

Water Level and Storm Trends, Pictured Rocks National Seashore

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Sea Level Summary

Historical tide gauge data from the Marquette, MI water level station show that water levels around Pictured Rocks (PIRO) are decreasing (IPCC 2013; NOAA tides and currents 2012; Figure 1). PIRO has not been directly in the path of any hurricane-strength storms over the last century. The nearest historical storm path was from extratropical storm Carla in 1961, which passed within ca. 100 miles of the park. Storms are expected to intensify over the next century.

Table 1. Historical and projected sea level and storm trends for Pictured Rocks National Seashore.

Sea Level and Storm Surge Trends, Pictured Rocks National Seashore		2080 ¹
Historical water level trend, 1980–2015	-2.72 in	
Number of tropical storms, depressions and subtropical storm paths within 10 miles of Pictured Rocks, 1842–2014	0	
Projected Lake Level (Scenario A1B) Lake Superior projected lake level		-0.39 ft
Projected Lake Level Scenarios Range (Scenarios B1, A1B, and A2) Lake Superior projected lake level		-1.86 to +1.12 ft

¹Source: Angel and Kunkel 2010.

Sea Level Change and Storm Surge Vulnerability at Pictured Rocks National Seashore

- Increasing sea levels may lead to loss of land and critical habitat.
- Increased erosion and/or accretion across the coastline by storms coupled with shorelines adjusting to new mean sea levels.
- Rising groundwater tables and possible salt water intrusion due to rising sea levels.
- Increased risk of high intensity storm events.
- Potential loss of nearby freshwater ecosystems as sea levels rise.

References for Additional Sea Level and Storm Surge Information

- Intergovernmental Panel on Climate Change: <http://www.climatechange2013.org/report/>
- USACE Sea Level Calculator: <http://www.corpsclimate.us/ccaceslcurves.cfm>
- NOAA Tides and Currents: <http://tidesandcurrents.noaa.gov>
- NPS Storm Surge Mapping: <http://mariacaffrey.com/storms>
- NOAA Historical Storm Data: <http://www.ncdc.noaa.gov/ibtracs/>
- Hayhoe, K., VanDorn, J., Croley, T., Schlegal, N., Wuebbles, D. 2010. Regional climate change projections for Chicago and the US Great Lakes. *Journal of Great Lakes Research*, 36: 7–21.
- Angel, J.R., Kunkel, K.E. 2010. The response of Great Lakes water levels to future climate scenarios with an emphasis on Lake Michigan-Huron. *Journal of Great Lakes Research*, 36: 51–58.

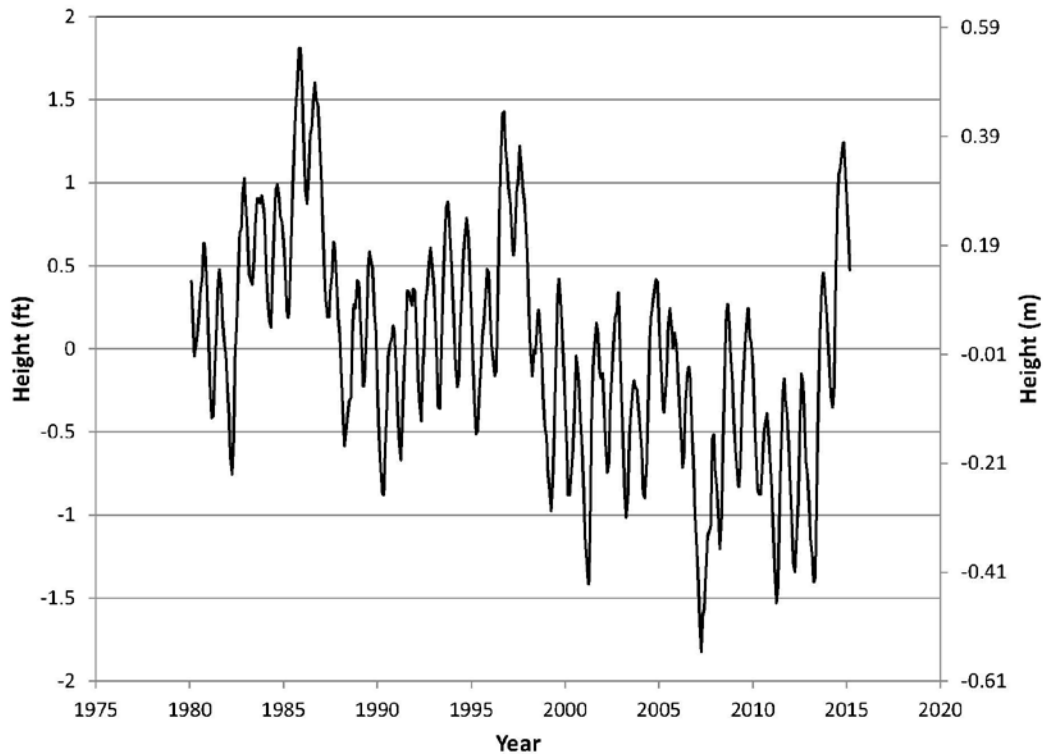


Figure 1. Water level trends, Marquette water level station, 1980–2015.

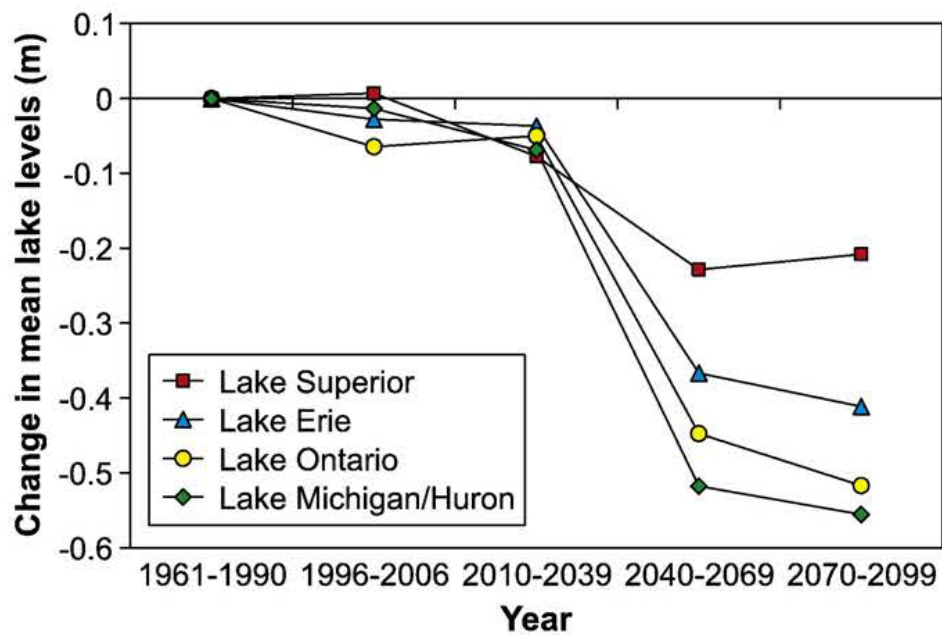


Figure 2. Average lake levels over time including projected lake levels under the IPCC A1FI (worst case) scenario. Source: Hayhoe et al. 2010.