Renewable Energy Potential Evaluation on Lands Under the Commission's Jurisdiction

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CALIFORNIA STATE LANDS COMMISSION

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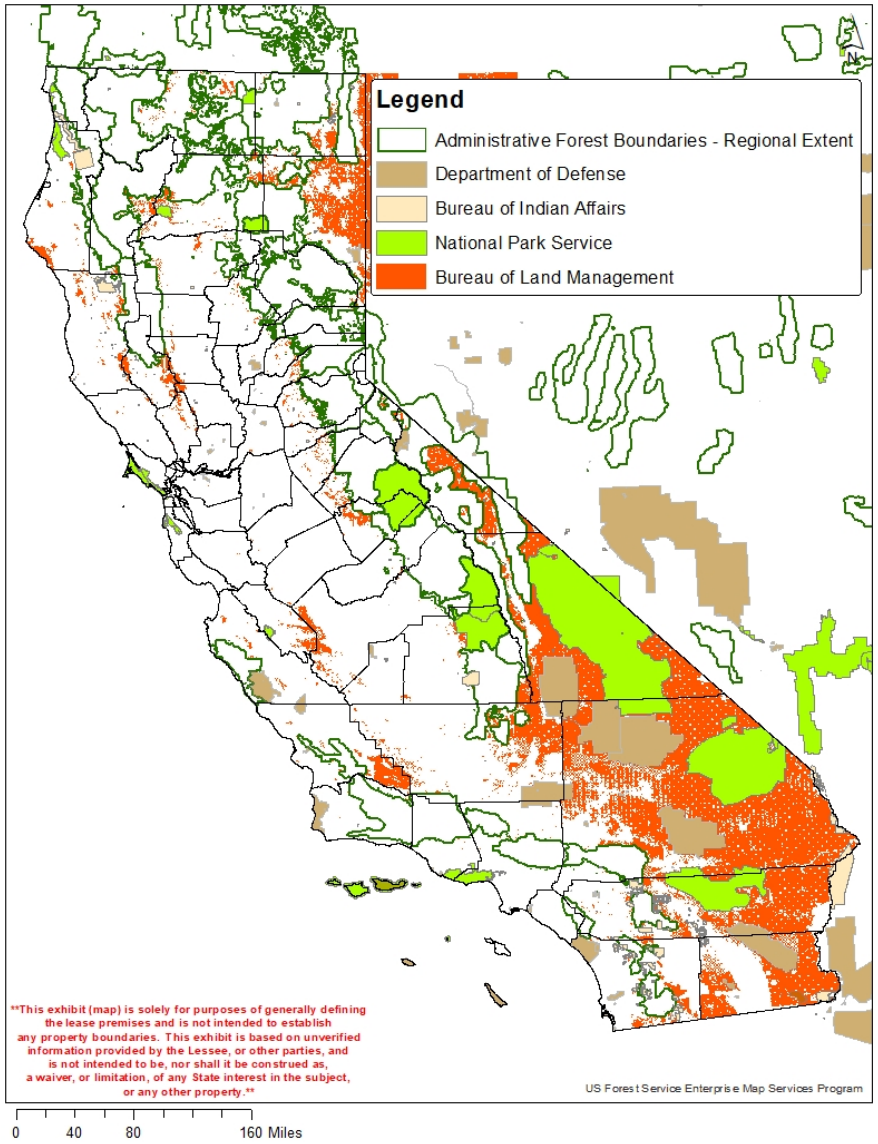
Who Owns What in California?



FEDERAL OWNERSHIP (Acres)

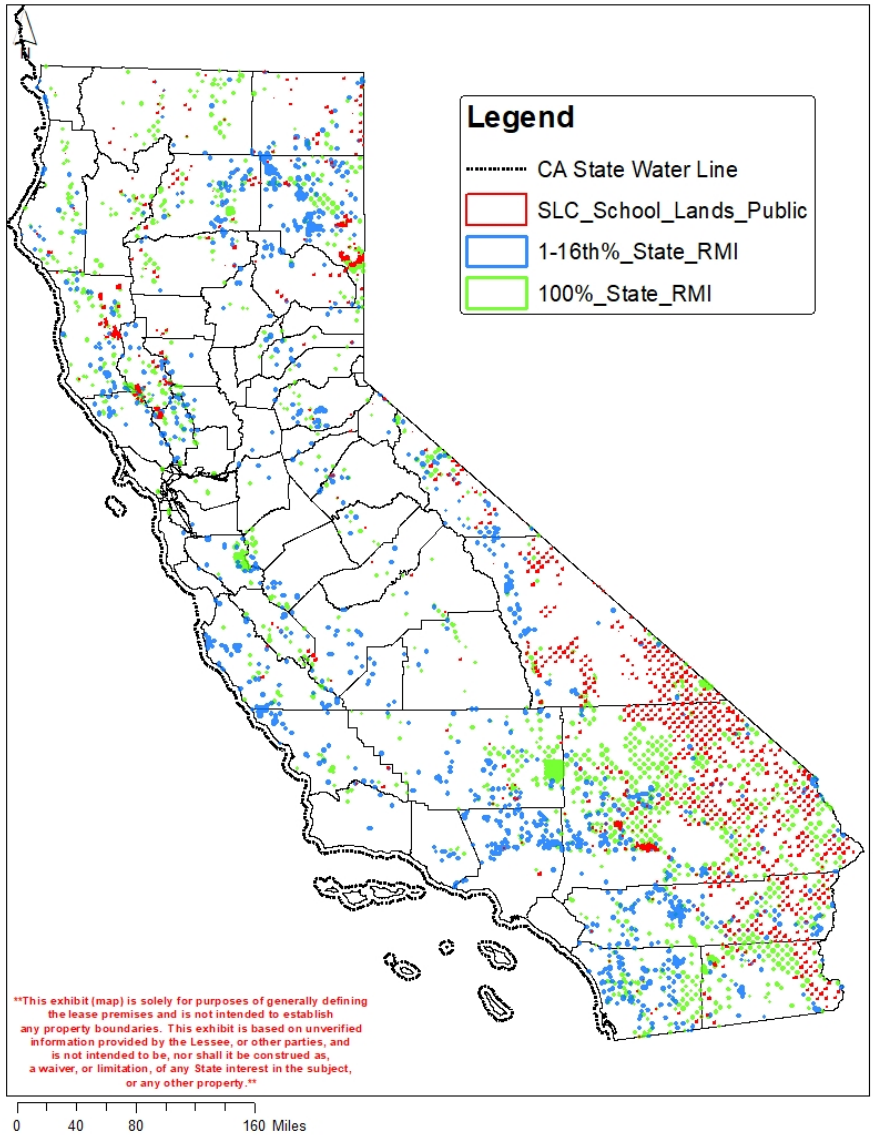
Forest Service	Bureau of Land Management	National Park Service	Department of Defense	Fish and Wildlife Service
20,762,205	15,364,784	7,588,161	1,990,931	294,247

TOP SIX IN STATE OWNERSHIP (Acres)

State Lands Commission	Dept of Parks and Recreation	Dept of Fish and Wildlife	University of California	Dept of Water Resources	Dept of Forestry & Fire Protection
4,479,937	1,366,718	677,952	129,243	109,357	75,114

Total acreage in California	Total Federal acreage in California	Total State acreage in California	Total Private acreage in California
100,206,720	46,000,329	6,953,547	47,252,843

State Lands under Commission Management



- Total acreage = approximately 4.48 million acres

- Sovereign Lands = approximately 4 million acres
  - Tidelands, lakes, and navigable rivers

- School Lands:
  - Fee = approximately 480,000 acres
  - 1/16% Reserved Mineral Interest = 146,094
  - 100% RMI = 520,262
  - Generates revenue for the CalSTRS

- Website to download school lands layer
  - http://www.slc.ca.gov/GIS/GIS.html

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Steps in Evaluation of Renewable Energy Potential on School Lands & Sovereign Lands

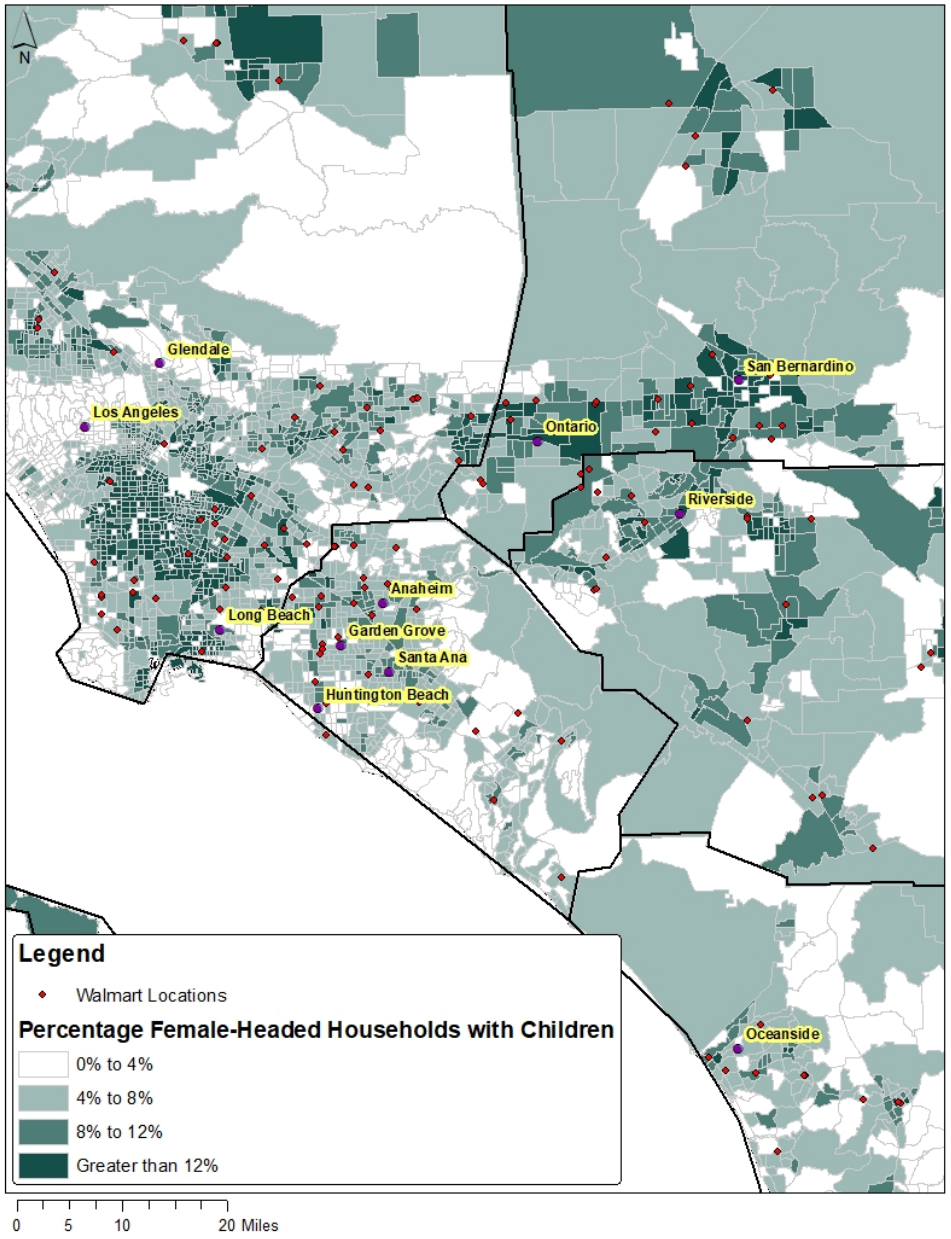
01	02	03	04	05	06
Conducted literature review	Developed screening criteria for site selection and prospecting	Identified qualified parcels/areas for renewable energy development	Developed database of CA wind and solar operators for prospective leasing	Established framework for economic analysis for solar and land based wind	Conducted research on federal and neighboring states' leasing, bonding, terms, incentives

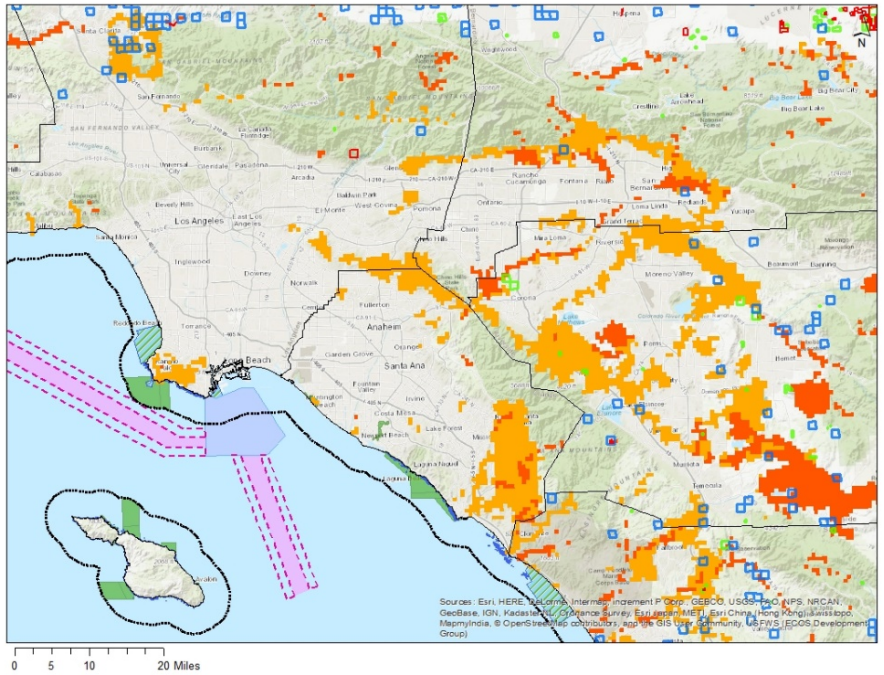
Scope of Renewable Energy Potential Evaluation on Lands Under Commission Jurisdiction

School Lands	• **Solar PV and concentrating solar** • **Land Base Wind** • **Biomass** • **Geothermal**
3 Miles Offshore	• **Offshore Wind** • **Wave/Tidal Energy**

Geographic Information Systems

- ArcGIS mapping and analysis software used for broad study
- GIS indicates everything in real space – Georeferenced
- Extremely powerful tool for organizing and analyzing spatial data
- A lot of data is available free for download – and it is always expanding
  - Walmart Example





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National Renewable Energy Laboratory

- About 75% of the GIS data gathered for this statewide study has come from the National Renewable Energy Laboratory (NREL)

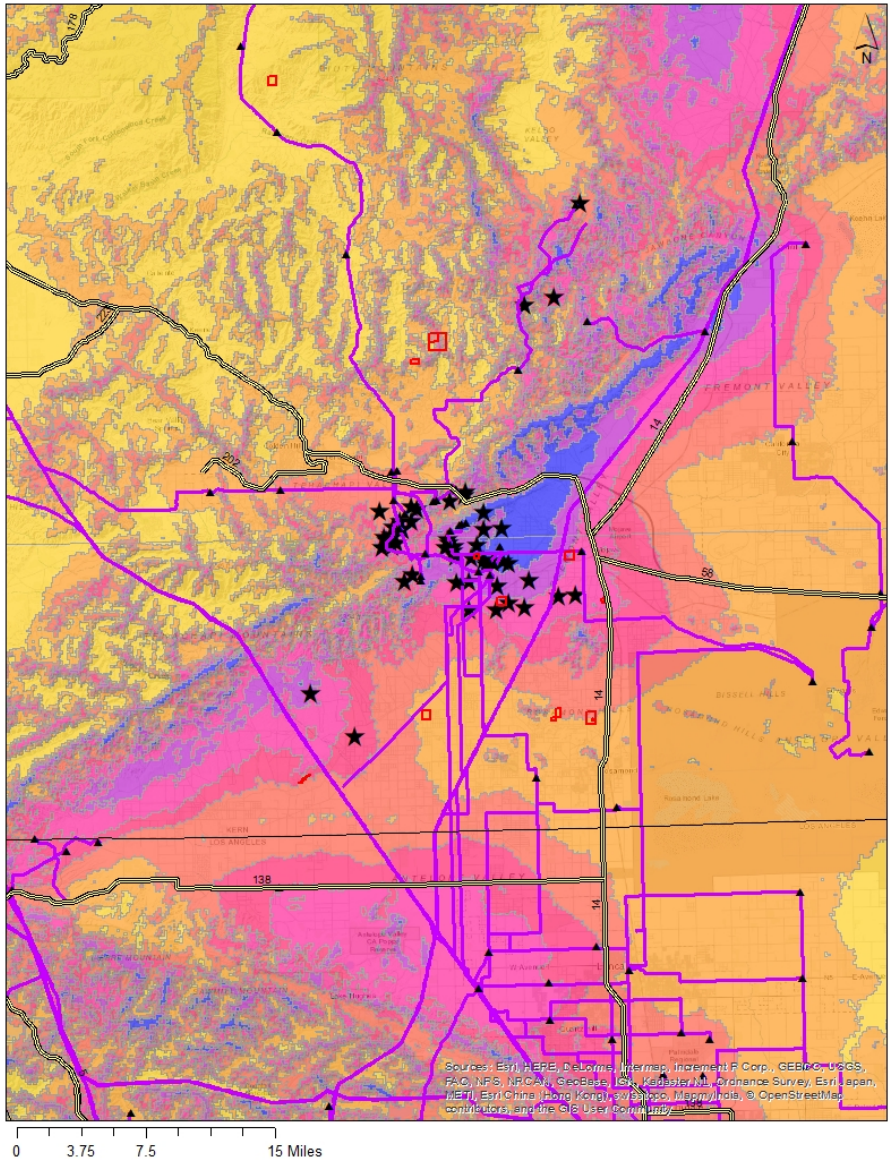
- The remaining 25% came from other public sources

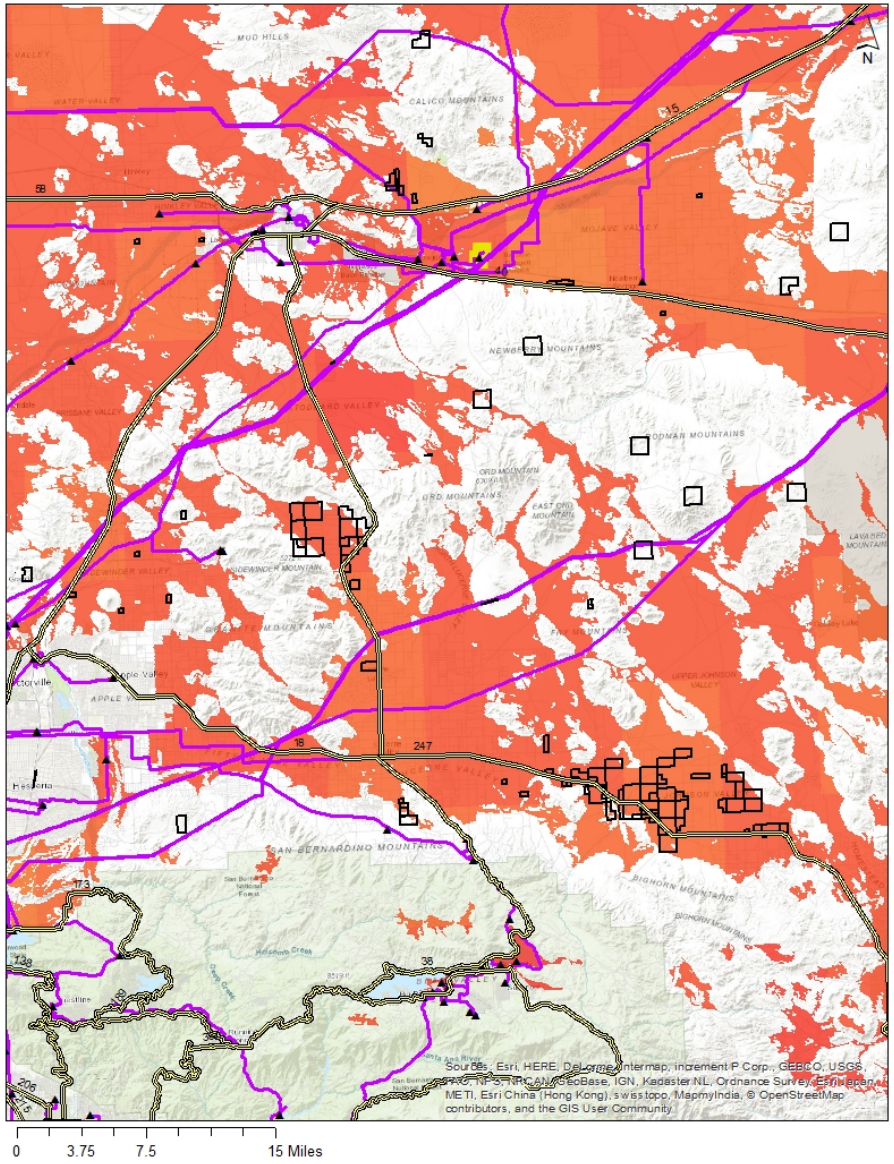
- The NREL is a depository of various kinds of renewable energy related data products that range in type from reports, to maps, to raw data.
  - It is important to note that NREL is not always the author of the data they provide, which could come from multiple sources
  - For example, NREL provides a nationwide database of deep geothermal resources potential that had been created through collaborative research conducted by the Southern Methodist University and NREL

- ESRI, the creators of ArcGIS, have also been hard at work developing a publicly available database of any and all types of spatial data with the hopes of “mapping” out everything possible

Wind and Solar

Red to purple represents mid-high Wind Power Density





Orange to Red represents 6-9 kWh/m^2/day

California Offshore Wind Energy

- Estimate: Total California offshore wind resource potential within 3 nautical miles and 60 m water depth is around ***5 gigawatts***

Screening Analysis Criteria

- Wind speed ≥ 7.5 m/s (wind power class ≥ 5)
- Distance to substation ≤ 30 miles
- Ocean depth ≤ 60 m
- Minimal environmental conflicts

Restricted Areas (a sample)

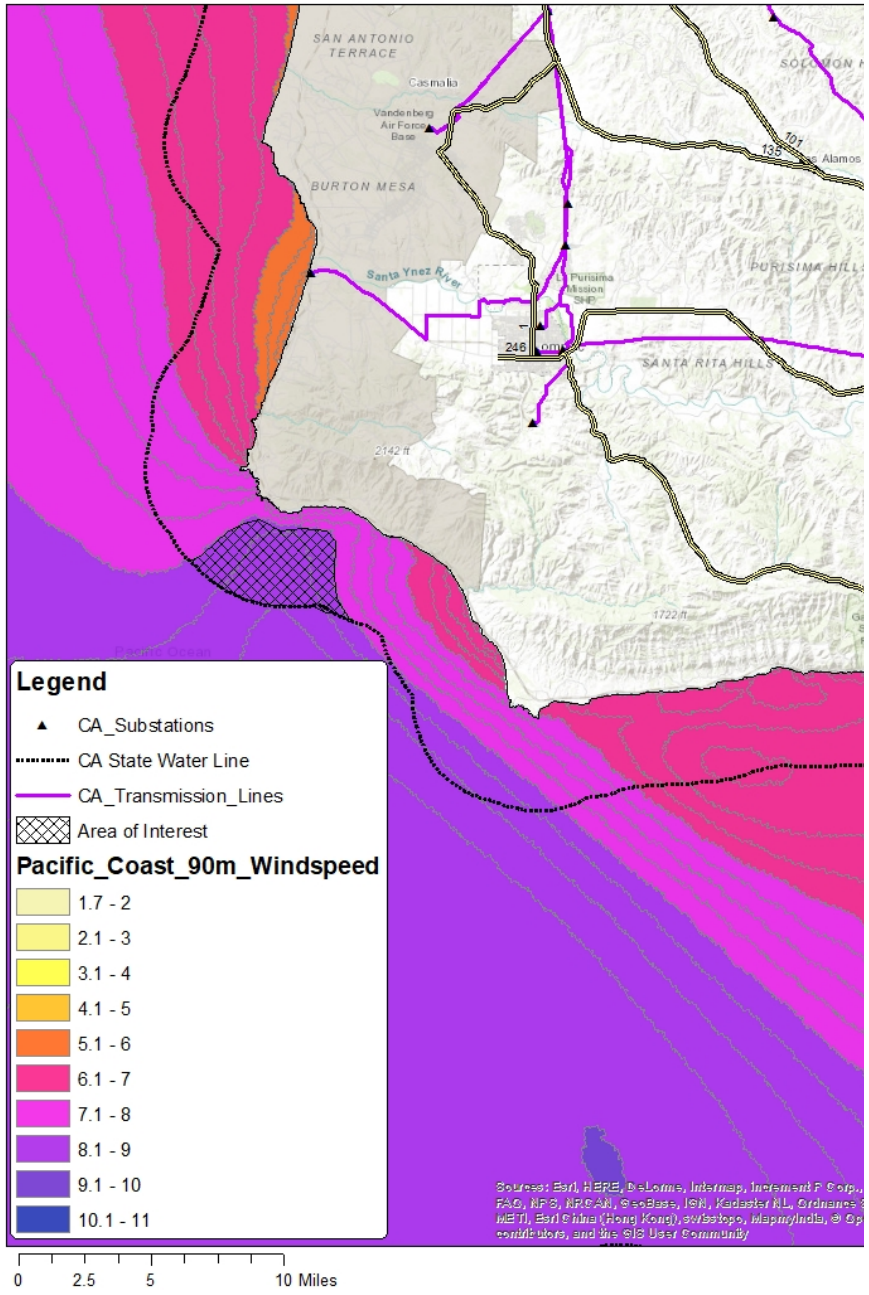
Offshore

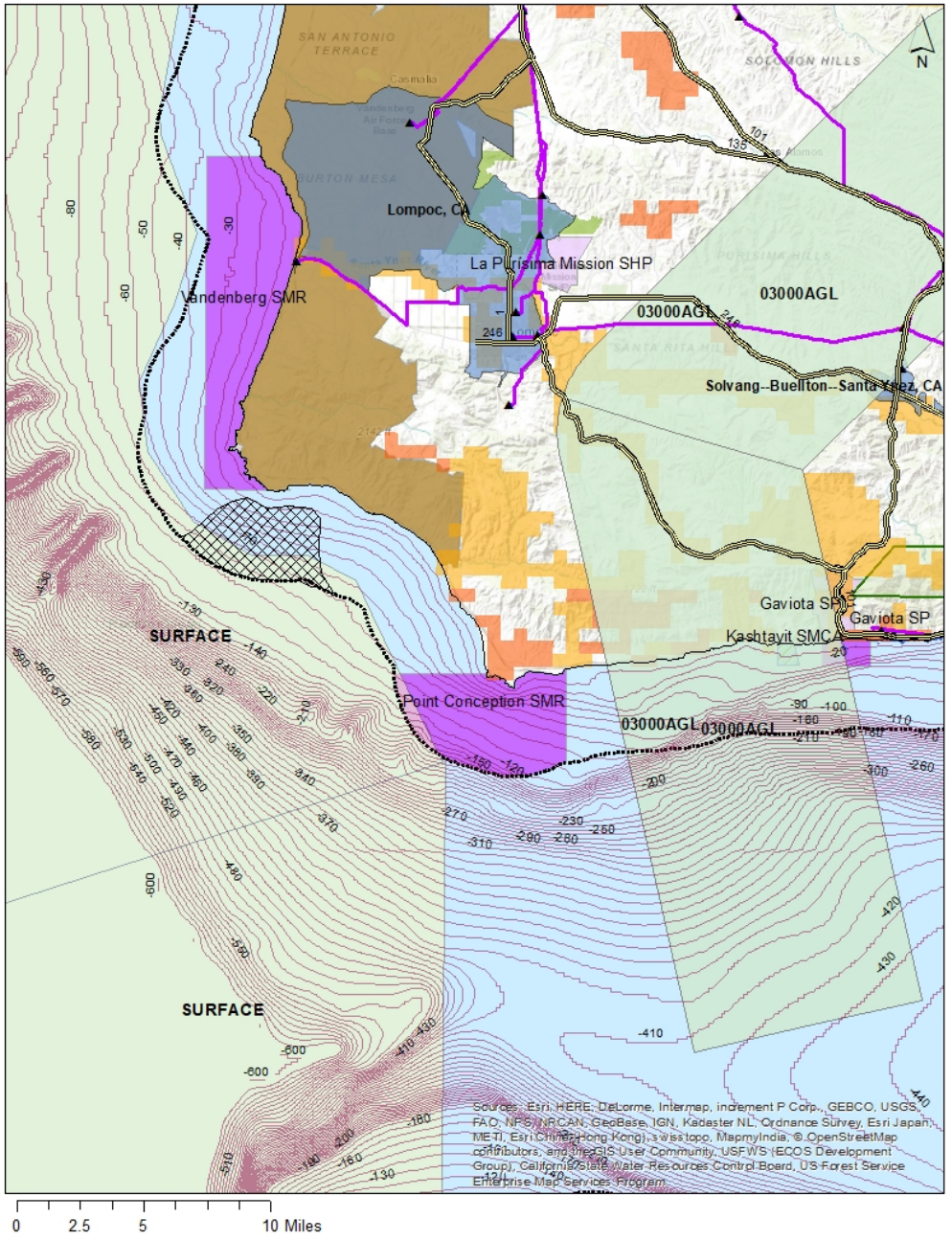
- ❑ Military Operations
- ❑ Areas of Special Biological Significance
- ❑ Critical coastal habitats
- ❑ Marine protected Areas
- ❑ Shipping lanes
- ❑ State beaches (State Parks layer)
- ❑ Kelp forests
- ❑ National marine sanctuaries in CA (Channel Islands and Monterey Bay area)
- ❑ National seashores (Point Reyes)
- ❑ National recreation areas
- ❑ Active State Leases
- ❑ Other conflicting structures (outfalls, optics cables, pipelines, and ROW's)

Onshore

- ❑ US Fish and Wildlife Lands
- ❑ BLM wilderness areas & National Parks
- ❑ Historic/scenic trails; State Parks
- ❑ National conservation area
- ❑ National recreation area
- ❑ Wild and scenic rivers
- ❑ Wilderness study areas
- ❑ Tribal lands
- ❑ Military lands & low altitude special use airspace

Santa Barbara County





	Distance to Substation (miles)
Shaded Area	9

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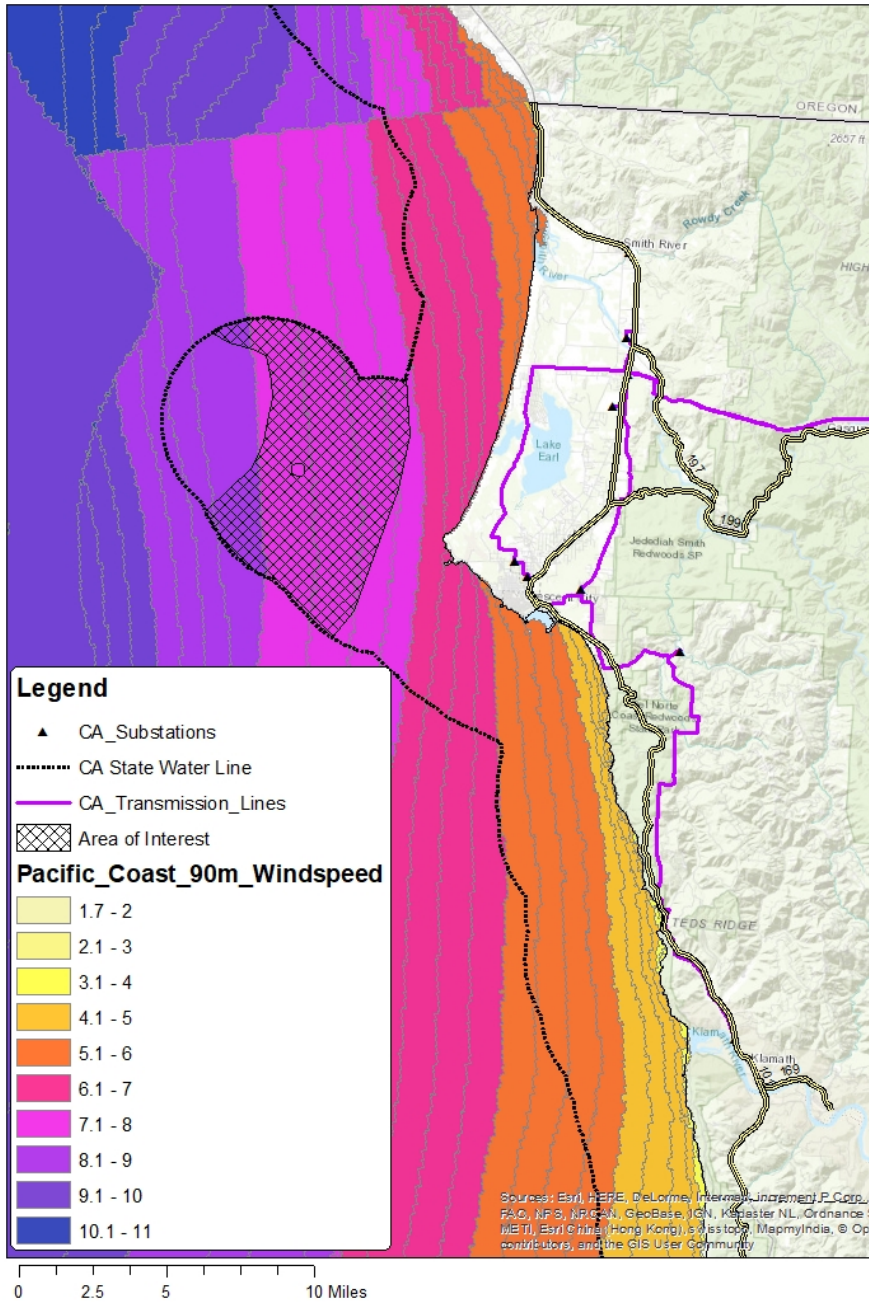
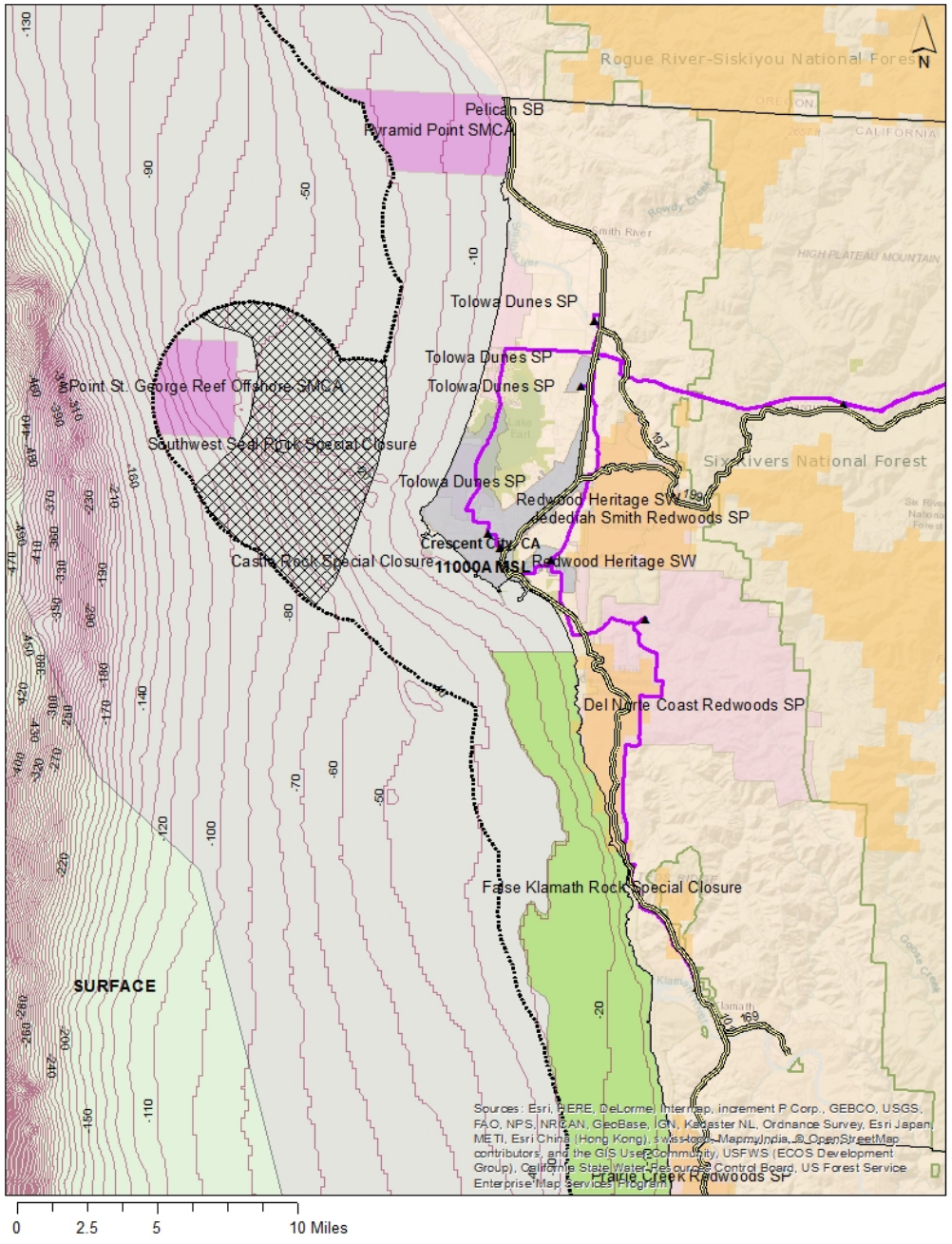
Del Norte County





	Distance to Substation (miles)
Shaded Area	5-6

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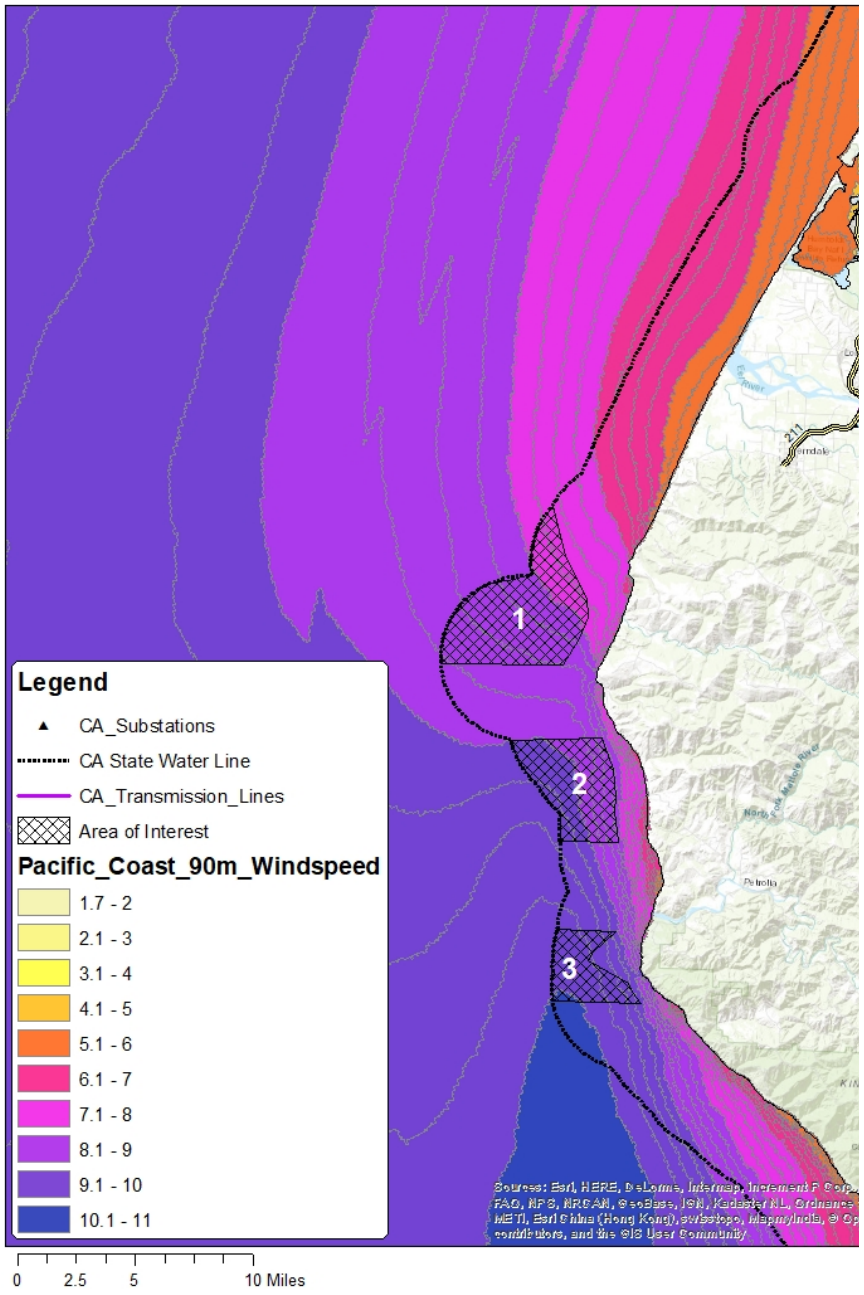
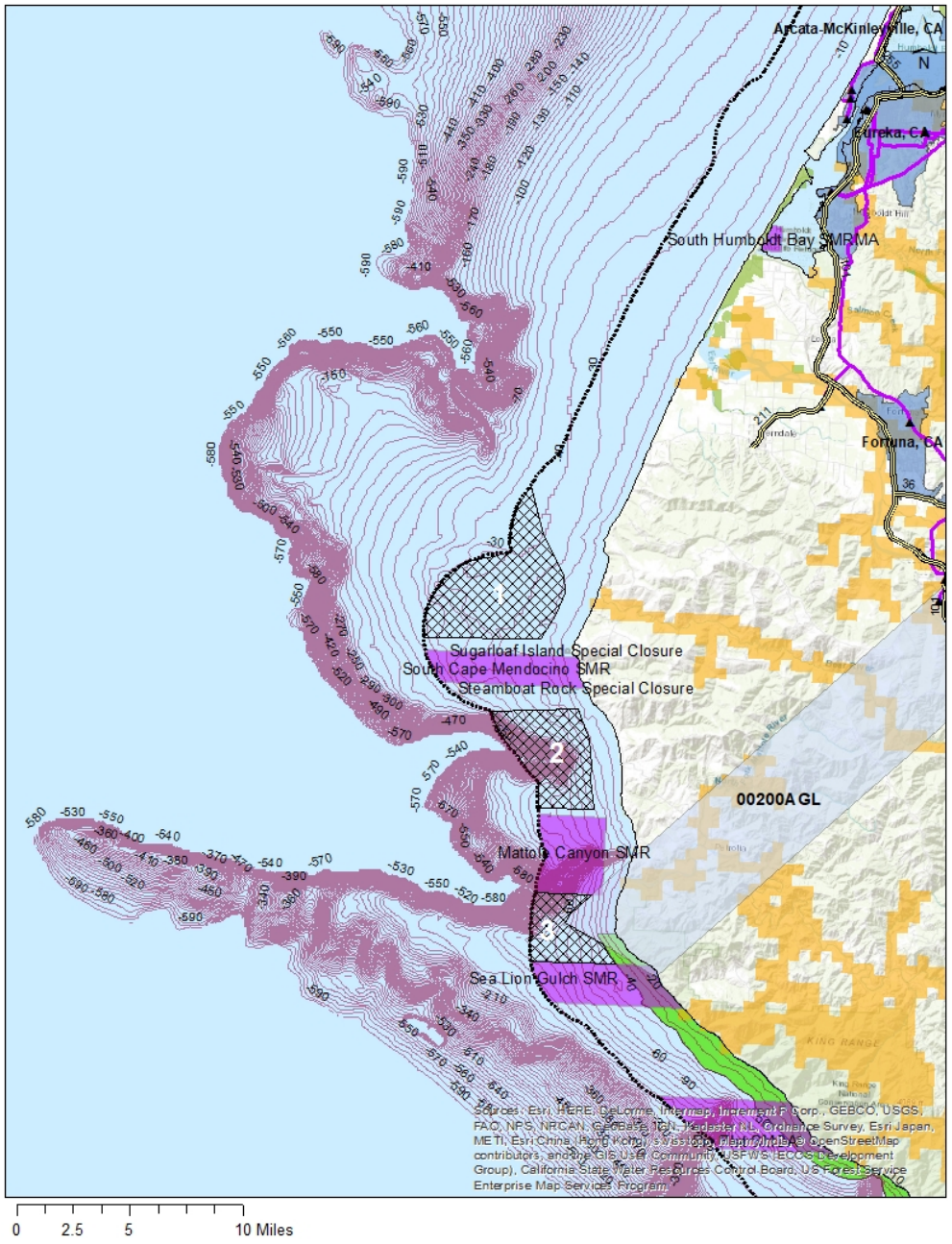
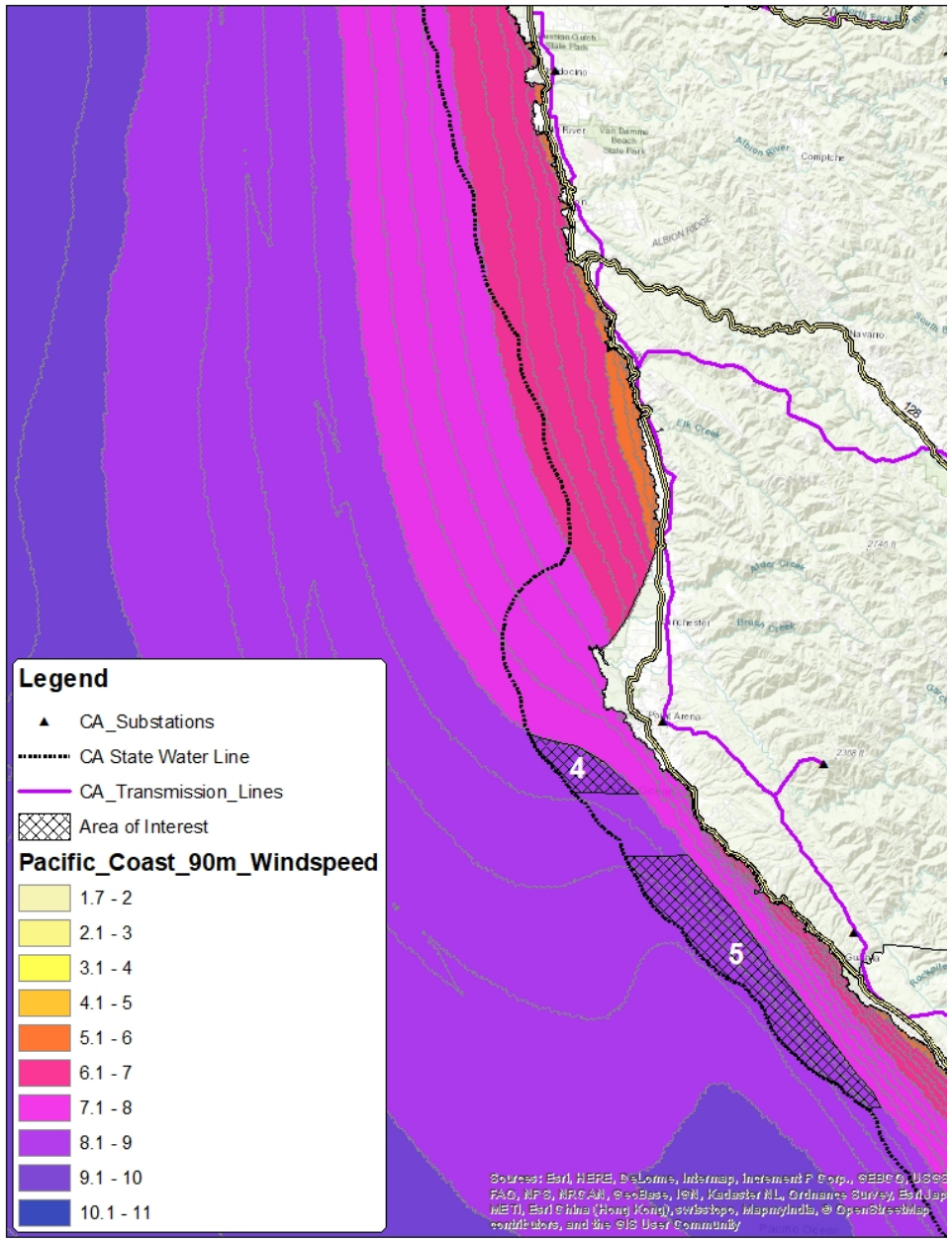


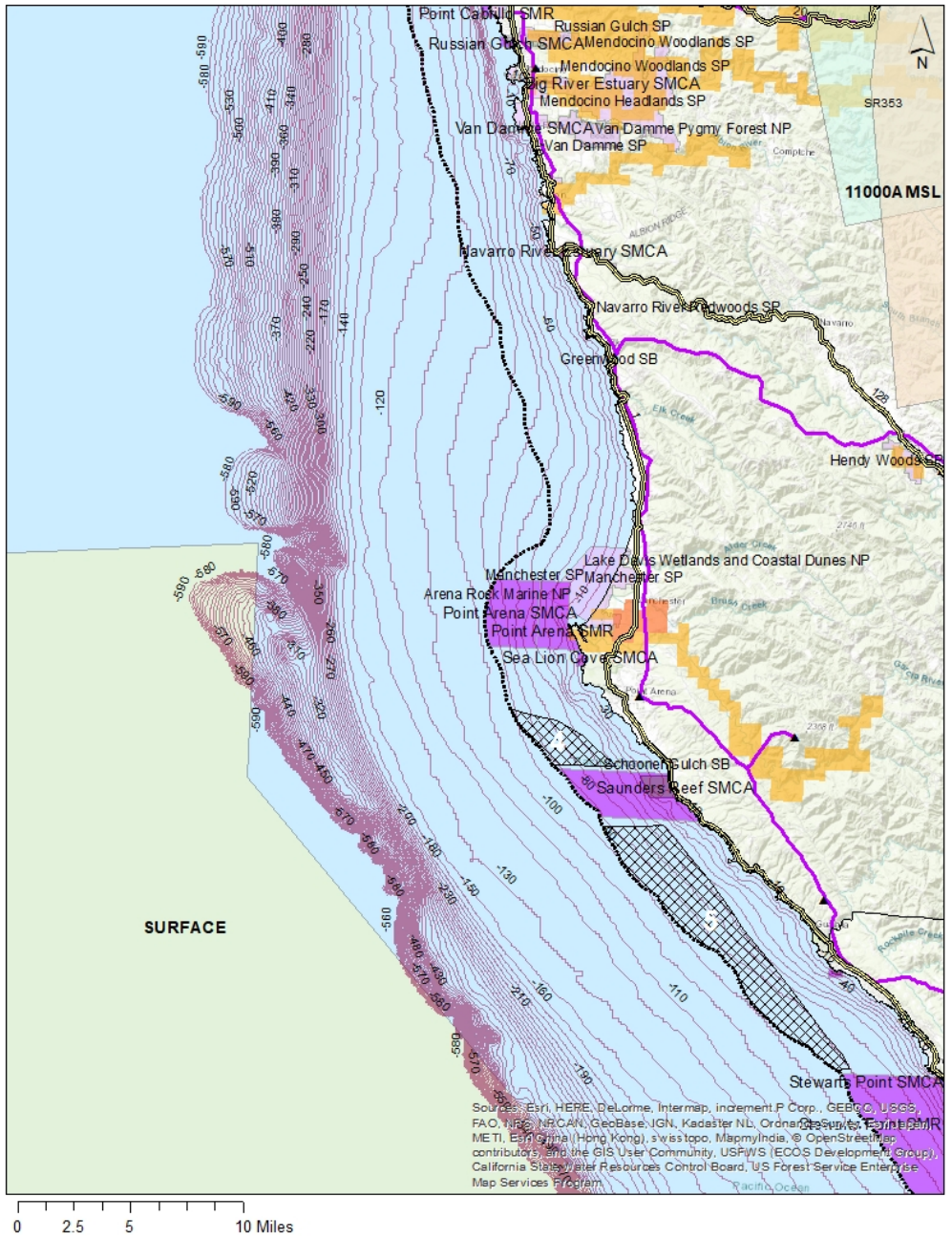


Humboldt County

Shaded Areas	Distance to Substation (miles)
1	17
2	16
3	21

Mendocino County





Shaded Areas	Distance to Substations
4	3
5	5

Next Steps

- Develop a better understanding of all environmental issues
- Identify renewable developers in CA and understand their development strategy
- Develop an understanding of incentives, capacity, transmission issues, regulatory issues, pricing, competition
- Incorporate Lessons Learned from other studies such as “Utilizing the Energy Resource Potential of DOE Lands”
- Develop framework for marketing, prospecting, bidding, leasing