Presentation to the Clean Environment Commission on the Regulation of Lake Winnipeg

by

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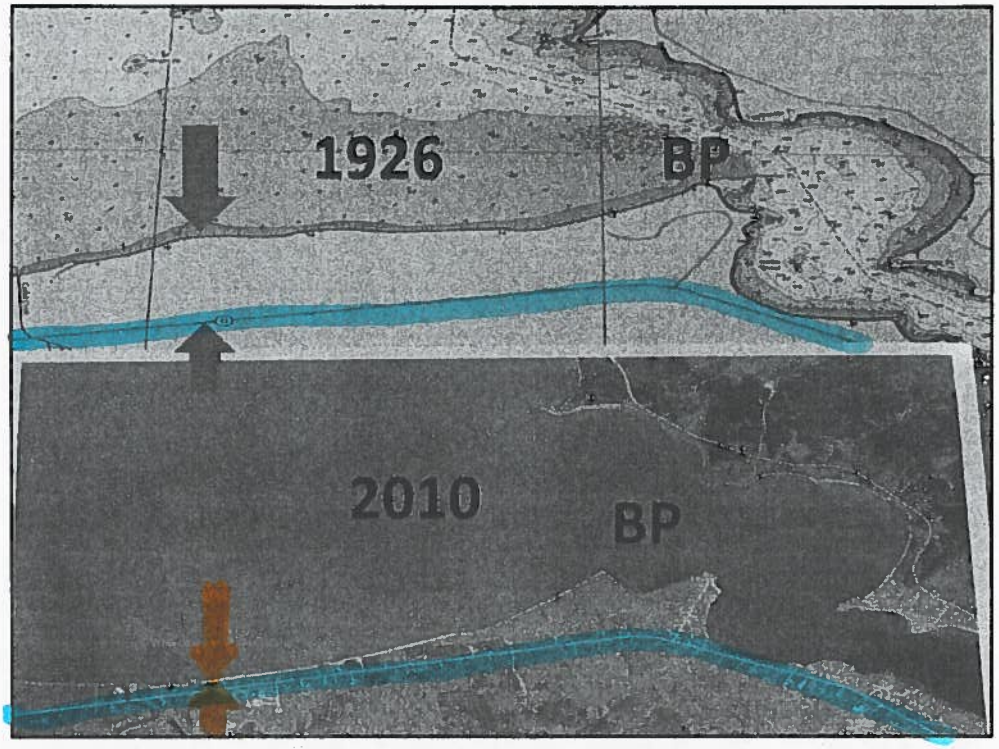
First, I would like to thank the Commissioners for the opportunity to talk about Lake Winnipeg, its future and how it should be regulated.

Lake Winnipeg is a large dynamic lake that changes not only with the seasons, like all water bodies, but from year to year. Some of the changes which have occurred may reflect the influence of man-made construction and/or the way that Lake Winnipeg water levels have been regulated. It is therefore important to look at parts of Lake Winnipeg where there has been significant shoreline movement. My presentation today will review shoreline changes in two areas of the lake and the possible impact of man made infrastructure on these changes.

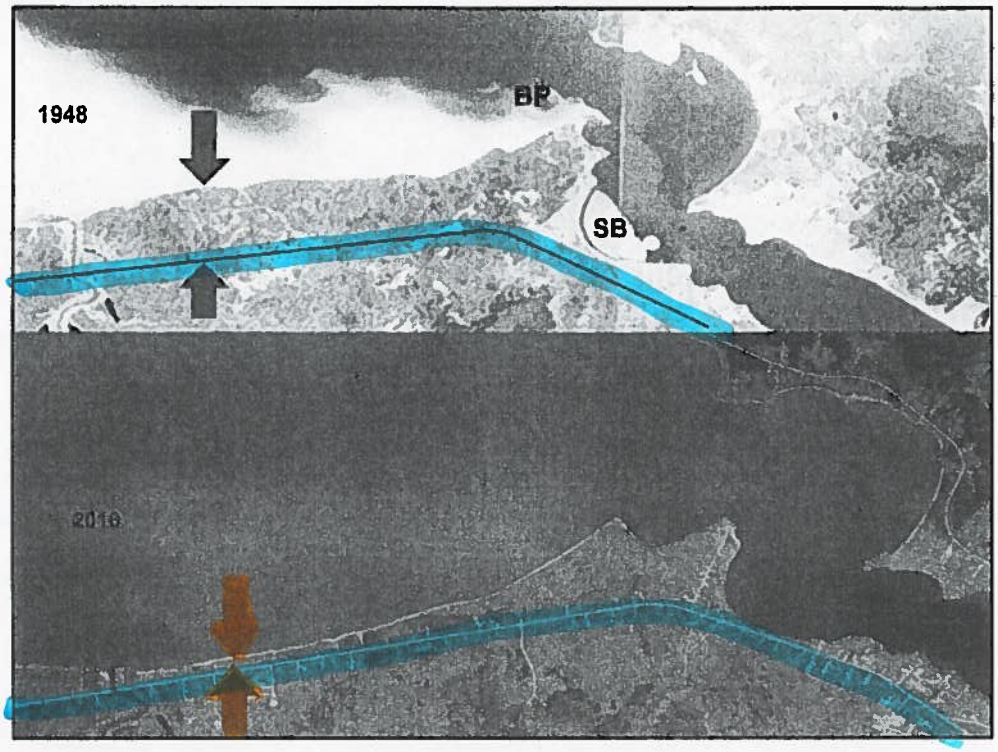
The two areas are noted on this figure – Traverse Bay and Riverton Harbour. Examples of infrastructure being considered for their impact include, the dams along the Winnipeg River starting in 1906, the Grand Rapids Dam on the Saskatchewan River completed in 1968, the Hecla Island Causeway completed in 1971, and the JenPeg Dam completed in 1979.

The first area I'd like to examine is around Traverse Bay at the mouth of the Winnipeg River.



This image compares a map of the shoreline in 1926 at the top with an aerial photograph of the shoreline in 2010 below it.

By using Provincial Highway 11 as a landmark you can see clearly that by 2010, there had been a very large amount of erosion along the south shore of Traverse Bay, as indicated by the arrows. Erosion is also apparent at Bruyere Point [labeled BP on this photo], where the channel has become much wider. The distance between the points of the arrows on the south shore of Traverse Bay decreased by about 500 meters from 1926 to 2010 – that is 500 meters of erosion.



In this next figure, an aerial photo from 1948 (on top) is compared with the aerial photo from 2010 (on the bottom). The arrows show the large amount of erosion since 1948. Along the southern shore of Traverse Bay the shoreline has moved southward up to 500 meters as shown by the arrows getting much closer together. The photo also shows, that in the period before the Pine Falls dam was built not far upstream from this spot, there was much more silt deposition creating a sand bar which might have provided some protection from erosion at Bruyere Point.

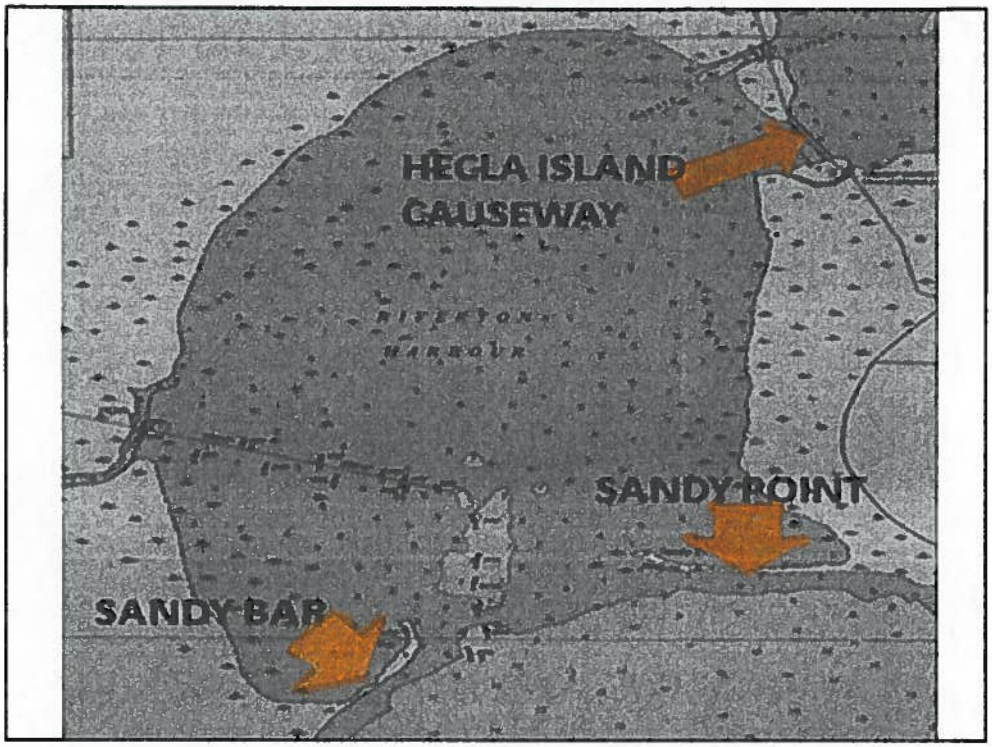
Thus the bulk of the change noted in the first comparison occurred between 1948 and 2010. This is true both for Bruyere Point and for the region to the west on the south shore of Traverse Bay. In reference to the sandbar labelled SB, visible on the aerial photo of 1948, it should be noted that where a fast flowing river carrying a significant amount of suspended particles enters a large lake like this, there is substantial deposition of suspended material from the flowing river water when it enters the slower moving water of the lake forming a delta. The building of dams along the Winnipeg River creating the water impoundments behind each dam has resulted in much of the sediment carried by the river being deposited behind the dams. Much less sediment is now left to deposit at the river delta. This effect will be most pronounced for the dam closest to the river mouth, which would be the Pine Falls Dam, completed in 1952.

In my discussions with people in the area, I have noted the following: First, in 2007, I met Murray Courchene who lived along provincial highway 11 where there had been the greatest erosion. He told me that when he was growing up Traverse Bay was so far away from his home you could not see the water. By 2007, water was very close to his house beside the road. This is consistent with the changes I have pointed out.

I was also there in the fall of 2007 shortly after winds and waves combined to cause this dramatic destruction of the foundation of this house. This resulted from a single severe fall storm that eroded the bank by 15 meters and caused the foundations of this home to fall from on top of the bank down to the water's edge.

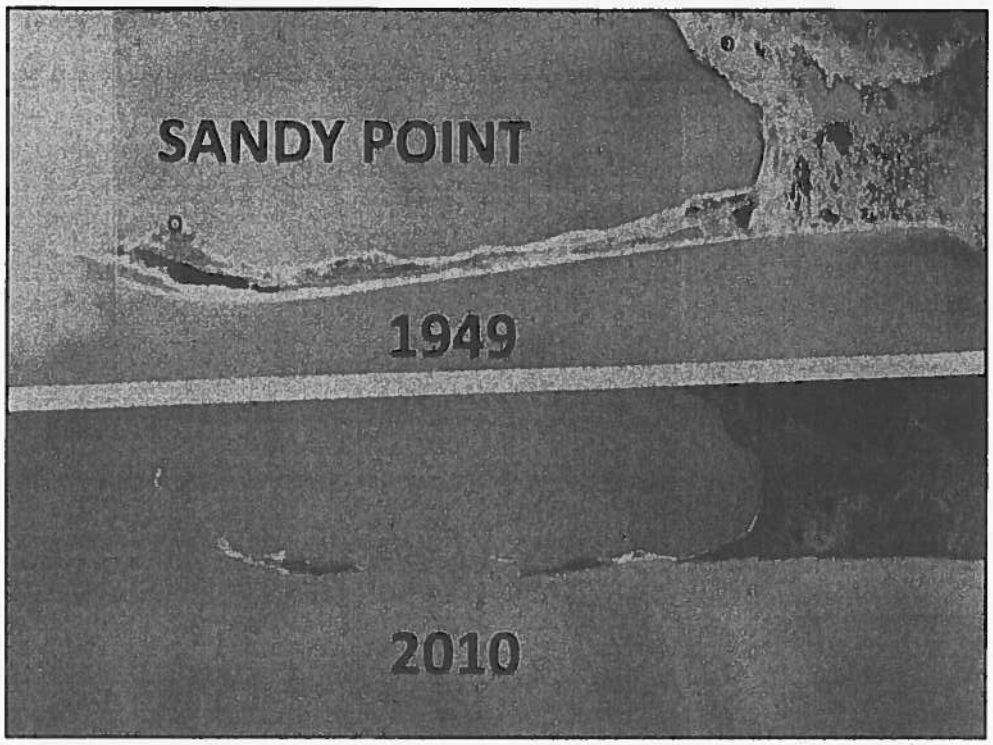
In addition, I have learned from others that historically (that would be before 1950) it was sometimes possible to walk across the Winnipeg River in this area in the fall because the water level was low, and probably also because of the buildup of silt in this area.

It is quite likely the changes on the south shore of Traverse Bay, with the nearly 500m of receded bank, are the result of the combined impact of the dams on the Winnipeg River, which have drastically reduced the deposition of silt at the river mouth, and the way Lake Winnipeg water levels are regulated keeping water in the lake longer into the summer and fall, making the shore more susceptible to erosion from autumn storms and high water.

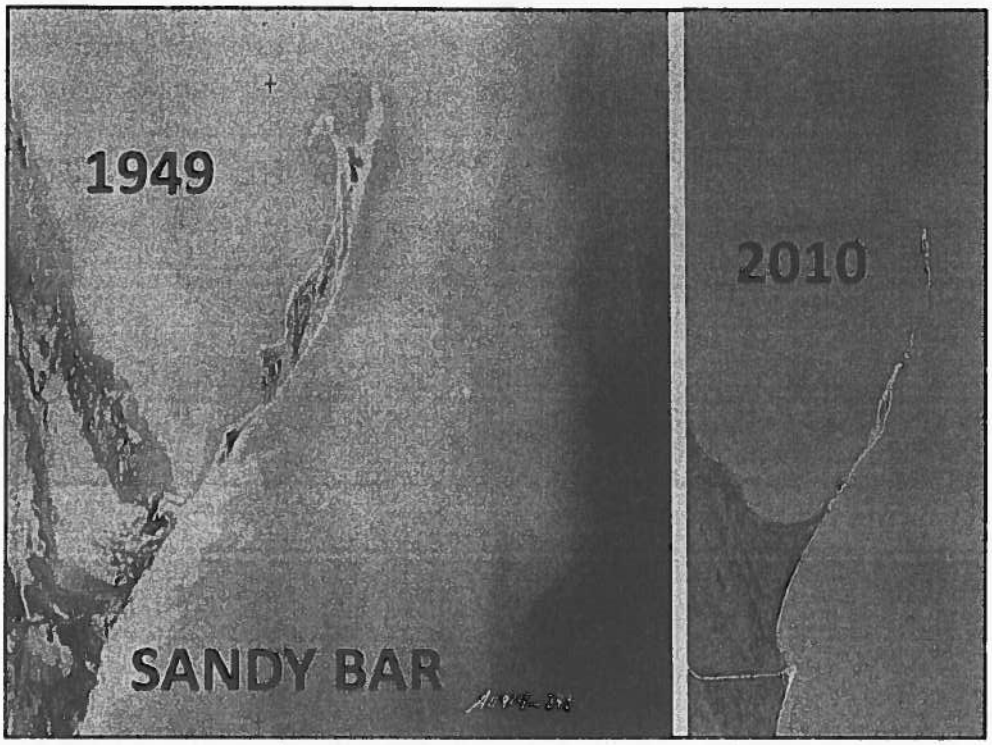


The second area of Lake Winnipeg that I will examine is Riverton Harbour, bordered by Hecla Island on the east. The Hecla Island Causeway seen here was completed in 1971. At the bottom, two projections are visible coming into the lake, Sandy Point on the right coming out from Hecla Island, and Sandy Bar on the left coming out from the west shore of Lake Winnipeg. Between the promontories there was a short walking distance over the ice or a short row in summer up until about 1970. Historically, occasionally the water was so low it could be walked in warmer temperatures as well.

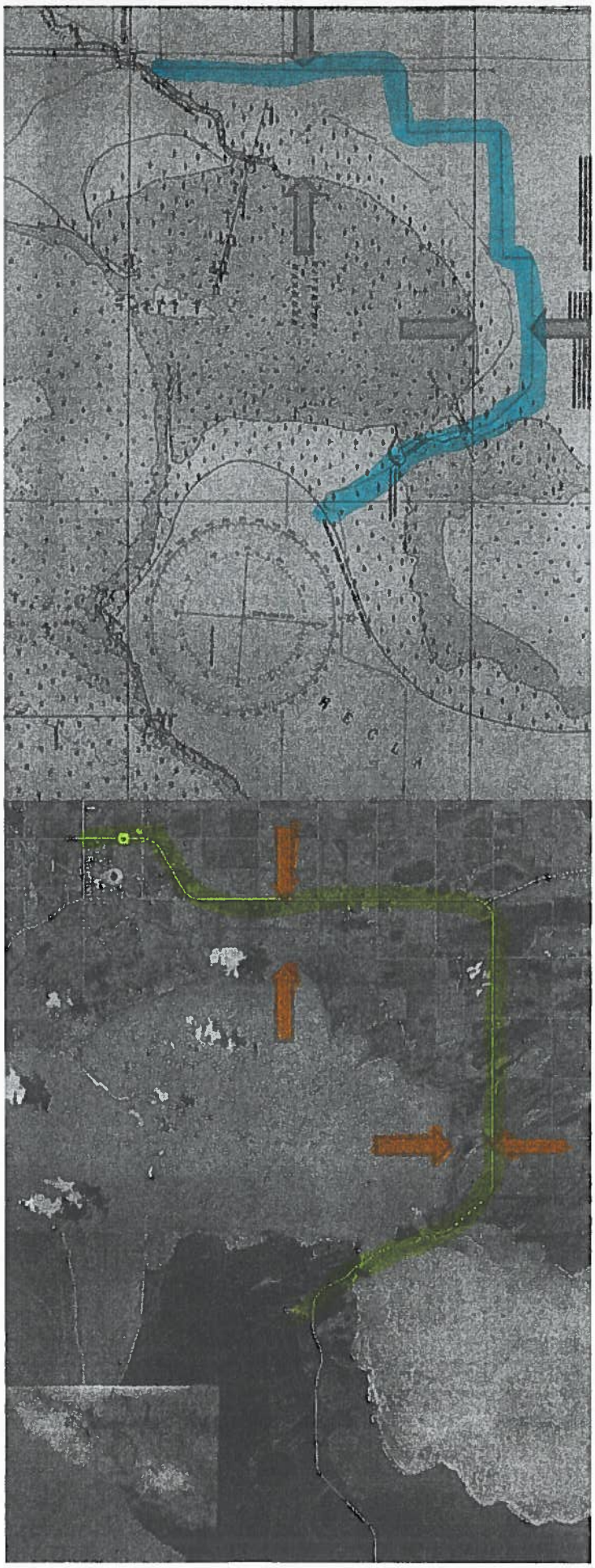
In this area, as at the mouth of the Winnipeg River, we see dramatic changes in the lake shoreline.

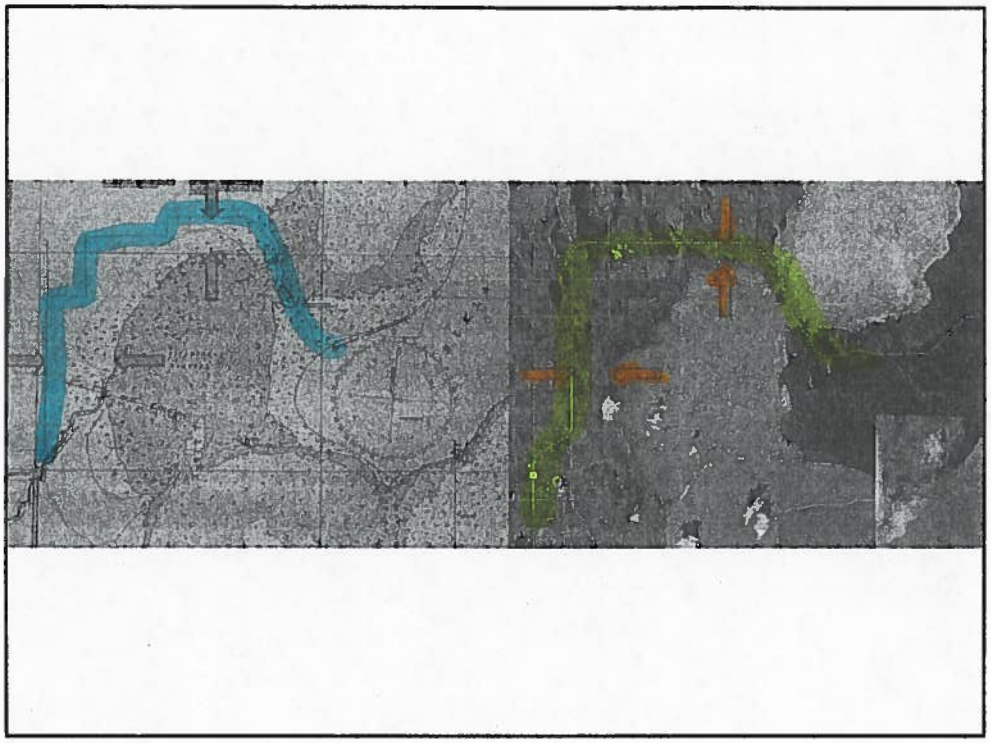


These aerial photos of Sandy Point show that there was a complete land structure in 1949, which has all but disappeared with only small remnant islands left by 2010. Along the promontory attached to Hecla Island, on a treed strip of land about 400 meters wide, a farmer built his home, and for years he and his family harvested hay on Hecla Island or the mainland to feed cattle at a feedlot near their house on the peninsula.

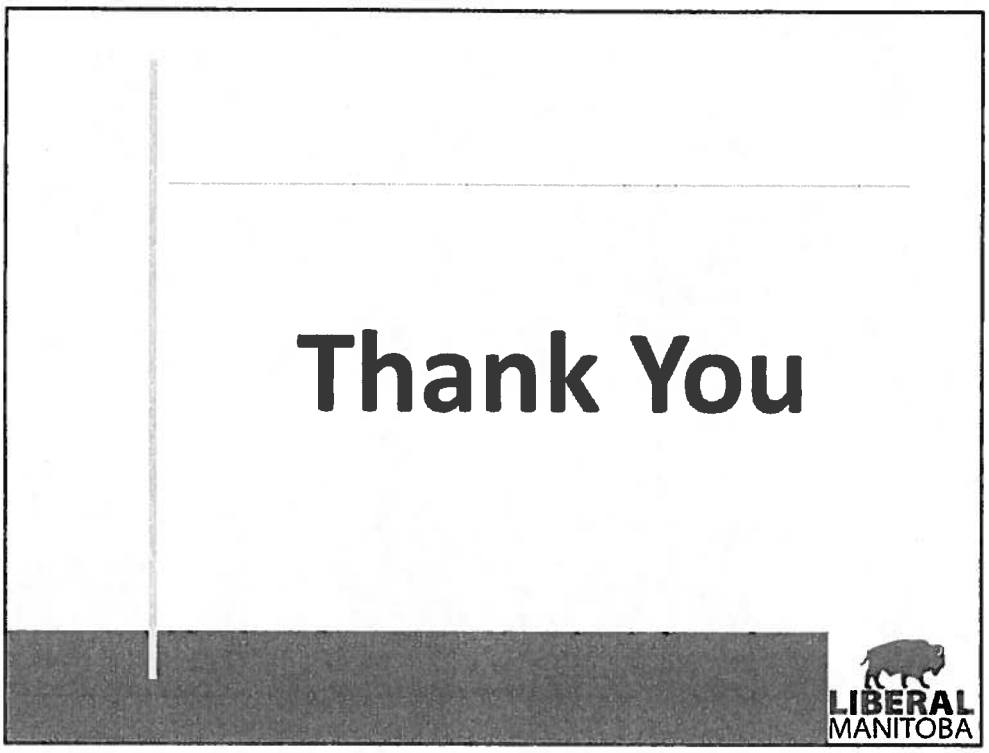


Here we compare Sandy Bar in 1949 with its eroded sliver in 2010. The changes may have resulted from the influence of the man-made construction in the nineteen seventies. It likely reflects the combination of the construction of the Hecla Island Causeway and the building of the Jenpeg Dam, with uncertainty as to whether one was the primary contributor or both.





It is not only at Sandy Bar and Sandy Point that we can see significant changes in the shoreline. This figure shows the changes around the area immediately south-west of the causeway. Again, using a provincial highway as a landmark, in this case highway 8, it is evident that the distance between the shore and the highway has shrunk significantly on the west side of Riverton Harbour. A comparison of the map from 1974 and the recent satellite photo from google maps suggests the shoreline has moved westward by about 1100 meters. At the north end of Riverton Harbour, the shoreline has also receded to the north, by about 400 meters. These changes have had an impact on the ability of people to live and farm in this area.



The point of my presentation is to emphasize that there have been significant changes in the shoreline of Lake Winnipeg in these two areas. It is likely that man-made changes to the infrastructure around Lake Winnipeg including the dams on the Winnipeg River, the Jenpeg Dam, the Hecla Island Causeway and the way water levels have been regulated have been contributing factors to these changes.

I am here to urge you, in your deliberations, to be aware of the changes which have occurred, likely as a result of human influence and to consider these effects. The alterations in water flow since 1970 should be a lesson to be reviewed as we look at the approach that is taken to regulating the waters of Lake Winnipeg and to developing a plan for the decades ahead. I am not speaking against growth or change, but rather to say that optimizing the regulation of the lake should not only recognize the need for impounding water for Manitoba Hydro. Appropriate regulation must also consider what is optimal for the Lake Winnipeg ecosystem as well as the ideal water level for those living around the lake. It is of interest, in relation to the ecosystem, that Grassy Narrows marsh, near the Causeway, used to be famous for the wildlife in the marsh. I am told by a local observer that since 1970 there has been a substantial deterioration in the quality of the marsh and a drastic decrease in the number of ducks, geese, muskrats and moose using it.

Lake Winnipeg is a large and ever-changing body of water. Responsible stewardship and careful consideration require in-depth studies that give us an understanding of the damage and change that may happen with water regulating structures, and the approach taken to regulating the water level. The examples I have reviewed provide documentation of change and the substantive impact that historic changes may have made on Lake Winnipeg. It is

important to stay vigilant as a new approach to regulation is developed and to consider what impacts it may have.

In concluding, I will add one additional comment. Research has shown that storage of the water upstream on the watershed – for example, on the land in south-western Manitoba, can have a very large impact to decrease flooding. Much improved storage of the water on the land upstream can also have a potential beneficial impact on the level of Lake Winnipeg. As well as serving to decrease the impact of drought on farmers in south-western Manitoba, it can decrease the impact of a drought on the amount of water in Lake Winnipeg available for production of hydroelectric power because the stored water can result in continued flow at times when streams and rivers would otherwise have little to no water. Such upstream storage could potentially also allow for occasional significant lowering of the water levelof Lake Winnipeg which may be desirable from an ecosystem perspective.