

LAKE HURON BEDROCK

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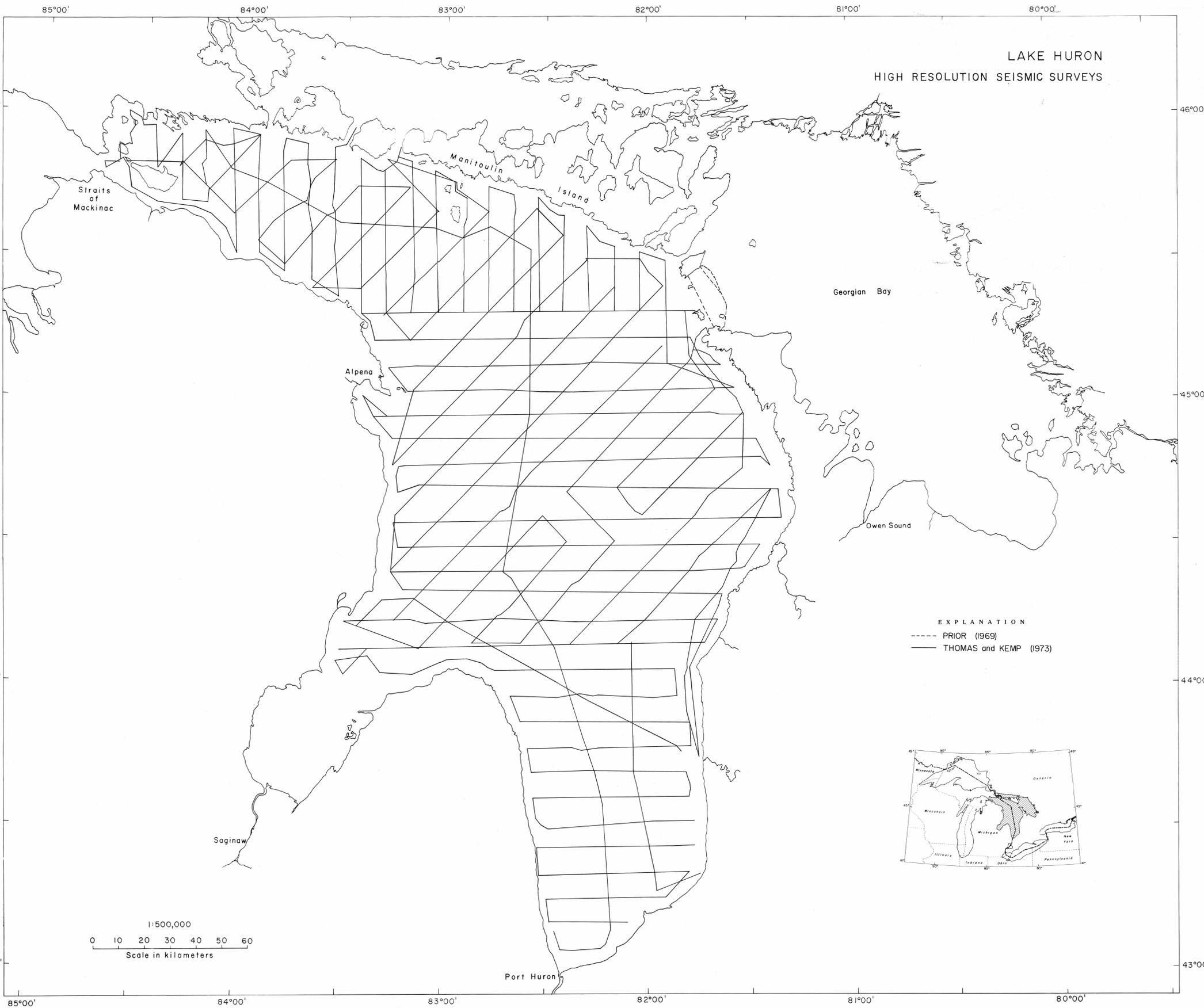
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LAKE HURON
HIGH RESOLUTION SEISMIC SURVEYS

EXPLANATION
--- PRIOR (1969)
— THOMAS and KEMP (1973)



Base from NOAA, National Ocean Survey chart No. 14880
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 location 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 Huron.

The physical task of compiling the vast amount of published papers and available reports and maps necessarily limited our objectives to a clean and concise listing with the best papers. In attempt we made to summarize the investigation over surrounding land areas or to list the immediate beach studies conducted by investigators at various universities and state and federal agencies. We did not include studies dealing only with the water column (limnology work).

A few comments should be made concerning our practices in compiling the bibliography. We included abstracts only when no full-length paper occurred; we included both theses and resulting publications. Partially accessible data which have not been published or published as references 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 included the bibliography into basic topics: seismic reflection surveys, magnetic surveys, gravity surveys, and sounding 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.

- Existing and proposed applications:**
 - Source: Great Lakes Commission, 220 Adelaide Drive, Ann Arbor, MI 48105.
 - Department of the Interior, Geological Survey, 1225 North Dearborn Street, Detroit, Michigan 48201.
 - Department of the Interior, Geological Survey, 1225 North Dearborn Street, Detroit, Michigan 48201.
 - Department of the Interior, Geological Survey, 1225 North Dearborn Street, Detroit, Michigan 48201.
- Historiography of Published Research on Geology of the Lake Superior Region:**
 - Source: Department of the Interior, Geological Survey, 1225 North Dearborn Street, Detroit, Michigan 48201.
- Historiography of Published Research on Geology of the Great Lakes and Their Drainage Basins 1950-1969:**
 - Source: Department of the Interior, Geological Survey, 1225 North Dearborn Street, Detroit, Michigan 48201.
- Historiography of Published Research on Geology of the Great Lakes Region:**
 - Source: Department of the Interior, Geological Survey, 1225 North Dearborn Street, Detroit, Michigan 48201.
- Historiography of Published Research on Geology of the Great Lakes Region:**
 - Source: Department of the Interior, Geological Survey, 1225 North Dearborn Street, Detroit, Michigan 48201.

1. Principal Organizations Involved in Great Lakes Geological Studies:

Geological Survey of Canada, 1225 North Dearborn Street, Detroit, Michigan 48201.

Department of the Interior, Geological Survey, 1225 North Dearborn Street, Detroit, Michigan 48201.

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in one of the reports that additional cores and bottom samples took over our charts) have been collected by the Great Lakes Research Division of the University of Michigan, Argonne National Laboratory, and Canada Centre for Inland Waters.

Some published reports are not out of print. We hope that, if additional basic data are available, investigators will list 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 them as well.

High Resolution Seismic Surveys - Chart Summary

Type of Data	Quantity	Reference
3-D seismic data	63	Prior (1969)
2-D seismic data	7000	Thomas & Kemp (1973)

Seismic Surveys - Chart Summary

Type of Data	Quantity	Reference
Bottom Gravimeter	~120 stations	Canada Department of Energy, Mines and Technical Surveys (1973)
Bottom Gravimeter	30 stations	Canada Department of Energy, Mines and Technical Surveys (1973)
Strapdown Gravimeter	~1000 in progress over 3 in transit	WGS (1973) and others (1973)

Magnetic Surveys - Chart Summary

Type of Data	Quantity	Reference
Ship-borne magnetometer	6,400	Wolfe (1968)
Aeromagnetic	10,000	O'Hare (1967)

2. Sampling Surveys: The Sampling Surveys Chart shows about 1500 sampling stations with a mixture of surface grabs, dredges and cores up to 3 meters in length.

Sampling Surveys - Chart Summary

Type of Data	Quantity	Reference
Surface Samples	623 (274)	Leafy and others (1961) and others (1965)
Surface Cores	76	Hovis (1962)
Surface Samples	61	Wood (1966)
Surface Samples	35	Anderson & Taraman (1966)
Surface Cores	1	Thomas & Kemp (1969)
Surface Samples	201	Sty (1969)
Surface Cores	13	Sutherland (1970)
Surface Cores	3 (3)	and others (1971)
Surface Samples	15	and others (1972)
Surface Samples	25	and others (1973)
Surface Samples	35 (130)	Thomas (1974)
Surface Samples	190	Thomas (1975)
Surface Samples	16	Fitchner & Hutchinson (1975)
Surface Cores	1	and others (1977)
Surface Cores	10	and others (1977)
Surface Cores	1	Kemp & Harper (1977)

Data Summary: The southeastern part of Lake Huron reflects the northeastern flank of the Michigan Basin. It also overthrusts the Precambrian shield to the northwest and is cut by the western part of the Greenlee River.

Lake Huron has had the least amount of geological and geophysical work done of any of the Great Lakes. The publicly available seismic data are limited to echo sounding data and a few kilometers of air gun data. Our knowledge about the configuration of the basement, glaciolacustrine, and glacial sediments is consequently small. There has been some proprietary CDP seismic data collected which provide limited information on the underlying Paleozoic and Precambrian rocks but these data are not publicly available. The gravity and magnetic data coverage is adequate for understanding the underlying geology on a regional basis. There are cores longer than 3 m available, the geologic information is best for understanding the surficial sediments on a regional basis only.

Good high resolution seismic studies of the unconsolidated sediments are needed along with concurrent deeper sounding studies. Along with seismic (multi-channel) CDP reflection studies and seismic refraction studies could aid in the deeper structures beneath the Lake.

LAKE HURON GEOLOGICAL AND GEOPHYSICAL DATA SOURCES

By
Richard J. Wold and Deborah R. Hutchinson