

Sea Level and Storm Trends, Ebey's Landing National Historical Reserve

University of Colorado, Department of Geological Sciences, Boulder, Colorado

Contacts: Maria Caffrey, maria.caffrey@colorado.edu; Rebecca Beavers, rebecca_beavers@nps.gov

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Sea Level Summary

Historical tide gauge data from the Port Townsend, WA tide gauge show that sea level around Ebey's Landing National Historical Reserve is rising (IPCC 2013; NOAA tides and currents 2012; Figure 1). EBLA has not been directly in the path of any hurricane-strength storms over the last century; however, storms are expected to intensify over the next century.

Table 1. Historical and projected sea level and storm trends for Ebey's Landing National Historical Reserve.

Sea Level and Storm Surge Trends, Ebey's Landing NHR		2050 ²	2100 ³
Historical sea level trend, 1972–2012	+0.07 in/yr		
Estimated storm surge height ¹ (50 yr return level)	3.9 ft		
Estimated storm surge height ¹ (100 yr return level)	4.0 ft		
Low Emissions Scenario (RCP 4.5) Projected sea level		+0.51 ft	+1.42 ft
Intermediate Emissions Scenario (RCP 6.0) Projected sea level		+0.54 ft	+1.48 ft
High Emissions Scenario (RCP 8.5) Projected sea level		+0.56 ft	+1.76 ft

¹Storm surge heights are based on Seattle, WA taken from C. Tebaldi, B.H. Strauss, and C.E. Zervas (2012) Modelling sea level rise impacts on storm surges along US coasts. Environmental Research Letters 7: 014032.

²Calculated by Caffrey and colleagues using IPCC data. These numbers do not include changes in land level. A report regarding changes in land level will be released at a later date.

³Ensemble mean based on data used for figure 13.20 by the IPCC (2013).

Sea Level Change and Storm Surge Vulnerability at Ebey's Landing National Historical Reserve

- 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/>

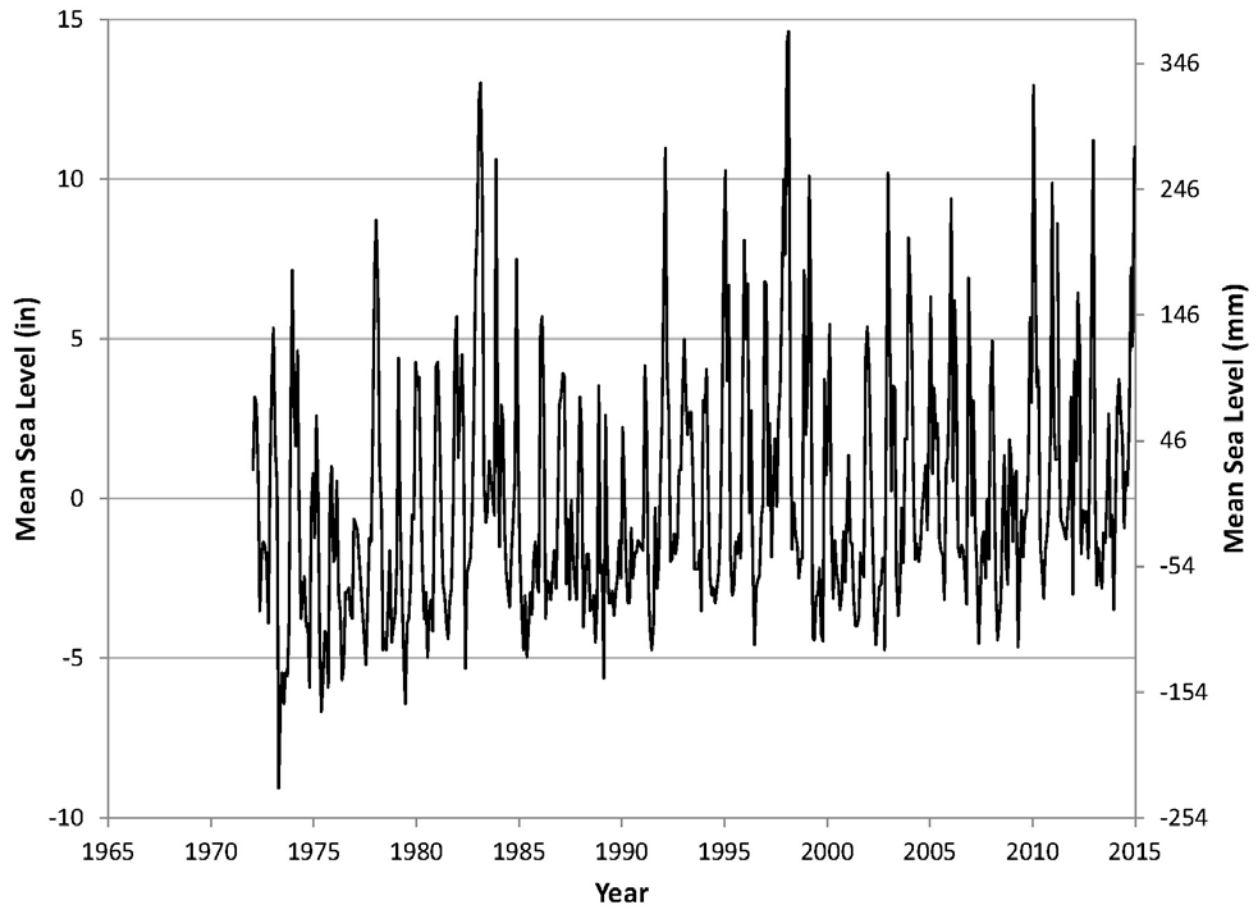


Figure 1. Sea level trends, St. Petersburg tide gauge, 1972–2014.