

Sea Level and Storm Trends, Pu'uuhonua O Hōnaunau National Historical Park

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Sea Level Summary

Sea level and trend and storm surge projection data are limited for this site. Historical tide gauge data from the Hilo, HI tide gauge show that sea level around Pu'uuhonua O Hōnaunau National Historical Park (PUHO) is rising (IPCC 2013; NOAA tides and currents 2012; Figure 1). PUHO has not been directly in the path of any hurricane-strength storms over the last century; however, it has been within 20 miles of two tropical storms (Daniel in 1982 and Eugene in 1993). Storms are expected to intensify over the next century. A Saffir-Simpson category 1 hurricane could travel up to PUHO by 2100.

Table 1. Historical and projected sea level and storm trends for Pu'uuhonua O Hōnaunau National Historical Park.

Sea Level and Storm Surge Trends, Pu'uuhonua O Hōnaunau National Historical Park		2050 ¹	2100 ²
Historical sea level trend, 1927–2014	+0.12 in/yr		
Number of tropical storms, depressions and subtropical storm paths within 10 miles of Pu'uuhonua O Hōnaunau, 1842–2014	0		
Low Emissions Scenario (RCP 4.5) Projected sea level		+0.68 ft	+1.65 ft
Intermediate Emissions Scenario (RCP 6.0) Projected sea level		+0.72 ft	+1.70 ft
High Emissions Scenario (RCP 8.5) Projected sea level		+0.72 ft	+2.21 ft

¹Calculated by Caffrey and colleagues using IPCC data.

²Ensemble mean based on data used for figure 13.20 by the IPCC (2013).

Sea Level Change and Storm Surge Vulnerability at Pu'uuhonua O Hōnaunau National Historical Park

- 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/>

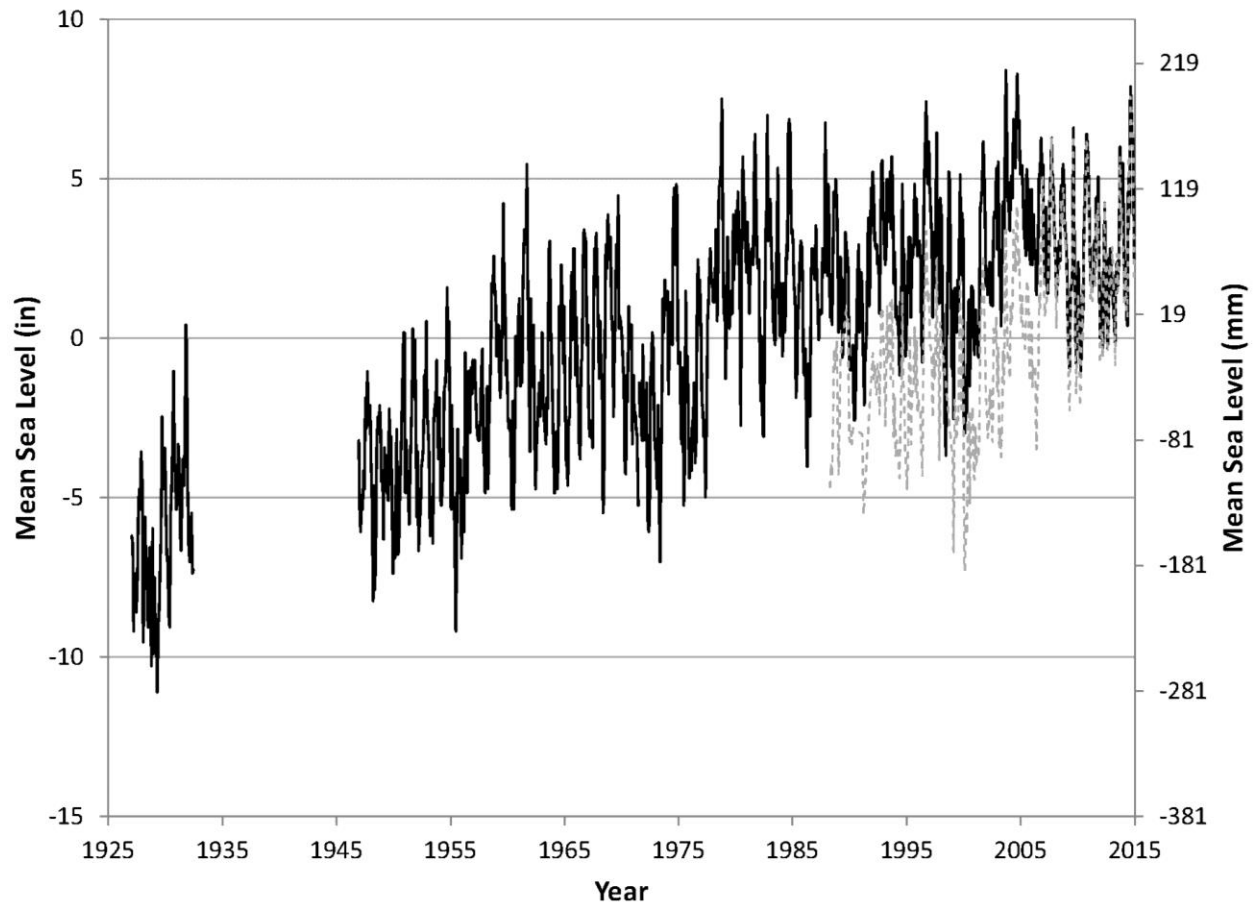


Figure 1. Sea level trend data from the Hilo, HI tide gauge (black line, 1947–2014) and Kawaihae, HI tide gauge (gray dashed line, 1988–2014).