

DIVISION OF SHORE EROSION

James A. Swartzmiller



Figure 10.1. F.O. "Barney" Kugel, first Chief of the Division of Shore Erosion, 1949-1960.



Figure 10.2. John R. Hyland, second Chief of the Division of Shore Erosion, 1960-1961.

THE EARLY YEARS

The Division was established in the Ohio Department of Natural Resources on 11 August 1949 with the enactment of Amended Senate Bill 13. The Division was created as the Division of Beach Erosion, and the name was changed in September 1951 to the Division of Shore Erosion. Responsibilities of the Division came from a section of the Department of Public Works. Substitute Senate Bill 236 enacted on 1 May 1935 had created a Beach Erosion Board within that department, and duties and responsibilities were expanded by Substitute Senate Bill 34 enacted on 28 June 1945.

The first Chief of the Division was F.O. "Barney" Kugel (Fig. 10.1), who transferred from the Department of Public Works to the newly created ODNR. John R. Hyland (Fig. 10.2) became Assistant Chief of the Division in 1955 and Chief on 1 March 1960 when Barney was appointed Chief Engineer by Director Eagon. Also in 1960, James A. Swartzmiller was appointed Assistant Chief of the Division. John Hyland remained as Chief until the

Division was abolished on 2 November 1961.

The Division's offices were located on the eleventh floor of the State Office (Ohio Departments) Building at 65 South Front Street in downtown Columbus. A Lake Erie Office was established in Sandusky in 1953 and was located in the Ohio Fisheries Building owned by the Division of Wildlife.

SHORE EROSION PROJECTS

The primary function of the Division when first created in 1949 was to assist construction of projects to provide shore protection along the Lake Erie shoreline (see Plate 10), a continuation of the work previously done by the Lake Erie Section of the Department of Public Works. In the early years, the Division could assist with construction only for the protection of publicly owned lands. The Division could pay up to two-thirds of the cost of shore protection from funds appropriated for such purposes by the General Assembly. House Bill 433, as passed by the 101st General Assembly, became effective on 30 October 1955 and expanded the assistance program to allow

the Division also to participate in the protection of private property along Lake Erie. Participation in the protection of private property was limited to one-third the cost. Many projects were constructed for the protection of public property. However, no projects were constructed for private property protection. The procedures to be followed, including public bidding, and the requirement that erosion protection be substantial, made the two-thirds costs for the private owners considerably more expensive than they could afford. Usually the private owners would construct protection in stages according to their ability to pay. This type of protection was not very effective and in most cases was a waste of the property owners' money.

House Bill 433 also included requirements that any shore protection constructed along Lake Erie must be done through a permit issued by the Division of Shore Erosion. This legislation was an attempt to control the type of erosion protection being constructed and also to bring some uniformity in the type of protection provided. The permit requirement was only for erosion protection facilities. Many other types of projects were constructed along the lake which seriously affected erosion processes in which the Division had no control; therefore, this permit program never really materialized into a beneficial program. The erosion permits were also a duplication of permits required by the United States Army Corps of Engineers. The Corps permits were required for any type of construction along the lake, and this permitting program was considerably more effective.

The Erosion Act of 1955 (House Bill 77), as passed by the 101st General Assembly, also expanded a function of the Division regarding the extraction of minerals from Lake

Erie. Prior to 1955, the Division controlled the removal of sand and gravel from designated and approved dredging areas in the lake. Sand and gravel was removed for commercial purposes and the Division was paid a royalty of 15 cents per cubic yard. The Erosion Act expanded this program to allow the removal of gas, oil, and other minerals from and under the bed of the lake.

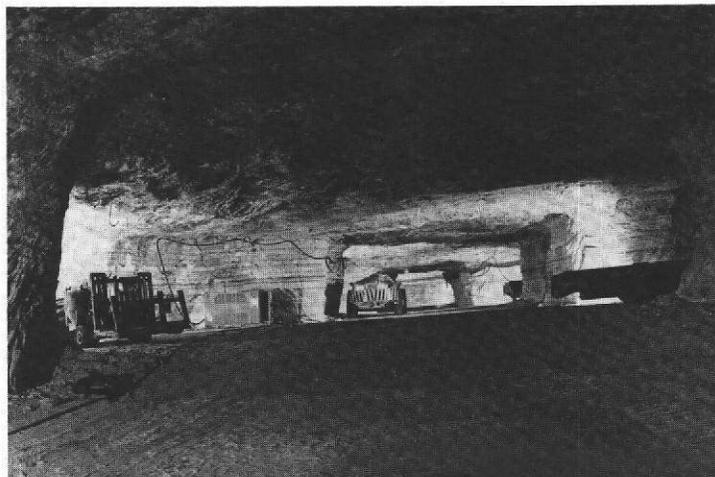
After enactment of the legislation, salt mines were established beneath Lake Erie at Fairport Harbor and Cleveland through a lease arrangement with the Division. Royalties received from the salt removed and from the sand removal operation were used for erosion protection construction. The salt mine at Fairport Harbor was opened in 1956 and extends to a depth of 2025 feet. The salt seam is 22 feet thick and the mining technique used was the "room and pillar" concept. Full production of the mine in the late 1960's reached 300 to 500 tons per hour. The Cleveland mine was started in 1957 and experienced considerable difficulty with ground-water problems. It was necessary to grout an 88-foot-thick seam of sandstone to eliminate water problems. The main shaft for the Cleveland mine is 1816 feet deep and the mine was opened for production in 1961 (Fig. 10.3).

The enactment of the Erosion Act also generated much interest in drilling for oil and gas in Lake Erie. This program, however, never really became established due to environmental concerns regarding possible spills and pollution of the lake waters.

With the funds derived from royalties for sand and gravel dredging within the lake and from salt removed from under the lake along with funds appropriated by the

General Assembly, a number of shore erosion construction projects were completed. Most of these projects were done in cooperation with local political entities. A total of 23 projects were completed from 1959 to 1961 at a total cost of \$905,100. Nine of these projects were in Ottawa County (Fig. 10.4), four in Erie

Figure 10.3. Room and pillar mining is used in a salt mine beneath Lake Erie at Cleveland. Photo courtesy of International Salt Company and the Division of Geological Survey.



1949-1989

County, four in Lake County, two in Lorain County, two in Cuyahoga County (Fig. 10.5), and two in Ashtabula County. Projects constructed in cooperation with local entities are to be maintained by the local entity, an administrative arrangement designed to assure that continued protection would remain in place.

WATERWAYS SAFETY PROGRAMS

The 101st General Assembly also created the Waterways Safety Commission within the Division of Shore Erosion through the Erosion Act which became effective 30 September 1955. The Commission was created:

- 1) To advise and make recommendations to the Chief of the Division concerning plans and programs for the construction, maintenance, repair, and operation of refuge harbors and other projects for the harboring, docking, and storage of light-draft (recreational) vessels in accordance with provisions of the Act (Fig. 10.6).
- 2) To advise and make recommendations to the Chief as to methods of coordinating the shore erosion projects of the Division with the refuge of recreational vessel harbor projects.
- 3) To consider and make recommendations upon any matter which was brought to its attention.
- 4) To submit to the Governor biennially recommendations for amendments to the laws relative to refuge and recreational harbor projects.

The Commission membership consisted of the ODNR Director and four members appointed by the Governor with the consent of the Senate. The Chief of Division of Shore Erosion served as Secretary. The first members of the Commission were Director Marion; A.F. Wakefield, Vermilion; Henry J. Watterson, Rocky River; Dr. Byron Johnson, Ashtabula; and Dr. K.D. Amsbary, Pomeroy.

Along with the Commission, the General Assembly created a Waterways Safety Fund which was to be used for acquiring, constructing, and maintaining refuge and recreational vessel harbor projects, channels, and facilities for vessels in the navigable waters lying within the boundaries



Figure 10.4. East Harbor State Park on Lake Erie received continued attention from the Division of Shore Erosion. These offshore breakwaters were installed in the early 1980's and have provided significant protection for a portion of this popular swimming beach in Ottawa County. Photo courtesy of Aerocon Photogrammetric Surveys, Inc.

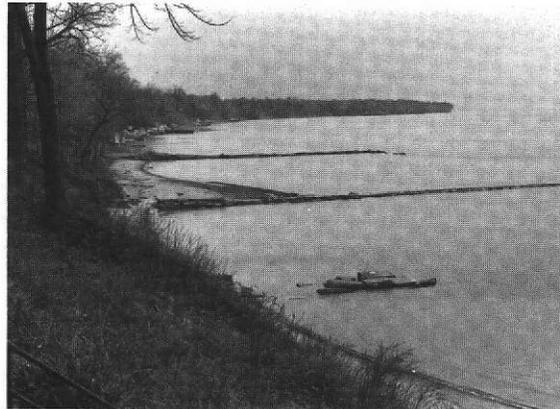


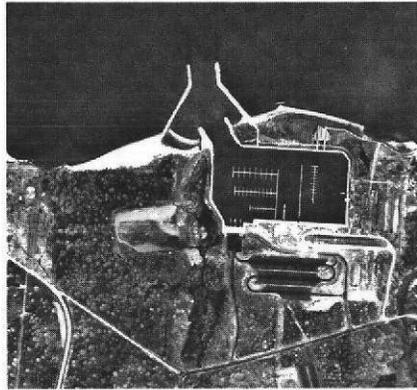
Figure 10.5. Stone groins were installed in 1950 to maintain a sand beach on Lake Erie at Huntington Reservation in Bay Village, Cuyahoga County.

of Ohio which are under the jurisdiction of the federal government. The Liquid Fuel Tax Law was also amended to the extent that the Marine Gasoline Fuel Tax, which was previously refunded upon application to owners of pleasure craft, would be deposited to the credit of the Waterways Safety Fund. In subsequent years since the original act in 1955, the Marine Fuel Tax has been increased and has been the source of funds for a heavy construction program for boating improvements by the Division of Watercraft within the Department.

LAKE ERIE RESEARCH

Soon after the Division was created, a geological research program on Lake Erie was developed. It was started on a part-time basis in 1950, and Dr. Howard J. Pincus of the Geology Department of The Ohio State University was in charge. From 1950 to 1953, the program was staffed by Dr. Pincus and Ohio State University students, with part-time technical and clerical assistance. The program operated full-time during summer field seasons. In 1953, the research program was expanded with the establishment of the year-round office in Sandusky which was staffed with a full-time geologist and hydrographer. James L. Verber was in charge of this office from 1953 to 1958. In 1959 until 1961, Robert P. Hartley administered the office. Dr. Pincus resigned from the program in 1960.

Figure 10.6. Aerial view of the harbor on Lake Erie at Geneva State Park in Ashtabula County. The jetties at the mouth of the harbor have been designed to provide safe entrance for the recreational boater, even during a severe storm, in accordance with provisions of the Erosion Act of 1955. ODNR-RSP photo. April 1989.



The types of research conducted included the complete mapping of the Ohio Lake Erie shoreline with emphasis on engineering geology, mapping of bottom deposits, study of bluff recession, subsurface data along the shoreline, bedrock geology under the lake, wave refraction diagrams, effects of ice on the shoreline and on structures in the lake, and studies on water levels, currents, wind, and water temperatures.

The main emphasis of this research in the early years was placed on identifying and understanding shore processes along the Lake Erie shoreline, particularly on the causes and effects of shore erosion. In later years, this research was expanded to achieve a better understanding of lake processes, and to contribute information on natural resources lying within the state's boundaries.

A significant result of this early research was the establishment of a baseline along 262 miles of the Lake Erie shoreline, with both horizontal and vertical control points correlated with existing United States Geological Survey bench marks and triangulation stations. The baseline was used to record shoreline topography a considerable distance shoreward from the water's edge and to perform a hydrographic survey approximately 2000 feet offshore. These data were used as a basis to make comparisons resulting in an accurate determination of erosion or accretion rates anywhere along the shoreline.

The results of this early research also proved invaluable in preparing and publishing a shore erosion master plan for Lake Erie in cooperation with the Corps of Engineers. This master plan was published in twelve reports

and covered the lake shore from the Michigan-Ohio line to the Ohio-Pennsylvania line. The reports are detailed and include discussions of the geology and coastal characteristics, beach and bluff composition, comparative profiles, investigations of existing protective structures and shoreline changes, and recommended effective and economical methods of preventing erosion. These reports have been used extensively by private property owners living along the lake and as a basis for planning and designing many erosion protection projects. The extensive research performed by the Division throughout the 1950's has been recorded in published and unpublished documents located in the Division of Geological Survey and is still used extensively to understand better the lake and its processes.

ABOLISHMENT OF THE DIVISION

In 1961, the Division of Shore Erosion was abolished by the 104th General Assembly upon enactment of Amended House Bill 379 which became effective on 2 November 1961. The functions and programs of the Division were transferred to other departmental units. The shore erosion cooperative construction program and the boating improvements construction program, along with the issuing of shore erosion permits, were transferred to the newly created Office of Chief Engineer. The Waterways Safety Commission, Waterways Safety Fund, and related duties and functions with this program were transferred to the Division of Watercraft. The responsibilities for Lake Erie research and mineral extraction permits were transferred to the Division of Geological Survey. All funding, equipment, supplies, and personnel were transferred with the respective programs, and the Division ceased to exist.

REFERENCES

Division of Shore Erosion Annual Reports. 1951-1960. Ohio Department of Natural Resources.

Herdendorf, Charles E. 1979. The Lake Erie geological research program, 1950-1970. Technical Report 252. Center for Lake Erie Area Research, Ohio State University, Columbus, 67pp.