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Project Title:	California Offshore Renewable Energy
TN #:	247222
Document Title:	Presentation - CEC Workshop on Assembly Bill 525 Assessing CA Seaports for OSW
Description:	***THIS DOCUMENT SUPERSEDES TN 247102 *** - 2022-10-31 CEC AB 525 SEAPORT STRATEGY PLAN UPDATE
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Docketed Date:	11/1/2022

CEC Workshop on Assembly Bill 525
Assessing CA Seaports for OSW

Status Update

October 31, 2022

moffatt & nichol

Meeting Agenda

1. Introductions
2. Background & Purpose
3. AB 525 Seaport Strategy Plan
4. Port Strategy Roadmap for OSW in California
5. Status Update of OSW Port Studies
6. Question and Answer

- **Ground Rules:**
  - Mute lines to keep audio clear
  - Please save questions for the end
  - Presentation ~45 mins
  - Question & Answer ~20 mins

Who We Are

moffatt & nichol

Creative People, Practical Solutions.®

- Port Infrastructure Consultant
- Since 1945, Naval Shipyards in Long Beach
- Experts where land meets water
- California coastline
- California Ports
- All Maritime Business Lines
  - Offshore wind, containers, bulk cargo, marinas, etc.

Matt Trowbridge, PE, SE, PEng

- Marine Structural Engineer
- Port Infrastructure Expert
- Offshore Wind Ports

AB 525 Strategic Plan for CA Offshore Wind

The strategic plan shall include, at a minimum, the following five chapters:

1. Identification of Sea Space
2. **Port Infrastructure and Workforce Development**
3. Transmission Planning
4. Permitting
5. Potential Impacts on Coastal Resources, Fisheries, Native American & Indigenous Peoples, and National Defense

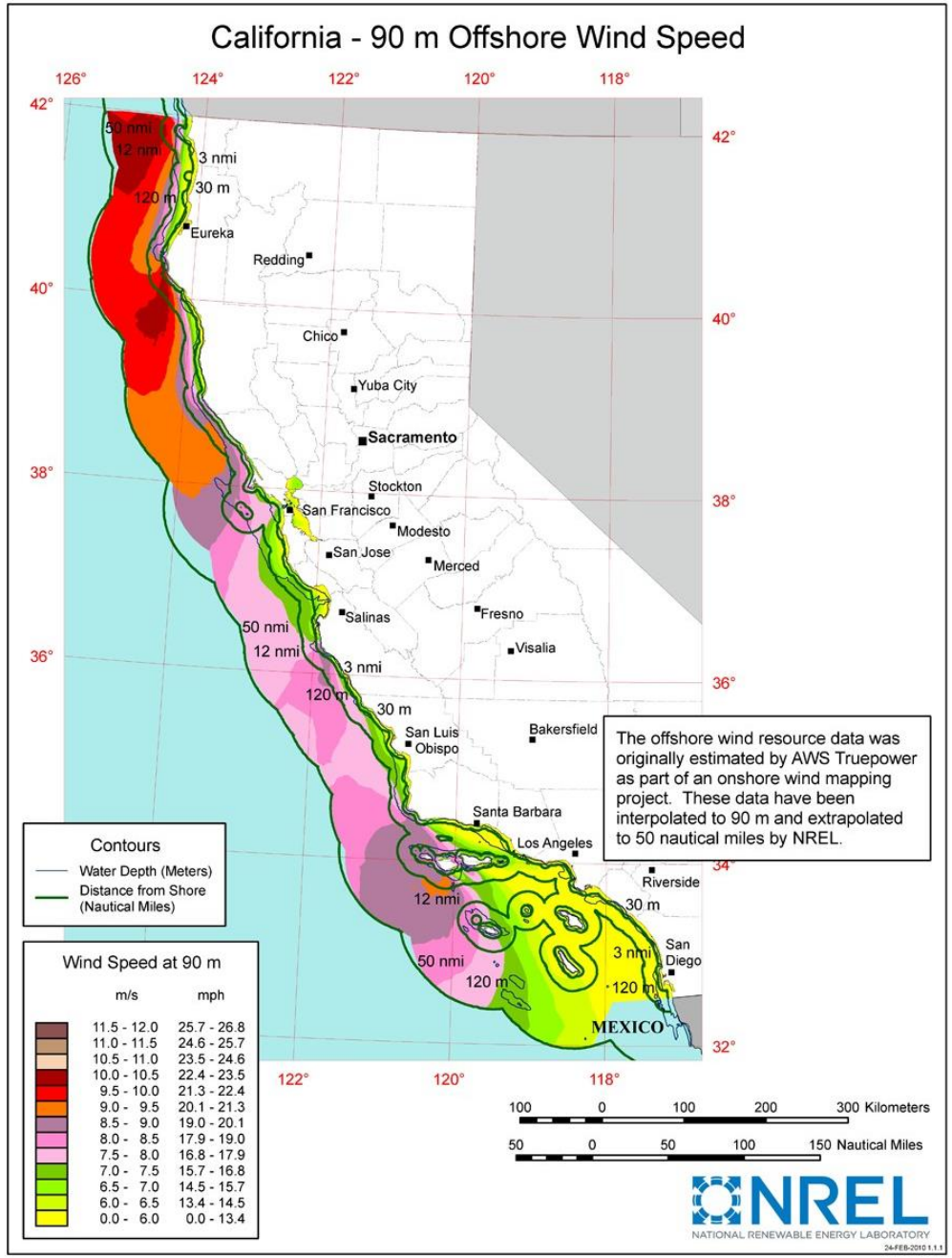
Strategic Plan due on or before June 30, 2023

California OSW Deployment Targets

- **Governor Newsom's Letter to CARB (July 2022):**
  - 20 GW by 2045
- **CEC Updated AB 525 Report (August 2022):**
  - 2–5 GW by 2030
  - 25 GW by 2045

25 GW = ~1,250 x 20 MW WTGs

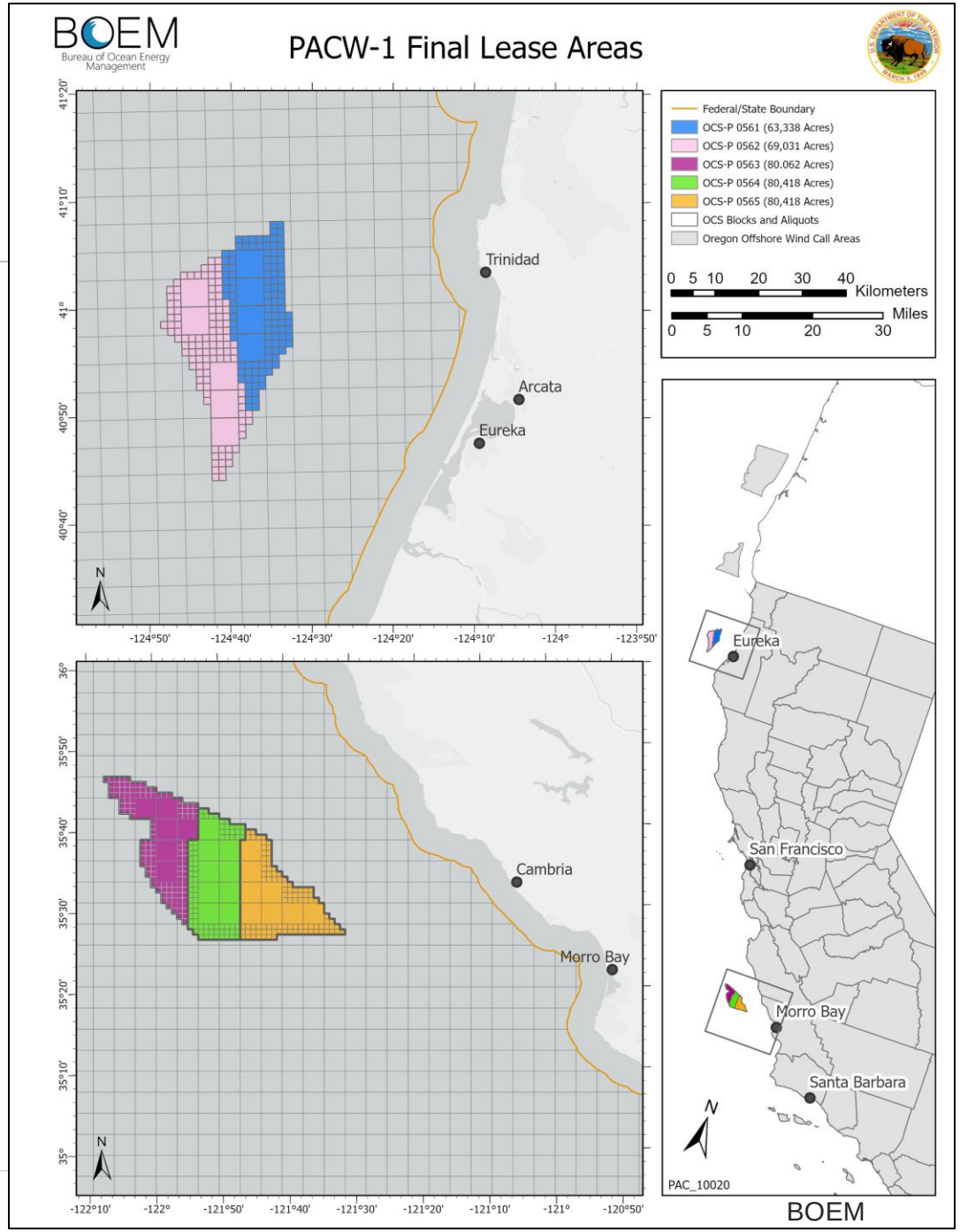
Principle Power



NREL

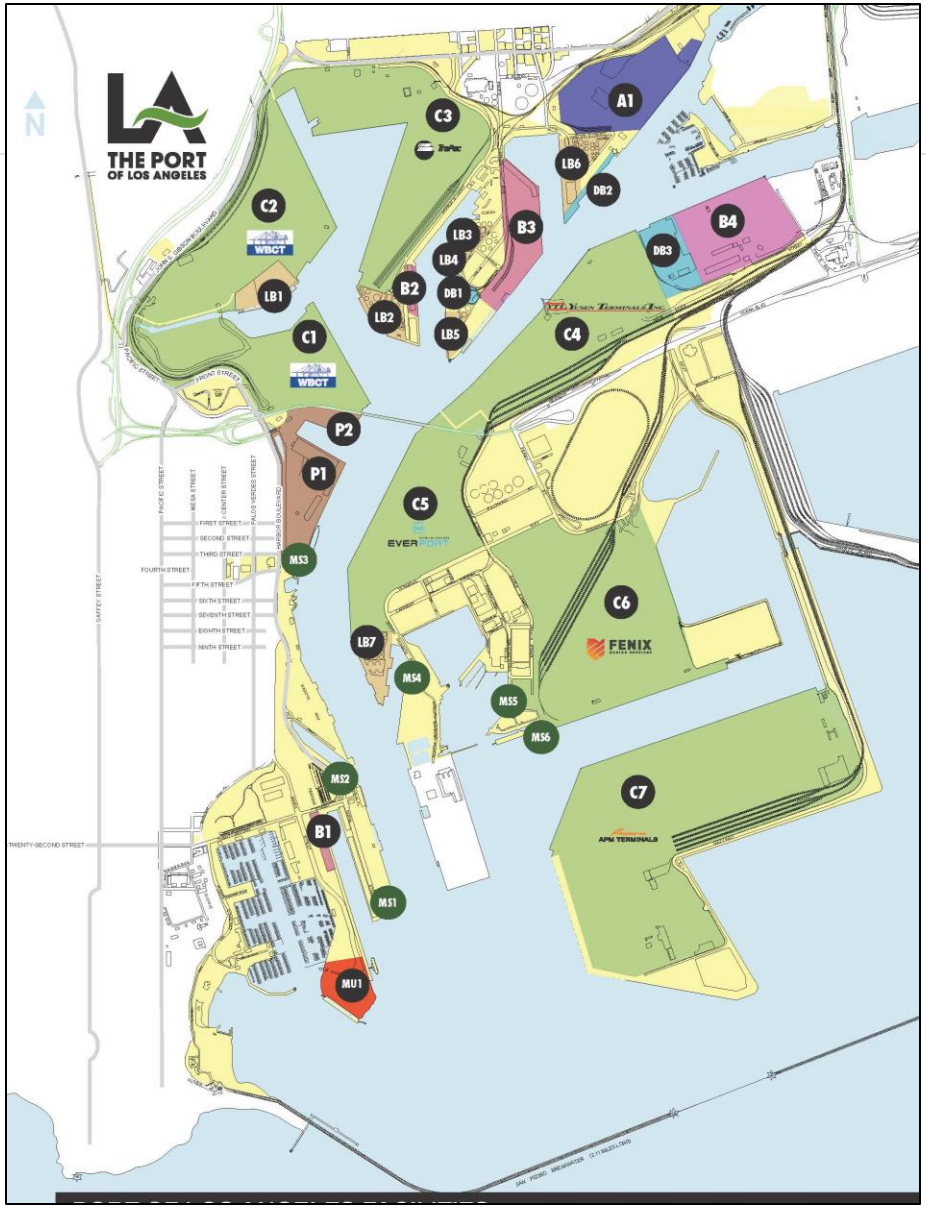
BOEM California
PACW-1 Final Lease Areas

- Humboldt WEA = ~1.6 GW
- Morro Bay WEA = ~3 GW
- BOEM Lease Sale 12/6/22



Definitions

- **Port:** a maritime facility comprising of one or more terminal sites. Some ports have many terminals (e.g., Los Angeles, Long Beach, Oakland, San Francisco).



Example of a Port, Map Courtesy of Port of Los Angeles

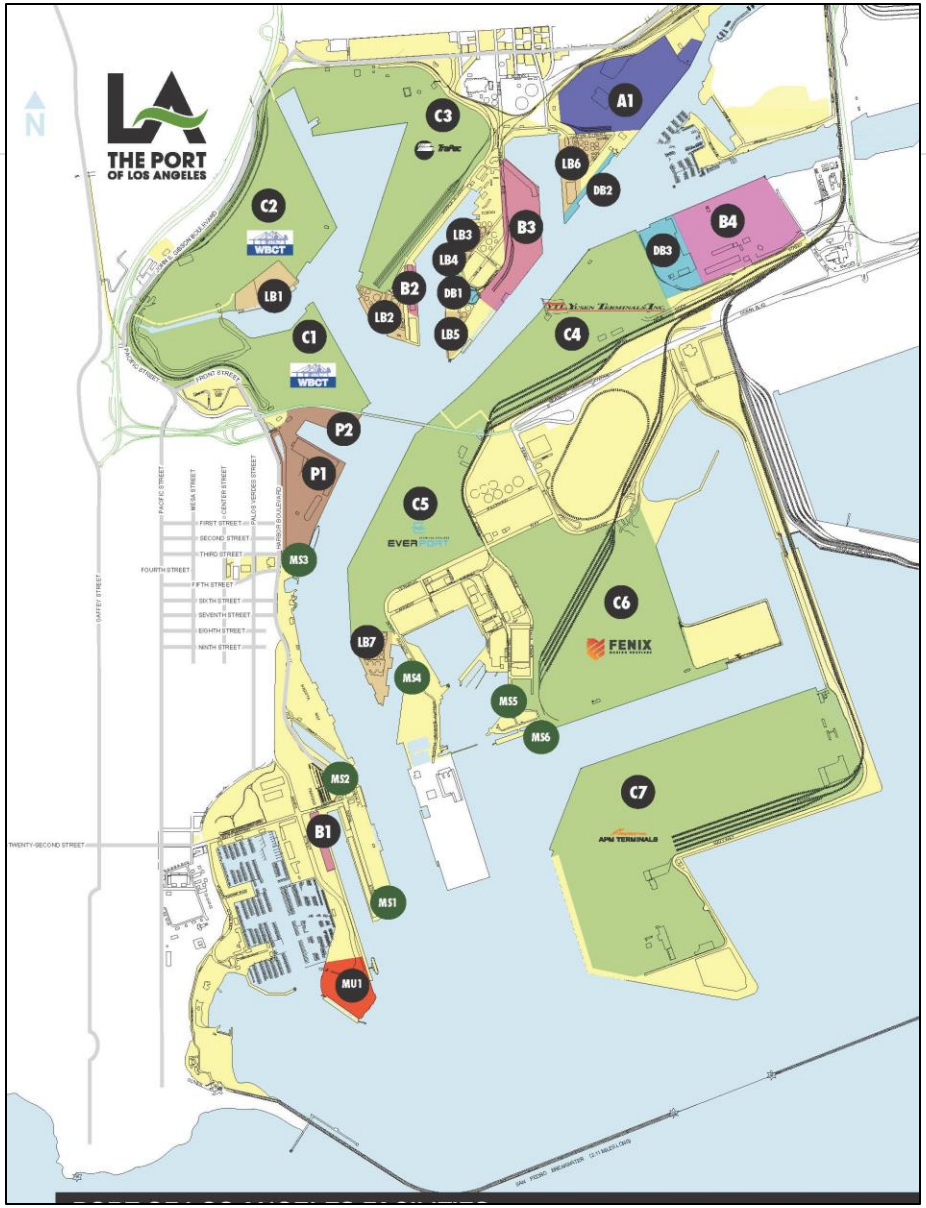
7

Definitions

- **Port:** a maritime facility comprising of one or more terminal sites. Some ports have many terminals (e.g., Los Angeles, Long Beach, Oakland, San Francisco).

- **Port Terminal or Port Site:** a single location within a Port to transfer cargo to and from a vessel.

Example of a Port Terminal Site, Rendering Courtesy State of Connecticut | Press Office



Example of a Port, Map Courtesy of Port of Los Angeles

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Offshore Wind Requires Ports


Principle Power

- **What is needed for Offshore Wind?**
  - Wind Resource
  - Electrical Grid
  - Ports and Port Terminals
- **Construction, Operations, and Maintenance of OSW farms requires Ports:**
  - Sheltered harbor areas
  - Large laydown areas
  - Deep, navigable water
  - Heavy load capacity
- **There are no existing port terminals on the US West Coast that can currently support OSW**
  - Requires significant investment and development
  - Requires a multi-port strategy
  - Adding a new maritime industry without displacing or replacing existing maritime uses

Types of OSW Port Terminals

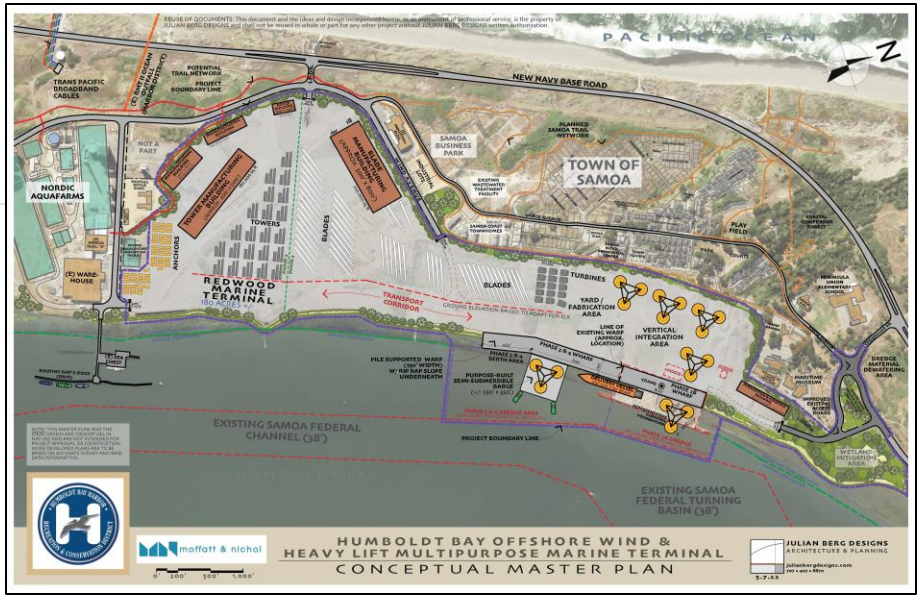
1. **Staging and Integration Facility (S&I):** a site to receive, stage / store, assemble, and load out offshore wind components.

   Vessel Operations Area: a protected harbor location with deep water to perform various vessel operations to support offshore wind construction and operations.

   Construction Support Facility: a home port for the fleet of construction vessels necessary for construction and commissioning of the offshore wind farm.

2. **Manufacturing / Fabrication Site (MF):** a site that receives raw materials via road, rail, or waterborne transport and creates larger components in the OSW supply chain typically located on the water to export the completed components via waterborne transport – this site typically has factory and/or warehouse buildings.

3. **Operations and Maintenance Facility (O&M):** a home port site for operation and maintenance vessels & supporting warehouse/offices during the operation period of the offshore wind farm.



Staging and Integration

Manufacturing Port (Towers Shown)

AB 525 Strategic Plan

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Strategic Plan due on or before June 30, 2023

CA Port Strategy Roadmap for OSW

Steps	Timeline	Studies	Study Type	
1. Determine Port Needs	Q4 2022	BOEM TO1	OSW Industry	Input Studies
2. Determine How Many Port Sites are Required	Q4 2022	BOEM TO2	Deployment Targets	
3. Identify Potential Port Sites	Q4 2022 / Q1 2023	BOEM TO2 CSLC Alternative Port Assessment REACH Central Coast	Ports & Harbors	
4. Determine Port Improvements Required	Q1 2023	BOEM TO3 CSLC Alternative Port Assessment	Ports & Harbors	
5. Determine Impacts of Port Development	Q1 2023 / Q2 2023	AB 525 Strategic Plan	Outreach Phase	Results & Recs
6. Rank Best Port Sites	Q2 2023	AB 525 Strategic Plan	Decision Report	
7. Publish AB 525 Seaport Strategic Plan	June 2023	AB 525 Strategic Plan	Strategy Report	

CA Port Strategy Roadmap for OSW

1. Determine Port Needs	**Q4 2022**
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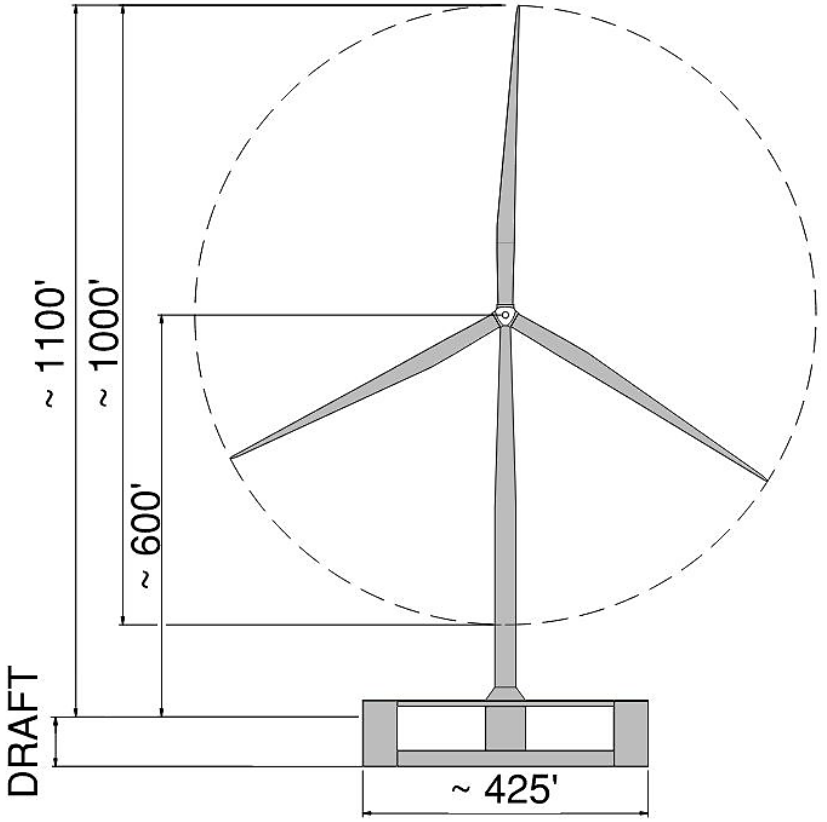
7. Publish AB 525 Seaport Strategy Report	June 2023

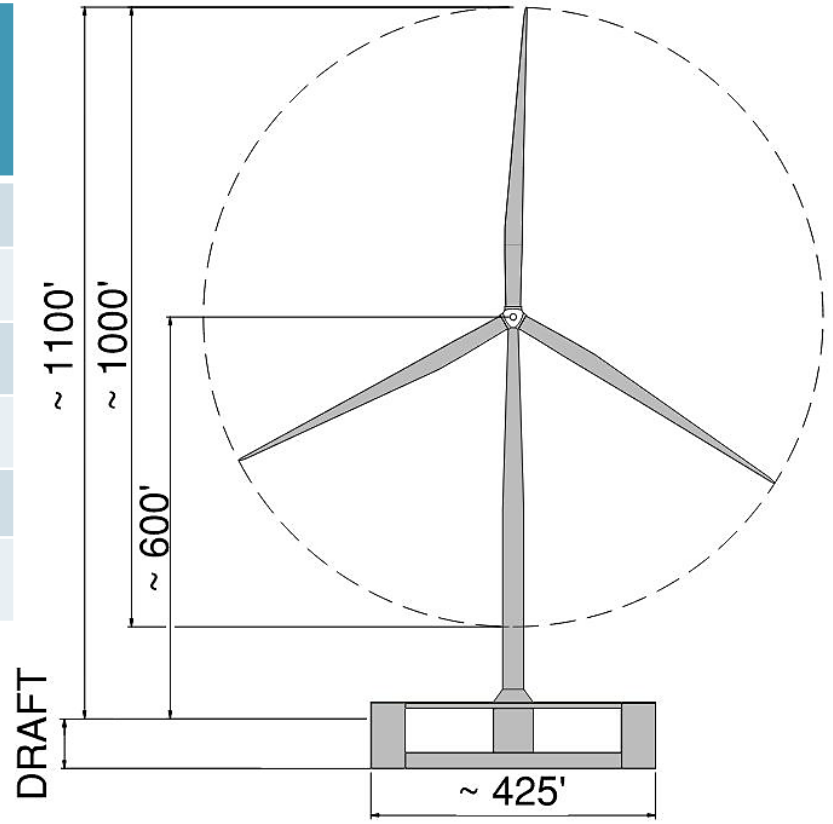
Summary of OSW Industry Port Needs

Floating Offshore Wind Turbine	Approximate Dimension [ft]	Approximate Dimension [m]
Foundation Beam / Width	Up to 425 ft x 425 ft	Up to 130 m x 130 m
Foundation Draft (Before Integration)	15 – 25 ft	4.5 – 7.5 m
Foundation Draft (After integration)	20 – 50 ft	6 – 15 m
Hub/Nacelle Height (from Water Level)	Up to 600 ft	Up to 183 m
Tip Height (from Water Level)	Up to 1,100 ft	Up to 335 m
Rotor Diameter	Up to 1,000 ft	Up to 305 m



Summary of OSW Industry Port Needs

Floating Offshore Wind Turbine	Approximate Criteria for Staging & Integration	Approximate Criteria for Component Manufacturing	Approximate Criteria for O&M
Acreage, minimum	30 – 100 acres	30 – 100 acres	5 – 10 acres
Wharf Length	1,500 ft	800 ft	300 ft
Minimum Draft at Berth	38 ft	38 ft	20 – 30 ft
Draft at Sinking Basin	40 – 100 ft	N/A	N/A
Wharf Loading	> 6,000 psf	Up to 6,000 psf	100 – 500 psf
Uplands / Yard Loading (for WTG components)	> 2,000 – 3,000 psf		



BOEM TO1 – Input Study

Summary of OSW Industry Port Needs

- **General**
  - Port sites need to be close to Lease Areas to reduce transportation risk and cost
  - Co-locate as many supply chain items in the same location as possible
  - US West Coast ports must plan for >15 MW turbines (20 MW by 2030 and 25 MW after)

- **Floating Foundations**
  - Likely to be semi-submersible floating foundation (concrete, steel, or hybrid)
  - Semi-sub barge with sinking basin, ramp, or direct transfer methods required to move floating foundation from land to water

- **Wet Storage**
  - Required to safely moor floating foundations or integrated turbines to mitigate risk of weather downtime, vessel traffic, entrance channel downtime, etc.

CA Port Strategy Roadmap for OSW

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Determining Required Number of Ports

- **Governor Newsom's Letter to CARB (July 2022):**
  - 20 GW by 2045
- **CEC Updated AB 525 Report (August 2022):**
  - 2–5 GW by 2030
  - 25 GW by 2045

Ongoing BOEM California Study:

Year	Target Deployment				
	Low		Medium	High	
Rate	0.5 GW/yr	1 GW/yr	1.5 GW/yr	2 GW/yr	2.5 GW/yr
2030	1 GW	2 GW	**3 GW**	4 GW	5 GW
2035	3.5 GW	7 GW	10.5 GW	14 GW	17.5 GW
2038	5 GW	10 GW	15 GW	20 GW	25 GW
2045	8.5 GW	17 GW	**25 GW**	34 GW	42.5 GW
2048	10 GW	20 GW	30 GW	40 GW	50 GW
2050	11 GW	23 GW	33 GW	44 GW	55 GW

Determining Required Number of Ports

How many Port sites are required?

- California will potentially require >10 port terminal sites for full OSW supply chain for 25 GW by 2045
- This requires a multi-port strategy
- Sites vary in use and size (5 acres to >100 acres)
  - Staging & Integration
  - Manufacturing: Blades, Towers, Nacelles, Floating Foundations
  - Operations & Maintenance
- Multi-state strategy needs to be studied (NREL West Coast Ports Strategy)

Year	Target Deployment				
	Low		Medium	High	
Rate	0.5 GW/yr	1 GW/yr	1.5 GW/yr	2 GW/yr	2.5 GW/yr
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CA Port Strategy Roadmap for OSW

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Identify Potential Port Sites

Options for OSW Port Sites in California

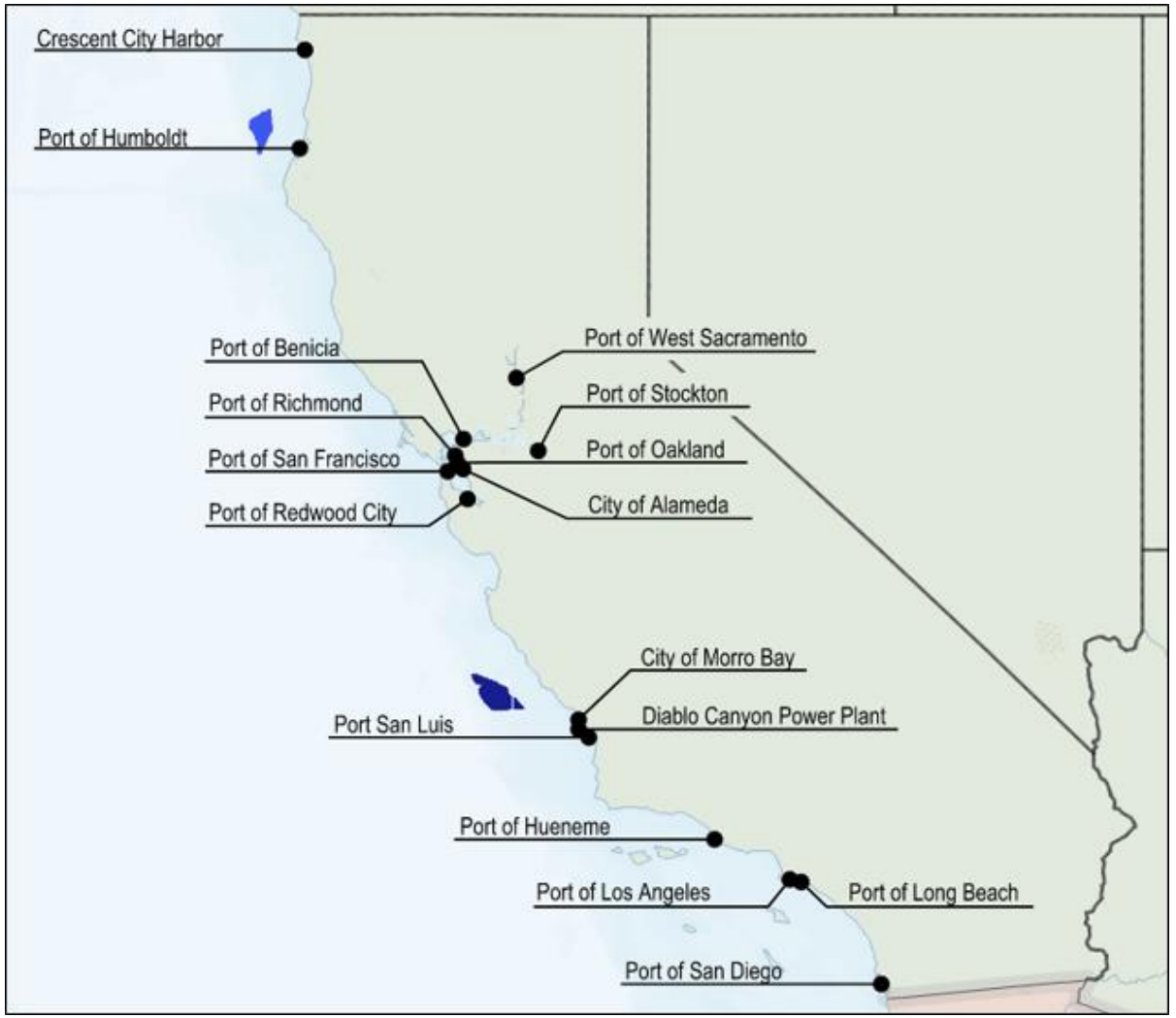
1. Use Existing Ports & Harbors - Upgrade port infrastructure within an existing port or harbor

2. Create a New Port or Harbor – Construct a new port at undeveloped site or at a former industrial site outside of existing ports (alternative option)

It is important to study both to ensure the best locations are identified

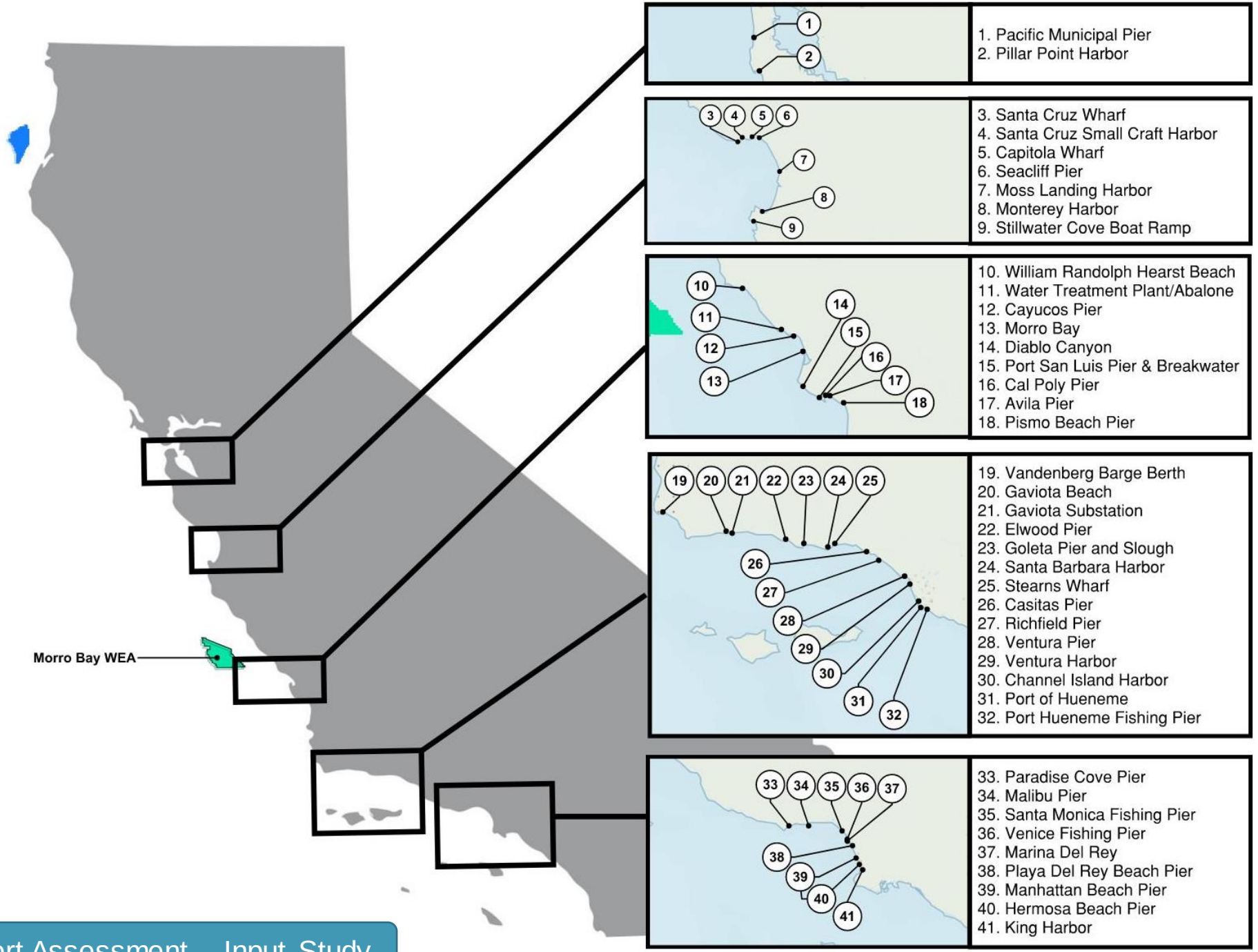
Identify Port Sites - Existing Ports & Harbors

- **Use Existing Ports & Harbors**



Identify Port Sites – Existing Ports & Harbors

- Use Existing Ports & Harbors



Port Outreach to Date

- June 30, 2022: City of Alameda
- July 05, 2022: Port of San Francisco
- July 07, 2022: Port of Oakland
- July 08, 2022: Diablo Canyon
- July 11, 2022: Port of West Sacramento
- July 12, 2022: Humboldt Harbor District
- July 13, 2022: Crescent City Harbor District
- July 14, 2022: Port of Los Angeles
- July 25, 2022: Port of Benicia
- July 25, 2022: Port San Luis
- July 26, 2022: City of Morro Bay
- July 26, 2022: Port of Long Beach
- July 27, 2022: Port of San Diego
- July 28, 2022: Port of Redwood City
- July 29, 2022: Port Hueneme
- August 04, 2022: NASSCO Port of San Diego
- August 05, 2022: Port of Stockton
- August 09, 2022: Port of Richmond
- August 10, 2022: Pasha Port of San Diego
- August 16, 2022: BAE Systems Port of San Diego
- August 17, 2022: AMPORTS Port of Benicia

Outreach to select CA harbors is currently underway

(17) Port Infrastructure Owners

(4) Port Operators (limited outreach)

Existing Port Sites Update

- **Key Take-Aways:**
  - Site availability at existing California Ports **could** be adequate to meet OSW deployment targets, **but**
  - Investment is required in California Ports to prepare sites for industry use
- **Report Status:**
  - Draft report to be sent to Ports for review prior to publishing report identifying which port sites are or could be available for OSW industry use

Identify Port Sites – Alternative Option

Identify Alternative Port Sites

- Outside existing Ports
- Proximity to Morro Bay Lease Area
- Sites Considered
  - Staging and Integration Sites
  - Operation & Maintenance Sites
  - Manufacturing Sites excluded

Alternative Port Site Screening Criteria

Site Screening Criteria

- Exclude the following sites:
  - Residential / Urban Areas
  - California Marine Protected Areas
  - State Parks
  - National Forest
  - Military Base
  - Vandenberg Danger Zone
  - Airspace Restrictions
  - Islands (e.g. Catalina, San Nicolas, San Clemente)
  - Existing offshore oil & gas platforms
- Consider Existing and Proposed National Marine Sanctuaries
- Consider Engineering Feasibility
- Consider Permitting and Environmental Impacts

Residential/Urban Areas

~26% Coastline

- Manually delineated based on aerial imagery – example above – anywhere with homes/neighborhoods/towns/cities directly on coastline were screened out.

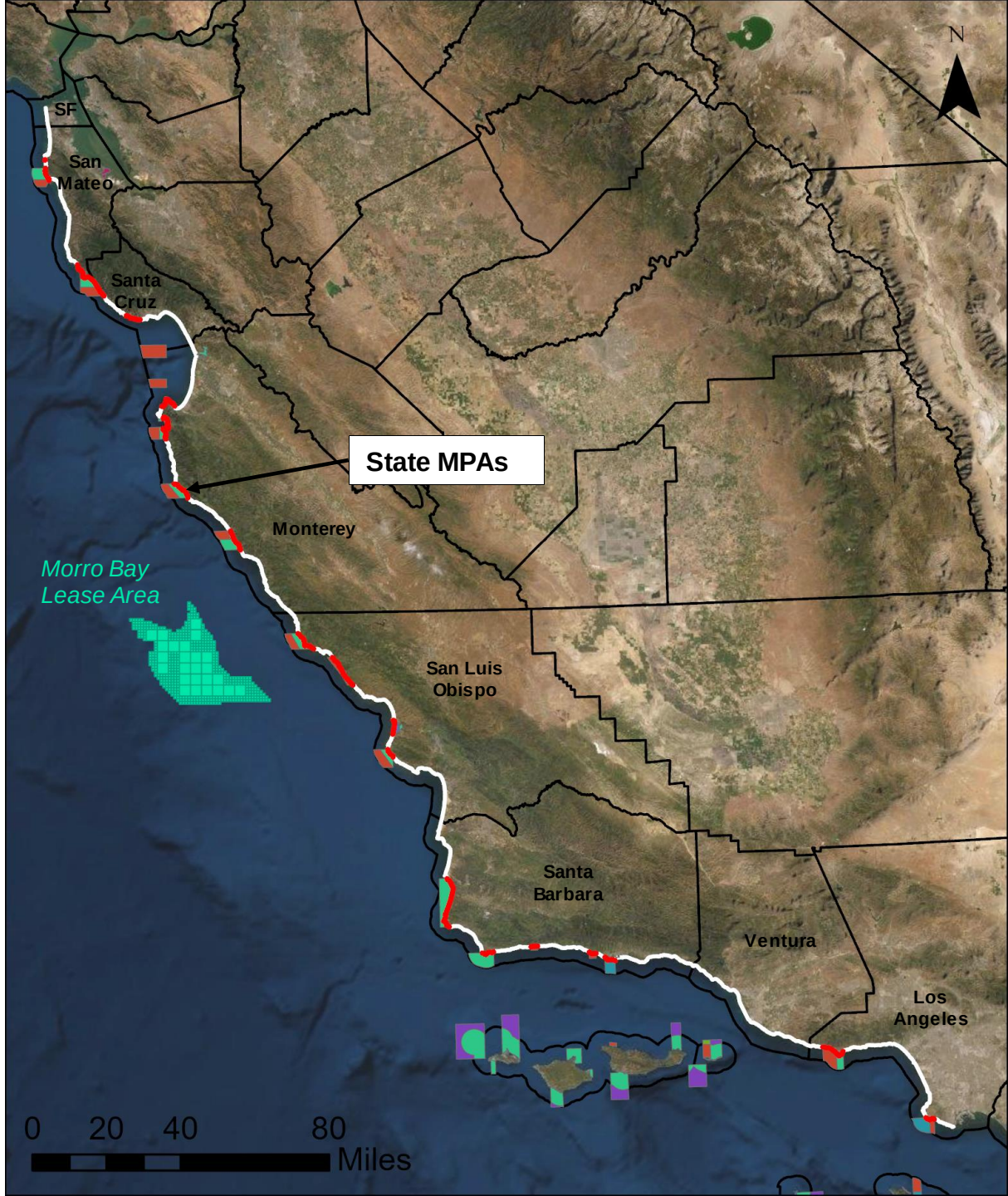
Example Urban Zone Delineation

CSLC Alternative Port Assessment Input Study

California Marine Protected Areas

~24% Coastline

- State Marine Conservation Areas
- Special Closure
- State Marine Reserves
- State Marine Recreational Management Areas
- State Marine Parks
- State Marine Conservation Area (No-Take)
- Federal Marine Reserves
- Federal Marine Conservation Area



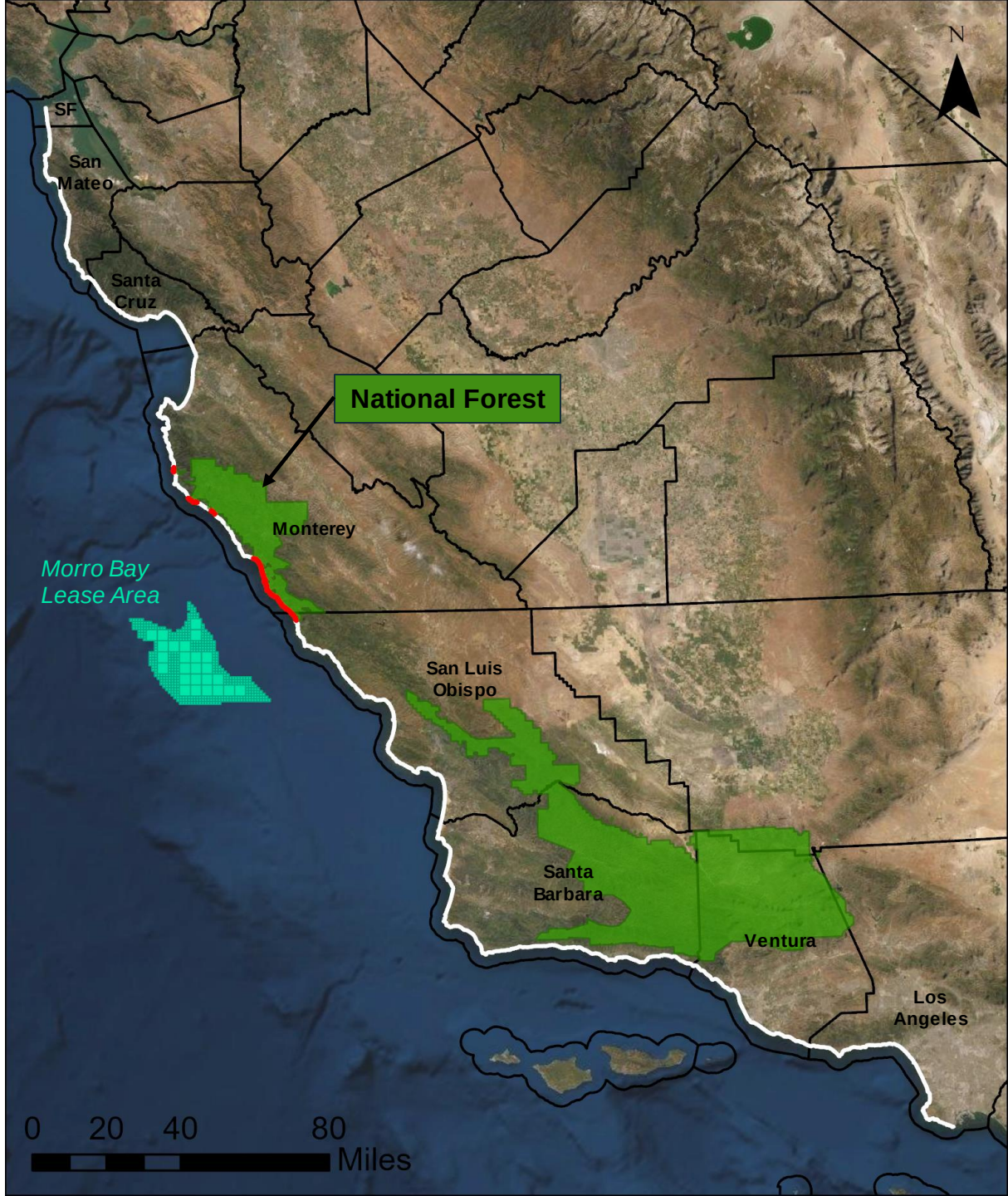
CSLC Alternative Port Assessment Input Study

State Parks

~34% Coastline

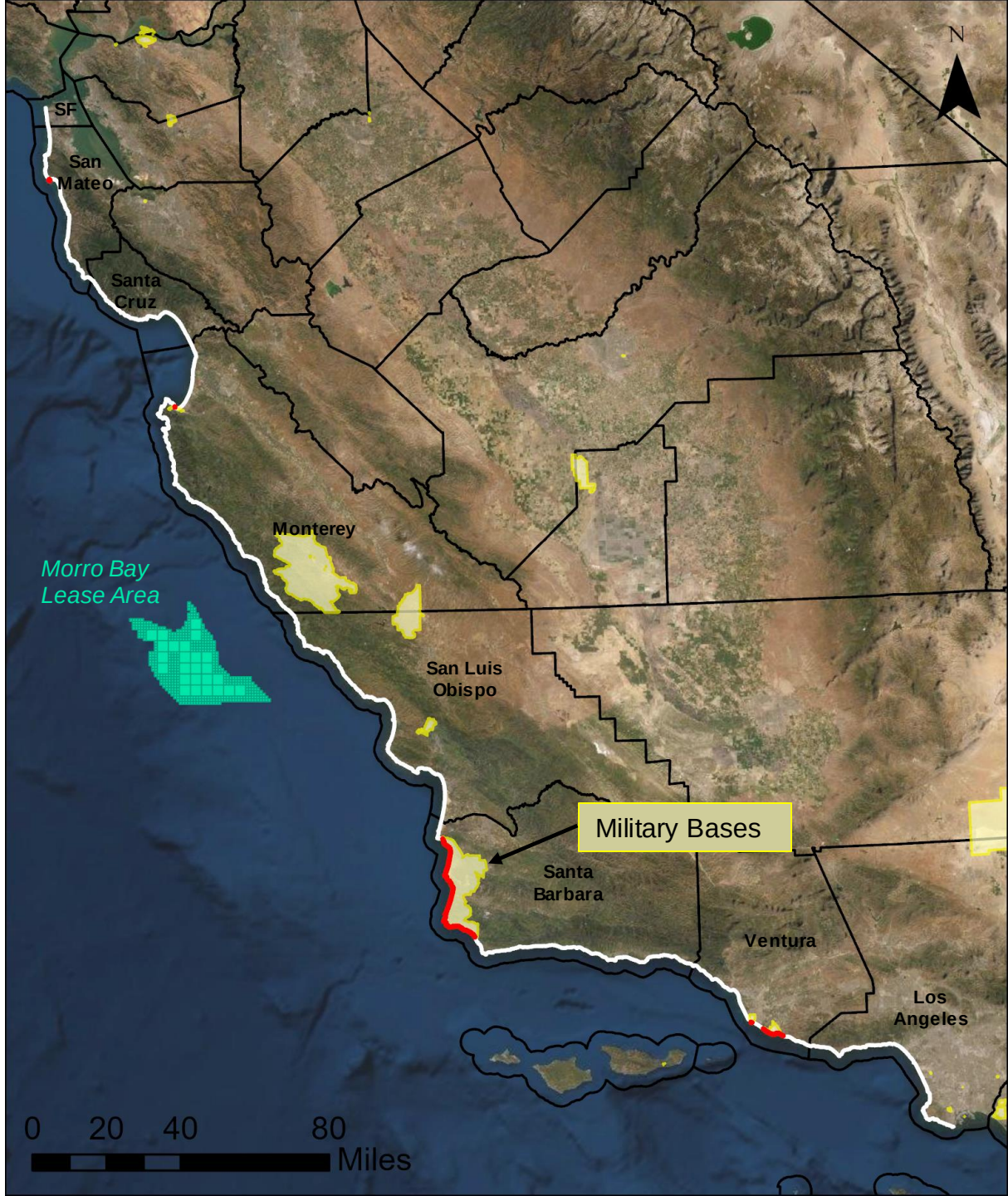
National Forest

~5% Coastline



Military Bases

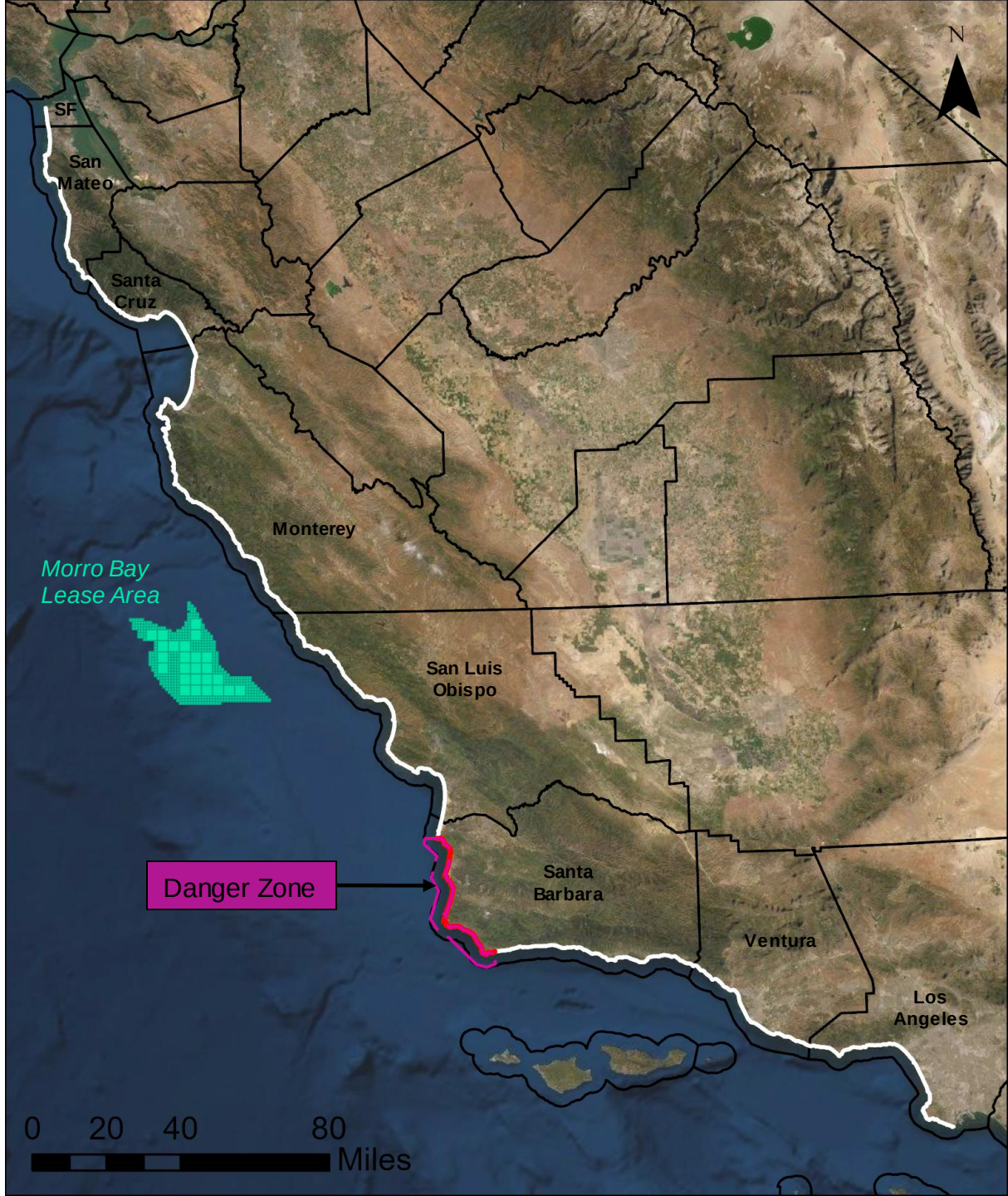
~8% Coastline



Vandenberg Danger Zone

~9% Coastline

- This area needs to be evacuated during launches

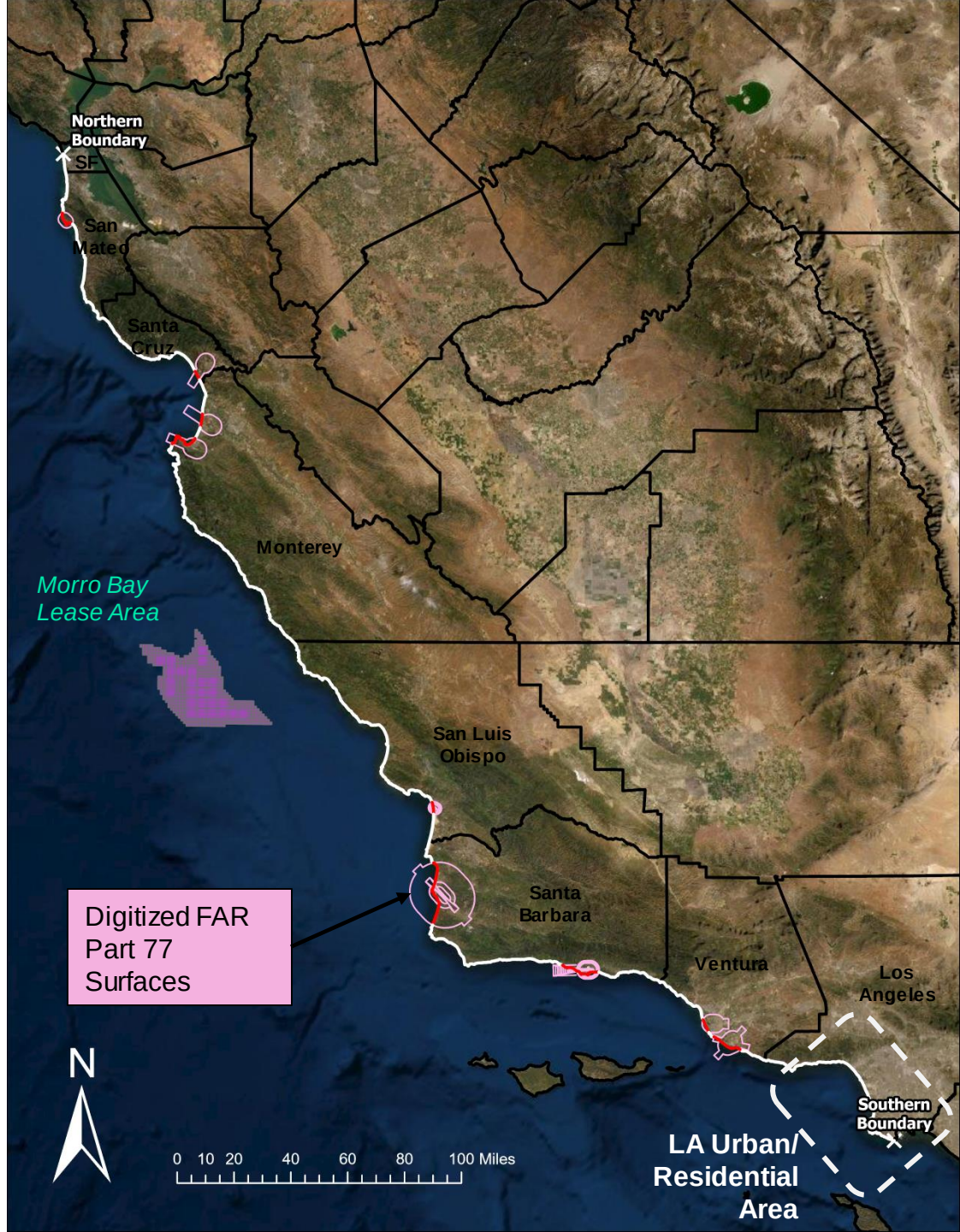


CSLC Alternative Port Assessment Input Study

Airspace

~12.6% Coastline

- Airspace screening applied to areas of shoreline not screened out due to other criteria
- Exclude those already screened out within LA Urban Area
- Map associated FAR Part 77 Surfaces



Preliminary Screening Results

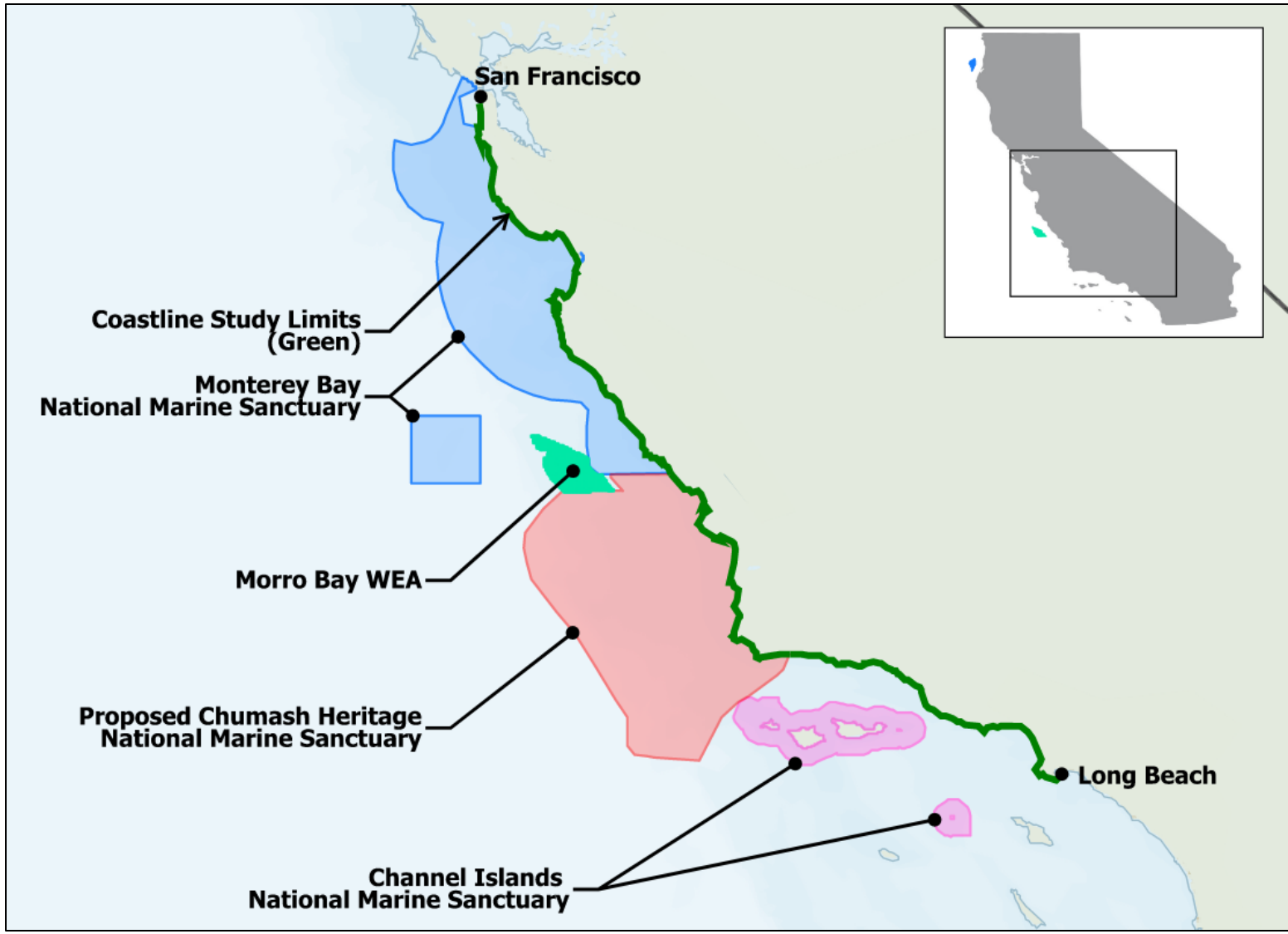
Primary Screening Criteria	Approx. % Shoreline*
Residential Zones	26%
State Marine Protected Areas	24%
Military Base	8%
Vandenberg Evacuation Area	9%
State Parks	34%
National Forests	5%
Airspace Restrictions	13%
Total	**~77%**

Red = portion of coastline eliminated from consideration = ~77%

National Marine Sanctuaries (NMS)

~ 49% Existing NMS
~ 75% Existing & Proposed NMS

- **Existing NMS**
  - Monterey Bay NMS
  - Channel Islands NMS
- **Proposed NMS**
  - Proposed Chumash Heritage NMS



Outside Existing Port Sites Update

- **Status Update:**
  - A few alternative staging and integration port sites were identified, but there are **significant challenges** for these sites (e.g., permitting, engineering, operations, cost, schedule, and impacts)
  - Sites within existing ports look more promising, however a detailed assessment is needed to verify this conclusion

CA Port Strategy Roadmap for OSW

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2. Determine How Many Port Sites are Required	Q4 2022
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7. Publish AB 525 Seaport Strategy Report	June 2023

Port Improvements Required

- **Improvements to existing port sites and alternative port sites:**
  - Infrastructure Improvements
    - What infrastructure improvements are required to prepare the site for OSW industry use (e.g., wharf, dredging, backland improvements, channel improvements, breakwater, etc.)
  - Cost
    - How much will it cost to prepare the site for OSW industry use?
  - Schedule
    - When will port site be ready for OSW industry use?
    - CA Deployment Targets: 2-5 GW by 2030 & 25 GW by 2045

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Impacts of Port Development

- **Determine Impacts of Port Development**
  - Enviro/coastal resources impact
  - Maritime Use / Navigation impact
  - Fisheries impact
  - Native American and Indigenous Peoples considerations
  - National Defense considerations
  - Economic benefits and workforce development
  - Environmental Justice and socioeconomics
  - Public outreach and feedback
  - Etc.

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Rank Best Port Sites

- **Rank Best Port Sites Based on:**
  - Impacts to natural/coastal/biological/cultural resources, fisheries, Native American and Indigenous peoples, and national defense
  - Consider recreation and socioeconomic impacts
  - Evaluate marine traffic and navigation impacts and conflicts with other maritime users
  - Engineering Assessment
  - Cost and Schedule
  - Workforce and Labor Development

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AB 525 Strategic Plan – Seaport Chapter

Seaport Chapter and Workforce Development Outline

1. Introduction and Background
2. Identification of Sea Space
3. Floating Offshore Wind Operations Overview
4. Offshore Wind Port Needs
5. Offshore Wind Port Demands
6. Offshore Wind Port Availability
7. Offshore Wind Port Improvements
8. Detailed Trade Off / Impact Analysis
9. Offshore Wind Port Lessons Learned
10. Recommended Port Development / Investment Plan
11. Workforce Development – Needs, Assessment, and Development Strategy
12. Additional Studies

Thank you