Lake Ontario Basin
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LAKE ONTARIO

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LAKE ONTARIO

Lake Ontario, the 14th largest lake in the world, is the smallest of the Great Lakes in surface area. Lake Ontario's level is controlled by a dam at Kingston, Ontario, and two-thirds of the lake lies below sea level. It ranks fourth among the Great Lakes in maximum depth, but its average depth is second only to Lake Superior. Lake Ontario lies 325 ft (99 m) below Lake Erie, at the base of Niagara Falls. The falls were always an obstacle to navigation into the upper lakes until the Trent-Severn Waterway, along with the Welland and Erie Canals were built to allow ships to pass around this bottleneck. The oldest lighthouse on the U.S. side of the Great Lakes was set up at Fort Niagara in 1818 to aid navigation.

The basin is largely rural, with many scenic resort areas. A few large urban areas, including Ontario's capital city (Toronto), are located on the Canadian shoreline. In 1972-73, 1,000 scientists, engineers and technicians undertook the most extensive survey ever made of a Great Lake.

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. 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 Ontario.

ECONOMIC IMPORTANCE

Agriculture: Region contains 17 percent of Canadian farmland. Top commodities include oats (Ontario), apples, grapes, sweet corn, and dairy products. Grape and wine-producing area in New York.

Industry: Machinery, electrical goods, transporta-

Toxics Management Plan has been cooperatively developed by Canada, the United States, Ontario and New York to implement existing programs and create new ones that will further reduce the level of toxic contamination that enters the lake.

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tronics. Food industries and fabricated metal products (mainly Canadian). Two-thirds of Canada's steel production in the province of Ontario, much of it in the Lake Ontario basin. Canada's leading commercial, industrial and population center. One of the world's leading producing areas of photographic and optical equipment is located at Rochester, N.Y.

Tourism: Toronto is one of Canada's major tourist and convention centers. Niagara Falls, the Thousand Islands and other areas on both sides of the lake support an important tourist industry.

Fishery: Commercial fishing — Major species caught in U.S. waters: yellow perch, white perch, brown bullhead. Value of 1986 U.S. catch was $235,977 (U.S.) for 246,737 lb (112,153 kg). Major species caught in Canadian waters, including the St. Lawrence River: yellow perch, bullhead and eel. Value of 1986 Canadian catch was $1,153,409 (CDN) for 502,886 kg (1,106,349 lb). Sportfishing — Major species: bass, perch, brown trout, brook trout, rainbow (steelhead) trout, walleye, sauger and salmon. In 1985, 7.9 million angler days had an estimated economic impact of $141 million (U.S.) in the U.S. and $87 million (CDN) in Canada.

RESOURCE ISSUES

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.

The types and severity of water quality problems vary throughout the Great Lakes basin. However, the International Joint Commission (IJC) and Great Lakes jurisdictions have designated 42 "areas of concern" (AOCs) because of their special water quality problems. Lake Ontario has nine AOCs.

Sources: Lake Ontario receives a great deal of pollution from the heavily industrialized Niagara River and from the rest of the Great Lakes, from chemical, steel, automobile and iron companies; wastewater treatment plants; overflows from combined storm and sanitary sewers; radium and uranium refining operations; a pulp and paper mill, and from leaking hazardous waste facilities.

Effects: The effects of water quality problems vary with the types of pollutants in the area. Coliform bacteria: closed beaches, human health risks, taste and odor problems. High levels of phosphorus and other nutrients: eutrophication (excessive plant and algae growth), taste and odor problems. Toxic organic chemicals and heavy metals (mercury, iron, aluminum): human health risks, fish and wildlife contamination, water quality degradation and economic losses (especially to fishery).

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 inputs have occurred due to improved controls by wastewater treatment facilities. Levels of toxic substances such as PCBs and DDT have steadily declined in wildlife samples during the 1970s and 1980s. Mirex and dioxin are still of concern because of the levels found in the lake itself. A Lake Ontario

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Other publications in this series are: Great Lakes Basin (E-1865, MICHU-SG-89-503); Lake Superior (E-1866, MICHU-SG-89-504); Lake Michigan (E-1867, MICHU-SG-89-505); Lake Huron (E-1868, MICHU-SG-89-506); and Lake Erie (E-1869, MICHU-SG-89-507). For additional copies, contact one of the organizations listed above, your county Extension office, or the MSU Bulletin Office, 10-B Agriculture Hall, East Lansing, MI 48824-1039.

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Lake Ontario

Lake Ontario is bounded by the powerful Niagara Falls on the west and the picturesque Thousand Islands on the east.

LAKE ONTARIO DIMENSIONS

LENGTH	193 mi / 311 km
BREADTH	53 mi / 85 km
DEPTH	282 ft / 86 m average; 804 ft / 245 m maximum
VOLUME	393 mi^3 / 1,640 km^3
WATER SURFACE AREA	7,340 mi^2 / 18,960 km^2
DRAINAGE BASIN AREA	23,400 mi^2 / 60,600 km^2
SHORELINE LENGTH	726 mi / 1,168 km (including islands)
ELEVATION	246 ft / 75 m
OUTLET	St. Lawrence River to the Atlantic Ocean
RETENTION/REPLACEMENT TIME	6 years
POPULATION	2,657,432 (U.S.); 4,616,070 (Canada)

LAND AND SHORELINE USE

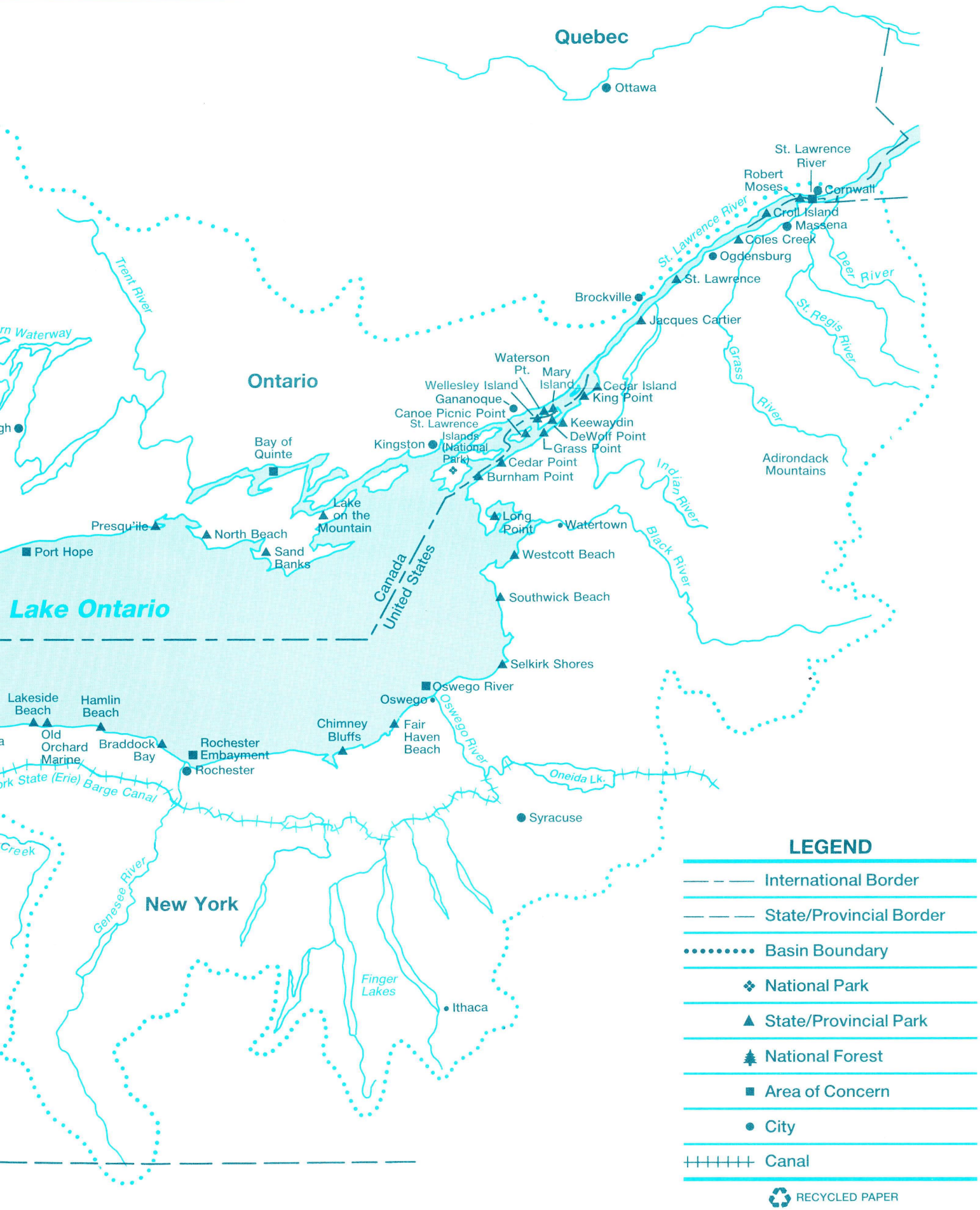
The percentages below were calculated in the 1970s, based on information collected by the former Great Lakes Basin Commission. A study group formed by the International Joint Commission began to assemble current shoreline use information in 1987.

LAND USE (Percent of total)

	Canada	U.S.	Basin
Agricultural	49	33	39
Residential/industrial	6	8	7
Forest	42	53	49
Other	3	6	5

SHORELINE USE (Percent of total)

	Canada	U.S.
Residential	25	40
Recreational	15	12
Agricultural	30	33
Commercial	18	8
Other	12	7



LEGEND

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

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