

# New York Great Lakes-St. Lawrence River Homeowner Program Guidance Booklet for Shoreline Management

## DESIGN WATER LEVELS

Surface water levels of the Great Lakes – St. Lawrence River vary as a result of natural processes and management. A general understanding of historical and current water level fluctuation is essential to properly identify the level of shoreline protection needed, appropriate strategy and the design of a project. Real time (and historical) water level data for a variety of Great Lakes-St. Lawrence River locations are available on the NOAA webpage at:

[https://tidesandcurrents.noaa.gov/water\\_level\\_info.html](https://tidesandcurrents.noaa.gov/water_level_info.html)

The design water level (DWL) is the elevation of surface water engineers use in the design of shoreline structures. Typically, the DWL is based on historic data obtained from water level gauge readings along the lake’s shore and is determined based on flood elevations and the level of acceptable risk for a project. DWLs should account for the purpose of the structure being designed and be based on a variety of considerations such as recent site-specific observations of water levels as well as additional safety factors.

The open-coast flood elevation levels provided here are to assist engineers and homeowners in determining the DWL for their site-specific project. Open-coast flood elevation levels were modified from data available in the 1988 Phase 1 & 2 Revised Report on Great Lakes Open-Coast Flood Levels prepared for Federal Emergency Management Agency (FEMA) by U.S. Army Corps of Engineers (USACE 1988).

*Table 1. Open-coast flood elevation levels (feet, IGLD85) at various return periods. Reach indicates the corresponding letter on Figure 1 (Lake Erie) and Figure 2 (Lake Ontario). The percent annual chance is shown for each return period in parentheses.*

Reach	Reach Description	Return Period (Percent Annual Chance of Flood Levels Reaching This Elevation)			
		10-yr (10%)	50-yr (2%)	100-yr (1%)	500-yr (0.2%)
<b>Lake Erie</b>					
A	Towns - Hamburg east of Mt. Vernon Cities -Buffalo and Lackawanna	579.2	580.6	581.1	582.2
B	Towns - Hamburg west of Mt. Vernon	578.6	578.0	580.4	581.5
C	Towns - Evans east of Sturgeon Point	578.1	579.4	579.7	580.8
D	Towns - Evans west of Sturgeon Point	576.8	578.9	579.1	580.2
E	Towns – Brant and Hanover Cattaraugus Reservation	577.1	578.4	578.6	579.7
F	Towns – Sheridan and Dunkirk	576.7	577.9	578.1	579.2
G	Towns – Pomfret, Portland and Westfield east of Barcelona	576.3	577.4	577.7	578.7

H	Towns – Westfield west of Barcelona and Ripley	Return Period (Percent Annual Chance of Flood Levels Reaching This Elevation)			
		576.0	577.0	577.3	578.2
<b>Niagara River</b>					
Upper	Upstream of Niagara Falls	565.3	565.8	566.1	566.6
Lower	Downstream of Niagara Falls	341.6	345.5	347	350.3
<b>Lake Ontario</b>					
A	Towns – Henderson, Ellisburg, Sandy Creek, Richland, Mexico, and New Haven.	248	248.8	249	249.7
B	Towns – Scriba, Oswego, Sterling, Wolcott, and Huron, Cities - Oswego	247.9	248.7	248.9	249.6
C	Towns – Sodus, Williamson, Ontario, Webster, Irondequoit, and Greece Cities - Rochester	247.8	248.6	248.8	249.5
D	Towns – Parma, Hamlin, Kendall, Carlton and Yates	247.7	248.5	248.7	249.4
E	Towns – Somerset, Newfane, Wilson, and Porter	247.6	248.4	248.6	249.3
<b>St. Lawrence River</b>					
Cape Vincent		247.7	248.4	248.7	249.3
Ogdensburg		247.2	247.9	248.2	248.7

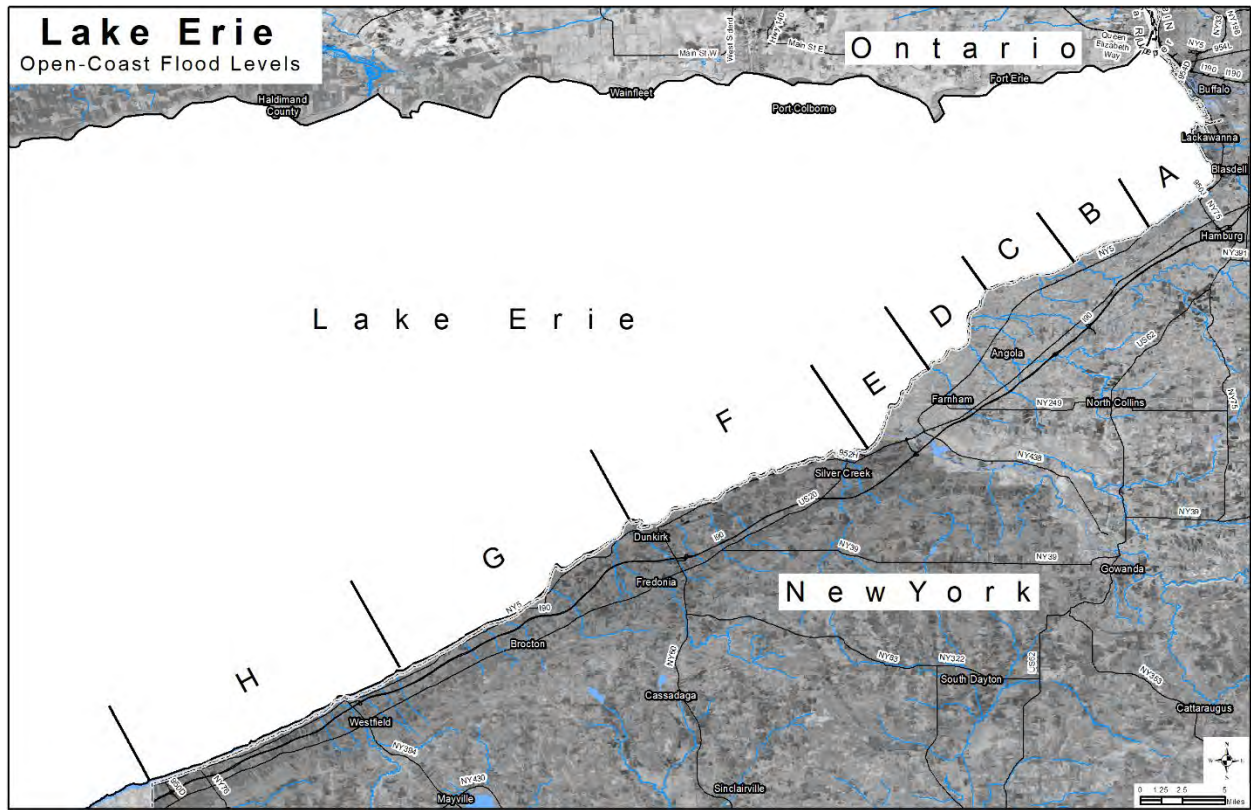


Figure 1. Coastal reaches used to develop open-coast flood elevation for Lake Erie. Modified from USACE 1988.

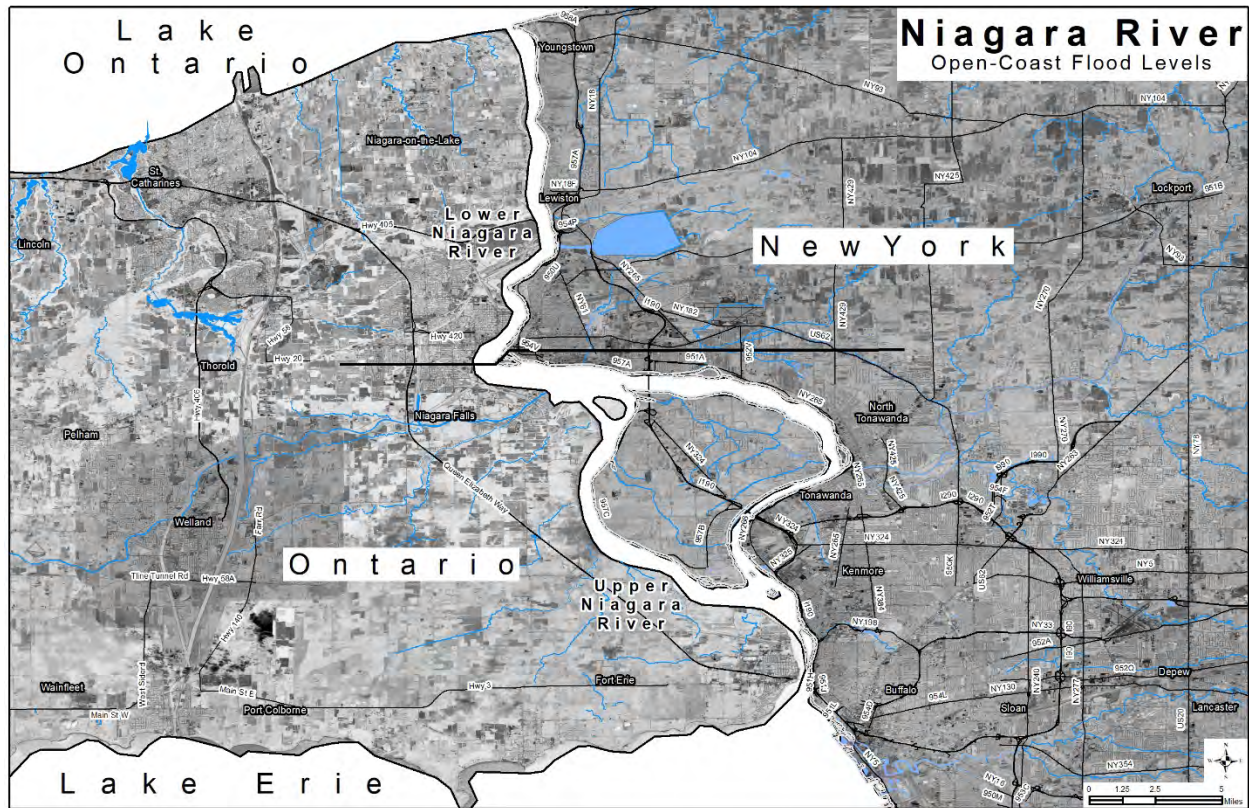


Figure 2. Coastal reaches used to develop open-coast flood elevation for the Niagara River (Upper and Lower Niagara).

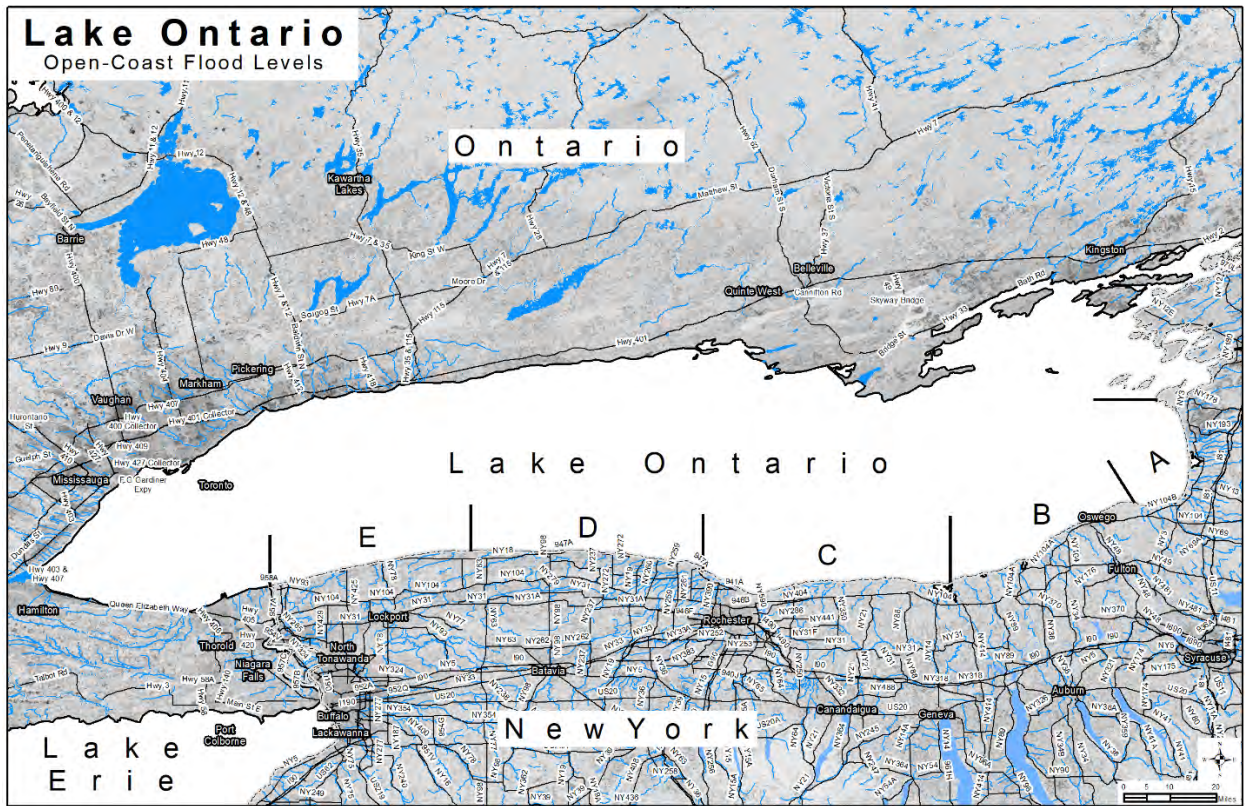


Figure 3. Coastal reaches used to develop open-coast flood elevation for Lake Erie. Modified from USACE 1988.

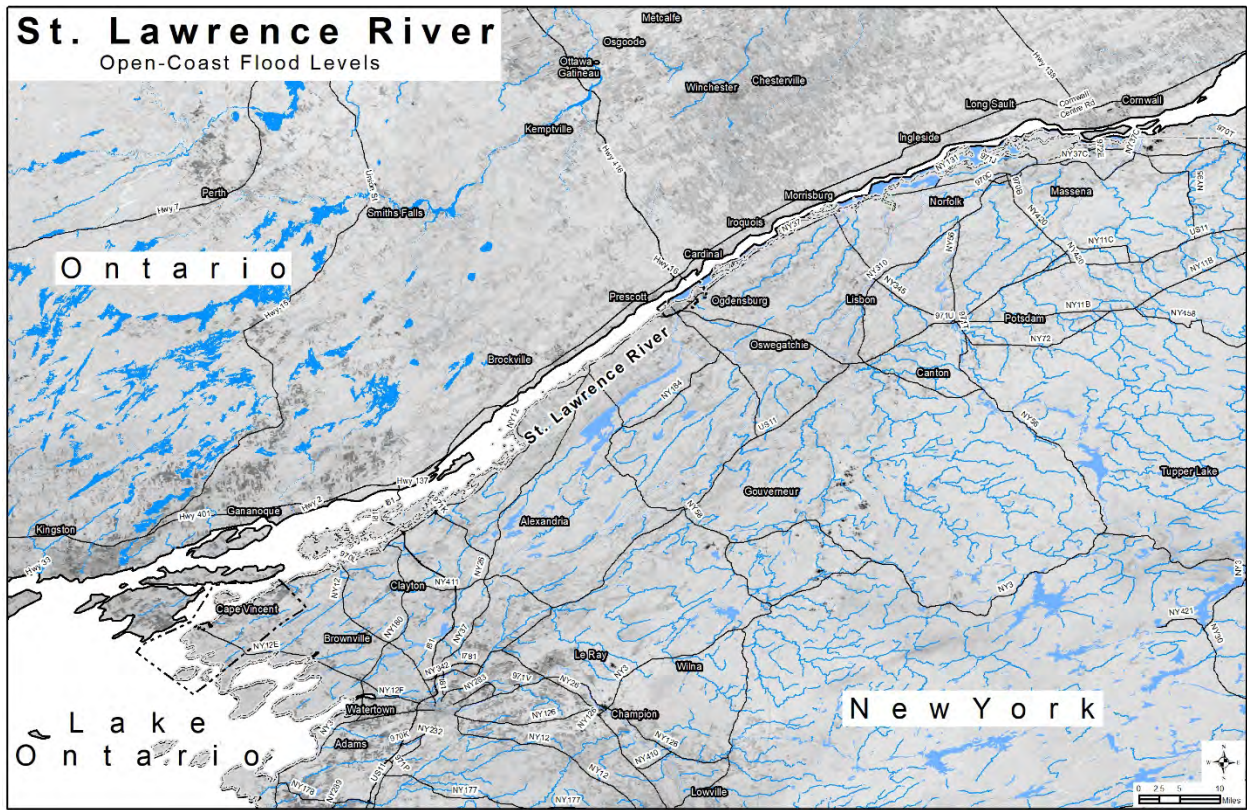


Figure 4. New York State portion of the St. Lawrence River.