

Port of Los Angeles Sea Level Rise Adaptation Study

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APRIL 20, 2022 | SAN DIEGO
ULI Coastal Forum

@ ULI 2022 SPRING MEETING
8:30 AM-12:00 PM PST



SAN PEDRO BAY PORT COMPLEX



Long Beach

Port of Long Beach

Port of Los Angeles

San Pedro Bay Port Complex

- #1 in US, #9 in the world
- 74% of West Coast Container Trade
- 31% of US Container Trade

THE PORT OF LOS ANGELES



7,500 acres

4,300 land and 3,200 water

43 miles of Waterfrontage

Water depth of -53 ft;

25 Terminals

- Auto
- Breakbulk
- Container
- Liquid Bulk
- Multi-Use
- Passenger

LA Waterfront—San Pedro & Wilmington

400 acres with 12 miles of waterfrontage

Market Share

43% West Coast, 18% Nationally

10.7 Million TEUs in 2021!

- The State of CA passed **AB 691** which required the following by July 2019
 - State public trust lands study the impact of SLR
 - Maps showing SLR (and storm surge) for 2030, 2050, and 2100
 - Financial cost of SLR
 - Plan to protect and preserve natural and manmade resources

Assembly Bill No. 691

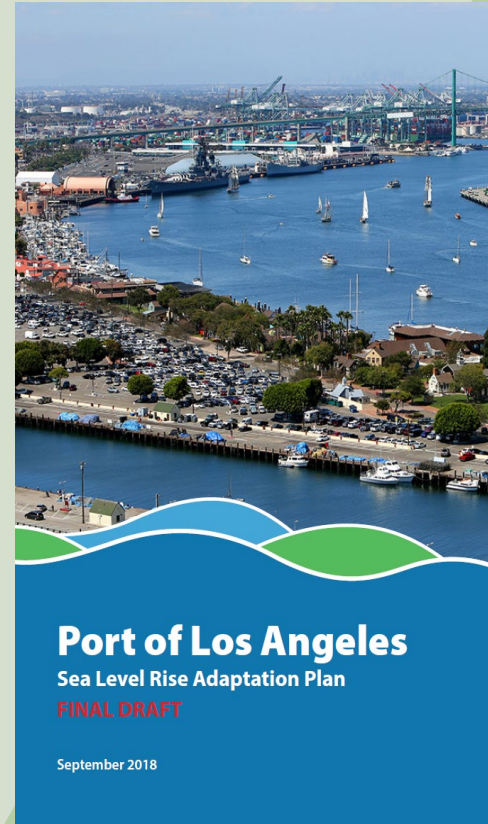
CHAPTER 592

An act to add Section 6311.5 to the Public Resources Code, relating to state lands.

[Approved by Governor October 5, 2013. Filed with
Secretary of State October 5, 2013.]

SEA LEVEL RISE STUDY OVERVIEW

- Task 1 ● Asset Inventory
- Task 2 ● Sea Level Rise Inundation Maps
- Task 3 ● Vulnerability Assessment
- Task 4 ● Development of SLR Adaptation Strategies
- Task 5 ● Prioritized Strategies
- Task 6 ● Sea Level Rise Adaptation Study

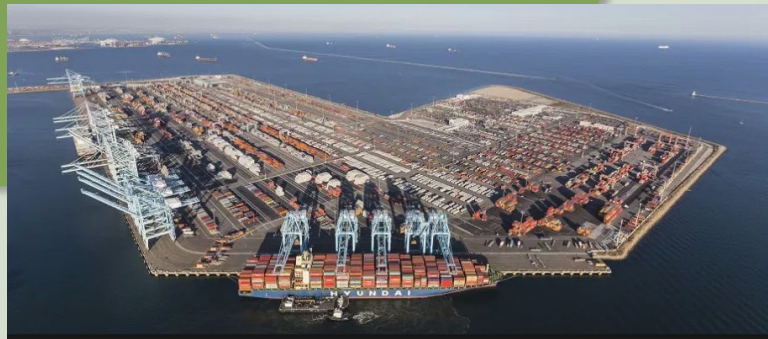


*One year ahead of schedule!

ASSET INVENTORY

1. Terminals

Container, Liquid/Dry Bulk, Passenger, Miscellaneous Operations



2. Critical Facilities

Fire Stations, electrical substations, pump stations, life/safety



3. Transportation (Rail/Road)



4. Community Assets



5. Natural Habitats

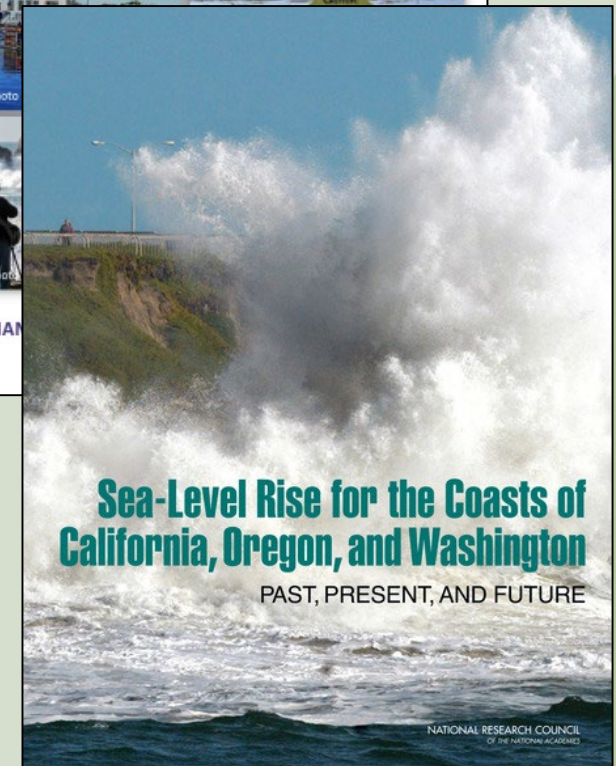
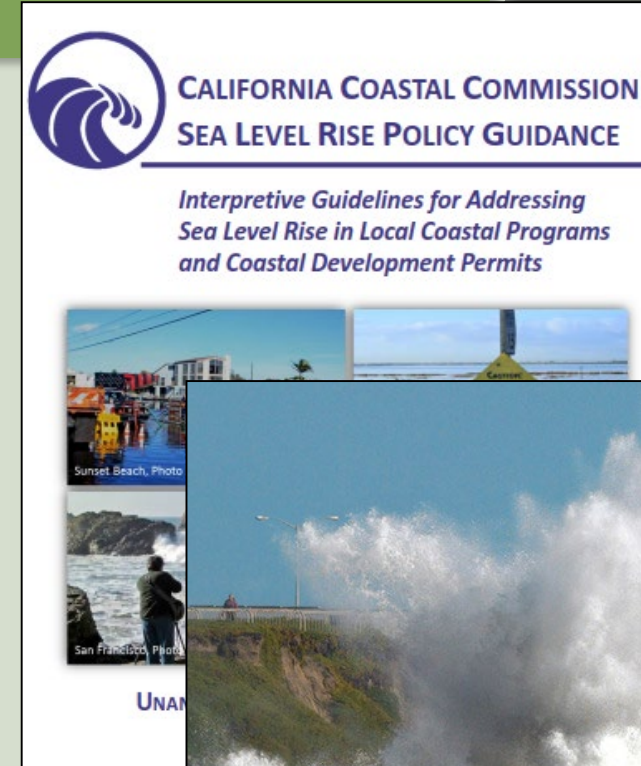


Sea Level Rise Maps

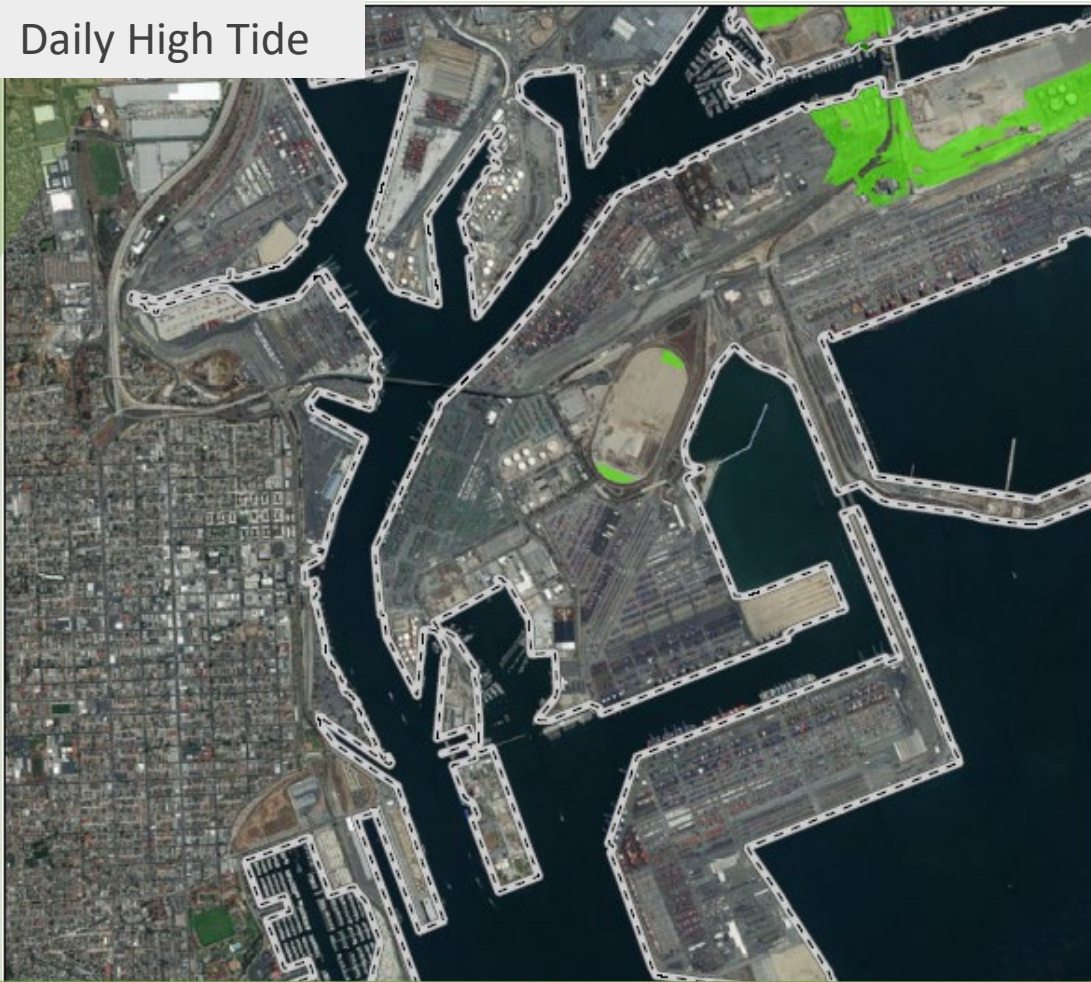
Based on National Research Council projections:

Year	Projection	Range	POLA SLR Study*
2030	5.8 in ± 2.0 in	2–12 in	12"
2050	11.2 in ± 3.5 in	5–24 in	24"
2100	36.7 in ± 9.8 in	17–66 in	37" 66"

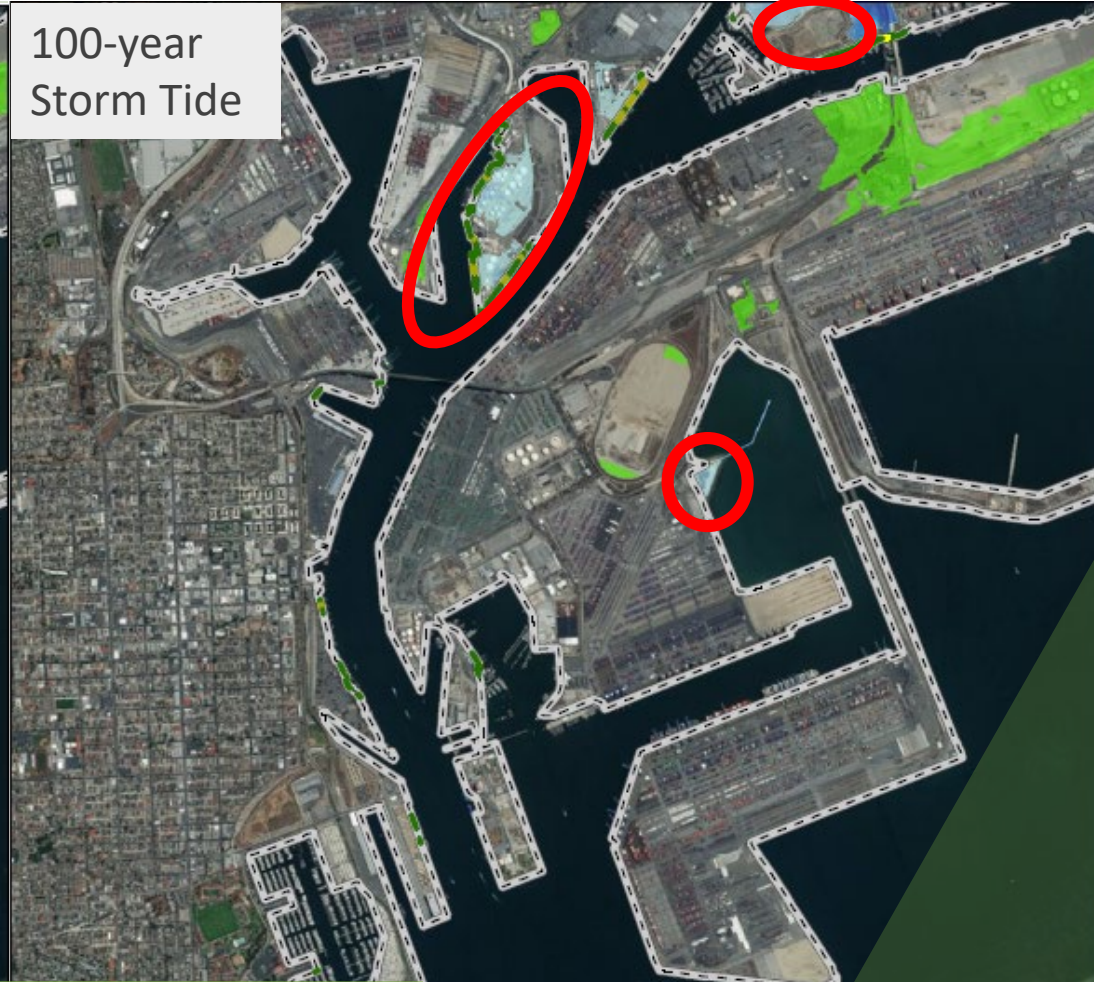
*Regional Sea Level Rise Projections at Los Angeles relative to year 2000



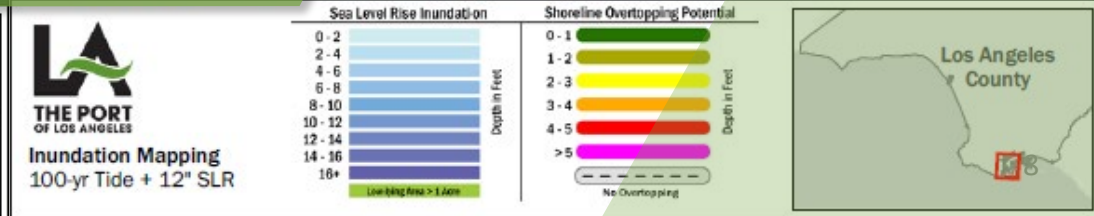
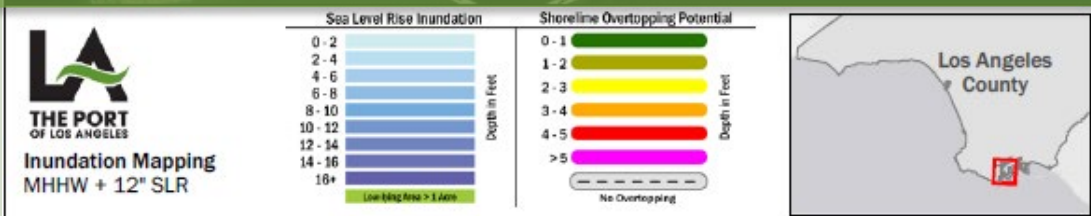
Daily High Tide



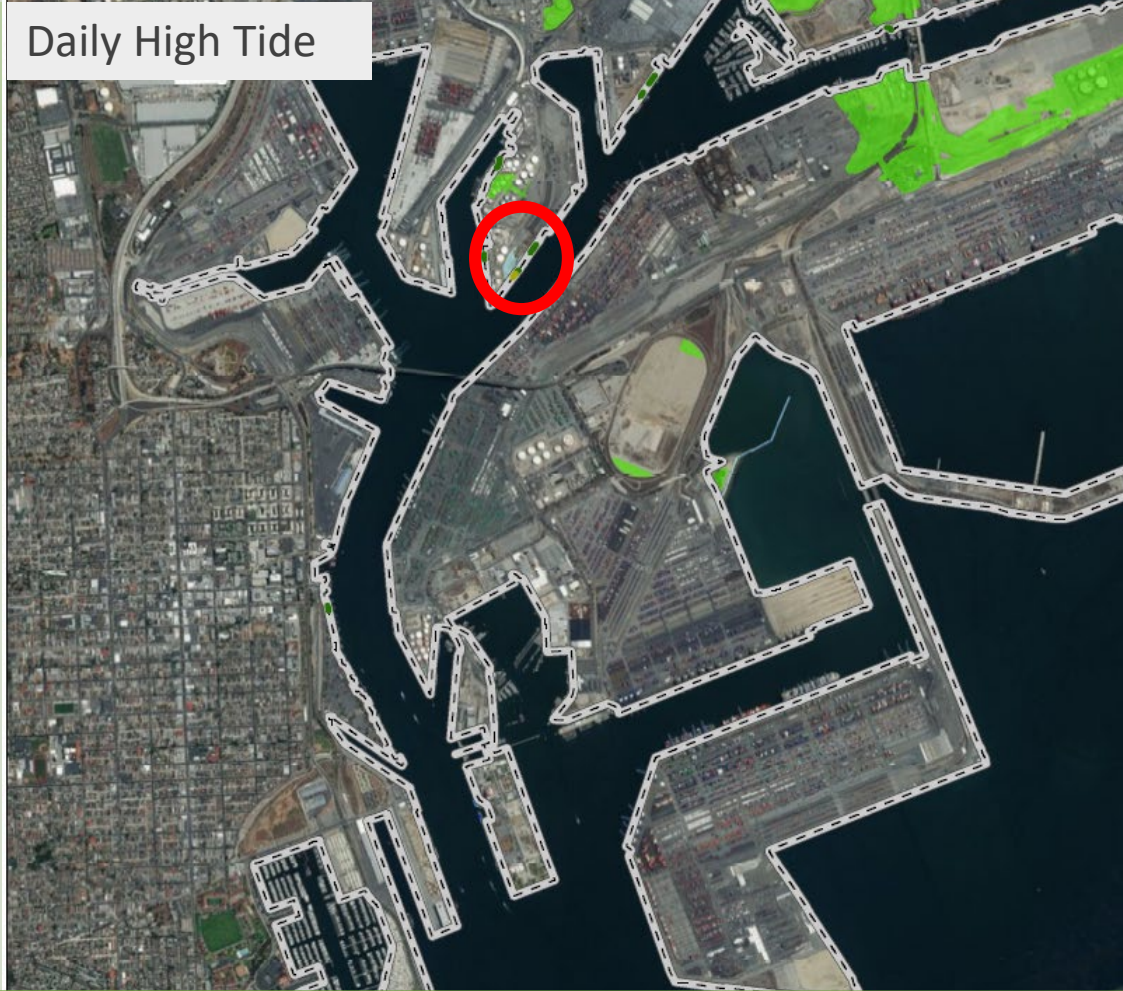
100-year Storm Tide



SEA LEVEL RISE MAPS – 12" (2030)



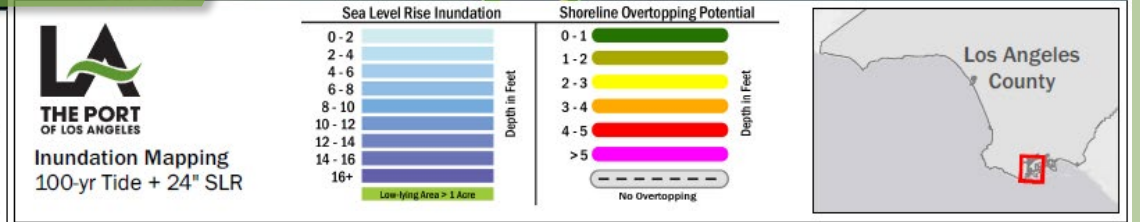
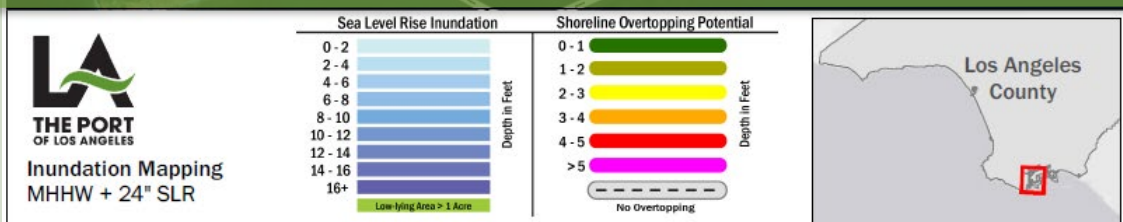
Daily High Tide



100-year Storm Tide



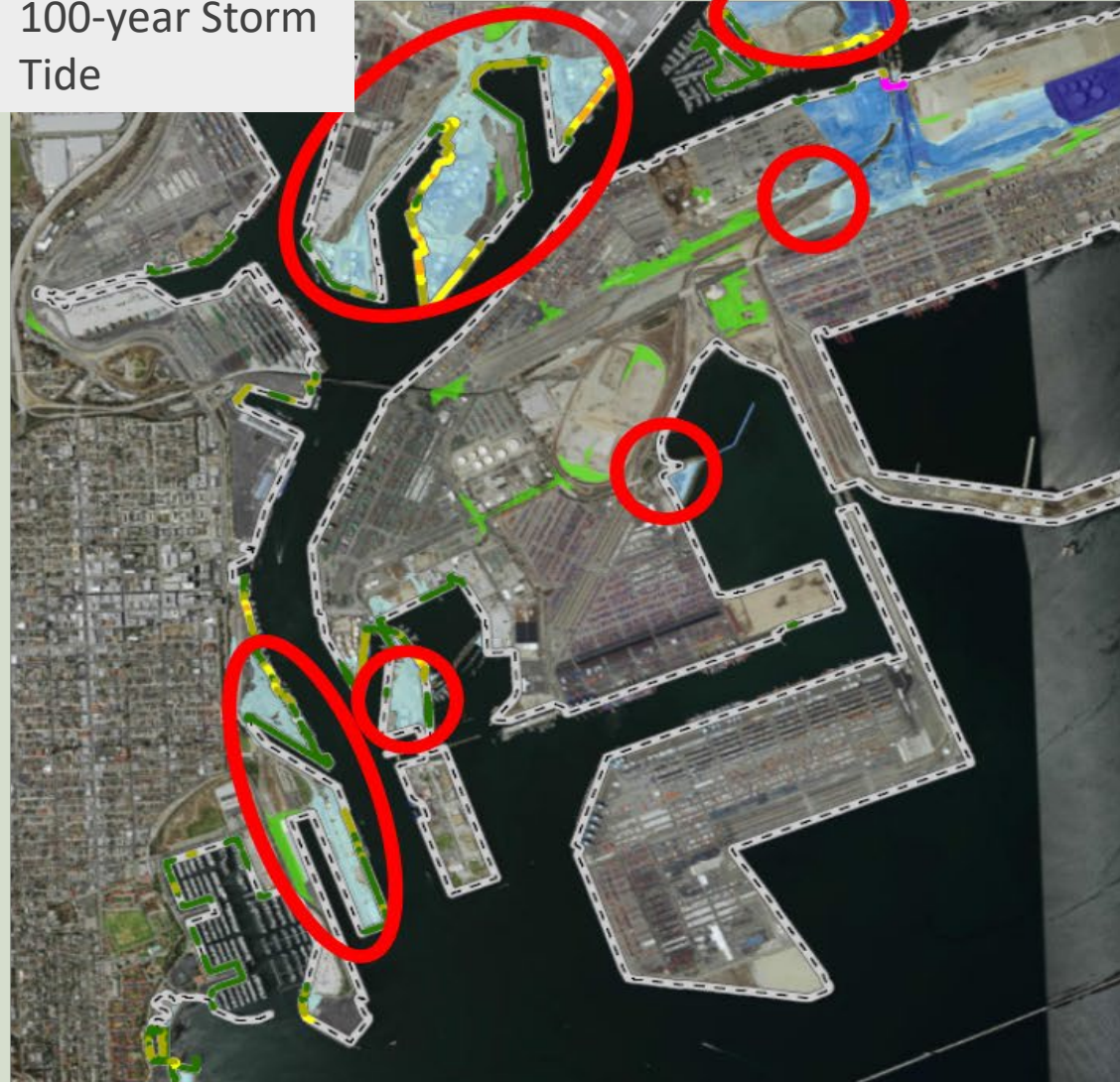
SEA LEVEL RISE MAPS – 24" (2050)



Daily High Tide



100-year Storm Tide



SEA LEVEL RISE – 37" (2100)

LA THE PORT OF LOS ANGELES Inundation Mapping

Sea Level Rise Inundation		Shoreline Overtopping Potential	
0 - 2	Depth in Feet	0 - 1	Depth in Feet
2 - 4		1 - 2	
4 - 6		2 - 3	
6 - 8		3 - 4	
8 - 10		4 - 5	
10 - 12		>5	
12 - 14			
14 - 16			

Los Angeles County

LA THE PORT OF LOS ANGELES Inundation Mapping 100-yr Tide + 66" SLR

Sea Level Rise Inundation		Shoreline Overtopping Potential	
0 - 2	Depth in Feet	0 - 1	Depth in Feet
2 - 4		1 - 2	
4 - 6		2 - 3	
6 - 8		3 - 4	
8 - 10		4 - 5	
10 - 12		>5	
12 - 14			
14 - 16			
16+			
Low-Lying Area > 1 Acre			

Los Angeles County

Daily High Tide



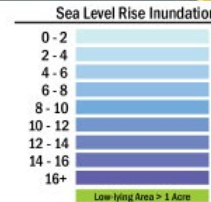
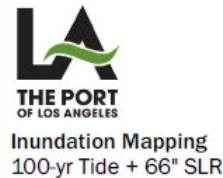
100-year Storm Tide



SEA LEVEL RISE – 66" (2100)

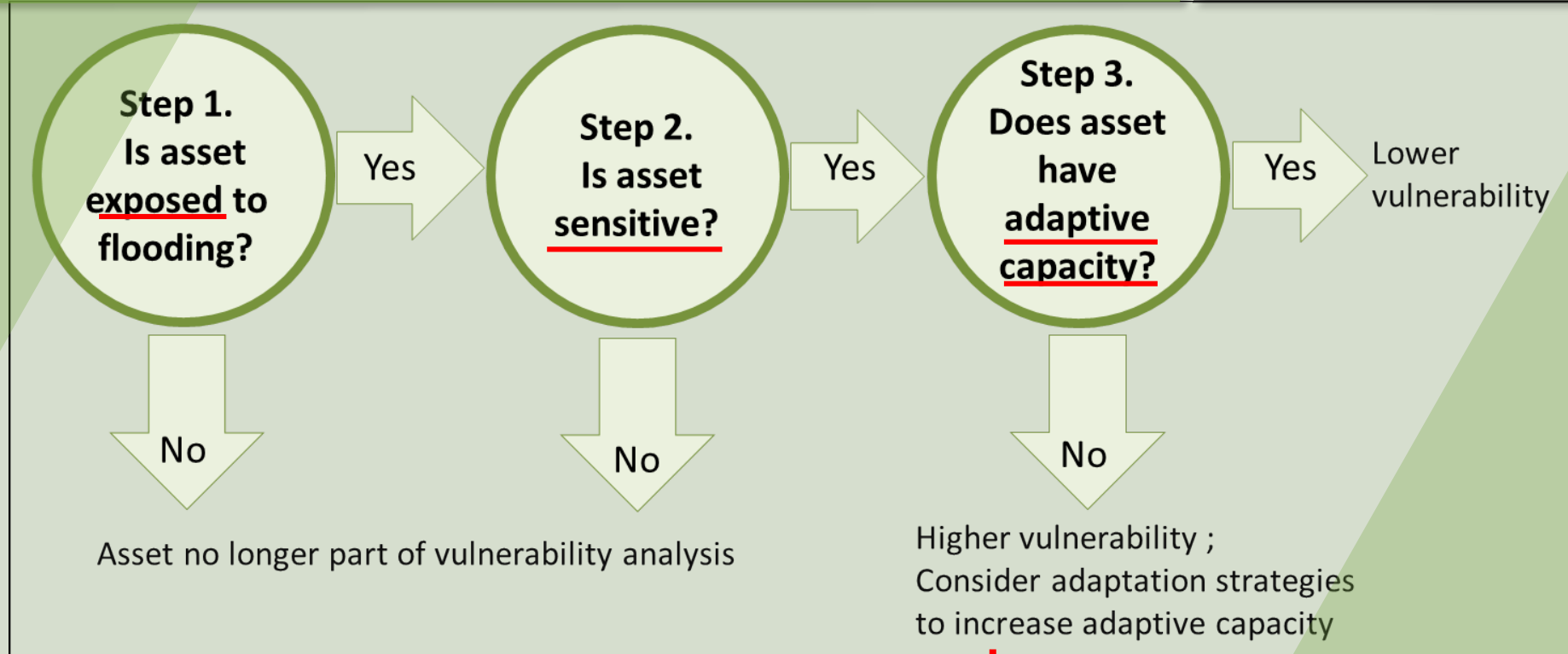
0 0.2 0.4 0.6 0.8 1 Miles

0 0.2 0.4 0.6 0.8 1 Miles



Vulnerability Assessment

Process:



Exposure (level of inundation)
Sensitivity (degree to which system is affected)
Adaptive Capacity (backup)

Consequences

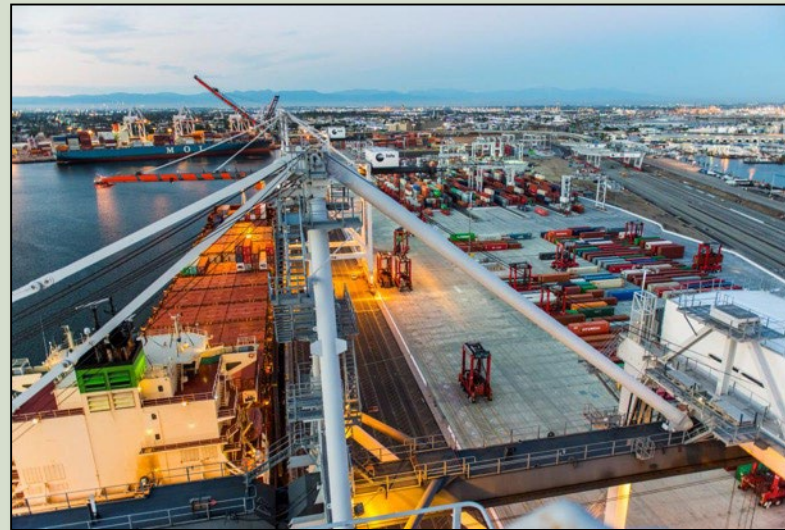


Not Sensitive



Sensitive

DEVELOPMENT OF STRATEGIES



Governance:

Include Sea Level Rise considerations in policy planning

Initiatives:

Feasibility Studies and Collaboration

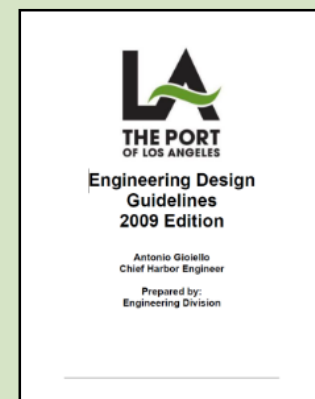
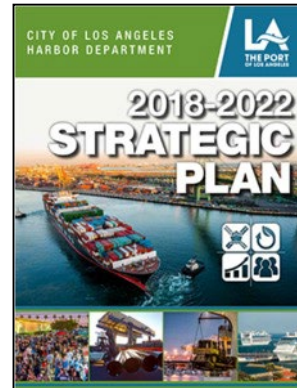
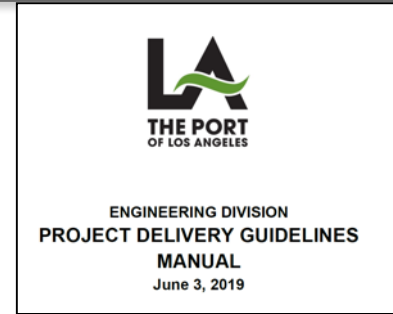
Physical Infrastructure:

Temporary/Permanent Protection around impacted areas

GOVERNANCE



1. Add language regarding SLR to the following guiding policy, planning, and design guidelines:
 1. Port Master Plan
 2. Engineering Design Guidelines
 3. LA Waterfront Design Guidelines
2. Develop a one page vulnerability zone map
3. Consider SLR in Capital funded projects
4. Monitor SLR science and continually update the plan



INITIATIVE

1. Regional Collaboration (POLB, City of LA)



Port of
LONG BEACH
The Green Port



2. Participate in CAPA Sea Level Rise Committee

3. Discuss breakwater vulnerabilities with ACOE

4. Funding opportunities

➤ Public Access Investment Plan

➤ Community Grants

➤ Caltrans Infrastructure Investment Jobs Act – Resilience and Climate Adaptation Working Group



5. Tenant Collaboration

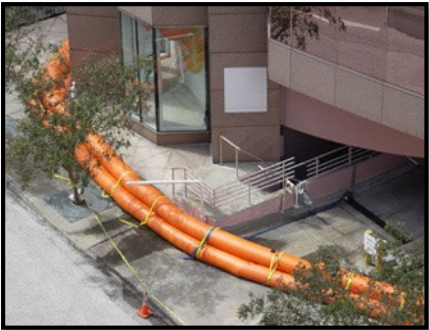
6. International Association of Ports and Harbors – Risk and Resiliency Committee

7. PIANC Tsunami Working Group

8. Climate Resilience – Advancements in Zero Emission technology

INFRASTRUCTURE STRATEGIES

Temporary Protection



Tiger Dam: Vinyl tubes filled with water or cement slurry

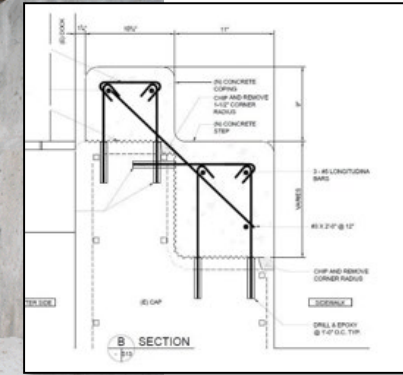
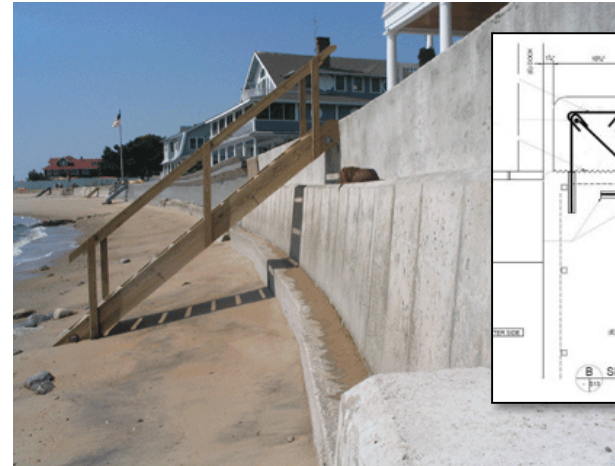


Sand Bags

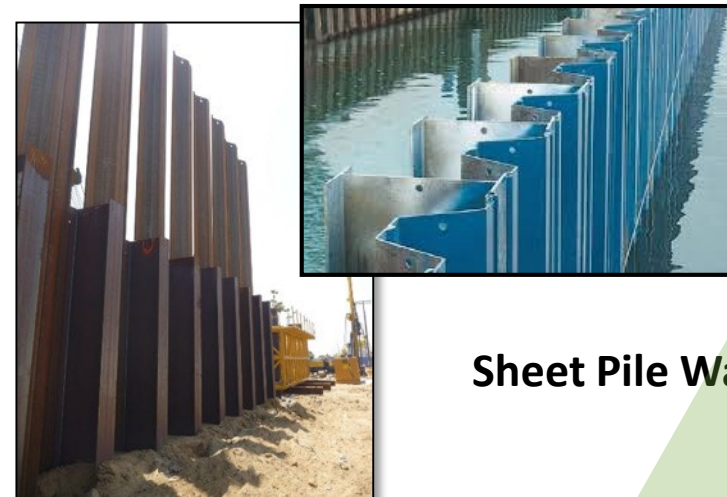


Aqua Fence: Deployable flood protection structure

Permanent Protection



Reinforced
Concrete Wall



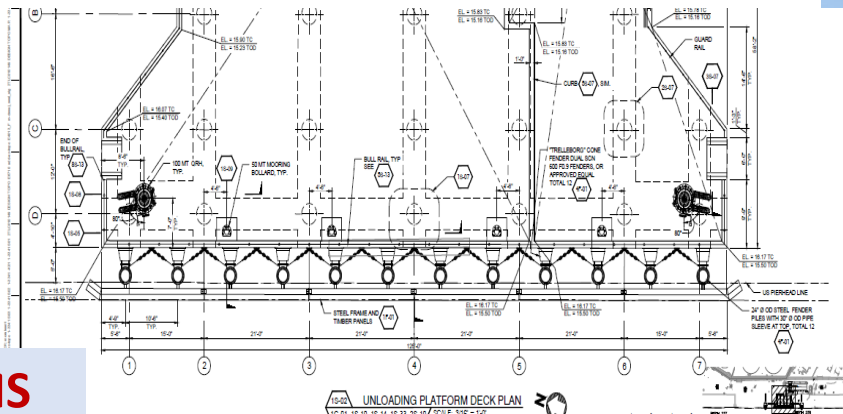
Sheet Pile Wall

INFRASTRUCTURE ACCOMMODATION

Wilmington Waterfront Promenade




MOTEMS



West Harbor Development



KEY TAKEAWAYS

- POLA is committed to staying resilient to climate change
- Sea Level Rise  is a component of our general plan
- Continue to Monitor Sea Level Rise



FOR MORE INFORMATION



Port of Los Angeles Sea Level Rise Adaptation Study

[https://kentico.portoflosangeles.org/getmedia/29acdb3a-c9a1-4e9c-a233-](https://kentico.portoflosangeles.org/getmedia/29acdb3a-c9a1-4e9c-a233-0a4e74438a3c/2018_Sea_Level_Rise_Adaptation_Study)

[0a4e74438a3c/2018 Sea Level Rise Adaptation Study](https://kentico.portoflosangeles.org/getmedia/29acdb3a-c9a1-4e9c-a233-0a4e74438a3c/2018_Sea_Level_Rise_Adaptation_Study)

California Coastal Commission SLR Policy Guidance

<https://www.coastal.ca.gov/climate/slrguidance.html>

NOAA's Sea Level Rise Calculator:

https://cwbi-app.sec.usace.army.mil/rccslc/slcc_calc.html



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THANK YOU



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