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INLET FORMATION AND WASHOVER PROCESSES AT NORTH POND, EASTERN LAKE ONTARIO

Gary M. Weir 1977

The area studied is a 5.4 km length of dune and sandy beach which separates along this length North Pond from Lake Ontario. The whole sandy area stretches from the Salmon River estuary to Stony Point about 22 Kilometers. The study was motivated by years of high water from 1973 through 1976. Some of those persons living around were afraid after there were changes in and overwash of portions of the barrier that it might be permanently damaged and perhaps destroyed as a result. The study was to provide information to help in planning how best to maintain the lake level. The problem was seen to be complicated by the increasing number of homes and cottages built on the shore line along this sandy stretch.

The entire system consists of beaches backed by dune fields, lagoons and estuaries. For much of the area there is a foredune of from three to 18 feet in height and behind them and in the narrower portions of the beach there are dunes up to 65 feet in height. The lake is interesting and has been generally shrinking since 12,000 years ago when the ice receded. There have been several stages. A major one called the Sandy Creek stage occurred when the lake was about 60 feet higher than at the present and the shore was located about four miles further inland along much of its present configuration. But the fascinating thing is that the dunes were formed when the lake was about thirty feet lower than it is now at a time when a lot more sand was exposed and could be blown up on shore by the wind. The rise in the lake level is interesting. It is due to a rise in the level or the rock base along the St. Lawrence, possibly associated with the melting of the ice sheet.

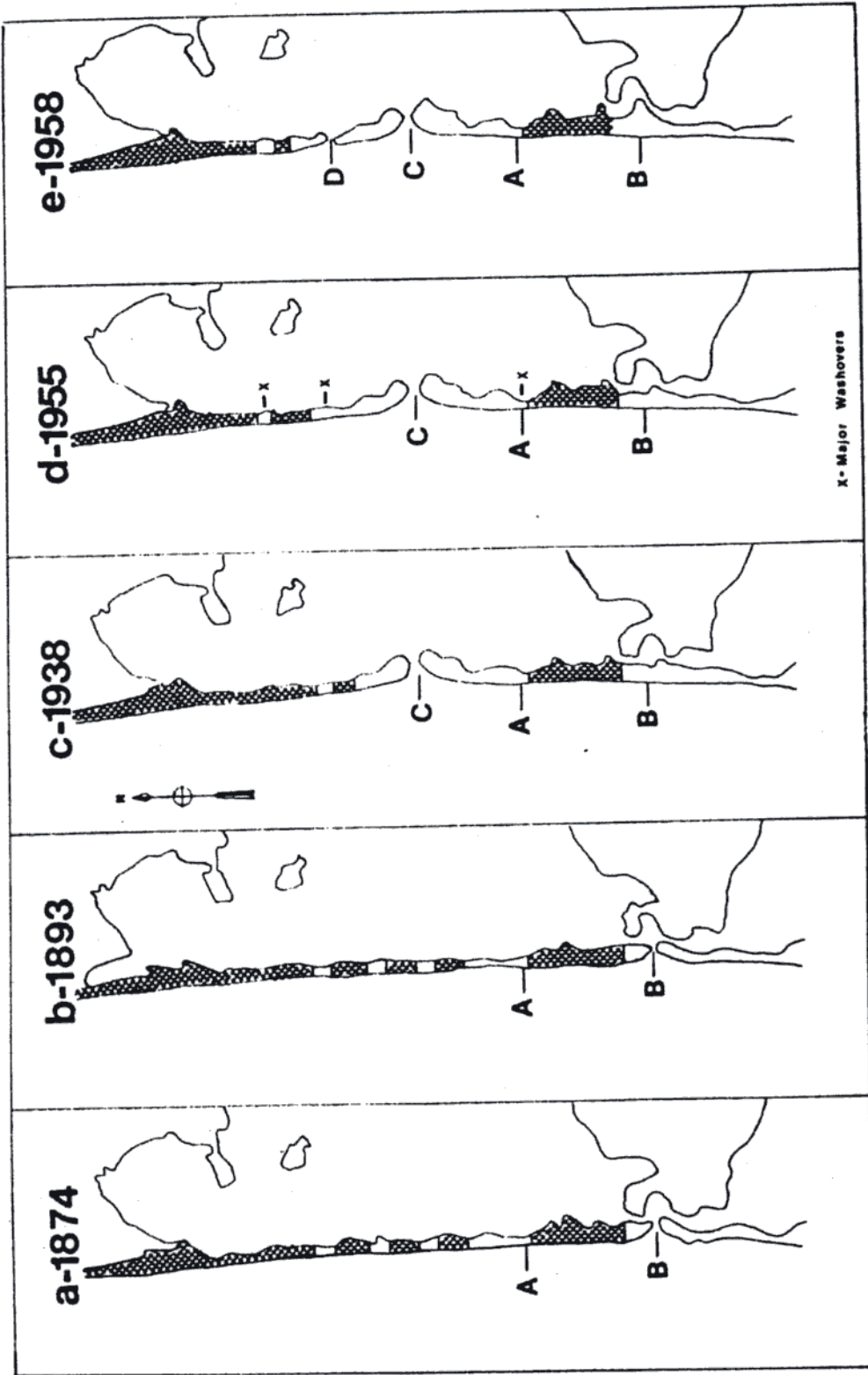
Factors, aside from man, affecting erosion are wind, primarily west wind, rain and snow fall throughout the Great Lakes basin. Storm surge can reach up to two feet. (Tide is not a factor, less than 1/2 "). Today the lake rises in summer and falls in winter due to variations in precipitation, outflow at the St. Lawrence and man-made diversions within the Lake Ontario basin. This difference runs about two feet. There are long periods of fluctuations. The water was high in the 70s and low in the 30s. I remember people being concerned about 1935. There was fear that the Chicago river canal was a factor.

The diagrams show channel formation since 1900. (Hand Out) The point A on the chart is believed to be the channel before the early 1800s. This is based on the shape of the beach which widens where there is a channel and does show evidence of a channel at that point in the past. B was the channel in my parents time and that generation always spoke of the "old outlet". There was an attempt to dredge a channel in 1896 which filled in quickly.

According to the author the Sandy Creek news reported a new channel opening in 1911 at point C. But the information from that time is sketchy. (see pictures).

It is interesting that this went through some high dune portions of the beach. By 1950 this channel was filling in and too shallow in the fall and winter. In 1950 a short lived attempt was made to dredge out another channel located just below the last two camps on the south spit below the conservancy land. There are still traces of it, but there is today a dune 16 feet high at the outer end of the dig. (Time Magazine Story). High water in the fifties caused three breaks and there was real concern. Break A was short lived and really a wash over which was slow to heal. The two at D persisted together for a while and gradually the northern one became the major channel during the sixties. In 1973 break E appeared and there has been some movement to the north from that point. Together with this erosion of the lake side of the spit there has been a movement eastward and the beach is much wider in its central portion than it was formerly before the channels passed through the various areas and thus it has been able to maintain itself in spite of erosion by the lake.

What was suggested by this study is that as the lake level rises, if the St. Lawrence lift continues, there may continue to be movement of the barrier eastward, about 100 meters in the last Century, but that there are a number of factors which will help to maintain the beaches and spit if man is careful not to tip the balance. (The rate of lift is not something to worry about in your lifetimes). It also appears that channels have, if left alone a life cycle. New channels are better drains for the pond and so the old ones close once a new one occurs, the latter where the spit is narrow and so will allow at first a better channel. It also appears, that except in periods of transition there tends to be enough outflow to maintain one channel. To keep this beach area and to be able to enjoy it. care must be taken by man to help the natural vegetative process and to not hasten erosion. Lake level control can also help.



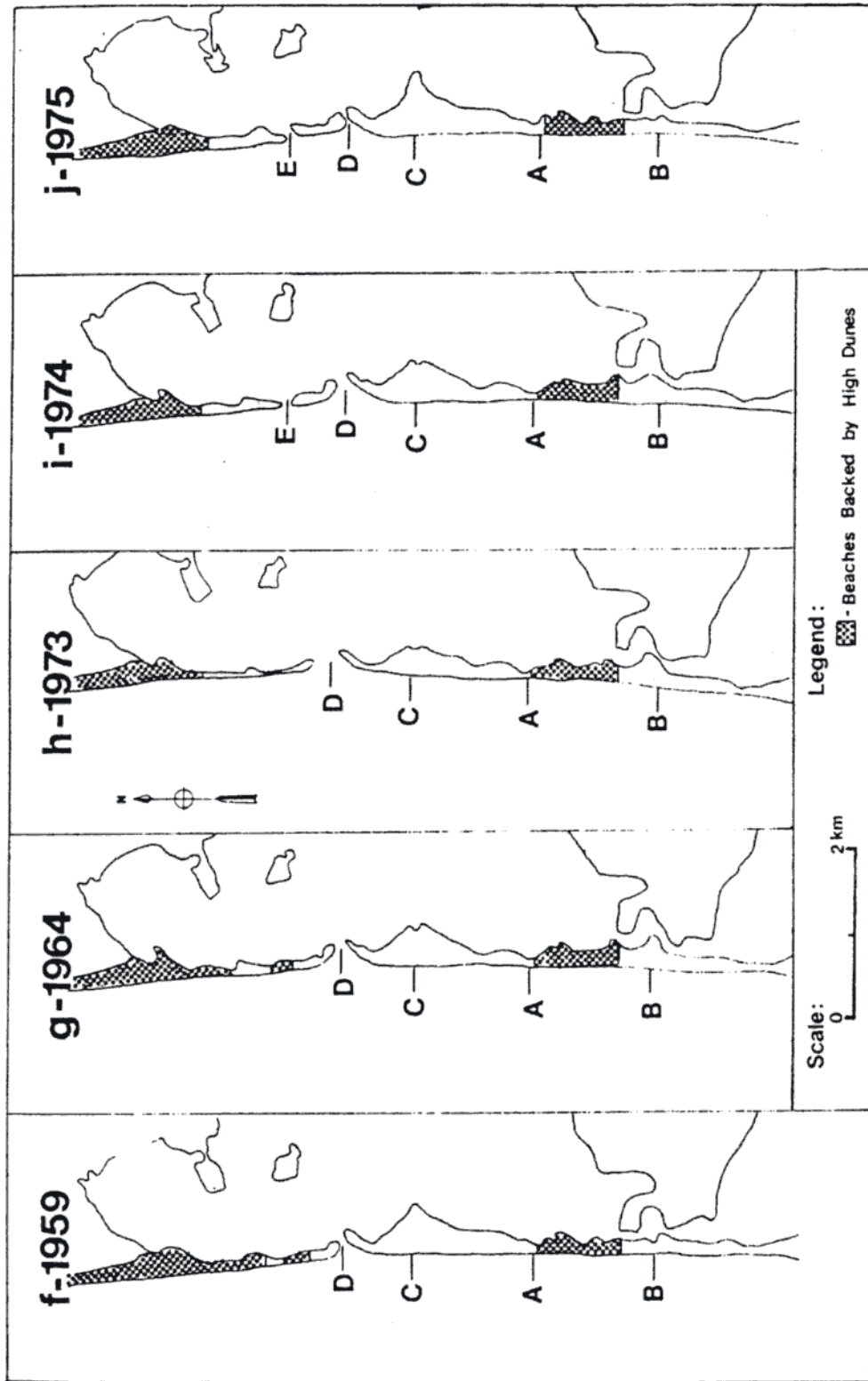


Figure 10. Historical North Pond barrier configurations from 1860 to 1975. High dunes are those greater than 9 m above the still water surface.