

## CHAPTER 2

### SETTING: PAST AND PRESENT

#### Natural History and Geography

The coasts of the United States are some of the most vital and productive ecosystems on earth. Water dependence of commerce and industry and the desirability of coastal living have attracted nearly half the U.S. population to the nearshore region.

Our nation's "fourth seacoast" extends 4,600 miles along the southern shores of the Great Lakes, the largest and most utilized "inland sea" in the world. Ohio is fortunate to occupy a favored position along this nationally significant lakeshore. The state's citizens, 41 percent of whom live within the Lake Erie basin, are entrusted with the stewardship of 262 miles of mainland and island shores, as well as 3,277 square miles of its waters (Figure 1). Ohio reaps numerous benefits from the wealth of natural, scenic and economic resources found therein.

Approximately 33,000 acres of valuable coastal wetlands in Ohio support at least 250 species of nesting birds, including the nation's symbol, the bald eagle. Shallow waters in the island and bay region provide fish spawning grounds and nurseries, sustaining a commercial and sport fishing industry that provides numerous benefits to citizens of Ohio. Ohio's role as a major mineral producer is rooted in abundant salt, sand, gravel, limestone and gypsum deposits in the coastal area. The lake's waters and many fine sand beaches attract millions of visitors annually for swimming, fishing, boating and camping. The scenic, rocky shores and slow-paced lifestyle of the Lake Erie islands provide a unique respite from mainland cares. Strategically located close to valuable midwest coal fields and grain centers, the lake ports have established their preeminence as transshipment points for regional and worldwide commerce. Abundant fresh water is essential for many manufacturing processes. Consequently, industrial development has thrived on the lakeshore, and urban and residential growth has followed, resulting in a shore that is more than 82 percent developed.

The area's bountiful natural heritage that provides these cultural benefits is partly the result of dynamic geologic processes that transpired over billions of years. The Great Lakes region has been primarily influenced by sedimentation, erosion and glacial activity.

The area's geologic foundation consists of ancient igneous and metamorphic bedrock that was periodically covered by shallow seas and subsequent sediment deposits. These sediments hardened into layers of sandstone, shale, limestone and dolomite that were, in turn, carved into wide valleys by river systems and advancing glacial ice. Varying erosion qualities of these sedimentary rocks account for some of today's picturesque landforms; less resistant shales and fractured limestones were scraped out to form lake areas, leaving more resistant shale cliffs in the east and a chain of limestone and dolomite islands to the west.

FIGURE 1

Four major stages of continental glaciation affected the Great Lakes area during the past 1 to 2 million years. Thick ice sheets advanced into the region, eroding soil and bedrock that was then deposited in other locations.

About 14,500 years ago, the last of the ice sheets slowly melted and retreated, releasing large volumes of water. This meltwater and precipitation in the drainage basin collected in pools in the basins created by previous glacial scouring. As the ice margin continued to retreat, these pools enlarged to form a large post-glacial lake in what is now the Lake Erie basin. The elevation of this lake changed as retreat of the ice margin exposed lower outlets or its re-advance blocked outlets. About 4,000 years ago, the upper Great Lakes began to drain through the Lake Erie basin, causing a rise in the lake level.

### Impact of Human Activities

Human pressures have left their mark on the Lake Erie environment as well. Early inhabitants were hunters who roamed the region in search of mastodon and caribou nearly 14,000 years ago. Archaeological evidence shows that they eventually adapted to the area's natural abundance by settling into a more sedentary, agricultural lifestyle.

European explorers happened upon Lake Erie in the 17th century on their way to the "Orient." Fur traders led a wave of American colonists who achieved dominance on land with their 1794 victory over the Indians at Fallen Timbers, near the present site of Toledo. But British naval power and economic control of the fur trade continued to exclude Americans from the waters of the Great Lakes. The fiery Battle of Lake Erie was a decisive victory for the Americans, part of a series of events that ultimately allowed them to wrest supremacy from the British.

Indians and Europeans alike stood in awe of the vast resources they found in the Lake Erie region. Lake waters brimmed with sturgeon and whitefish. Seas of grassy savannahs supported wild oats 3 meters high. This deceptive bounty prompted J. Disturnell to remark in 1863 that the fisheries were "so inexhaustible...that were a population of millions to inhabit the lake shore, they would furnish an ample supply...without any sensible diminution." Thus did the region's first settlers establish a precedent, overlooking the need for prudent resource conservation.

By 1900, the population of Ohio's coastal counties had not yet reached 1 million. However, despite Disturnell's rosy optimism, the settlers had already wrought considerable changes in the land, the water and the area's natural resources. In fact, 25 million acres of woodlands were cleared prior to the turn of the century. Savannahs were burned and swamps tilled and drained. The lake soon became the dumping ground for raw sewage from scores of small towns. Effluents from tanneries, breweries, chemical works, oil wells and mines, and sawdust from lumber yards on all the Great Lakes accelerated the normally slow process of the lake's aging.

Settlement of the area has wrought dramatic changes in the Lake Erie wetlands and estuaries. An extensive barrier beach-wetland system originally comprised the shoreline westward from Sandusky to Toledo and northward to Detroit. Wetlands of the original Black Swamp covered nearly

300,000 acres throughout the western Lake Erie watershed. Today, only an estimated 33,000 acres of coastal wetlands remain in Ohio. Such wetland loss is primarily attributed to drainage practices associated with agriculture, filling and dredging. In particular, urban development during low water periods has blocked the landward extension of wetlands during times of high water.

### Institutional and Political Response

Over time, the U.S. and Canada began to recognize the serious threats to the Great Lakes region. It became apparent to both countries that degradation of the lakes by any state, province, or nation could have widespread effects upon the lakes and their shoreline residents. Thus, in 1909 the U.S. and Canada joined to sign the Boundary Waters Treaty, under which the International Joint Commission (IJC) was established in 1912. The Commission became responsible for investigating and making recommendations for resolving transboundary water issues, including Great Lakes problems referred to it by either or both of the governments. The U.S. established its unilateral interest in Great Lakes water quality with pollution investigations conducted from 1910-1912 by the U.S. Public Health Service. The Great Lakes Fishery Commission was established by convention in 1955 to develop and coordinate fishery research and management, to advise governments on measures to improve the fisheries and to develop and implement programs to control the sea lamprey population.

But the problems have not been easily resolved, and new conflicts have arisen frequently. The difficulties inherent in developing critical shorelands peaked as the 1960s came to a close. The public became concerned in Ohio when high coliform bacteria counts resulted in closed beaches and the anoxic (oxygen-deprived) area of the Central Basin extended to more than 1,500 square miles in 1970. The lake had not died, but had been degraded considerably since 1920. Prime farmland and valuable marshes in the coastal area had been lost to urbanization. Utility, navigation, industrial, municipal, recreational and environmental interests all joined to voice their concerns over losses due to the lake's battered condition.

This public outcry stimulated a massive governmental response. Many organizations, task forces, agencies and federal, state, local and provincial laws were created to respond to the multifaceted conflicts. The Great Lakes Basin Commission began developing a comprehensive plan for water resources information on limnology, navigation, shore erosion, recreation and other areas, and included recommendations for improved resource development. The Ohio State University's Stone Laboratory at Put-In-Bay conducted research on Lake Erie's fish and benthic communities and the effects of various land and water uses upon them. The Ohio Department of Natural Resources (ODNR), Division of Wildlife (DOW), developed a Fish Work Group Report that addressed the entire Lake Erie drainage basin through specific biological, social and economic discussions. This 1970 report reviewed historic, current and projected human activities and their impacts upon the Lake Erie fisheries resources. The Division of Geological Survey developed databases on beach and shore erosion, lake sediments, water quality and lake water masses, including currents. The Ohio Environmental Protection Agency (Ohio EPA) developed plans to improve Lake Erie water quality.

The year 1972 saw the initiation of several major Lake Erie protection measures. First, regional agencies (Northeast Ohio Areawide Coordinating Agency [NOACA] and Toledo Metropolitan Area Council of Governments [TMACOG]) developed local water quality management plans mandated by the Federal Water Pollution Control Act (FWPCA) of 1972 (P.L. 92-500). Second, the U.S. and Canada signed the Great Lakes Water Quality Agreement that established the Water Quality Board and the Science Advisory Board of the IJC. The third measure came into effect when Congress passed the Coastal Zone Management Act (CZMA, P.L. 92-583), which provided financial and technical assistance to states for the development and implementation of comprehensive programs to protect and manage their coastal resources and to establish National Estuarine Research Reserves.

The Governor of Ohio, by Executive Order in 1973, placed responsibility for developing a coastal management program with ODNR. To help the department initiate program planning and development, the federal Office of Coastal Zone Management (now the Office of Ocean and Coastal Resource Management, OCRM) made four grants to Ohio that were matched with state funds.

ODNR's Division of Water had an important coordinating role as the designated lead for coastal management from 1974 to 1988. In 1974, the first program development grant was used to compile resource and institutional databases from existing sources of information. Local individuals, government officials and diverse interest groups helped identify coastal issues by participating in a series of county-wide workshops and by responding to questionnaires. Public concern was especially strong with regard to erosion and flooding, declining wildlife populations, loss of valuable natural and historic sites, air and water quality, mineral development, and recreational issues.

By 1977, ODNR possessed a clearer view of both critical issues and information gaps. Thus, it was able to effectively channel the second year grant money into appropriate areas. One of the first actions was to coordinate research efforts between various agencies. This yielded 11 separate studies concerning critical resources and specific land use inventories.

That same year, ODNR also organized County Advisory Groups. These seven groups ranged from 30 to 50 members and represented a diverse cross section of the population. This innovative approach formed the basis of the public involvement effort and served as a model for similar programs in other states. Meetings revolved around the nomination of special management areas, determination of the coastal area boundary and designation of uses subject to management. The year's work culminated in the compilation of 75 policy alternatives relating to the main public concerns.

To further increase public awareness of lake issues, ODNR implemented an extensive public education campaign. In addition to submitting articles to local newspapers, the agency also published a quarterly newsletter called "The Beacon" and other public information materials. ODNR produced a slide show and financed three public-service announcements for television. Staff members conducted numerous public meetings in coastal communities and encouraged the full participation of county and regional planning commissions. The planning commissions proved especially helpful in assessing the impact of various land uses upon their respective shore areas.

In 1978, recommendations from previous years' work were converted into objectives and proposed policies which, along with a proposed organization and implementation mechanism, were set forth in a recommended Coastal Management Program for Ohio's Lake Erie shoreline.

In 1979, ODNR published a draft document of its proposed coastal management program. Additional efforts focused on formulating legislation based upon the document. This entailed extensive involvement with advisory groups, interest groups and municipalities to develop legislation acceptable to all parties. A coastal bill was introduced in the Ohio House of Representatives, where it was reported out of committee but never voted on by the full House. Unfortunately, political and economic factors discouraged the bill's reintroduction in 1981. This limited ODNR's coastal activities since legislation was needed to establish a coastal management program and provide for erosion and floodplain hazard area management. Efforts to develop a federally approved management program ended in early 1981. Nonetheless, the department remained involved in areas such as wetlands, lake access, erosion, floodplain management and water diversions. ODNR continued to meet with interest groups to promote coastal management and cooperated with other Great Lakes states on regional issues.

The 1980s brought further institutional activity such as the formation of the Council of Great Lakes Governors. The Council's first achievement was the creation of the Great Lakes Charter in 1985. Prompted by the threat of potential water diversion projects, this charter expressed a firm commitment to regional cooperation in Great Lakes management. The Council also opposed oil drilling in U.S. waters and, in the spring of 1986, formulated the Great Lakes Toxic Substances Control Agreement.

In 1987, Canada and the U.S. strengthened the toxic control provisions of the Great Lakes Water Quality Agreement. This re-emphasized the ecosystem approach to Great Lakes management and addressed both air and groundwater pollution. The FWPCA of 1972 was also updated in 1987. The revised version included provisions that address toxic wastes and nonpoint source pollution control. Ohio received federal approval of the Ohio Nonpoint Source Management Program in 1989.

The same year, Ohio's Governor created the Lake Erie Office within ODNR to coordinate existing programs and develop ways to better manage and protect Lake Erie. The state also moved ahead with its Lake Erie Access Program, established the Division of Water Transportation in the Department of Transportation and initiated remedial action plans for Ohio's four "Areas Of Concern" pursuant to the Great Lakes Water Quality Agreement (GLWQA).

Throughout the 1980s, ODNR's Division of Water played a vital role in policy development as the lead entity for coastal program development. The division worked with citizen groups, municipalities and state and local governments to develop an Ohio coastal management program. The division developed, and provided staff to assist in the passage of, the Ohio Coastal Management Law.

In 1987, a bill based on the previous coastal legislation and designed to fill gaps in needed authorities was introduced as Senate Bill 70. Both the House and the Senate unanimously approved

S.B. 70 and submitted it to the Governor, who signed it on December 13, 1988. It became effective on March 15, 1989. The Ohio Coastal Management Law establishes a coastal management program within ODNR and creates the mechanisms for improving Lake Erie resource management. Rather than supplant existing ordinances, zoning authorities or government agencies, this program provides a framework to guide public and private activities in the coastal area. Components of the law include defining the landward boundary of the coastal area, establishing a grant program for local communities, simplifying and consolidating various permitting activities, creating an advisory council to promote public participation in the coastal program and adopting the management program. To improve resource management, ODNR is required to identify coastal erosion areas and administer a permit system for construction within such areas, implement the Lake Erie Access Plan and administer the leasing of submerged lands.

In 1989, reports were published by both the Ohio Lake Erie Shore Area Redevelopment Task Force and the Ohio Coastal Resource Management Project Task Force. These independent groups were formed to provide a balanced perspective regarding the use of the Lake Erie resources, and their suggestions have been incorporated wherever possible within this management plan.

Water quality programs have received a significant boost in Lake Erie and the Great Lakes. On February 26, 1989, the Great Lakes Governors signed a unique environmental agreement to create the Great Lakes Protection Fund, a \$100 million endowment for regional action to combat toxic pollution. It is the first regional effort of its kind. The Ohio Legislature created the Lake Erie Commission and the Lake Erie Protection Fund by amending Ohio's coastal management law in 1990. Annually, a portion of the Great Lakes Protection Fund is returned to Ohio and the other participating states. The Lake Erie Commission uses the fund to support water quality and environmental health related research, remedial action projects and other activities to establish a firm base for implementing a basinwide system of water quality management for Lake Erie and its tributaries. The Lake Erie Commission also is charged with advising the directors of Natural Resources and Environmental Protection on policies and programs related to coastal management and long-term, comprehensive protection of Lake Erie water resources and water quality that are consistent with the Great Lakes Water Quality Agreement and the Great Lakes Toxic Substances Control Agreement.

On November 5, 1990, Congress enacted the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). Several new provisions affect Ohio's coastal management program. CZARA strengthened the CZMA by reaffirming the requirement that federal actions affecting any land or water use or natural resource of the coastal area, regardless of location, be consistent with state coastal management policies and by establishing a new, voluntary coastal zone enhancement grants program to improve the coastal management program in identified areas such as coastal wetlands, hazards, public access improvements and special area management planning. A major finding of Congress was the clear essential connection of water quality and aquatic resources protection to the nation's and the states' economic vitality and the quality of human uses of coastal areas and coastal resources. To address the impacts of nonpoint source pollution on coastal water quality, Section 6217, "Protecting Coastal Waters," provides that each state with an approved coastal management plan must develop and submit to the United States Environmental Protection Agency (USEPA) and

NOAA for approval a Coastal Nonpoint Pollution Control Program. This is to serve as an update and expansion of the Ohio Nonpoint Source Management Program as well as to build upon coastal management efforts.

In September 1991, Governor Voinovich announced the establishment of a new Ohio Lake Erie Office, separate from ODNR, to assist the Lake Erie Commission in its Lake Erie protection agenda. Located in Toledo, the Ohio Lake Erie Office enjoys proximity to organizations such as the Great Lakes Commission in Ann Arbor, Michigan, and the International Joint Commission in Windsor, Ontario. This office assists in administering Lake Erie Protection Fund grants; plays an important role in advising the Governor and the directors of relevant agencies on the development, implementation and coordination of Lake Erie programs and policies; and serves to increase representation of Ohio's interests in regional, national and international forums pertaining to resources of the Great Lakes.

In February 1992, the Ohio Coastal Management Program (OCMP) published a Public Review Draft Document that incorporated findings and policies from the earlier program development process as well as advisory council and other task force suggestions. The OCMP conducted two public hearings during May of that year in Huron and Cleveland and public meetings in Toledo and Ashtabula to provide an opportunity for comments on program policies, authorities, the coastal boundary and other aspects of the proposed program. The 1992 Public Review Draft document was then revised in 1993 to incorporate revisions in response to public and agency review and comment.

Throughout 1993, ODNR held numerous meetings with local officials, coastal area residents and other interested individuals to discuss proposed rules for enforcing a coastal erosion area permit system, preliminary coastal erosion area maps and the broader context of the Coastal Management Program. The dialogue established through these meetings clarified several issues that needed to be addressed by amendments to Ohio's Coastal Management Law. Amendments were enacted in May of 1994, and in the fall of that year ODNR began working with an external ad hoc advisory group to change previously adopted rules for designating coastal erosion areas. Following that process, ODNR filed amendments to those rules as well as the new rules for enforcing the permit system in coastal erosion areas. Work then continued in 1995 to modify this document to incorporate the coastal erosion area policy changes and to update agency authorities and policies. Chapter 11 contains specific responses to public comments received regarding the 1992 draft document and during the public involvement process conducted between 1993 and 1995.