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Lake Erie Basin
Michigan State University Cooperative Extension Service
Michigan SeaGrant
Issued January 1990
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LAKE ERIE

Lake Erie is the eleventh largest lake in the world (by surface area). It is the fourth largest of the Great Lakes in surface area and the smallest by volume. Ninety-five percent of Lake Erie’s total inflow of water comes via the Detroit River from all the “upper lakes” — Superior, Michigan and Huron — the St. Clair River, Lake St. Clair, and numerous tributaries. The rest comes from precipitation. Lake Erie is the shallowest of the Great Lakes and is especially vulnerable to fluctuating water levels. Wind setups (wind pushing the water from one end of the lake toward the other), usually from west to east, have produced large short-term differences in water levels at the eastern and western ends of the lake, the record being more than 16 ft (4.88 m).

The water provided by Lake Erie for waterborne commerce, navigation, manufacturing, and power production has led to intensive industrial development along its shore. However, the basin’s moderate temperatures have also encouraged recreation and agriculture. Lake Erie is the warmest and most biologically productive of the Great Lakes, and the Lake Erie walleye fishery is widely considered the best in the world.

Point Pelee National Park in Lake Erie is the southernmost point on Canada’s mainland.

WATER USE

The Great Lakes provide water for many purposes: residential, commercial and institutional facilities; agricultural operations; industrial processes; electric power generation; navigation; sanitation; recreation; and habitat for fish, waterfowl and other aquatic organisms. More than 11 million people obtain their drinking water from Lake Erie. In 1987, the Great Lakes states and provinces established at the Great Lakes Commission a regional water use data base for the Great Lakes basin and the individual lakes. However, as of 1989, it was not yet possible to obtain accurate information for all categories of water use in Lake Erie.

ECONOMIC IMPORTANCE

Manufacturing: 36 percent of U.S. cars/trucks/buses and 38 percent of Canadian cars and trucks are produced in the basin, which is also a principal source of power for the region. The lakes provide important transportation routes for both regions, and the lakes themselves are productive of fish, waterfowl, and other aquatic organisms.

Improvements: In 1985, the Great Lakes states and provinces agreed to clean up and restore the AOCs in the basin. Each jurisdiction is developing "remedial action plans" (RAPs) to control and stop existing sources of pollution and restore water quality in its AOCs. The governments will report to the IJC regularly on progress in developing and implementing the RAPs. Significant reductions in phosphorus loadings have resulted from improved controls, including the banning of detergents with high phosphate levels by Ohio’s northern communities in 1988. Mercury, PCB and DDT levels in fish samples have declined due to upstream industrial controls.

SPONSORS/INFORMATION SOURCES

MICHIGAN SEA GRANT COLLEGE PROGRAM
Michigan State University
334 Natural Resources Building
East Lansing, MI 48824-1222 (517) 353-9568
or
The University of Michigan
2200 Bonisteel Boulevard
Ann Arbor, MI 48109 (313) 764-1138

International Joint Commission
Great Lakes Regional Office
100 Ouellette Avenue, Eighth Floor
Windsor, ON N9A 6T3 (519) 256-7821
or
P.O. Box 32869
Detroit, MI 48232-2869 (313) 226-2170

CANADA-ONTARIO AGREEMENT
Environment Canada
Communications Directorate
25 St. Clair Avenue East, Room 600
Toronto, ON M4T 1M2 (416) 973-6467
or
Ontario Ministry of the Environment
Public Information Centre
135 St. Clair Avenue West
Toronto, ON M4V 1P5 (416) 323-4321

Great Lakes Commission
The Argus Building II
400 Fourth Street
Sault Ste. Marie, MI 49783 (906) 635-4367
or
Great Lakes Commission
The Argus Building II
400 Fourth Street
Sault Ste. Marie, MI 49783 (906) 635-4367
Agriculture: The economy along the lake’s western and northern shores is based on agriculture. Approximately 10 percent of Canadian farms and 30 percent of Canadian farmland is located in the region. Seventy percent of Canadian sheep and lambs are raised in the Lake Erie basin. Lake Erie leads the Great Lakes basin region in number of farms and in the production of hogs and pigs, sheep and lambs, chickens, corn, soybeans and wheat. Major products: vegetables, grapes and orchard fruits, wine, tobacco (Canada), dairy products (U.S.).

Shipping: 13 ports serve as major distribution centers for iron ore, coal, manufactured goods and grain.

Mining: Sand and gravel for construction; limestone and salt.


Effects: Property damage, safety risks, economic losses, loss of wetlands.

Problem: Water quality. Industrial, navigational, municipal and recreational uses of the Great Lakes add pollutants to the ecosystem. Some of them may stay in the water or lake sediments for hundreds of years and affect other uses of the water. Pollution is usually most severe in major population centers on Great Lakes rivers, harbors and connecting channels. The types of problems include: toxic substances in water, sediments and fish; damage to other organisms living in or depending on the water: elevated levels of bacteria; high levels of phosphorus and other nutrients; heavy metals; and aesthetic problems.

RESOURCE ISSUES

Problem: Urban flooding and shoreline erosion.

Source: Development in floodplain areas without adequate planning or regulation.
Lake Erie

Lake Erie has the largest sport fishery of the Great Lakes.

**LAKE ERIE DIMENSIONS**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LENGTH</td>
<td>210 mi / 338 km</td>
</tr>
<tr>
<td>BREADTH</td>
<td>57 mi / 92 km</td>
</tr>
<tr>
<td>DEPTH</td>
<td>62 ft / 19 m average; 210 ft / 64 m maximum</td>
</tr>
<tr>
<td>VOLUME</td>
<td>116 mi³ / 483 km³</td>
</tr>
<tr>
<td>WATER SURFACE AREA</td>
<td>9,906 mi² / 25,657 km²</td>
</tr>
<tr>
<td>DRAINAGE BASIN AREA</td>
<td>22,720 mi² / 58,800 km²</td>
</tr>
<tr>
<td>SHORELINE LENGTH</td>
<td>871 mi / 1,400 km (including islands)</td>
</tr>
<tr>
<td>ELEVATION</td>
<td>571 ft / 174 m</td>
</tr>
<tr>
<td>OUTLET</td>
<td>Niagara River and Welland Canal</td>
</tr>
<tr>
<td>RETENTION/REPLACEMENT TIME</td>
<td>2.6 years (shortest of the lakes)</td>
</tr>
<tr>
<td>POPULATION</td>
<td>9,183,347 (U.S.); 1,742,805 (Canada)</td>
</tr>
</tbody>
</table>

**LEGEND**

- International Border
- State/Provincial Border
- Basin Boundary
- National Park
- State/Provincial Park
- National Forest
- Area of Concern
- City

(RECYCLED PAPER)
The percentages below were calculated in the 1970s, based on information collected by the former Great Lakes Basin Commission. A study group formed by the International Joint Commission began to assemble current shoreline use information in 1987.

**LAND USE (Percent of total)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Canada</th>
<th>U.S.</th>
<th>Basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural</td>
<td>80</td>
<td>63</td>
<td>67</td>
</tr>
<tr>
<td>Residential/industrial</td>
<td>4</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Forest</td>
<td>15</td>
<td>23</td>
<td>21</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**SHORELINE USE (Percent of total)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Canada</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>39</td>
<td>45</td>
</tr>
<tr>
<td>Recreational</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Agricultural</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Commercial</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>16</td>
</tr>
</tbody>
</table>