineral-water equilibria, Great Lakes- alumino silicates [abs.]: Geological Society of America Special Paper 121, p. 379-380.

Sutherland, J.C., 1970, Silicates mineral stability and mineral equilibrium in the Great Lakes: Environmental Science and Technology, v. 4, no. 10, p. 826-833.

Taylor, F.B., 1929, The status of Lake Erie in present and recent land tilting: Michigan Academy of Science, Arts and Letters, v. 10, p. 251-260.

Terasmae, J., Karrow,P.F., and Dreimanis, A., 1972, Quaternary stratigraphy and geomorphology of the eastern Great Lakes region of southern Ontario: International Geological Congress, 24th, Montreal, Canada, Field Excursion A43, 75p.

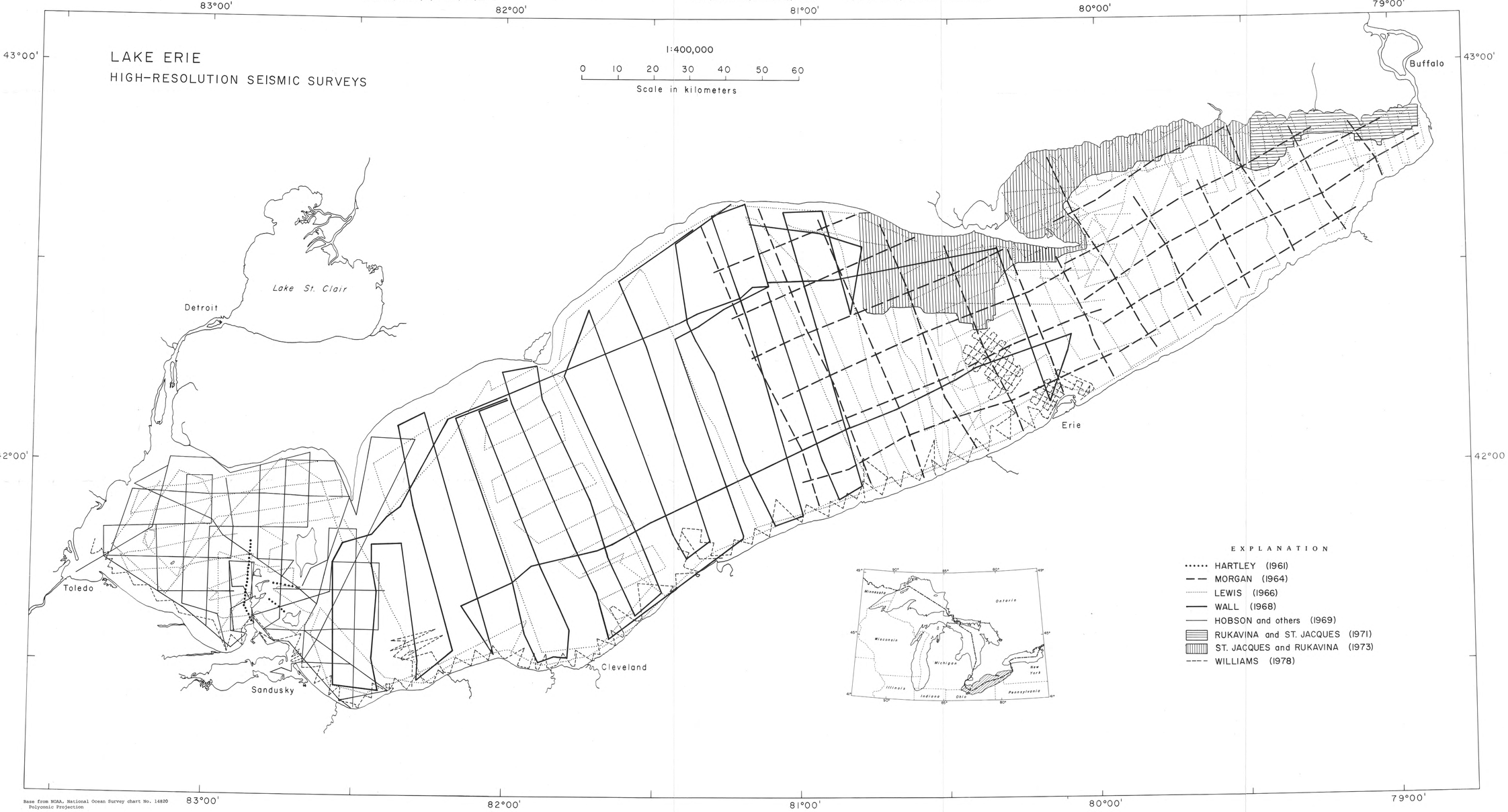
Thomas, R.L., 1974, The distribution and transport of mercury in the sediments of the Laurentian Great Lakes System: Proceedings of the International Congress on Transport of Pollutant Chemicals in Aquatic Ecosystems, Ottawa, Canada, p. 1-1-1-18.

Wahlgren, M.A., and Marshall, J.S., 1976, Distribution studies of Great Lakes sediments: in Proceedings of the Second International Conference Heated Discharges and Methods in environmental research, Columbia, Missouri, 1974: U.S Energy Research and Development Administration, p. 267-275.

Walcott, R.I., 1972, Late Quaternary vertical movements in eastern North America: quantitative evidence of glacio-isostatic rebound: Reviews of Geophysics and Space Physics, v. 10, p. 849-884.

Wright, H.E., Jr., 1964a, The classification of the Wisconsin glacial stage: Journal of Geology, v. 72, p. 635-637.

Wright, H.E., Jr., 1964b, Aspects of the early postglacial forest succession in the Great Lakes region: Ecology, v. 45, p. 439-448.



Base from NOAA, National Ocean Survey chart No. 14820
Polyconic Projection

A bibliography of various geological and geophysical data sources was compiled as part of an overall effort to evaluate the status of research on the Great Lakes. We hope that such a summary will be a catalyst for additional work and be an aid in planning future work. Our presentation has two forms: maps showing the locations of the different data types and a bibliography which lists the references from the maps and additional relevant papers. The charts shown in this map summarize the data sources for Lake Erie.

The physical task of compiling the vast amount of published papers and unpublished reports and theses necessarily limited our objectives: we included only studies dealing with the lake proper. No attempt was made to summarize the investigations over surrounding land areas or to list the innumerable beach studies conducted by investigators at various universities and State and Federal agencies. Nor did we include studies dealing only with the water column (limnological work).

A few comments should be made concerning our guidelines in compiling the bibliography. We included all references we found (excepting beach and limnological studies). We included abstracts only when no follow-up paper occurred; we included both theses and resulting publications. Publcally accessible data which have not been openfiled or published are referenced as a personal communication which shows the data when we obtained the data and the location where the data are available for public inspection.

We divided the bibliography into basic topics: seismic reflection surveys, magnetic surveys, gravity surveys and sampling surveys. Some references are listed under more than one section. We also created a "General" reference section which lists those papers that are relevant but do not fit the above categories. Finally, we found the following sources extremely useful in our compilation.

1. Existing bibliographic publications:

Publication	Source
Great Lakes Research Checklist	Great Lakes Commission 2200 Bonisteall Blvd. Ann Arbor, MI. 48105
Publication of the International Association of Great Lakes Research	Dr. Merv. D. Palmer Secretary-Treas. c/o Water Res. Br. Ontario Ministry of the Envir. 135 St. Clair Ave, West Toronto, Ontario M4V 1P5 Canada
Bibliography of Current Research on Geology of the Lake Superior Region	Dr. M.M. Kehlenbeck Dept of Geology Lakehead University Thunder Bay, Ontario P7B 5E1 Canada
Bibliography of Published Geologic Papers and Unpublished Theses of the Great Lakes and their drainage basins, 1950 thru 1958	Zumberge, J.H., 1960, in Proceedings 3rd Conference on Great Lakes Research Ann Arbor, Michigan, 1960 Univ. of Mich, Publication #4,p.51-59
Microfilm of Theses: Great Lakes Research Checklist	University Microfilms P.O. Box 1346 Ann Arbor, MI. 48106

2. Journals and Proceedings:

Journal of Great Lakes Research (Volume 1, published in 1975).

Proceedings of the Conference on Great Lakes Research (21 conferences held thru 1978)

Proceedings of Annual Meeting of the Institute on Lake Superior Geology (24 meetings held thru 1978).

3. Navigation and bathymetry chart indices:

Nautical Chart Catalog 4 (U.S. Great Lakes and adjacent waterways).	Available from: NOAA, Distribution Division (N44) National Ocean Survey Riverdale, MD. 20840
Informaation Bulletin 1 (Canadian Nautical Charts, Great Lakes and adjacent waterways).	Available from: Canadian Hydrographic Service Ottawa, Ontario Dept. of the Environment 1675 Russell Rd. P.O. Box 8080 Ottawa, Ontario K1G 3H6 Canada

4. Principal Organizations involved in Great Lakes Geological Studies:

Argonne National Laboratory 9700 South Cass Avenue Argonne, Ill. 60439	Department of the Army Coastal Engineering Research Center Kingman Building Fort Belvoir, VA. 22060
Canada Center for Inland waters 867 Lakeshore Rd. P.O. Box 5050 Burlington, Ontario L7R 4A6	Great Lakes Research Division University of Michigan Ann Arbor, MI. 48106

We have several explanatory comments for the charts. The data have been grouped together according to the type of survey: seismic reflection, gravity, magnetic or sampling. For sampling where the data are dense, we further divided the maps into a "Generalized" and a "Specialized" map. The "Generalized Sampling Surveys" map shows those studies that either sampled throughout the lake or dealt with the geological history of the lake. The "Specialized Sampling Surveys" map shows studies either restricted geographically to one part of the lake or highly specialized in analysis (e.g. X-ray stratigraphy, element analysis or manganese nodule occurrence). The large-scale seismic maps are compiled on standard polyconic projections which overlay either National Ocean Survey charts or Canadian Hydrographic Service bathymetry maps. The small scale maps are half-scale reductions of the same projection.

In some cases, more than one author has published studies of parts or all of the same survey. To accomodate this on the legends, we listed the earliest reference which describes the total survey first and subsequent references alphabetically. We then organized the legends chronologically by the earliest reference. In papers dealing with sampling, it was not always clear whether some samples came from the same survey, or from identical locations in later surveys. These have been grouped together. The legends do not reference theses unless follow-up papers were not published. For heavy density sampling surveys, we show the study area as a shaded portion on the chart.

We caution the reader that the charts we show are not scrupulously accurate. The data were plotted as carefully as possible, but location errors arising from enlarging small scale maps in journals are inevitably present. Where we could obtain large scale maps from authors, these were utilized and referenced as a personal communication.

We feel that we have listed the bulk of the publicly available data but we suspect other sources exist that were not readily available. For instance, it is apparent in some of the reports that additional cores and bottom samples (not shown on our charts) have been collected by the Great Lakes Research Division of the University of Michigan, Argonne National Laboratory, and Canada Center for Inland Waters. Many M.S. theses are not always microfilmed at University Microfilms. Some published reports are now out of print. We hope that, if additional public data are available, investigators will let us know the purpose of the studies, type of data, location, publications, and availability of these data, so that we might update this summary. If any errors are found in our compilation we would like to know about these as well.

Lake Erie Data Summary

The data summarized below correspond to each chart and are a first-order attempt to show the reader more specifically what types of data were collected in each survey. The references are grouped together as on the maps. An asterik (*) before the reference indicates that it appears elsewhere in the same table with a different type of data. Where authors have used data from part of a survey, the full quantity is listed next to the first reference and the amount each author (s) used is listed in parentheses. For example, if a piston core survey shows the quantity 5 (3), that means five locations are shown on the map but this author (s) used only 3.

I. Seismic Reflection surveys

Seismic data collected on Lake Erie have generally been from high-resolution systems, (3.5 khz or higher frequency). Sound sources include the Uniboom ** and Boomer**. Over 9000 km of high-resolution data and 10,500 km of fathometer data have been collected. In addition, the velocity of sound has been measured in Lake Erie sediments (Morgan, 1964).

Lake Erie High-Resolution Seismic Surveys-Chart Summary		
Type of Data	Quantity-km	Reference
Fathometer	35	Hartley (1961)
Hydrosonde/Fathometer	1400 ?	Morgan (1964)
Fathometer	4000-5000 ?	Lewis (1966)
Boomer**	2000	Wall (1968)
Boomer** and Fathometer	1300	Hobson and others (1969)
Transit sonar and Fathometer	425	Rukavina & St. Jacques (1971)
Fathometer	2000	St. Jacques & Rukavina (1973)
Fathometer 3.5 KHz and Uniboom	860	Williams (1978)

II. Magnetic Surveys

Magnetic data collected over Lake Erie include 2300 km of ship towed proton precession magnetometer measurements and 3 piston cores on which paleomagnetic measurements were made. The location of aeromagnetic data over the Lake (Meyers and Voltzmer, 1978) has not been published to date.

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Lake Erie Magnetics Surveys-Chart Summary		
Type of Data	Quantity - km	Reference
Ship towed proton precession magnetometer	2300	Peter and Wall (1961)
Paleomagnetism (Piston cores up to 26 m long)	3	Creer and others (1976)

III. Gravity Surveys

Forty-two Bottom Gravimeter stations are the only published gravity data known from the Lake Erie region.

Gravity Surveys- Chart Summary		
Type of Data	Quantity	Reference
Bottom Gravimeter	42	Canada, Dept. of Energy, Mines and Resources (1971)

IV. Sampling Surveys

Lake Erie is unique to the Great Lakes in being the only lake where natural gas is commercially drilled. At least 283 holes (as deep as 6.4 km) have been drilled (Donnan, 1961) and approximately 500 wells are shown on the Coast and Geodetic Chart of the Lake. Approximately 850 surface sample sites, 50 (published) gravity core locations, about 400 piston core locations and over 200 shoreline observations have been included on the Generalized Sampling Surveys Chart. The Specialized Sampling Surveys Chart includes almost 1700 surface samples, 325 shallow (e.g. gravity) cores, 107 vibratory cores, 50 piston cores and 24 shoreline samples.

Generalized Sampling Surveys - Chart Summary		
Type of Data	Quantity	Reference
Drill Holes (up to 6.4 km)	283	Donnan (1961)
Surface samples Piston cores Shoreline	~45 ~400 ~60	Lewis (1966)
Piston cores (up to 9 m)	3	Lewis and others (1966)
Piston cores	6	Lewis (1969)
Surface samples Shoreline samples	98 46	Rukavina & St. Jacques (1971)
Surface samples	20	Schelske and Roth (1973)
Surface samples Shoreline samples	425 125	St. Jacques and Rukavina (1973)
Surface samples Gravity cores Surface samples	275 (275) 50 (35) (259) (48)	Thomas and others (1976) Dell and Booth Kemp and others (1977) Thomas and Jaquet (1976) Williams and others (1976a)

Specialized Sampling Surveys-Chart Summary		
Type of Data	Quantity	Reference
Surface samples	14	Cuthbert (1964)
Subsurface borings	71	Ross (1950)
Subsurface borings	99	Hartley (1961)
Surface samples Subsurface borings Surface samples	824 44 1303	Herdendorf (1963) Herdendorf & Braidech (1972)
Surface samples Gravity cores Piston cores (up to 14m)	28 (28) (5) (12) 4	Kemp and Lewis (1968) *Kemp (1969) *Kemp (1969) *Kemp (1969)
Surface samples Gravity cores	22 20	Skoch and Dritt (1969) Skoch and Turk (1972)
Surface samples Hand driven cores Jetting cores (up to 8m)	10 6 32	Benson (1971)
Surface samples	120 ?	Coakley (1972)
Gravity cores	3	Kemp and others (1972)
Hand-driven	63 5 3 3	Walters and others (1972) Kroeck and Walters (1972) Walters and others (1974a) *Walters and Walters (1974)
Gravity cores Piston cores (up to 17m)	30 3	Lewis and others (1973)
Surface samples	74	Stitz (1973)
Gravity cores	70 (30) (10)	Walters (1973) *Walters and Walters (1974)
Gravity cores	6 (6) (5) (6) (5) (3) (6)	Kemp and others (1974) Anderson (1974) *Kemp and Dell (1975a)1976) Kemp and Thomas (1976) *Williams and Meyer (1976) *Williams and others (1976b)
Gravity cores	8	Walters and others (1976b)
Surface samples Piston cores (less than 1m.)	60 9	Fitchko and Hutchinson (1975)
Piston core (24m)	1	*Fritz and others (1975)
Shoreline samples	12 ? ?	*Kemp and Dell (1975, 1976) *Kemp and others (1976)
Gravity cores	? 10	*Williams and others (1976b) *Kemp and others (1976)
Vibratory cores (up to 6m)	107	Williams (1978)

* Listed more than once

Data Review

Research on Lake Erie, like the other Great Lakes, has been extensive, but large gaps in our understanding of the lake's processes and history still exist. The bulk of the literature dealing with the lake focuses on its uppermost unconsolidated lacustrine sediments through the use of the extensive sampling and fathometer/high resolution programs. Sedimentologic properties and Recent lake history are therefore known with considerable detail. The deeper glacial-glaciolacustrine section remains less well understood. Few of the piston cores penetrate into or theough till. Bedrock elevation maps have been constructed for the western and central parts of the lake. We know of no such map that exists for the eastern portion of the lake.

Unlike the other Great Lakes, the Paleozoic section which underlies Lake Erie is quite well known. Gas is commercially produced from these strata and wells (up to 6 km deep) have been drilled in exploration. These wells almost entirely lie within the Canadian half of the lake.

We feel a major gap exists in our magnetic and gravimetric coverage of Lake Erie. The western basin of the lake shows no magnetic or gravity coverage. The eastern basin has very few magnetic track lines. Consequently, our knowledge about the Precambrian crystalline basement rocks remains limited. Similarly, we have little indication of what the deeper crustal structure may be, from magnetic, gravity or seismic refration methods. The only deep seismic reflection information is from proprietary multichannel data. Lake Erie is, however, one of two Great Lakes with a measured paleomagnetic stratigraphy.

One notable point about Lake Erie is the abundance of beach and near shore erosion studies. These were not included in this compilation, and we refer interested investigators to the U. S. Corps of Engineers (Beach Erosion Board), the Ohio Department of Natural Resources, and numerous unpublished theses from the Ohio Universities and Colleges, for more information.

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