



Base From NOAA, National Ocean Survey Chart No. 14960
Polyconic projection

A series of seismic-reflection surveys was run in Lake Superior from 1965 through 1967. A total of 8450 kilometers (km) of seismic-reflection data were obtained, and several energy sources were used:

- 1965 - 5-kilowatt Bommer*
- 1966 - 5-to 7-kilowatt sparker
- 1967 - 5-to 10-cubic inch air gun.

The 1965 data were reported by Wold and Ostensio (1966). The data obtained in the 1966 and 1967 surveys were used to construct this bedrock topography map.

The first step in making the map was to interpret the bedrock surface on the profiles. Once this was done, an isochron map of the material above bedrock (unconsolidated till and lake sediments) was prepared. The time units on the isochron map were then converted to thicknesses by using a velocity of 1.524 km/sec (6000 ft/s). This velocity was based on a hole drilled to bedrock in the lake in 1961 (Zumberge and Gast, 1961) between Isle Royale and the Keweenaw Peninsula. The resulting sediment isopach map was overlaid on the Canadian Hydrographic Service Chart 885 (Bathymetric Chart of Lake Superior), and the two surfaces were combined to produce the bedrock topography map of the lake. This map is referenced to a lake level of 182.88 meters (m) (600.0 ft) above the International Great Lakes Datum of 1955.

The seismic-reflection surveys were carried out aboard the U.S. Coast Guard tug NAUGATUCK based in Sault Ste. Marie, Mich. Navigation for the surveys relied on radar fixes and dead reckoning; therefore the accuracy was mainly dependent upon length of time between known points. In the worst case (middle of the lake) the navigation could have been in error by approximately 7.4 km.

Tracings of interpreted seismic profiles are shown where the tracklines cross major topographic features.

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REFERENCES CITED

- Wold, R.J., and Ostensio, N.A., 1966, Aeromagnetic, gravity and subbottom profiling studies in western Lake Superior, in Steinhardt, J.S., and Smith, T.J., eds., The earth beneath the continents. American Geophysical Union, Geophysical Monograph 10, p. 86-94.
- Zumberge, J.H., and Gast, P., 1961, Geological investigations in Lake Superior. Geotitles, v. 6, no. 4, p. 10-13.

