


VCPWA Policy, Procedure & Standards Manual

Chapter:		Chapter Number:	
Policy/Procedure (<u>Underline One</u>): Infrastructure Planning - Sea Level Rise		Departments: <input type="checkbox"/> CS <input type="checkbox"/> ES <input checked="" type="checkbox"/> RT <input checked="" type="checkbox"/> WP <input checked="" type="checkbox"/> WS	Policy Number:
PWA Adopted: 5/31/2023	Reviewed:	Revised: Click or tap to enter a date.	Version Number: 1
Approved By: Jeff Pratt	Date: 6/5/23	Signature: 	

Departments/Staff Affected

All department, all staff.

POLICY

The Ventura County Public Works Agency (PWA) shall use the sea level rise predictions for 2050 in NOAA’s 2022 sea level rise report^[1] to perform sea level rise vulnerability assessments for all existing coastal PWA infrastructure as of 2023 as shown in Figure 1, and to inform the planning and design of new PWA infrastructure within county coastal regions.

This policy is established following direction from the County Board of Supervisors to PWA for infrastructure planning design, as it relates to climate change and sea level rise on July 26, 2022^[2].

PROCEDURE

Western Ventura County is a coastal community and PWA has vital infrastructure providing critical public services from flood control, environmental protection, transportation to sewer lines in county coastal regions. Sea level rise has the potential to negatively affect the level of service the PWA facilities provide or even disrupt the service.

Historically, PWA infrastructure projects have been built using design standards based on analysis of recorded climate data, but as the current and future climate conditions diverge from historic norms, PWA must prepare to adapt.

To improve resilience to sea level rise and coastal flooding, Ventura County 2040 General Plan (as directed by the State) uses Ocean Protection Council’s Sea Level Rise Guidance (2018)^[3] and policy HAZ-3.2^[4] to administer development in coastal regions in which projects sited along or seaward of Highway 101 are required to accommodate 100-years of projected sea level rise in accordance with the ‘H++’ extreme risk aversion sea level rise scenario, which estimates a sea level rise of 9.8 feet by year 2100 and 13.7 feet by year 2120. However, this is based on outdated climate change and sea level science. Implementing this policy for PWA infrastructure would be very costly and, in some cases, impractical.

PWA keeps track of the latest developments in the research of climate change and sea level rise and uses the up-to-date science for sea level rise predictions. The report “Global and Regional Sea Level Rise Scenarios for the United States”^[1] produced by NOAA and a number of other federal agencies dated February 2022 is the “best available” sea level rise research product at the time of this policy. Using observation-based extrapolations method and with higher confidence than ever before, this report predicts an “intermediate” sea level rise of 0.8 ft and a “high” sea level rise of 1.3 ft by year 2050 for Ventura County coast (Southwest U.S.). PWA shall use the NOAA 2050 sea level rise predictions for coastal infrastructure planning and design because the risks and uncertainties associated with these predictions are acceptable.

To implement the policy, all existing PWA facilities in coastal regions shall perform a sea level rise vulnerability assessment to evaluate any level of service deficiencies by year 2050, as compared to the level of service today, using “intermediate” sea level rise predictions. For those that are deficient, remediation measures shall be proposed, project costs estimated, and timing and action thresholds determined. Projects identified through sea level rise vulnerability assessments shall be included in the long-term project management plan and/or 5-year Capital Improvement Plan depending on project priorities. New PWA infrastructure projects or projects to replace or upgrade existing facilities in coastal regions shall be designed to accommodate 2050 “intermediate” sea level rise with adaptive management contingency plans for 2050 “high” sea level rise prediction.

Sea level rise vulnerability for PWA coastal infrastructure shall be assessed in at least two aspects: hydraulics and erosion. Sea level rise may negatively affect flood control facilities’ flow capacities or inundate roadways; sea level rise may accelerate the rate of shoreline erosion that may compromise structure foundations or expose underground structures such as sewer lines.

The level of service for a flood control facility is defined as the level of flood protection the facility provides and is expressed as annual exceedance probability or return period. For a road or bridge, the level of service is defined as how often it get inundated by floods and is expressed by design elevations. For a sewer line, the level of service is defined as remaining service life and is expressed in years.

For existing infrastructure vulnerability assessments, the following steps shall be followed:

1. Establish baseline conditions through hydraulic analysis and/or erosion/morphology assessment.
2. Determine level of service at baseline conditions.
3. Perform sea level rise impact analysis through hydraulic analysis and/or erosion/morphology assessment, using 2050 “intermediate” sea level rise prediction.
4. Determine level of service deficiencies in comparison with baseline conditions.
5. If no deficiencies are found, complete a sea level rise vulnerability assessment report by summarizing the findings; if deficiencies are found, go to next step.
6. Using NOAA’s sea level rise predictions for U.S. Southwest coast from 2020 to 2050 (Figure 2), estimate timing and action thresholds. This means performing additional hydraulic analysis and/or erosion/morphology assessment using an “intermediate” sea level rise prediction for the year between now and 2050 to determine the first year when the current level of service will be compromised.

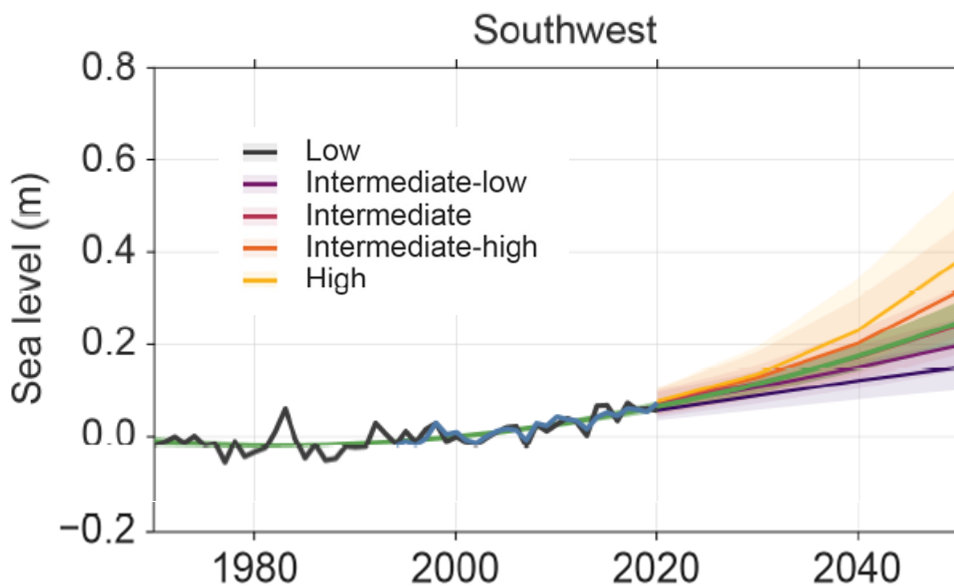


Figure 2: 2022 NOAA Sea Level Rise Predictions for U.S. Southwest Coast ^[1]

7. Develop adaptation strategies or remediation measures that can be deployed if action thresholds are reached.
8. Estimate adaptation/project costs.

9. Prepare a sea level rise vulnerability assessment report by summarizing the findings.

For new infrastructure planning and design, the following steps shall be followed:

1. Determine level of service at year 2050.
2. Perform hydraulic analysis and/or erosion/morphology assessment, using 2050 “intermediate” sea level rise prediction.
3. Design the facility to provide the level of service with the minimum freeboard as defined by PWA design manuals.
4. Perform hydraulic analysis and/or erosion/morphology assessment, using 2050 “high” sea level rise prediction.
5. Check if the height of the facility can accommodate 2050 “high” sea level rise prediction, without freeboard. If yes, go to next step. If not, go to step #8.
6. Estimate project cost.
7. Finalize the project design and prepare a project design report.
8. Develop adaptation management contingency plans for “high” sea level rise prediction.
9. Estimate project cost and the cost for the adaptation plan.
10. Finalize the project design and prepare a project design report.

For baseline conditions hydraulic analysis, FEMA guidance for flood risk mapping^[5] stipulates Mean Higher High Water (MHHW) level of the nearby tidal station be used as starting water surface elevation. The MHHW for north county coast is 5.39 feet NAVD88 at Santa Barbara tidal station (station ID: 9411340)^[6] and for south county coast 5.43 feet NAVD88 at Santa Monica station (station ID: 9410840)^[7]. Hydraulic analysis for future conditions shall use MHHW + sea level rise as starting water surface elevation.

This policy does not apply to non-PWA infrastructure.

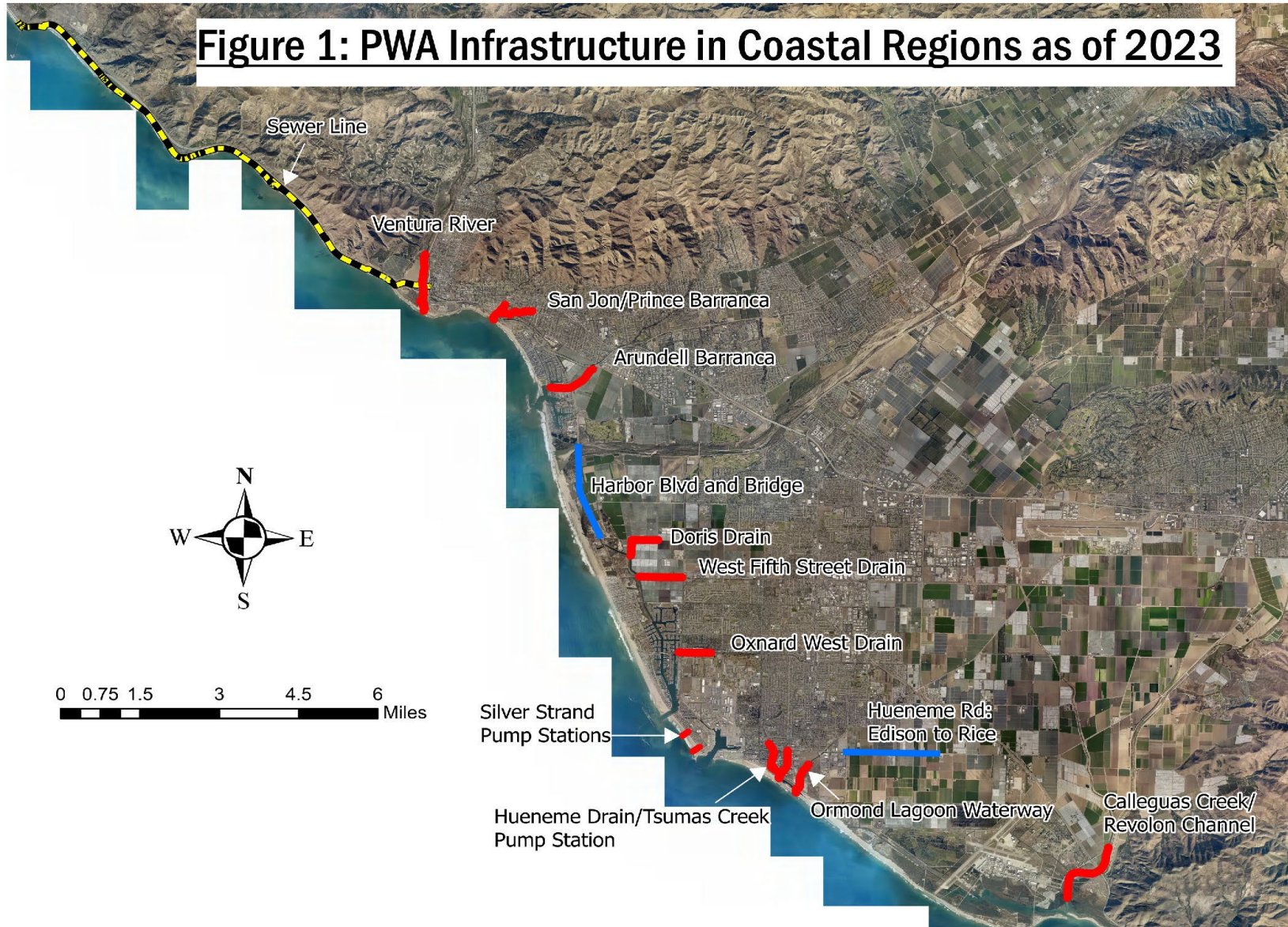
This policy shall be updated along with the evolving climate and sea level science.

REFERENCES

1. Global and Regional Sea Level Rise Scenarios for the United States. National Oceanic and Atmospheric Administration, February 2022.
2. Board Letter: Provide Direction to the Public Works Agency for Infrastructure Planning Design as it Related to Climate Change and Sea Level Rise. Ventura County Public Works Agency, July 26, 2022.
3. State of California Sea-Level Rise Guidance 2018 Update. California Ocean Protection Council, 2018.
4. Ventura County 2040 General Plan, Hazard and Safety Element. Ventura County Resource Management Agency, September 2020.

All policies are subject to amendment. Please refer to the Public Works Agency Shared Folder ([PWA Standards and Templates](#)) for the official, most recent version.

5. Guidance for Flood Risk Analysis and Mapping, Hydraulics: One-Dimensional Analysis. FEMA, November 2016
6. Datums for 9411340, Santa Barbara CA.
<https://tidesandcurrents.noaa.gov/datums.html?id=9411340>
7. Datums for 9410840, Santa Monica CA
<https://tidesandcurrents.noaa.gov/datums.html?id=9410840>



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