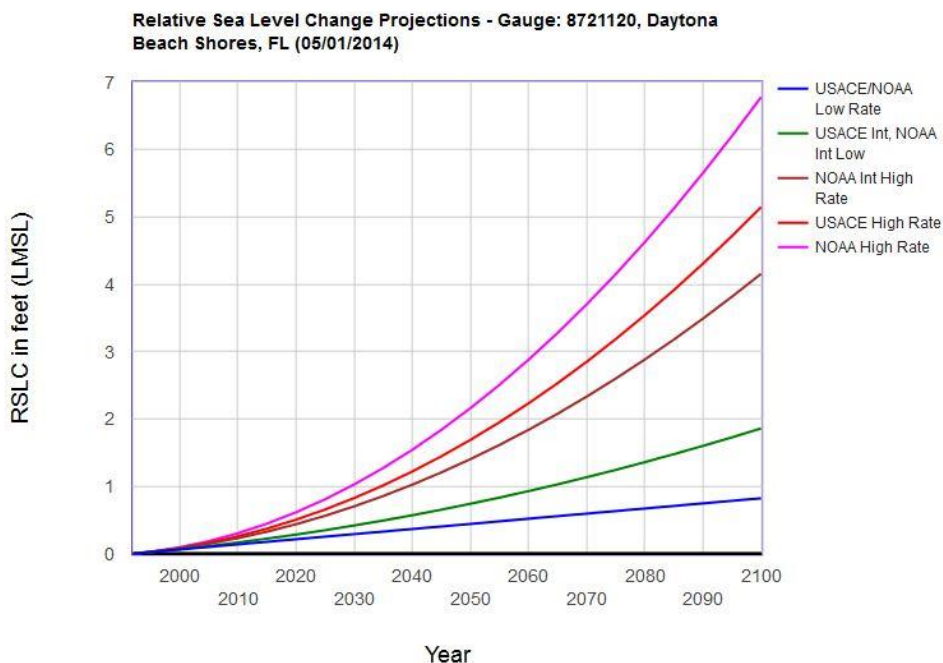


## Overview of Two Sea Level Rise Projections: National Oceanic and Atmospheric Administration & U.S. Army Corps of Engineers

Two commonly used sets of sea-level rise (SLR) projections are from the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers (USACE). Confusion has arisen around the differences between the two. This document is intended to help clarify the differences. Both NOAA and USACE collaborated with multiple partners (federal agencies, universities, and external organizations/ experts) in developing SLR projections. NOAA has adopted 4 projections and USACE has adopted 3. The lowest two projections from NOAA and USACE are the same, resulting in 5 total projections (see graph below) between the two agencies. The NOAA high projection estimates up to 2 meters of SLR by 2100, while the USACE high projection estimates up to 1.5 meters of SLR by 2100.

8721120, Daytona Beach Shores, FL  
NOAA's Published Rate: 0.00761 feet/yr



### U.S. Army Corps of Engineers Sea Level Change Projections

The USACE utilizes three sea level change projections for evaluating the effects of SLR on coastal projects. Each projection represents a future scenario of sea level change, resulting in global sea level rise values of 0.2 meters, 0.5 meters, and 1.5 meters by 2100. With input from multiple partners, these projections were adapted from the National Research Council's report [Responding to Changes in Sea Level: Engineering Implications](#).

1. **USACE Low Curve (8 inches or 0.2 meters by 2100):** Represents a linear extrapolation of the historic rate of global SLR (of 1.7 mm/yr) based on observed sea level measurements. The USACE Low and NOAA Low are equivalent.

2. **USACE Intermediate Curve (1.6 feet or 0.5 meters by 2100):** Computed from the modified NRC Curve I considering the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) projections and modified NRC projections with the local rate of vertical land movement added. The USACE Intermediate Curve and NOAA Intermediate Low are equivalent.
3. **USACE High Curve (5 feet or 1.5 meters by 2100):** Computed from the modified NRC Curve III considering the IPCC AR4 projections and modified NRC projections with the local rate of vertical land movement added. “This ‘high’ rate exceeds the upper bounds of IPCC estimates from both 2001 and 2007 to accommodate the potential rapid loss of ice from Antarctica and Greenland, but it is within the range of values published in peer-reviewed articles since that time” (USACE, 2013, p.2).

USACE (2013). *Incorporating Sea Level Change into Civil Works Programs*. ER 1100-2-8162.

[http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER\\_1100-2-8162.pdf](http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1100-2-8162.pdf)

USACE Sea Level Change Calculator: <http://www.corpsclimate.us/ccaceslcurves.cfm>

## NOAA Sea Level Change Projections

Under the Global Change Research Act of 1990, the U.S. National Climate Assessment (NCA) is commissioned by U.S. Congress every four years to consider future SLR trends and synthesize current scientific literature on global SLR. The NCA is a multi-agency effort, led by NOAA, and provides four global mean SLR scenarios which can be used for assessing potential impacts. These four scenarios estimate that mean global sea level will rise at least 0.2 meters (8 inches) and no more than 2.0 meters (6.6 feet) by 2100. Each of the scenarios incorporates different amounts of thermal expansion from ocean warming and ice sheet loss, resulting in a range of projected SLR amounts.

1. **NOAA Low Curve (8 inches or 0.2 meters by 2100):** Represents a linear extrapolation of the historic rate of global SLR (of 1.7 mm/yr) based on observed sea level measurements. The NOAA Low and USACE low are equivalent.
2. **NOAA Intermediate Low Curve (1.6 feet or 0.5 meters by 2100):** Based on upper end of the IPCC AR4 global SLR projections resulting from climate models using the B1 emissions scenario. The NOAA Intermediate Low and USACE Intermediate are equivalent.
3. **NOAA Intermediate-High Curve (3.9 feet or 1.2 meters by 2100):** “Based on an average of the high end of semi-empirical, global SLR projections. Semi-empirical projections utilize statistical relationships between observed global sea level change, including recent ice sheet loss, and air temperature”. (NOAA, 2012, p.2)
4. **NOAA High Curve (6.6 feet or 2.0 meters by 2100):** “The greatest uncertainty surrounding estimates of future global SLR is the rate and magnitude of ice sheet loss, primarily from Greenland and West Antarctica” High rate “...derived from a combination of estimated ocean warming from IPCC Fourth Assessment Report (AR4) global SLR projections and a calculation of the maximum possible glacier and ice sheet loss by the end of the century.” (NOAA, 2012, p.2)

NOAA (2012). *Global Sea Level Rise Scenarios for the United States National Climate Assessment*. Climate Program Office (CPO) – NOAA Technical Report OAR CPO-1.

<http://cpo.noaa.gov/AboutCPO/AllNews/TabId/315/ArtMID/>