



US Army Corps of Engineers

Climate Change Preparedness and Resilience: How NOAA Data Supports Implementation in the Pacific Islands

NOAA Hydrographic
Services Review Panel
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OUTLINE



- Overview of USACE Civil Works and Military Projects in the Pacific Islands
- Climate Change Policy and Requirements for USACE Projects
- NOAA Data that Supports USACE Climate Preparedness and Resilience Efforts
- Looking Forward - Additional Data Needed



USACE CIVIL WORKS PROJECTS



27 Federally maintained Deep Draft
and Small Boat Harbors within
Hawaii and the US Pacific Territories

14 Federal Flood Control Projects

13 non-Federal Flood Control Projects

20 Shore Protection Projects

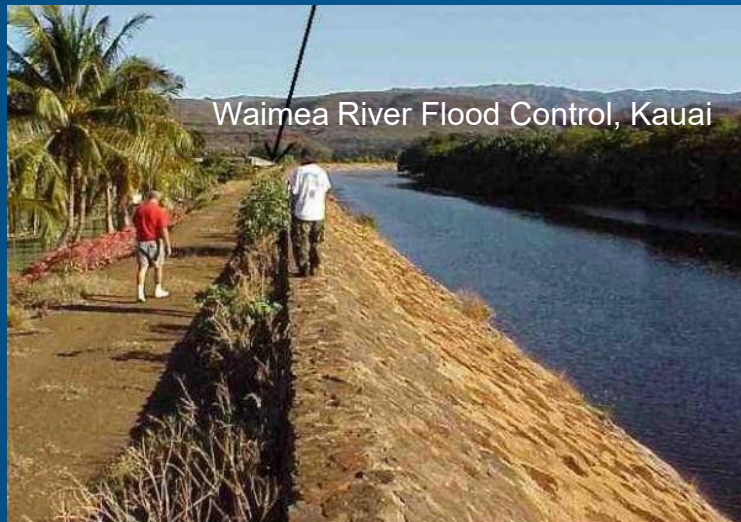
Kahului Deep Draft Harbor, Maui



Auasi Small Boat Harbor, American Samoa



Waimea River Flood Control, Kauai



Agat Small Boat Harbor, Guam



Saipan Beach
Road Shore
Protection, CNMI





USACE MILITARY CONSTRUCTION



Army Pier at Naval Station White Beach,
Okinawa, Japan



Pi'ilau Army Recreation Center,
Oahu

Photo credit: goodfellowbros.com



Army Family Housing, Kwajalein



USACE Climate Change Regulation and Policy



Sea Level Rise:

- **Engineer Regulation, ER 1100-2-8162**, provides guidance for incorporating the direct and indirect physical effects of projected future sea level change (SLC) across the project life cycle.
- Engineer Technical Letter, TL 1100-2-1 explains how to comply with the policy.
- *Potential relative sea level change must be considered in every USACE coastal activity as far inland as the extent of estimated tidal influence. The planning, design, construction, operation, and maintenance of USACE water resource projects in and adjacent to the coastal zone must consider the potential for future accelerated rise in global mean sea level (GMSL) to affect the local MSL trend, which may vary considerably from global changes.*

Inland Hydrology:

- Engineering and Construction Bulletin (ECB) 2018-14, Guidance for Incorporating Climate Change Impacts to Inland Hydrology in Civil Works Studies, Designs, and Projects. This ECB applies to all hydrologic analyses supporting planning and engineering decisions having an extended decision time frame.
- *All Civil Works Studies, Designs, and Projects, incorporate climate change information in hydrologic analyses in accordance with the USACE overarching climate change adaptation policy.*



Wave overtopping at Hilo Harbor (Hawaii Island)



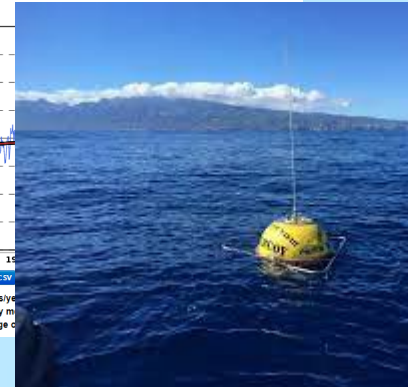
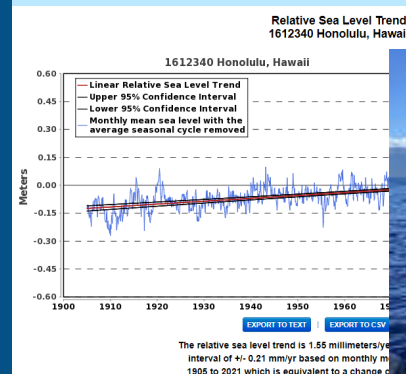
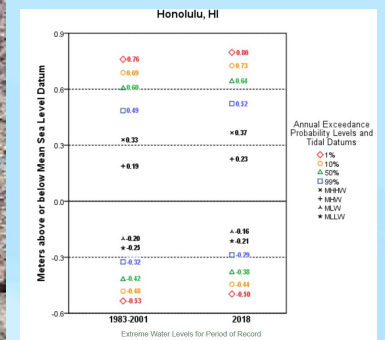
- Relative Sea Level Trends
- Predicted/Observed Water Levels
- Extreme Water Level Analysis
- Interannual/Seasonal Variation

- Benchmark Elevations
- Pacific Datum and Geoid Information
- Horizontal/Vertical Transformation Tools

- Digital Coast Data Access Viewer
- SLR Viewer

- PacIOOS Wave Buoy Data and Forecast

- Precipitation Frequency Estimates
- State Climatic Summaries





USACE CLIMATE ANALYSIS PRODUCTS USING NOAA DATA



- USACE SLC Calculator

Estimated Relative Sea Level Change Projections - Gauge: 1612340, Honolulu, HI





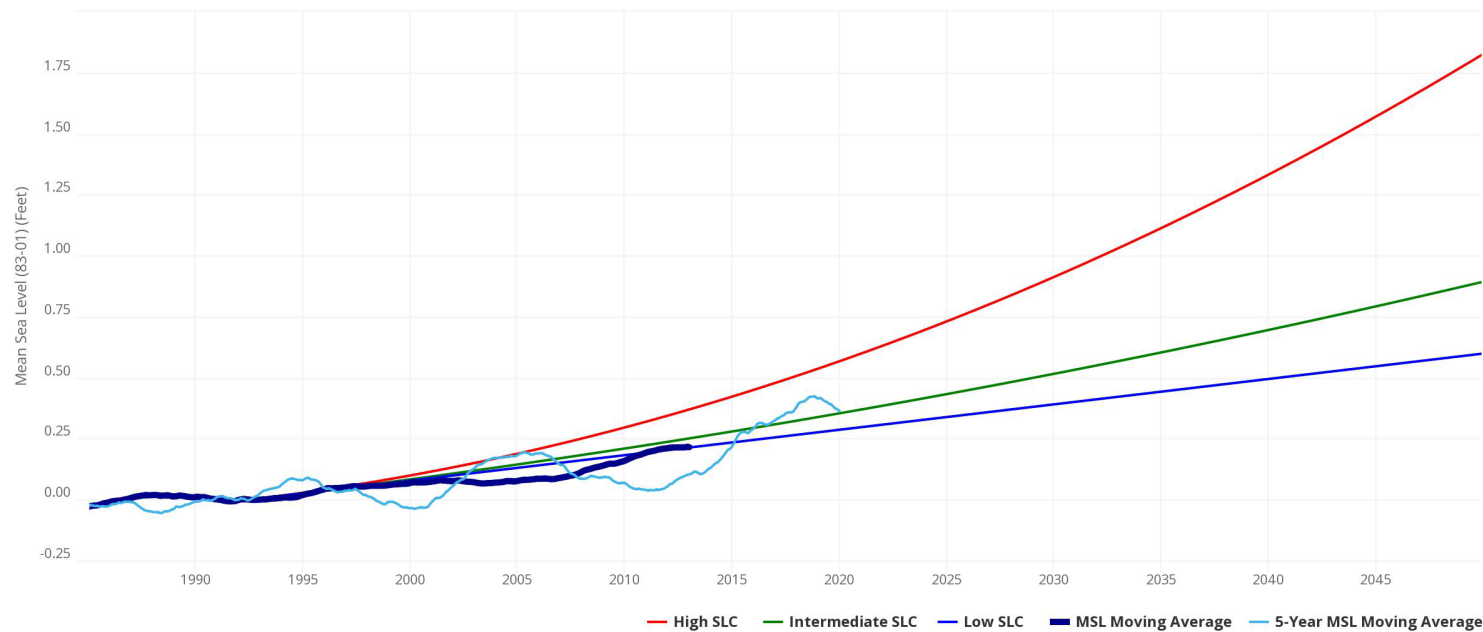
USACE CLIMATE ANALYSIS PRODUCTS USING NOAA DATA



- USACE SLC Calculator
- USACE SLC Tracker

Sea Level Rise with USACE SLC Scenarios for Hilo, HI (1617760)

Active and compliant tide gauge

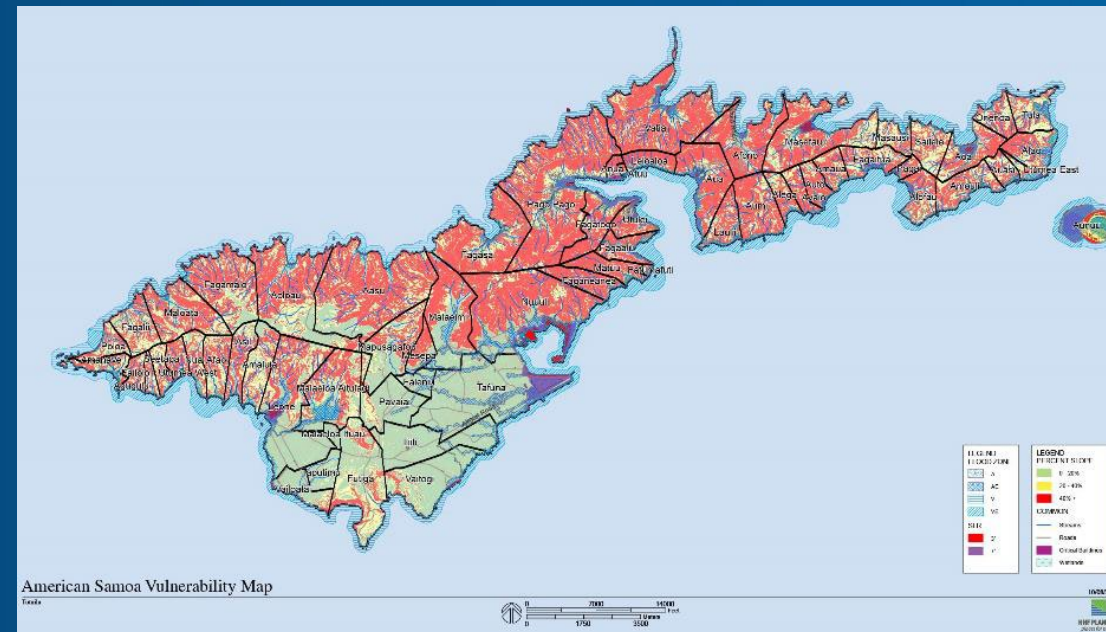


USACE Sea Level Change Predictions for Hilo, HI (NOAA Tidal Gauge #1617760) for user selected datum: MSL.
Timeframe: Jan, 1990 - Dec, 2031 (42 years, 0 months)
Timeframe contains 7 missing points; the longest gap is 0 years, 4 months.
Rate of Sea Level Change: 0.0104 ft/yr (Regional 2006)

USACE CLIMATE ANALYSIS PRODUCTS USING NOAA DATA

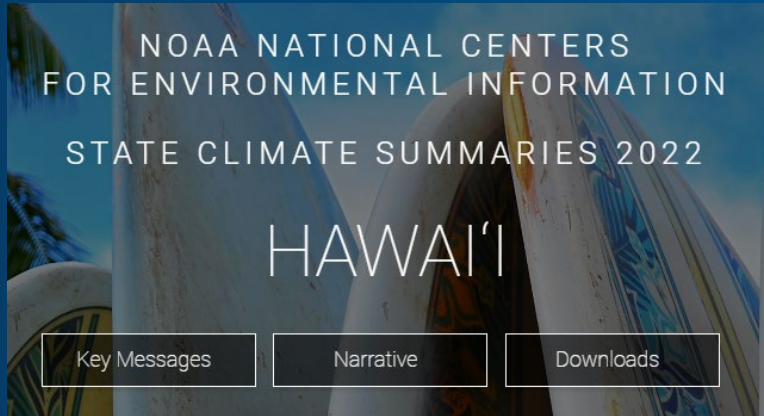


- USACE SLC Calculator
- USACE SLC Tracker
- Site Specific Studies of Climate Vulnerability





USACE CLIMATE ANALYSIS PRODUCTS USING NOAA DATA



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- Hydrologic Analysis

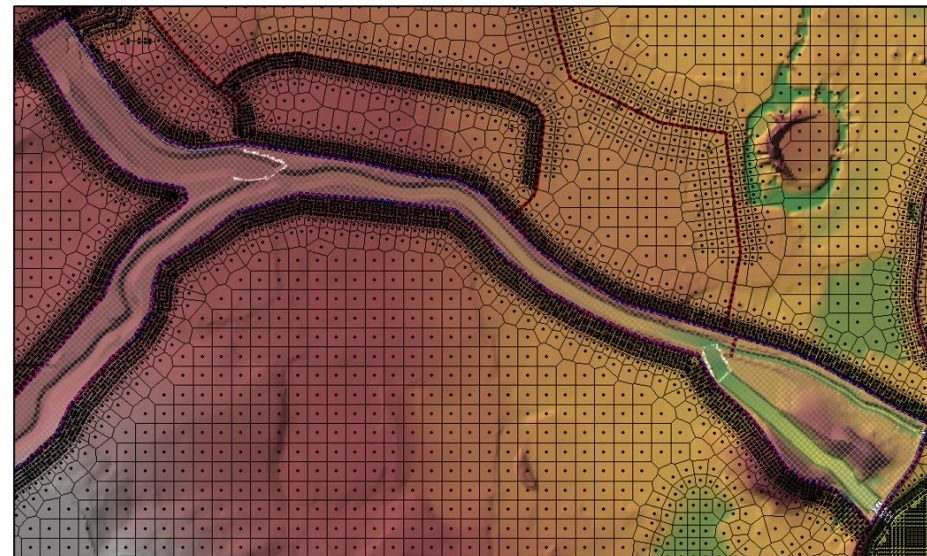
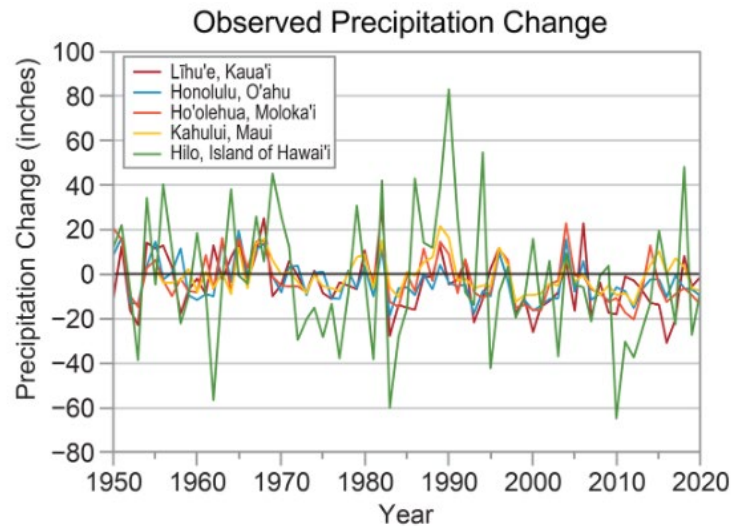
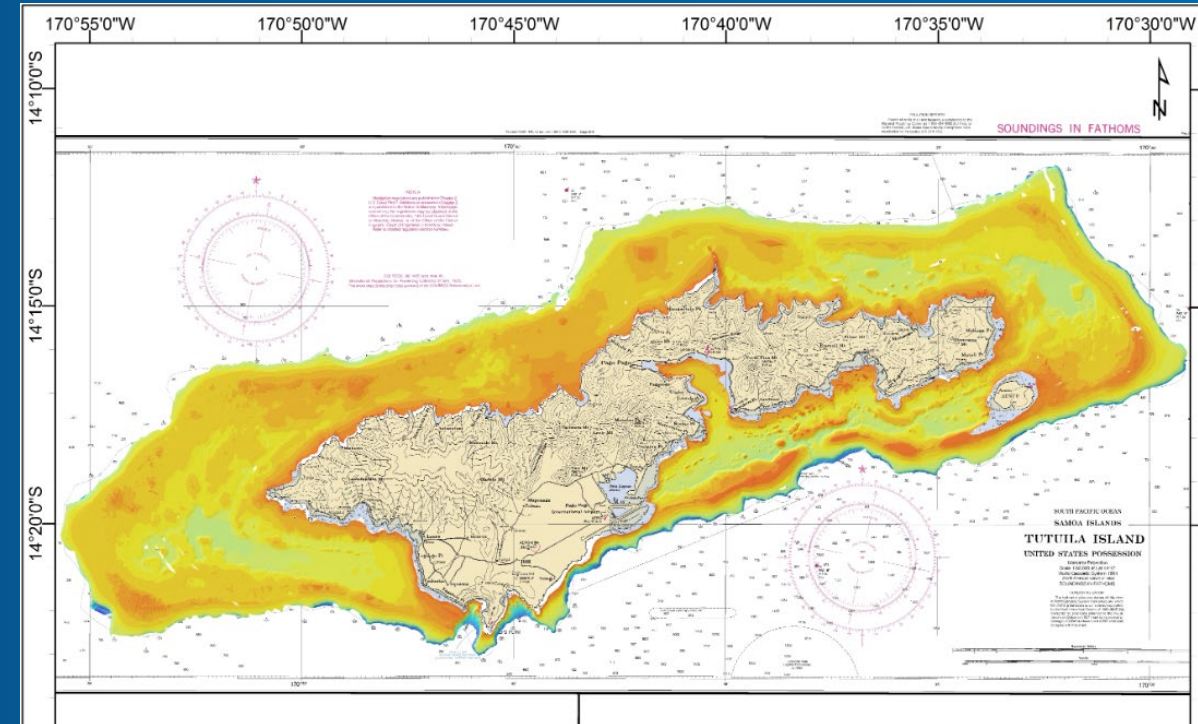
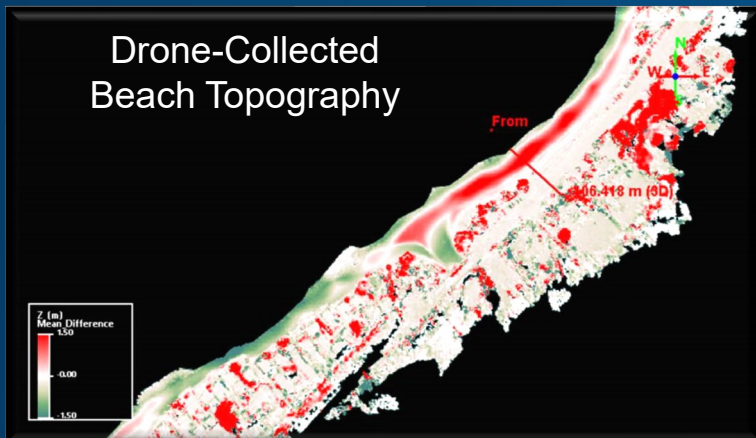


Figure 20: Main Flood Control Channel (Waialeale Stream) Cell Mesh Resolution

FUTURE DATA NEEDS FOR PLANNING AND ADAPTATION

- Topography and Bathymetry – Airborne/UAS LiDAR in fringing reef environments
- Water Level Stations (or GPS data) in remote locations to estimate SLR
- Database for UAS imagery/elevation data
- Measurement and Analysis of water level interannual variability (ENSO, etc.) across the Pacific to incorporate into design





THANK YOU



SILVER JACKETS

Many Partners, One Team