
Lake Ontario was at sea level about 12,900 years ago

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A massive, overstepped, sand and gravel barrier beach beneath Holocene mud in western Lake Ontario has been delineated in piston cores, and acoustic and seismic reflection profiles between the communities of Grimsby and Oakville, Ontario. The Grimsby-Oakville barrier crest is about 78 to

80 m below the lake and 3 to 5 m below present sea level. A similar barrier that now encloses Hamilton Harbour has been constructed by westward longshore drift of shoreline sediment across the present end of Lake Ontario. A similar origin for the paleo-barrier is related to a unique interaction of deglaciation, sea level, and differential glacial rebound of the western and eastern ends of the Lake Ontario basin which connects with the upper St. Lawrence River valley. When the lower St. Lawrence valley was deglaciated about 12 900 cal BP, glacial lakes were drained and the rising Atlantic Ocean entered the upper St. Lawrence valley as the Champlain Sea. Analysis of rebound shows that the Grimsby-Oakville barrier and Champlain Sea beaches were then at the same elevation while sills and sea level were both rising, causing a near stillstand in western Lake Ontario before rebound raised the upper St. Lawrence sills above sea level and isolated the lake from the Champlain Sea after a few centuries. Although freshwater supply from northern glacial lakes prevented early Lake Ontario from becoming saline, its water surface was confluent with that of the Champlain Sea, a condition that makes the Grimsby-Oakville barrier a sea-level datum, the farthest west datum in eastern North America at the time between Hudson Strait and Gulf of Mexico.