Morro Bay Offshore

1,000 MW floating offshore wind farm

Public Information Session

TRIDENT WINDS

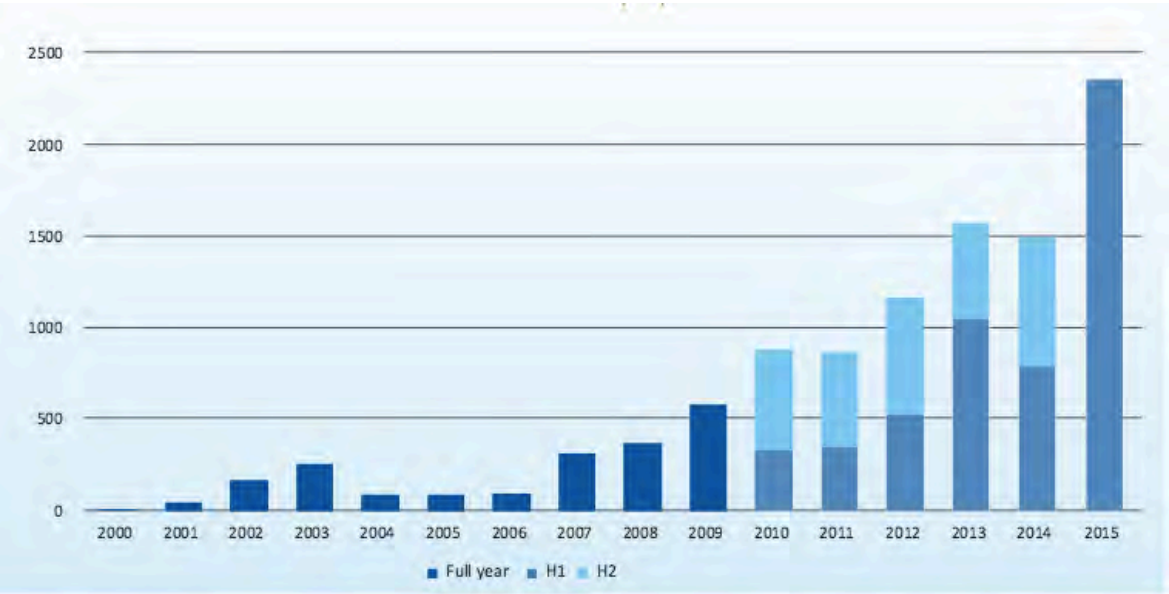
Morro Bay, December 10, 2015

Who are we?

	Alla Weinstein	Eric Markell	Brian Walshe
Experience:	• Founder, CEO & President of Principle Power Inc., a market entry company that developed and is supplying floating support structures to offshore industry • Founder, European Ocean Energy Association that brought together EU marine renewables technology developers • Founder of AquaEnergy Group Ltd, a market entry company that developed wave energy systems • Over 20 years at Honeywell	• Former CFO and Chief Resources Officer of Puget Sound Energy: led acquisition of over 1,600 MW of wind and gas representing $2 billion investment • Former CFO of IPP specializing in distressed energy companies' turnarounds • Significant experience in the acquisition and development of generating facilities	• Former Managing Director in Navigant Consulting financial transaction practice • Performed operational assessments or other site services at over 200 generating facilities in 10 countries • Expert witness in utility rate cases, bankruptcy proceedings, and civil litigation
Previous Employers:	• Principle Power Inc. • European Ocean Energy Association • AquaEnergy Group Ltd • Honeywell	• Puget Sound Energy • United American Energy Corp • Central Hudson Gas & Electric	• McKinsey & Company • Navigant • Stone & Webster
Education:	• B.E. EE, Stevens Institute of Technology • MBA Thunderbird School of Global Management	• B.S. Economics Union College • MPA Syracuse University	• B.S. Civil Engr. Northeastern Univ • MBA University Michigan

Offshore Wind Experience:
> 10 GW Fixed installed in Europe; 8 MW Floating worldwide

Fixed: 10,393 MW installed capacity in Europe



Source: EWEA

Floating: 8 MW installed capacity world-wide

Floating: > 200 MW projected by 2020 in UK, Portugal, Japan and France

Floating Offshore Wind:
Deep Water locations / Reduces Environmental Impacts

Environmental Impact and Geotechnical Requirements

- No Piling - eliminates noise, pile rejection, offers reduced weather dependence.
- Complete decommissioning – all infrastructure fully recoverable
- Reduced core sampling in field – drag embedment anchors

Flexible Site Location

- Deep water solution – incremental cost increase minimum
- Conventional mooring – inexpensive, uses steel chain and cable
- Drag embedment anchors – effective in all soil conditions: clay, sand and layered soil.
- Produce more energy – site selection is based on resource energy density

Serial Production – On Shore Construction

- Every floating support structure hull in a project is identical – learning curve of 80%
- Fabrication technique is modular – distributed manufacturing
- Load out is bottleneck but can be done in a few days

Quayside Commissioning and WTG Installation

- All commissioning activity completed onshore – onshore labor rates infrastructure.
- Reduced weather dependence – everyone comes to work everyday in shipyard

Morro Bay Offshore:
Clean Energy, Clean Views

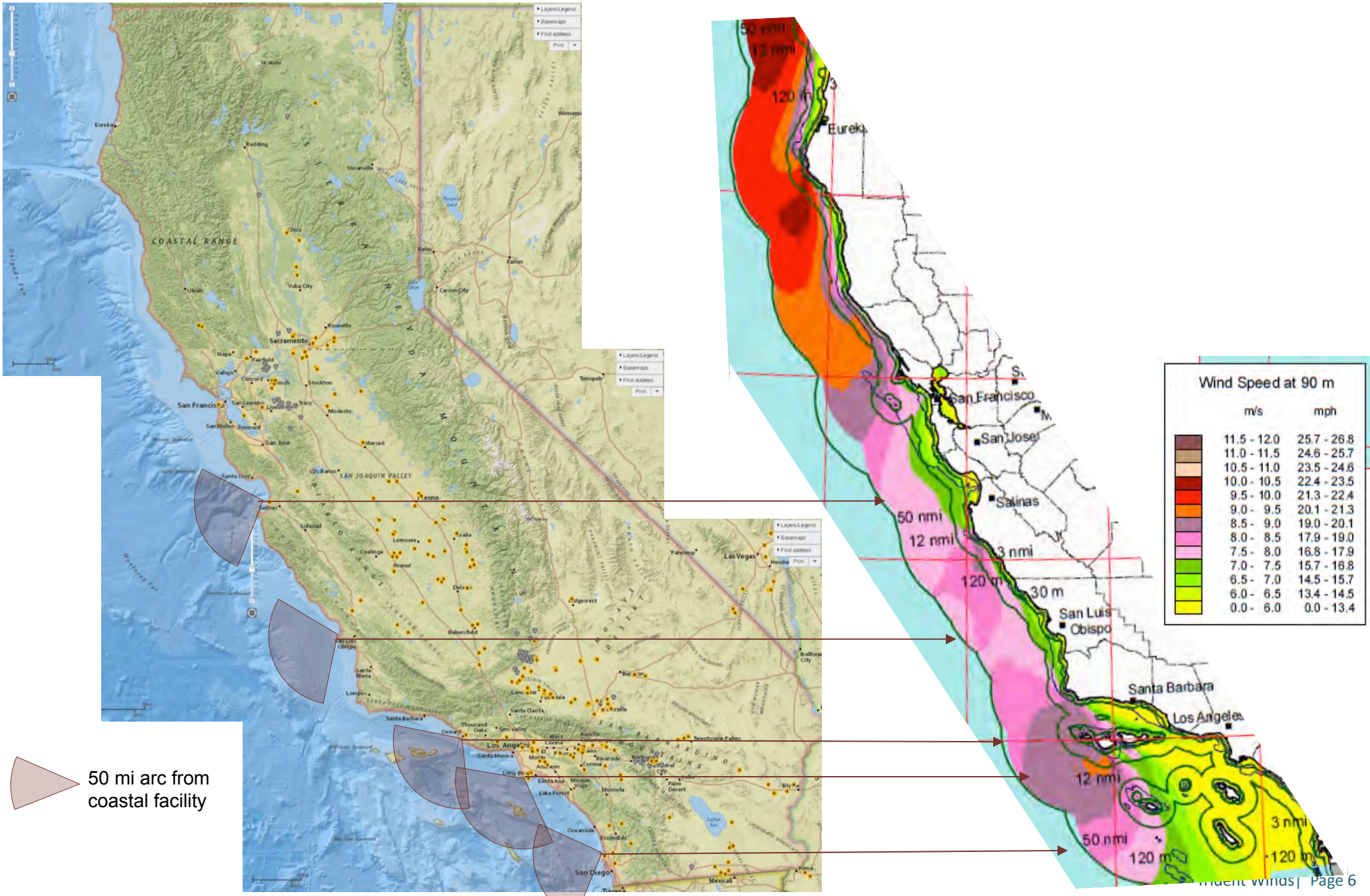
Site location

- Over 20 miles from Pt Estero, Cambria and San Simeon
- Over 30 miles from Morro Bay beach
- Greater than 8.5 miles per second wind resource

Site has been OPTIMIZED to reduce impacts on:

- Fishing grounds
- Birds
- Marine mammals
- Fish habitats
- Shipping lanes
- Minimize visability

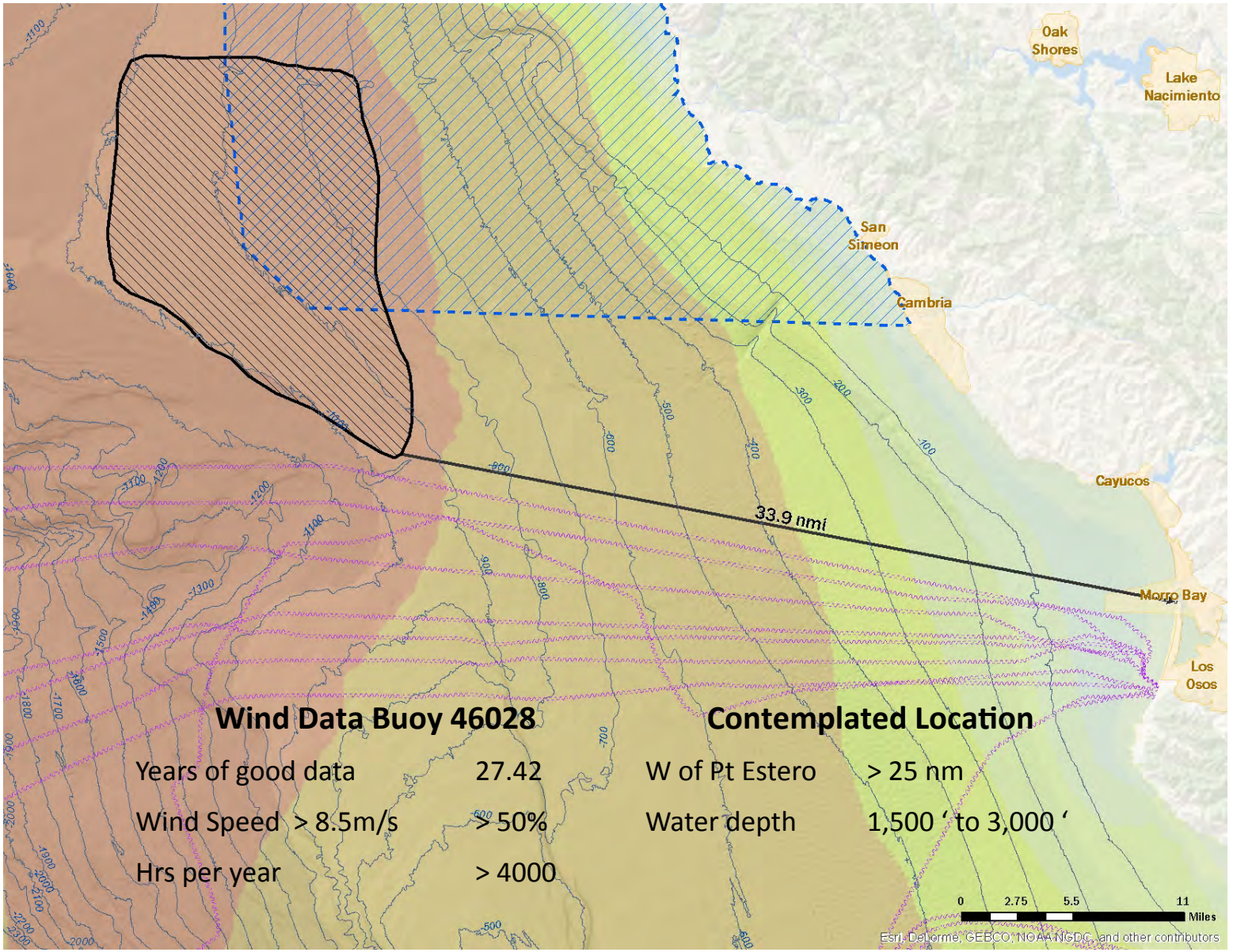
CA Wind Resource/ Interconnection Points



50 mi arc from coastal facility

Morro Bay Offshore:
Site Location – Over 20 miles offshore

Wind Resource / Distance to Shore

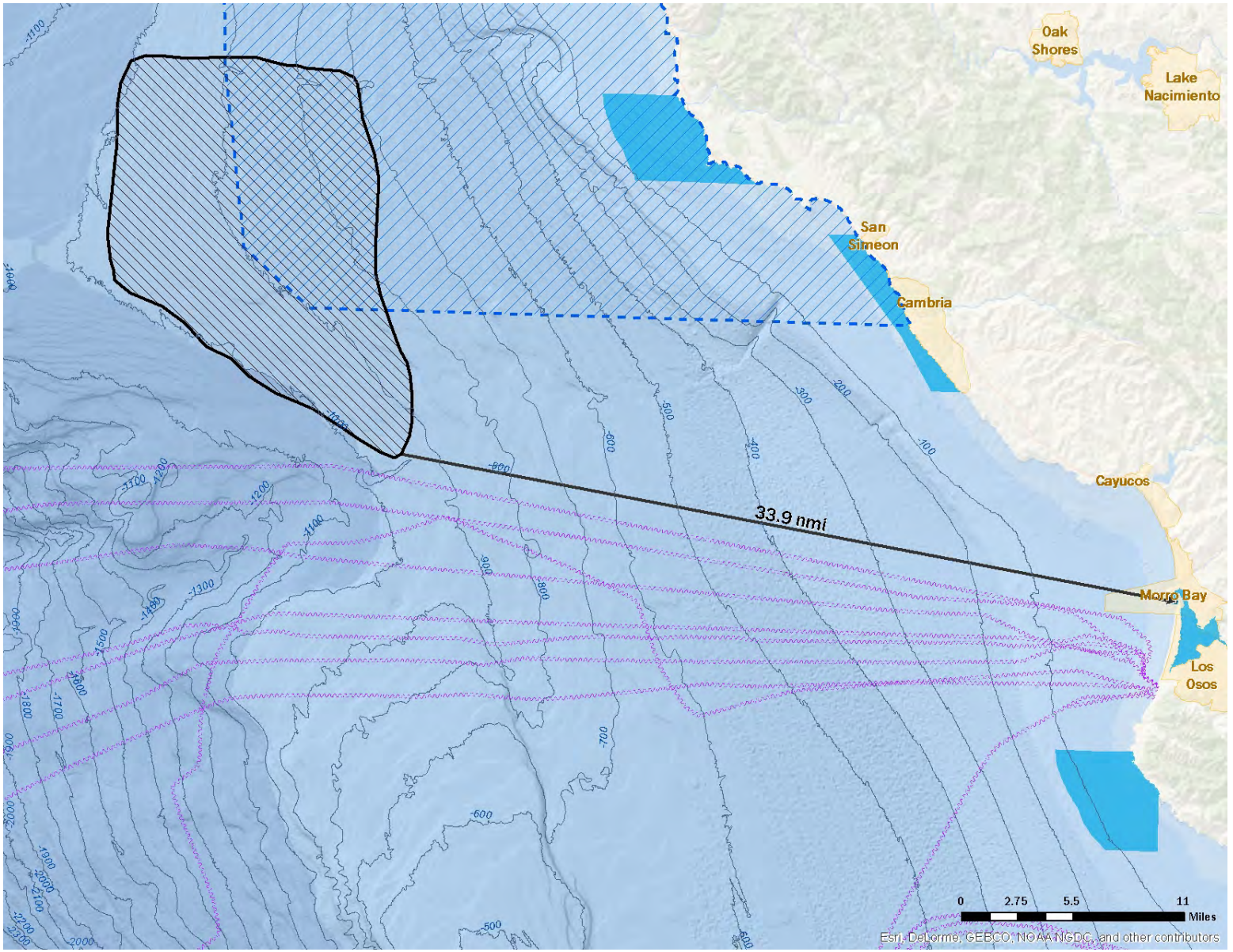


Wind Data Buoy 46028		Contemplated Location	
Years of good data	27.42	W of Pt Estero	> 25 nm
Wind Speed > 8.5m/s	> 50%	Water depth	1,500 ' to 3,000 '
Hrs per year	> 4000		

Morro Bay Offshore:
Site Location – Shore/Grid connection

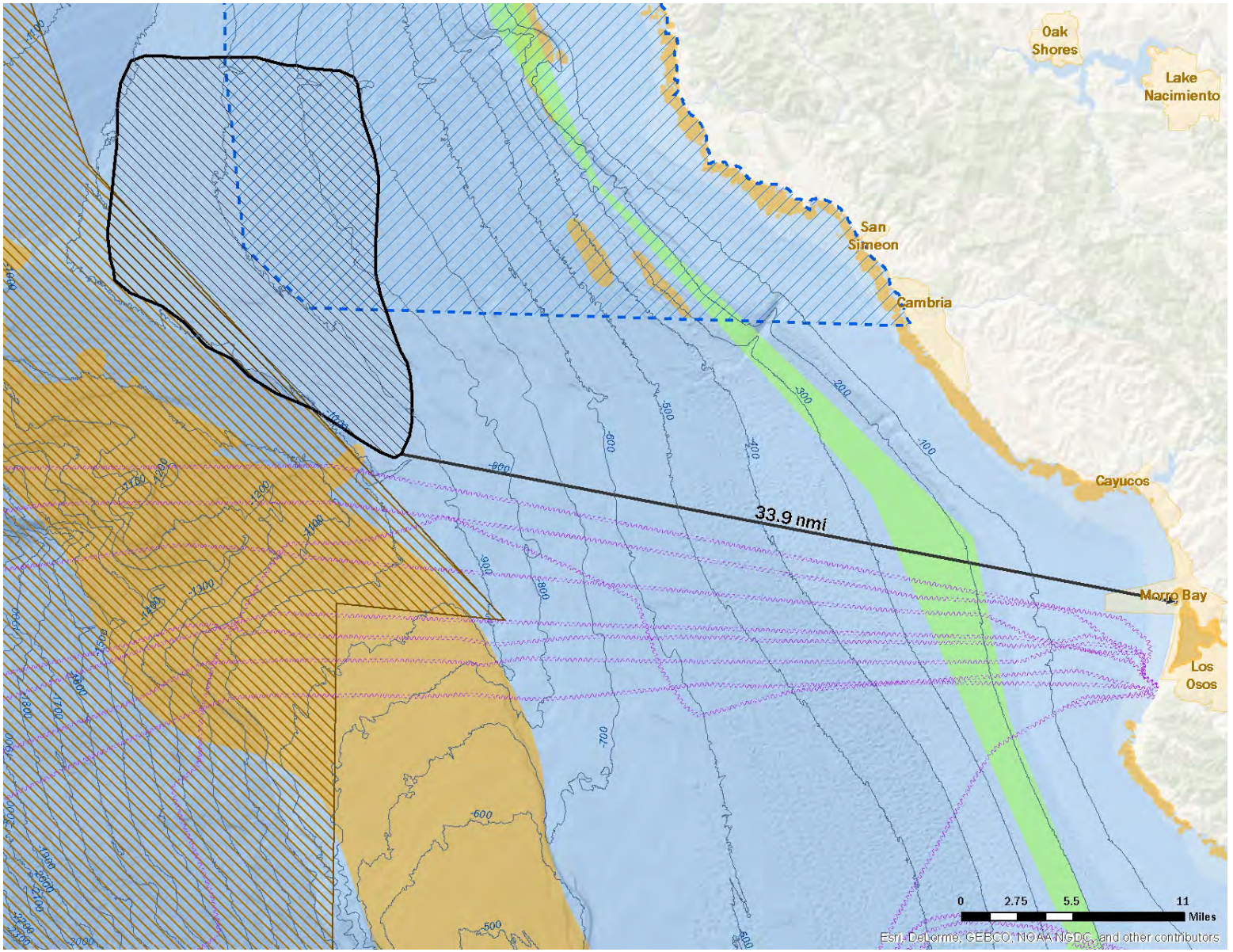
Morro Bay Offshore:
GIS Layers / Site Constraints

California Marine Protected Areas / Submarine Cables



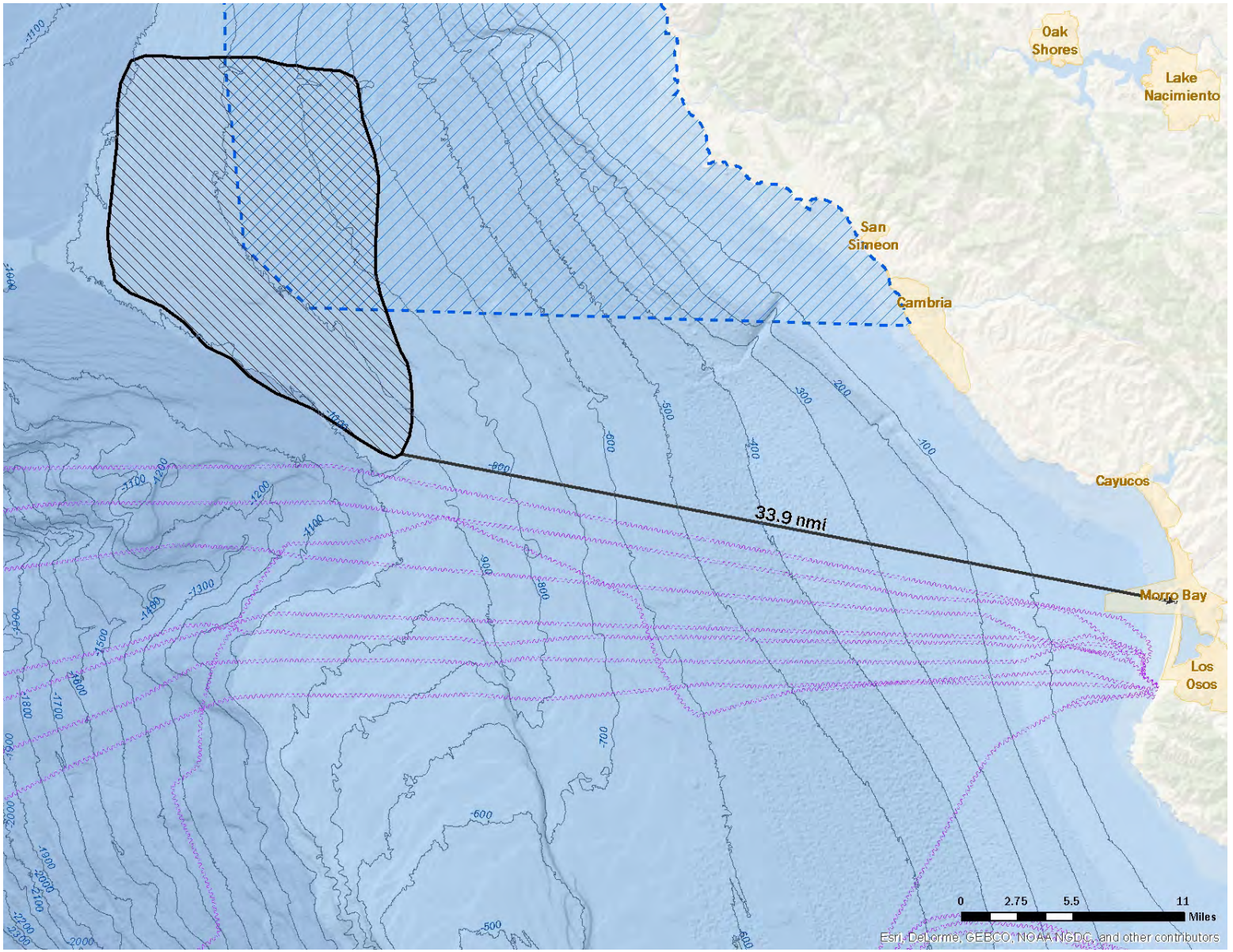
Morro Bay Offshore:
GIS Layers / Site Constraints

Closed Fishing / Conservation Areas



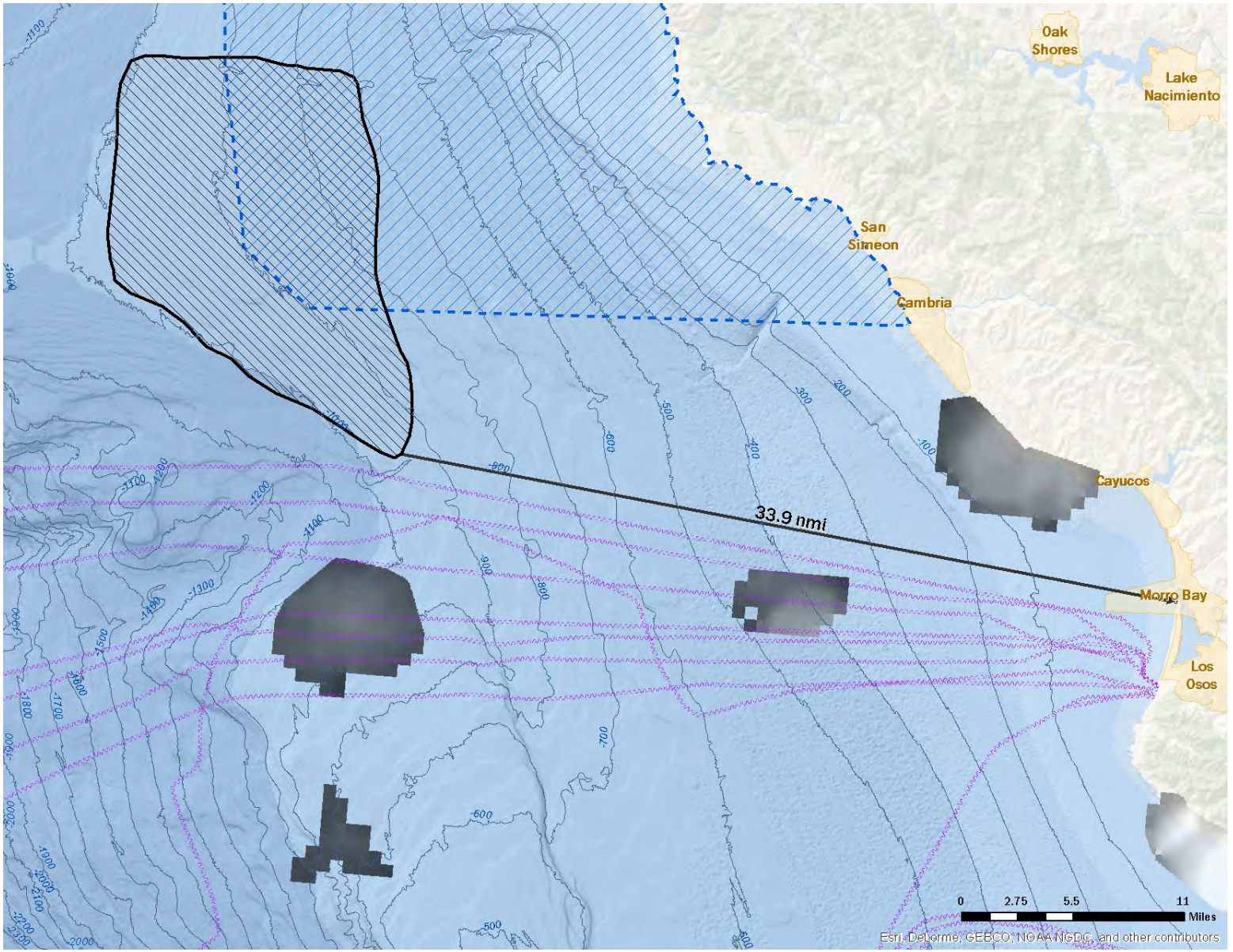
Morro Bay Offshore:
GIS Layers / Site Constraints

Bottom Trawling Intensity After EFH (2006-2010)



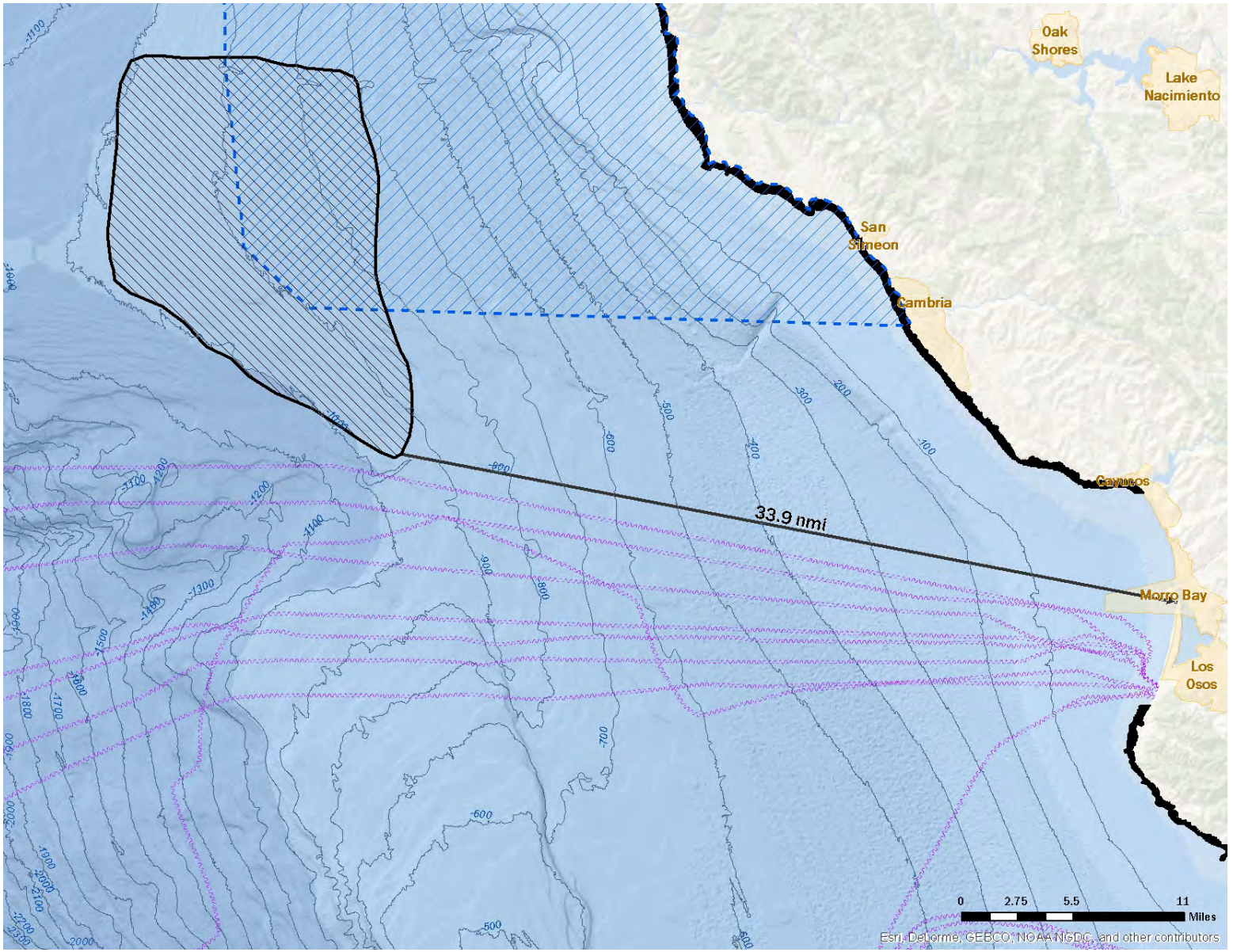
Morro Bay Offshore:
GIS Layers / Site Constraints

Fixed Gear Fishing Intensity After EFH (2006-2010)



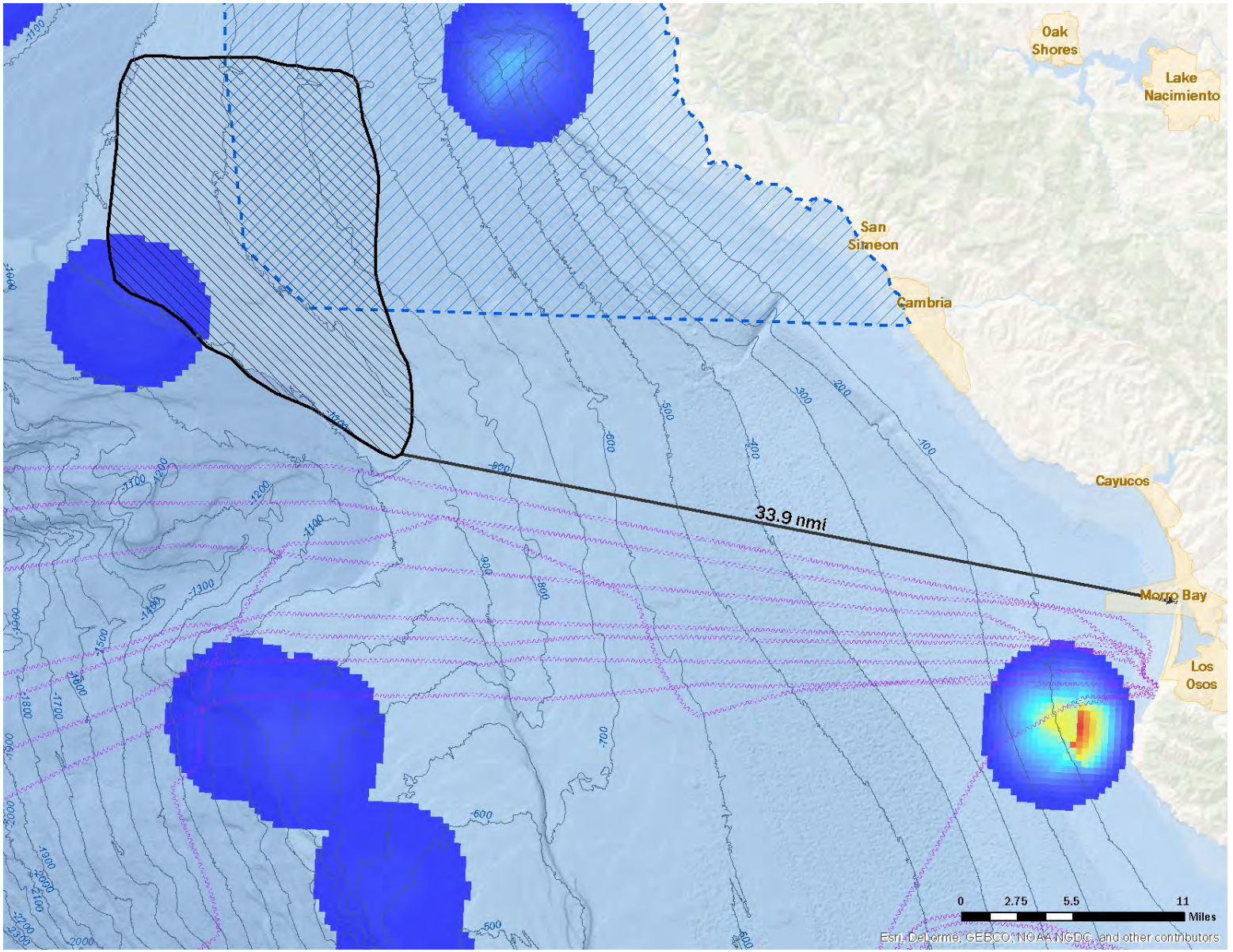
Morro Bay Offshore:
GIS Layers / Site Constraints

Black Abalone Crab Critical Habitat



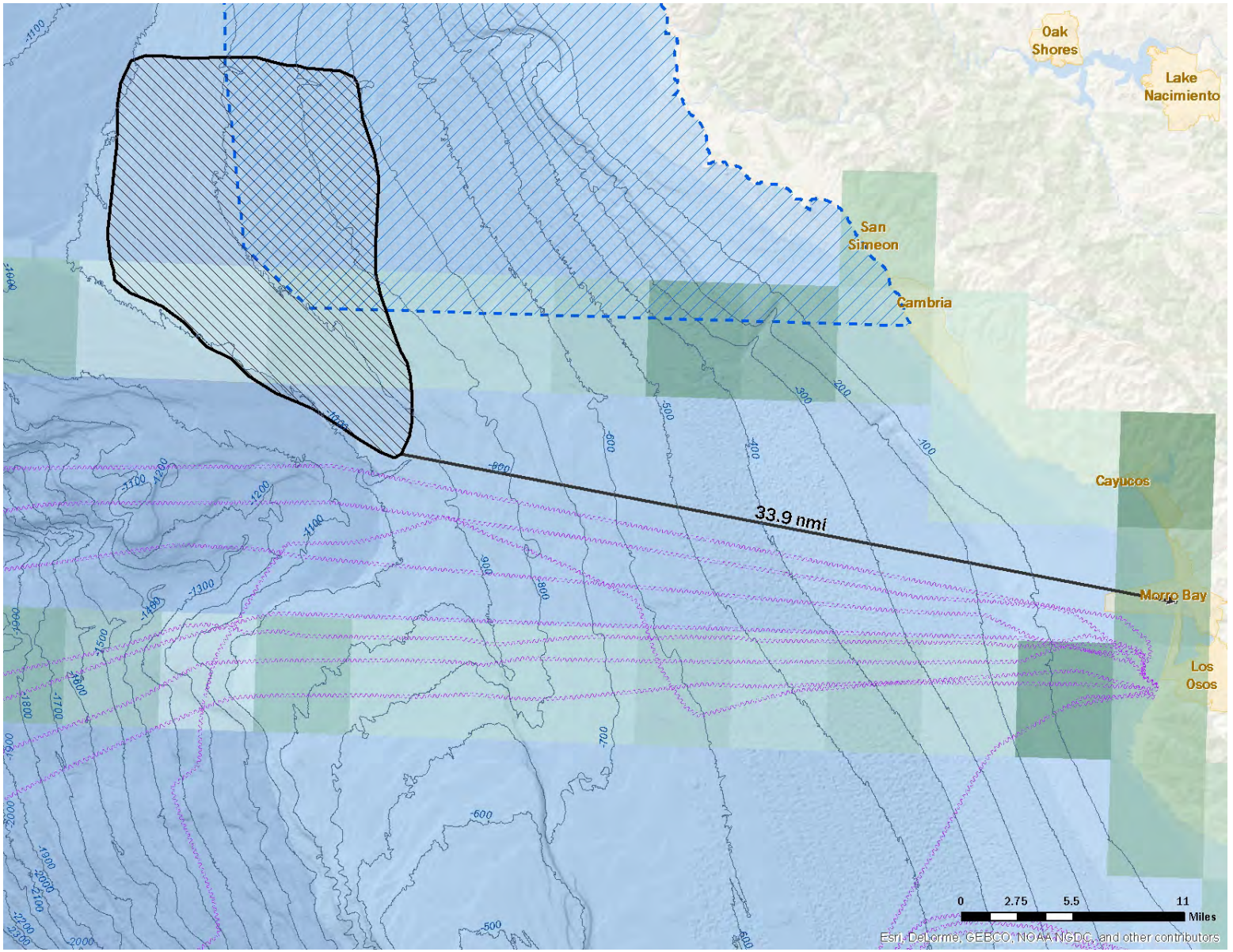
Morro Bay Offshore:
GIS Layers / Site Constraints

Coral Standardized Catch After EFH



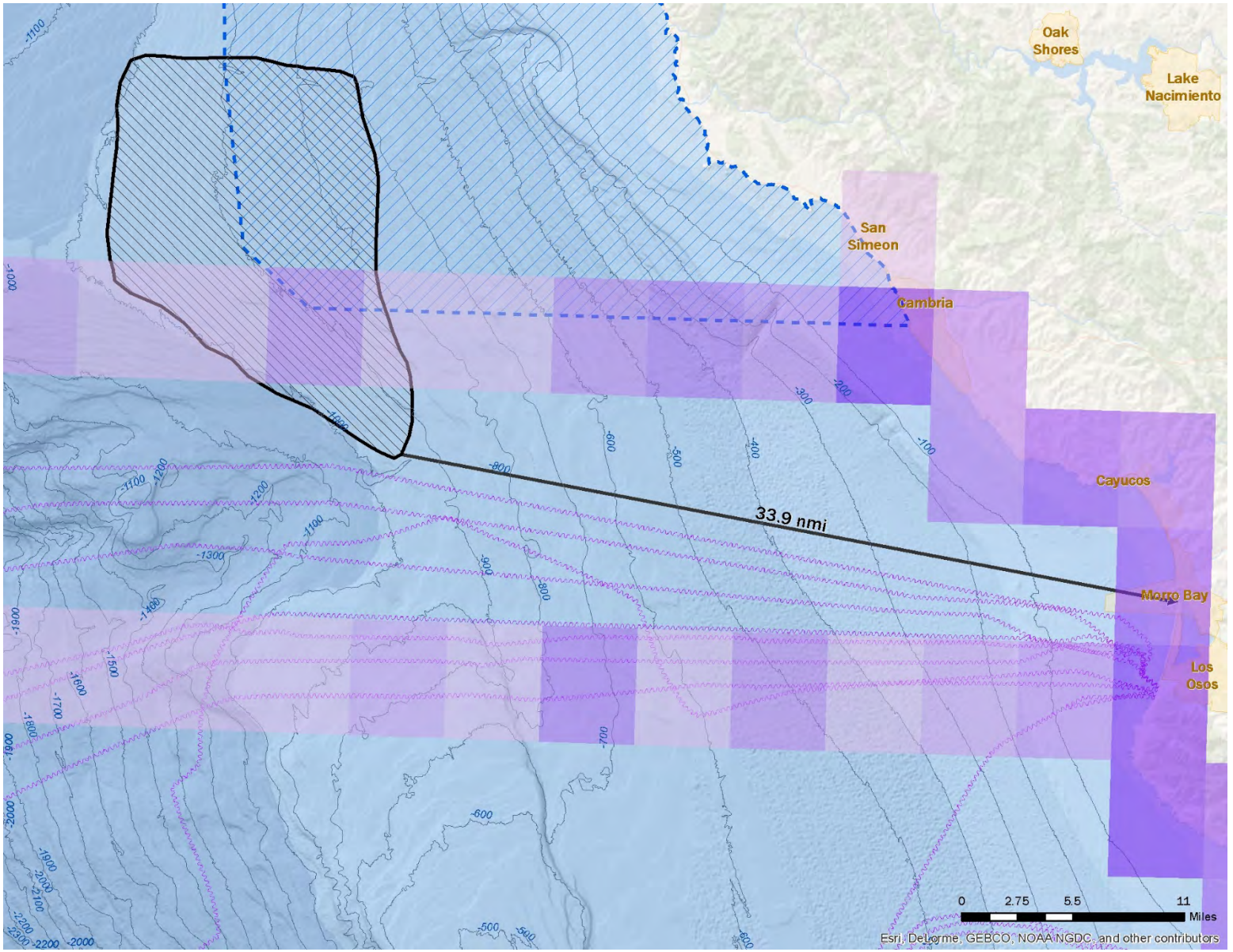
Morro Bay Offshore:
GIS Layers / Site Constraints

Seabirds Density



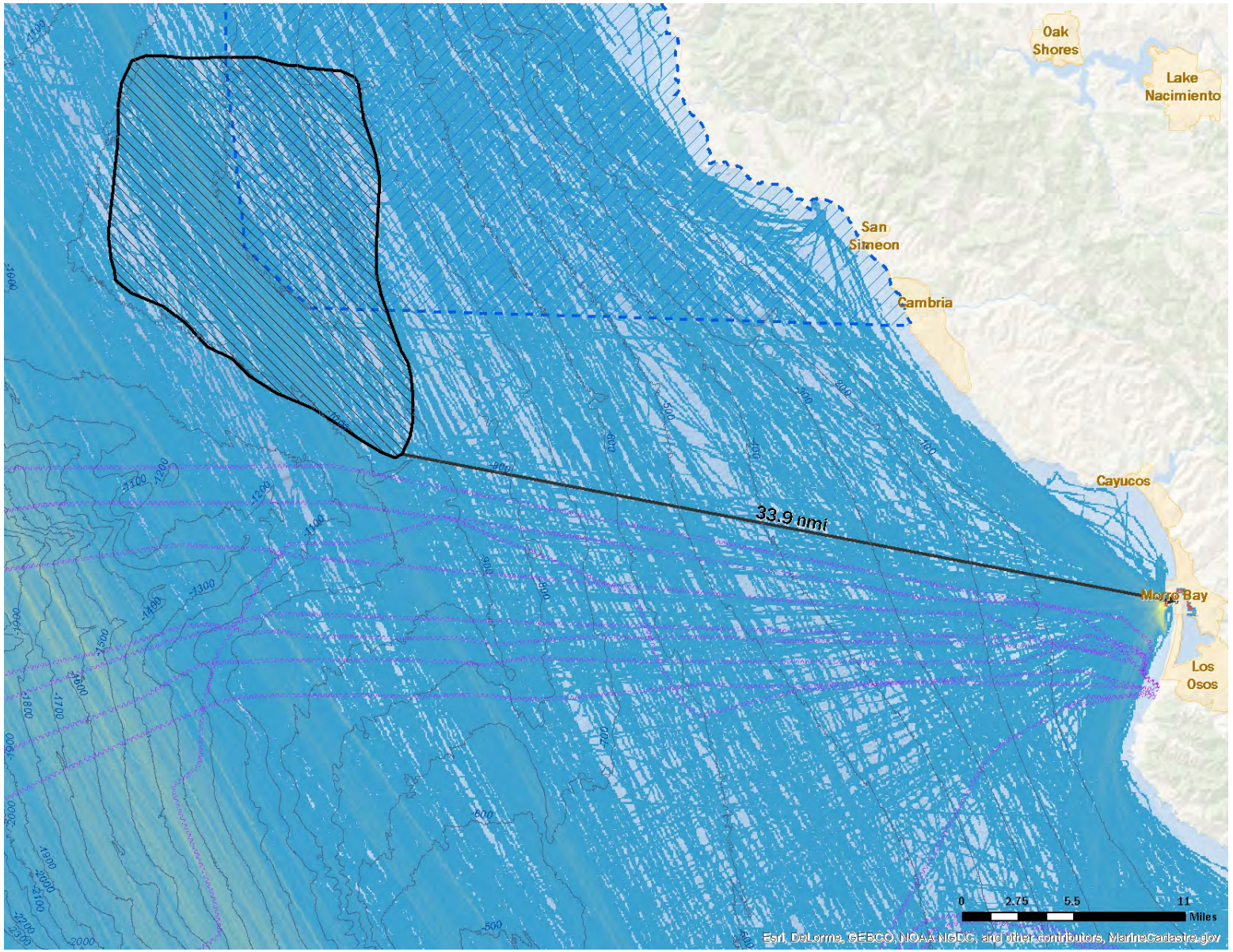
Morro Bay Offshore:
GIS Layers / Site Constraints

Marine Mammals Density



Morro Bay Offshore:
GIS Layers / Site Constraints

Dominant Shipping Traffic

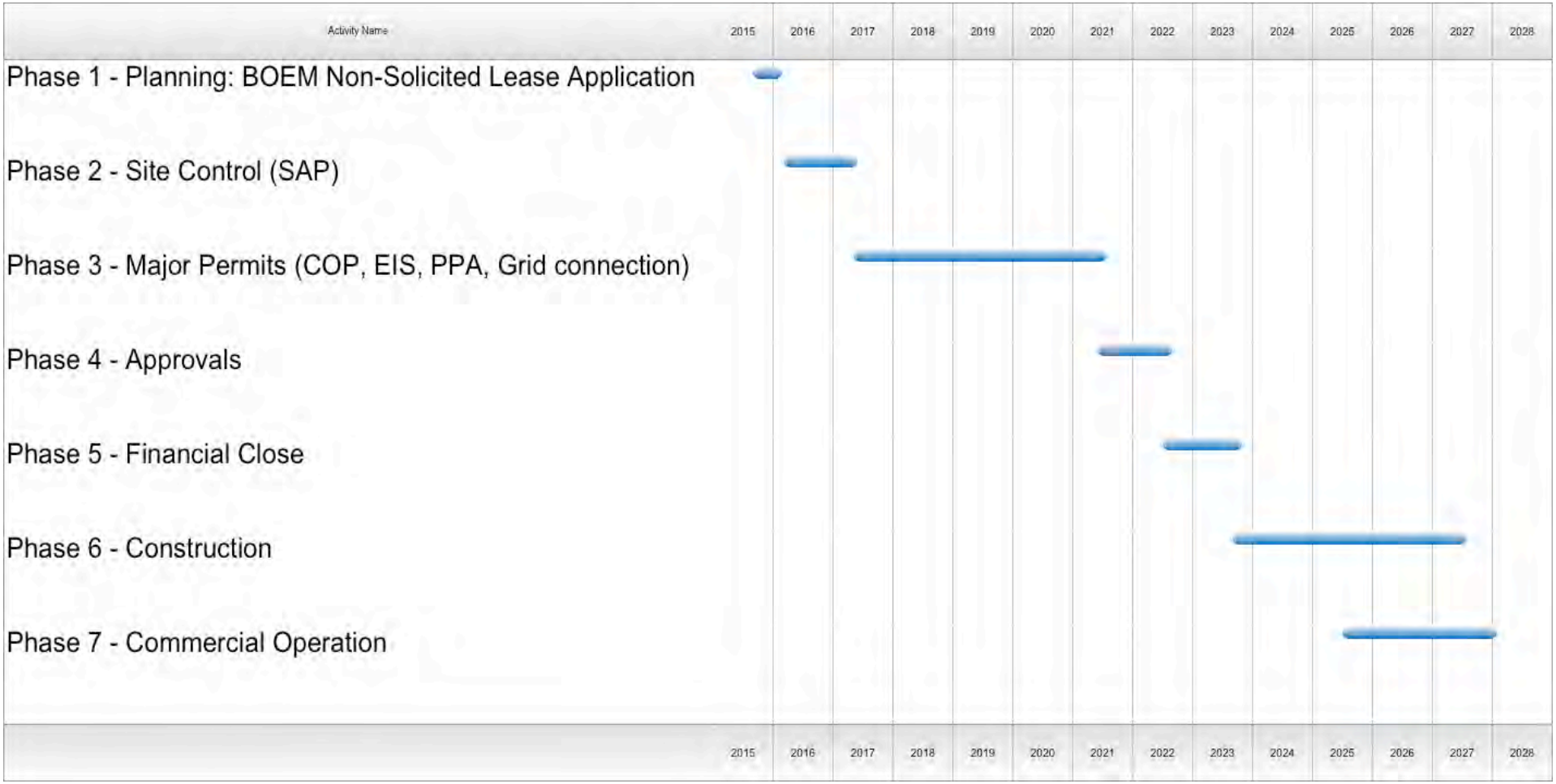


Morro Bay Offshore: Project Phases as defined by NREL

Step	Phase Name	Phase Start Criteria	Phase End Criteria
1	Planning – Early Stage	Starts when developer or regulatory agency initiates formal site control process	Ends when a developer obtains exclusive development rights to a site (e.g., through competitive auction or a determination of no competitive interest in the United States)
2	Planning – Site Control	Begins when the developer obtains exclusive development rights to a site (e.g., through competitive auction or a determination of no competitive interest in the United States)	Ends when the developer files major permit applications (e.g., a construction operations plan for projects in federal waters in the United States)
3	Major Permits Submitted	Starts when the developer files major permit applications (e.g., construction operation plan for projects in federal waters in the United States)	Ends when a regulatory body(s) grants authorization to proceed with construction; a rejection may cause the project sponsor to appeal (still permitting phase), place the project on hold, or cancel
4	Approved	Starts when project has been approved by the relevant regulatory bodies and is fully authorized to proceed with construction	Ends when sponsor announces FID, and has signed unconditional contracts for major construction work packages; achievement of this milestone generally requires that a project has secured sufficient revenue mechanisms (e.g., power offtake contracts, subsidies, or tax incentives) to be financially viable
5	Financial Close	Begins when sponsor announces FID and has signed unconditional contracts for major construction work packages; achievement of this milestone generally requires that a project has secured sufficient revenue mechanisms (e.g., power offtake contracts, subsidy, or tax incentives) to be financially viable	Ends when project begins offshore construction work
6	Under Construction	Starts when offshore construction work is initiated	Ends when project has been connected to the power grid and all units fully commissioned; COD marks the official hand-over from construction to operations
7	Operating	Commences when project has been connected to the power grid and all units fully commissioned; COD marks the official hand-over from construction to operations	Ends when the project has begun a formal process to decommission and stops feeding power to the grid
8	Decommissioned	Starts when the project has begun a formal process to decommission and stops feeding power to the grid	Ends when the site has been restored and lease payments are no longer being made, or if the site has been repowered
N/A	On Hold/ Canceled	Starts when sponsor stops development activities (i.e., discontinues lease payments) and/or abandons a prospective site	Ends when the sponsor announces the restart of project development activities

Source: NREL

Morro Bay Offshore:
Top Level Project Schedule



Morro Bay Offshore
Permits – a total of 33 permits and licenses

Federal Agencies	Jurisdiction	CA State Agencies	Jurisdiction
Bureau of Ocean Energy Management	Leasing, lead agency for NEPA	CA Department of Fish and Wildlife	Listed species, managed species
U.S. Fish and Wildlife Service	ESA, MBTA	CA Lands Commission	CZMA, Territorial Sea Plan,
NOAA Fisheries	ESA, MMPA, MSFCA, CZMA	CA State Historic Preservation Office	Cultural/Archeology
U.S. Army Corp of Engineers	CWA 404; Rivers and Harbors Act	CA Department of Environmental Quality	CWA: WQ & Sediment transport
Federal Energy Regulatory Commission	Interconnect	CA State Parks and Recreation	Parks and Recreation
U.S. Coast Guard	Navigation	CA Lands Commission	Cable route and crossing
Federal Aviation Administration	Aviation, Flight paths	CAISO/PG&E	Substation connection and hookup
DOD	Military operations	CA Ocean Protection Council	
		CEC/CPUC	PPA/RPS

Morro Bay Offshore
City, Tribes and Stakeholders

City/Tribes	Interests	Stakeholder Groups	Interests
NCTC	Sanctuary nomination	MBCFO	Fishing interests
City of Morro Bay	Cooperation Agreement	The Sierra Club	Clean Air Act, Clean Water Act, and Endangered Species Act
City of Morro Bay	Local permits	The Audubon Society	Birds
		Surfrider Foundation	Surfing
		The Nature Conservancy	Wildlife
		The Environmental Defense Fund	Smart economics, practical partnerships & rigorous science
		Natural Resources Defense Council	Wildlife and wild places

Morro Bay Offshore: Phase 1 and 2 Tasks

Planning Phase Tasks

- BOEM Leasing/Permitting
- Public and community outreach
- Environmental Studies
- Wind resource assessment & quantification
- Pre-FEED
- State and local permits
- Transmission study
- Power Purchase Agreement (PPA)
- Environmental Impact Statement (EIS)

Planning Phase Deliverables

- Approved Site Assessment Plan (SAP)
- Approved Construction and Operation Plan (COP)
- PPA
- Transmission Interconnect Agreement

Morro Bay Offshore:
Public outreach / Cooperation with the City of Morro Bay

Planning Phase Outreach

- Trident Winds has conducted an extensive stakeholder outreach campaign:
  - Morro Bay City Council members
  - Morro Bay Commercial Fishermen Organization – 3 meetings
  - Northern Chumash Tribal Council
  - Ocean Conservancy
  - SLO Clean Energy
  - CISO, CEC, CPUC
  - The Audubon Society, the Sierra Club, NRDC
- Planning near-term meetings with:
  - Environmental NGOs and local groups
  - State Agencies, like CA Lands and Coastal Commissions, etc.
  - Federal Agencies

Cooperation with the City of Morro Bay

- Signed Cooperation Agreement on Oct 13, 2015 to ensure cooperation and transparent process

BOEM Non-Solicited lease application

- Plan to submitted to BOEM in early Jan 2016

"The Future for Offshore Wind is Bright……. and it will also be FLOATING"

DNV-GL – "10 Years, 10 Lessons", 2013

Questions and Answers