

State Water Resources Control Board
ASBS Monitoring Stakeholders Meeting
Monterey, CA
December 19, 2007



Regional Monitoring Planning
and Consideration of Reference
Sites in Central and Northern
California

Agenda

1. Review and updates
 - Review last Central/Northern Cal Meeting
 - So Cal Bight 08 Meeting (Dec 5)
 - Natural Water Quality Committee meeting (Dec 10)
2. Review GIS results on reference sites
3. Discussion of monitoring plan for the Pilot Monitoring.

At Our Last Meeting

- Need for ASBS monitoring
 - Southern Cal has same issues
- Desire for “natural water quality”
 - Focus on receiving water
- Primary concern was wet weather
 - Pilot Study, emphasis on reference sites this winter
 - Regional Study, reference and discharge, 2008-09

Monitoring Questions

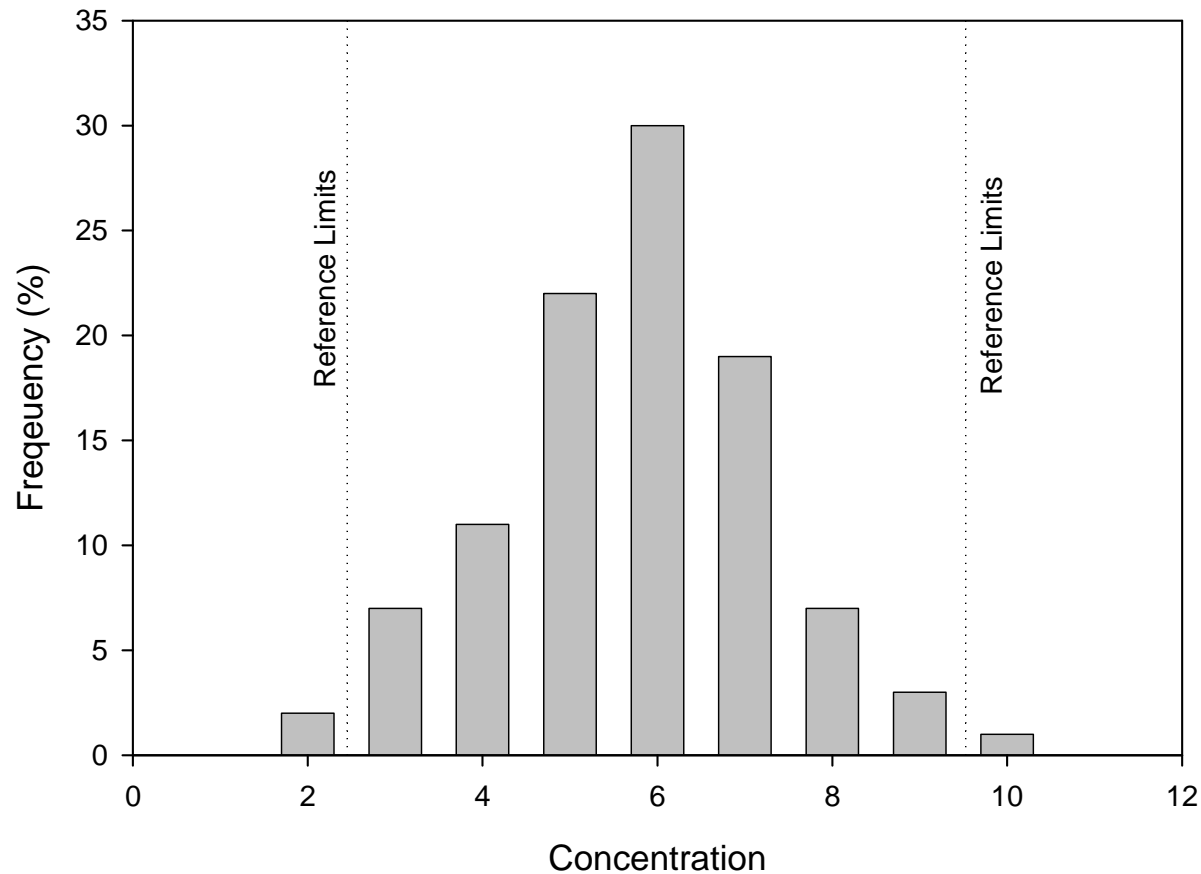
- What is the range of natural conditions at reference locations?
- How does this range of natural water quality compare to ASBS discharge sites ?
- What is the extent of impact at shorelines in ASBS with and without discharges?

Three Phase Approach

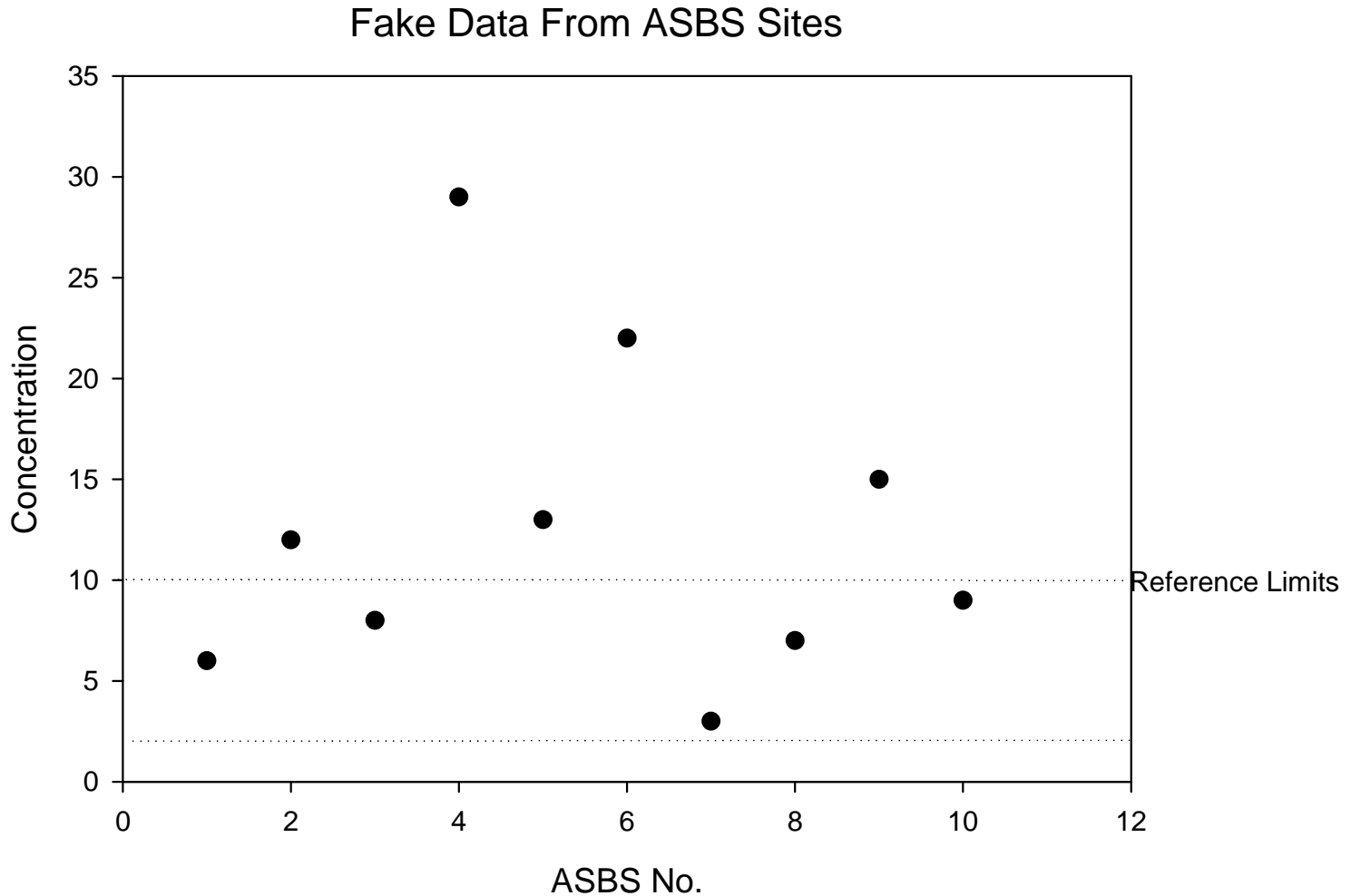
- Develop natural water quality “limits”
- Compare specific ASBS discharge locations to natural water quality limits
- Estimate extent of ASBS shoreline that exceeds natural water quality limits

Defining Natural Water Quality

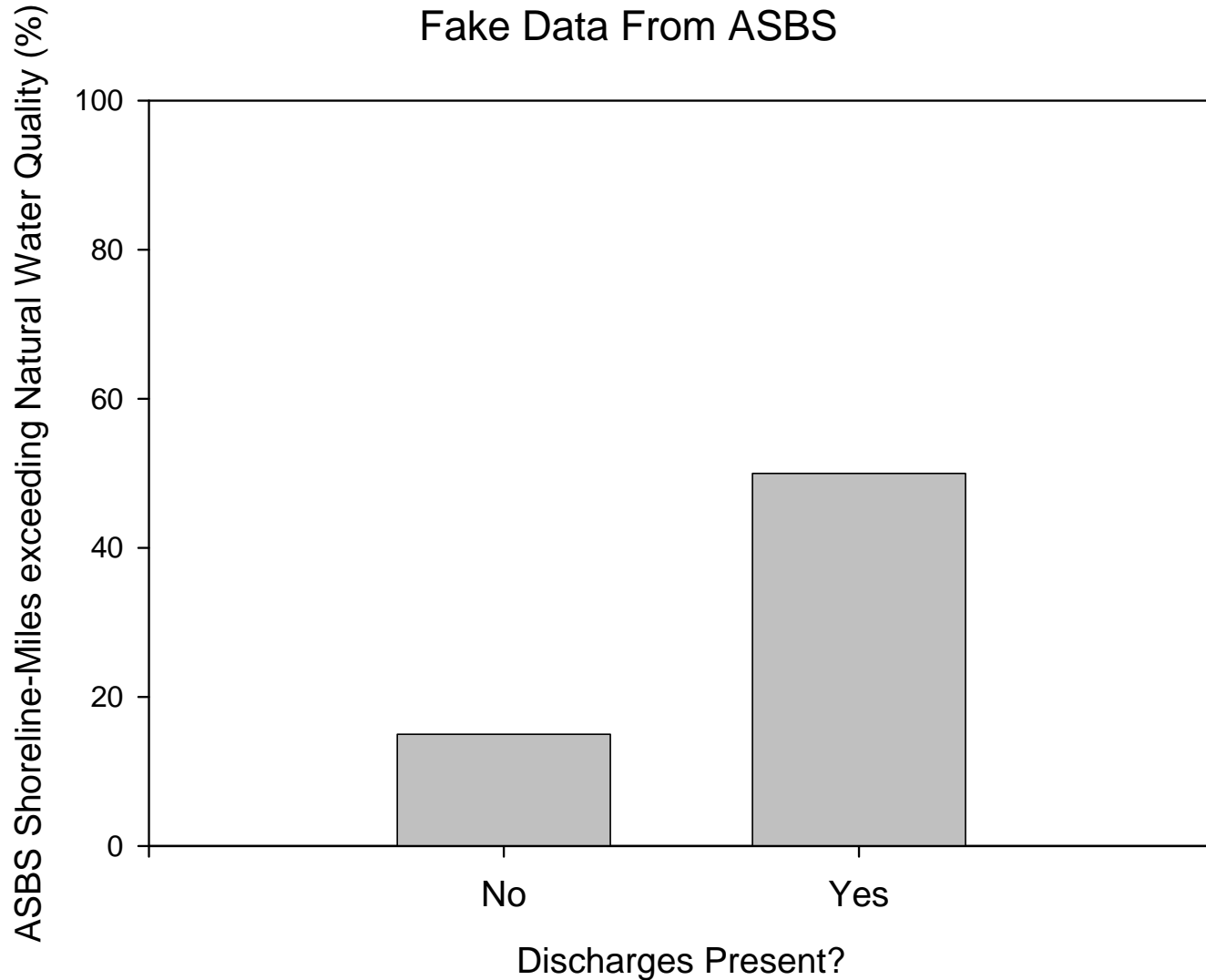
Fake Data From Reference Sites



Comparing ASBS to NWQ Limits

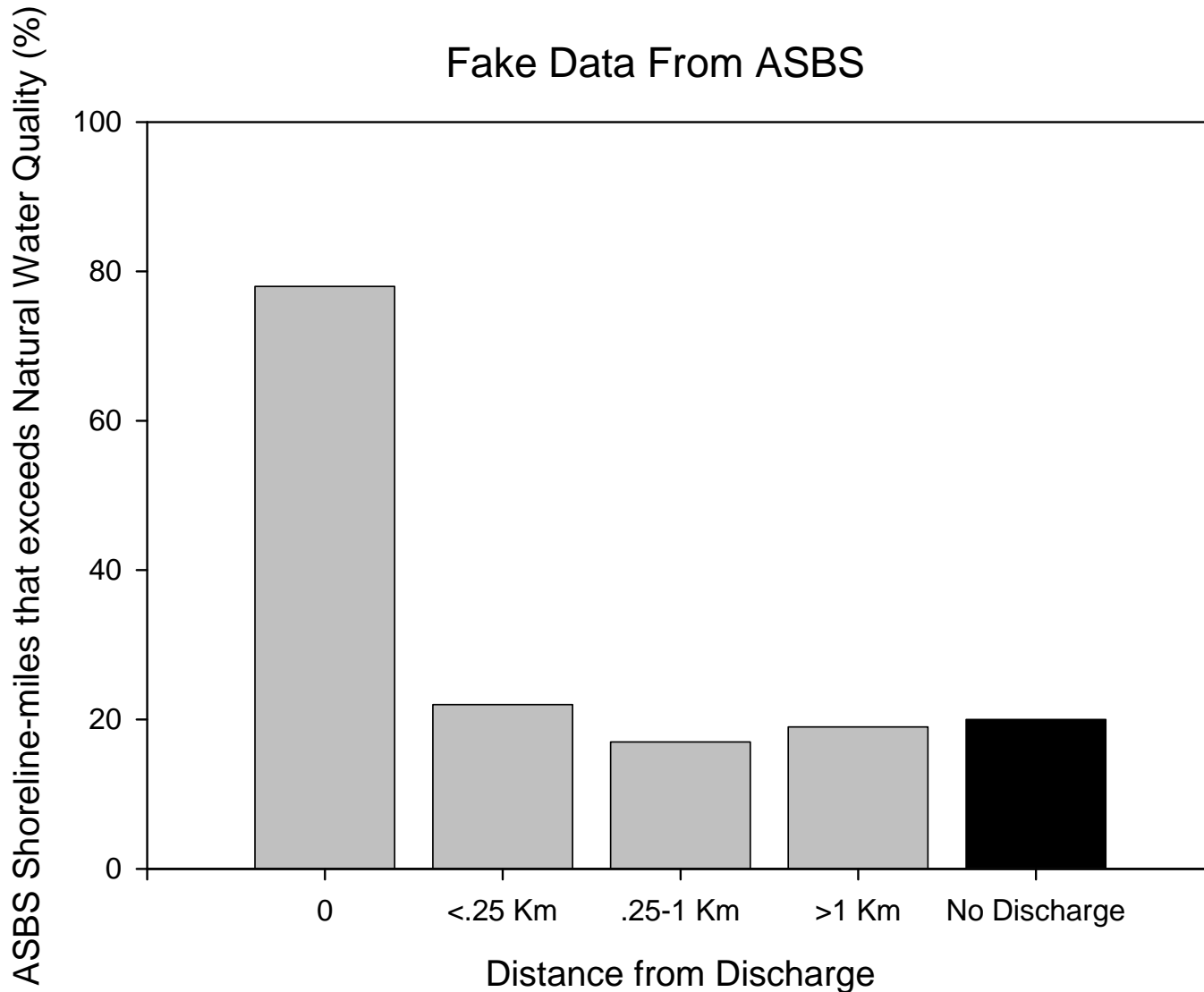


Extent of ASBS Impacts



Extent of ASBS Impacts

Fake Data From ASBS



Southern California

- ASBS monitoring moving forward as part of Bight 08
- Constituents and sampling design
- Reference criteria determined at 90% open space, island and mainland sites
- Rocky intertidal biological monitoring
- Leveraging
 - Rocky subtidal collaboration
 - Bioaccumulation via NOAA/SWRCB/SCCWRP Mussel Watch

Natural Water Quality Committee

- Discussed definition of **natural water quality**
- Monitoring approach discussed
 - Committee supported overall approach
 - Recommended adding pesticides and nutrients to constituents list
 - Supportive of collaboration with MARINe for rocky intertidal

Constituents

Salinity	N, S	
TSS	N, S	
Organic Carbon	N, S	
Metals	N, S	
PAHs	N, S	
Bacteria	N only	
Pesticides	?	NWQ Com advises
Dioxin	S only	
Toxicity	S only	
Nutrients	?	NWQ Com advises

Pilot '07-08 Sampling

- Grab samples
- Surf zone
- Point zero drainage into ocean
- May include some discharge sites

Reference Site Criteria

- Open beach with breaking waves
- No 303(d) listings
- Minimal human disturbance
 - So Cal 90% Open Space
 - Cen/Nor Cal 95% or better Open Space?
- Catchment size within the range of ASBS discharges
- If possible, range of geologic conditions, watershed and shoreline
- Cen/Nor Cal – watershed vegetation considered, but may be a function of latitude

GIS Information Used For Site Selection

- ASBS layer (SWRCB)
- Coastline Layer (Coastal Commission)
- 2006 303(d) list (SWRCB)
- City boundaries
- Coastal Change Analysis Program 2000 land cover data set (NOAA CCAP)
- Calwater hydrologic sub-areas
- MARINe Intertidal sites
- Ocean Discharge Points (SWRCB)

NOAA Coastal Change Analysis Program 2000 Land Cover Map

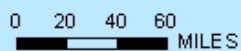
-  Background
-  Unclassified (Cloud, Shadow, etc)
-  High Intensity Developed
-  Low Intensity Developed
-  Cultivated Land
-  Grassland
-  Deciduous Forest
-  Evergreen Forest
-  Mixed Forest
-  Scrub/Shrub
-  Palustrine Forested Wetland
-  Palustrine Scrub/Shrub Wetland
-  Palustrine Emergent Wetland (Per
-  Estuarine Forested Wetland
-  Estuarine Scrub/Shrub Wetland
-  Estuarine Emergent Wetland
-  Unconsolidated Shore (Intertidal
-  Bare Land
-  Water
-  Palustrine Aquatic Bed
-  Estuarine Aquatic Bed
-  Tundra
-  Snow/Ice

0 10 20 30
MILES

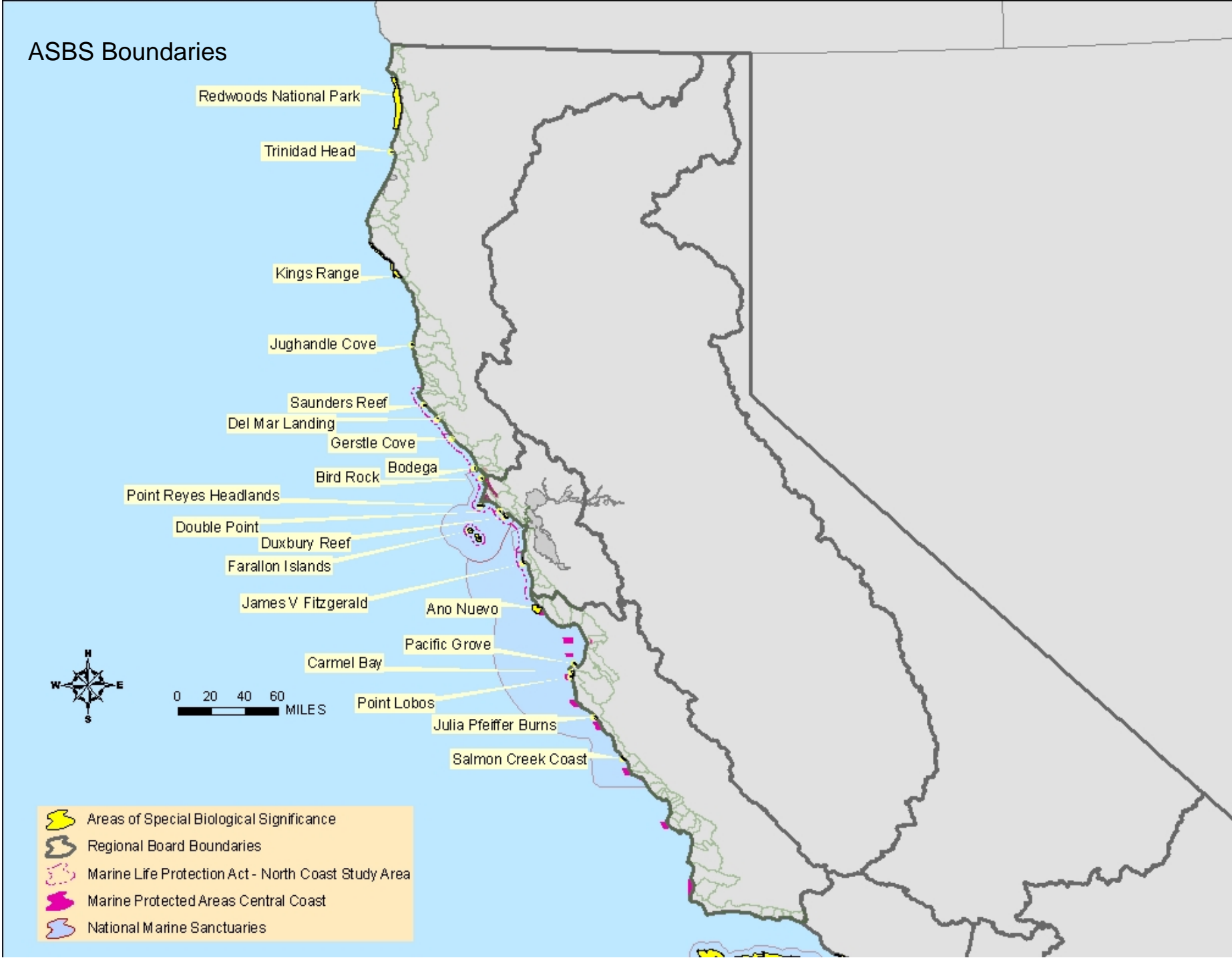


ASBS Boundaries

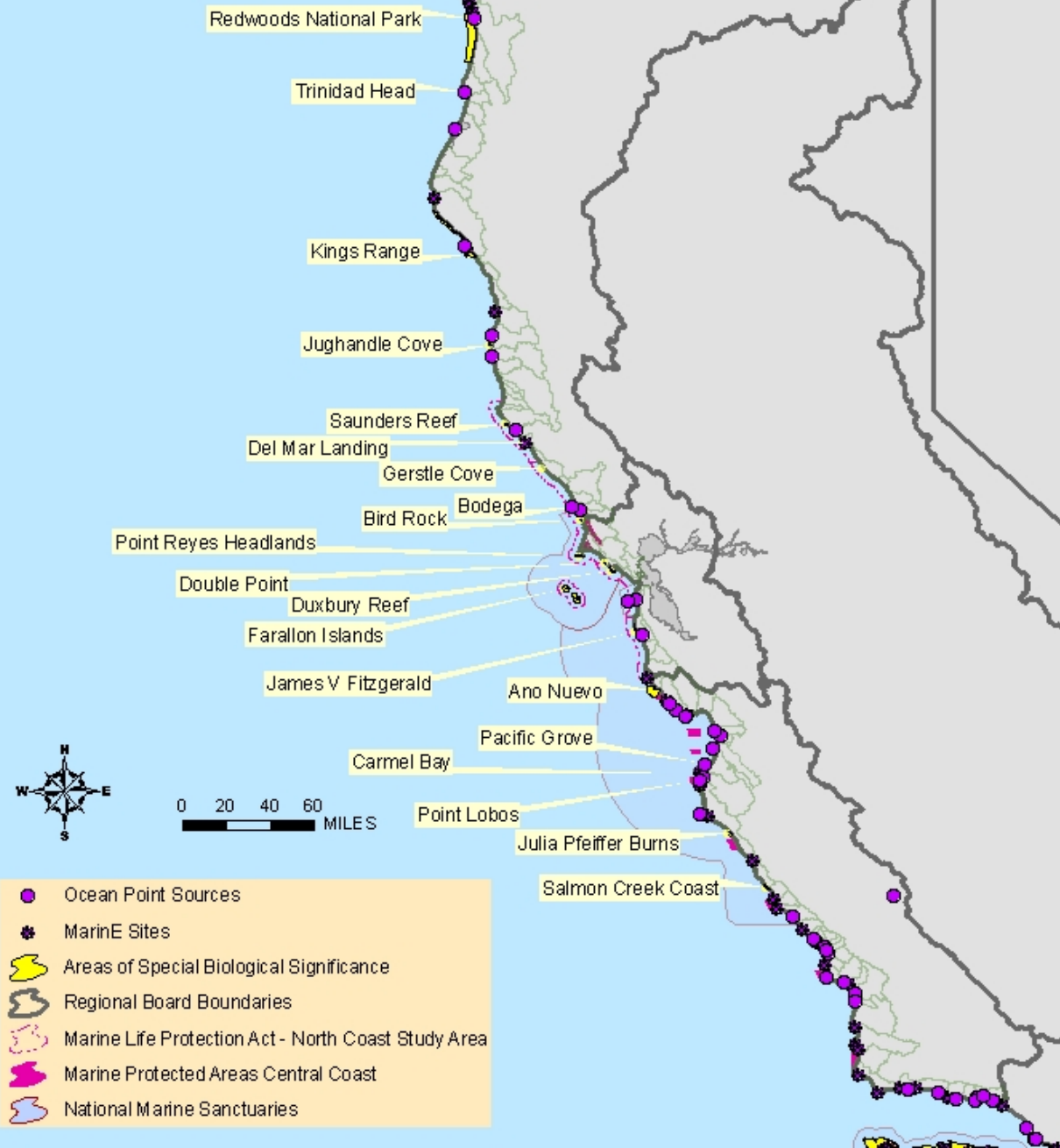
- Redwoods National Park
- Trinidad Head
- Kings Range
- Jughandle Cove
- Saunders Reef
- Del Mar Landing
- Gerstle Cove
- Bodega
- Bird Rock
- Point Reyes Headlands
- Double Point
- Duxbury Reef
- Farallon Islands
- James V Fitzgerald
- Ano Nuevo
- Pacific Grove
- Carmel Bay
- Point Lobos
- Julia Pfeiffer Burns
- Salmon Creek Coast



- Areas of Special Biological Significance
- Regional Board Boundaries
- Marine Life Protection Act - North Coast Study Area
- Marine Protected Areas Central Coast
- National Marine Sanctuaries



Ocean point sources and MARINE intertidal study sites

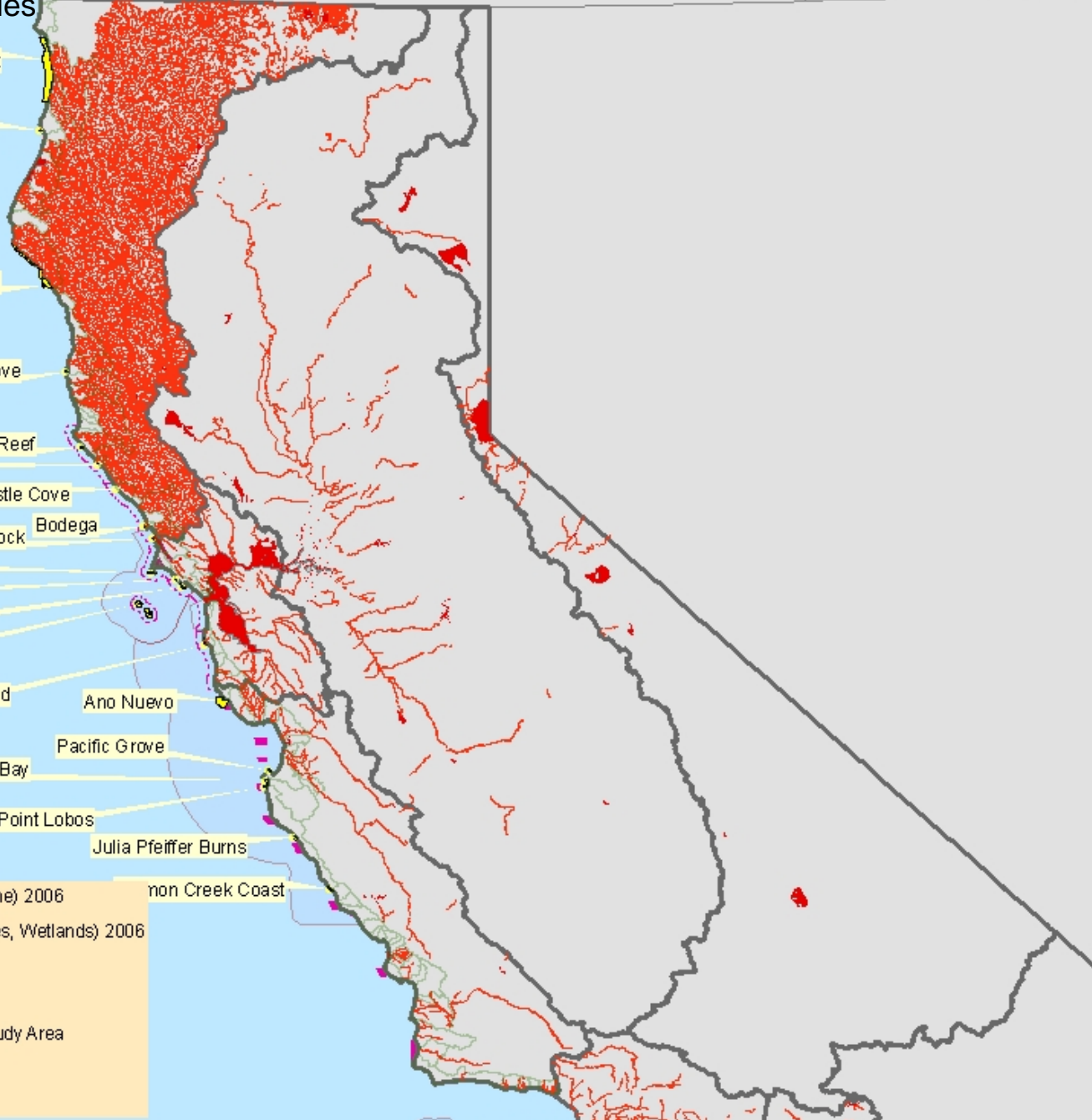


2006 303(d) Listed Water bodies

- Redwoods National Park
- Trinidad Head
- Kings Range
- Jughandle Cove
- Saunders Reef
- Del Mar Landing
- Gerstle Cove
- Bodega
- Bird Rock
- Point Reyes Headlands
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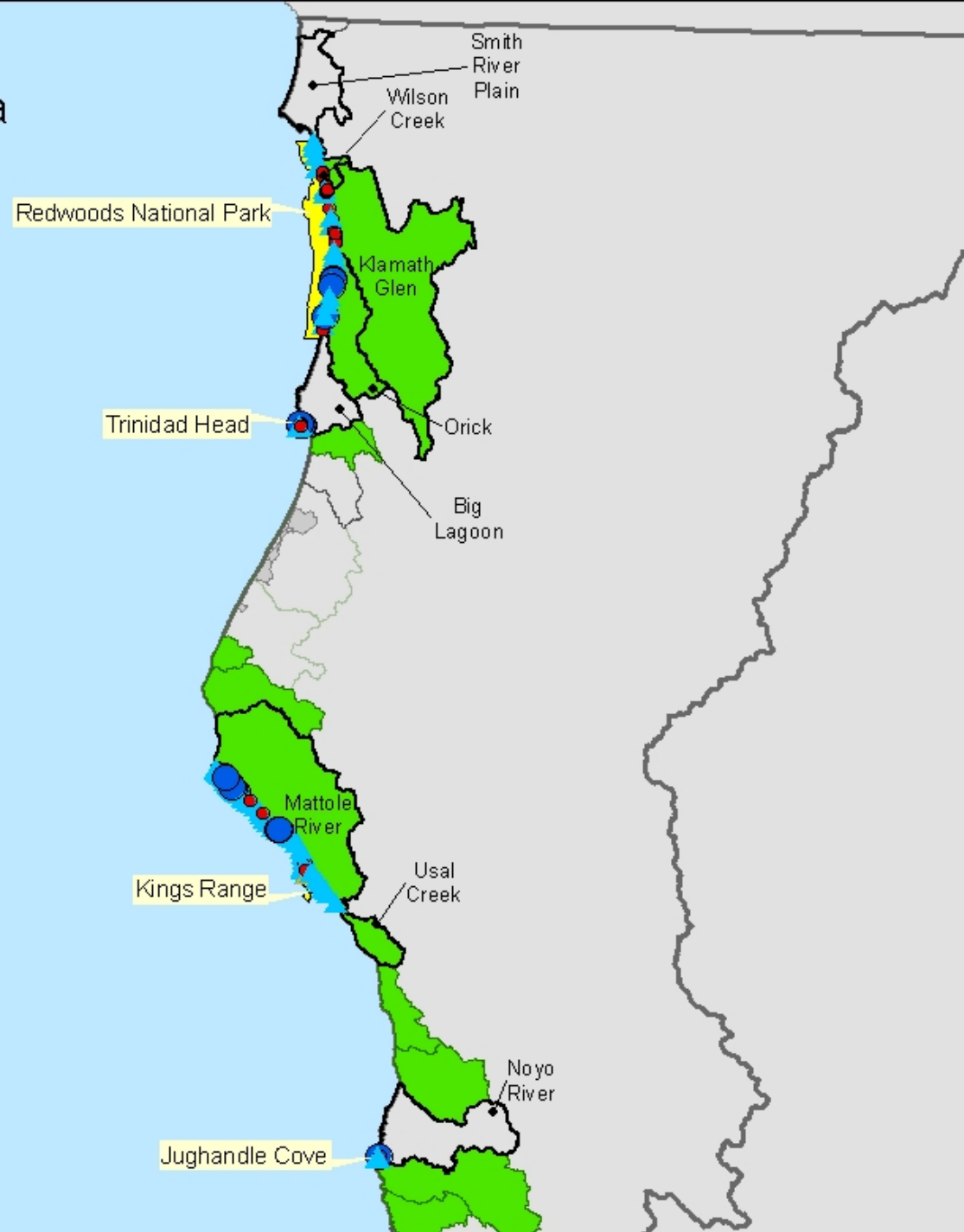
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Watersheds with > 99% Open Space







Discharges into ASBS by Coastal Hydrologic Sub-Area










▲ Intake
● discharge
▲ outlet
● spring/seep
 ASBS Watersheds
 Areas of Special Biological Significance
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 Percent Open Space > 99%


0 6 12 18
 MILES


Percent Open Space by Coastal Hydrologic Sub-Area


-  Ocean Point Sources
-  Marine Sites
-  ASBS Watersheds
-  Areas of Special Biological Significance


Percent Open Space

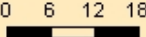
-  0 - 20%
-  20 - 40%
-  40 - 60%
-  60 - 80%
-  80 - 90%
-  90 - 99%
-  99 - 100%


 Regional Board Boundaries

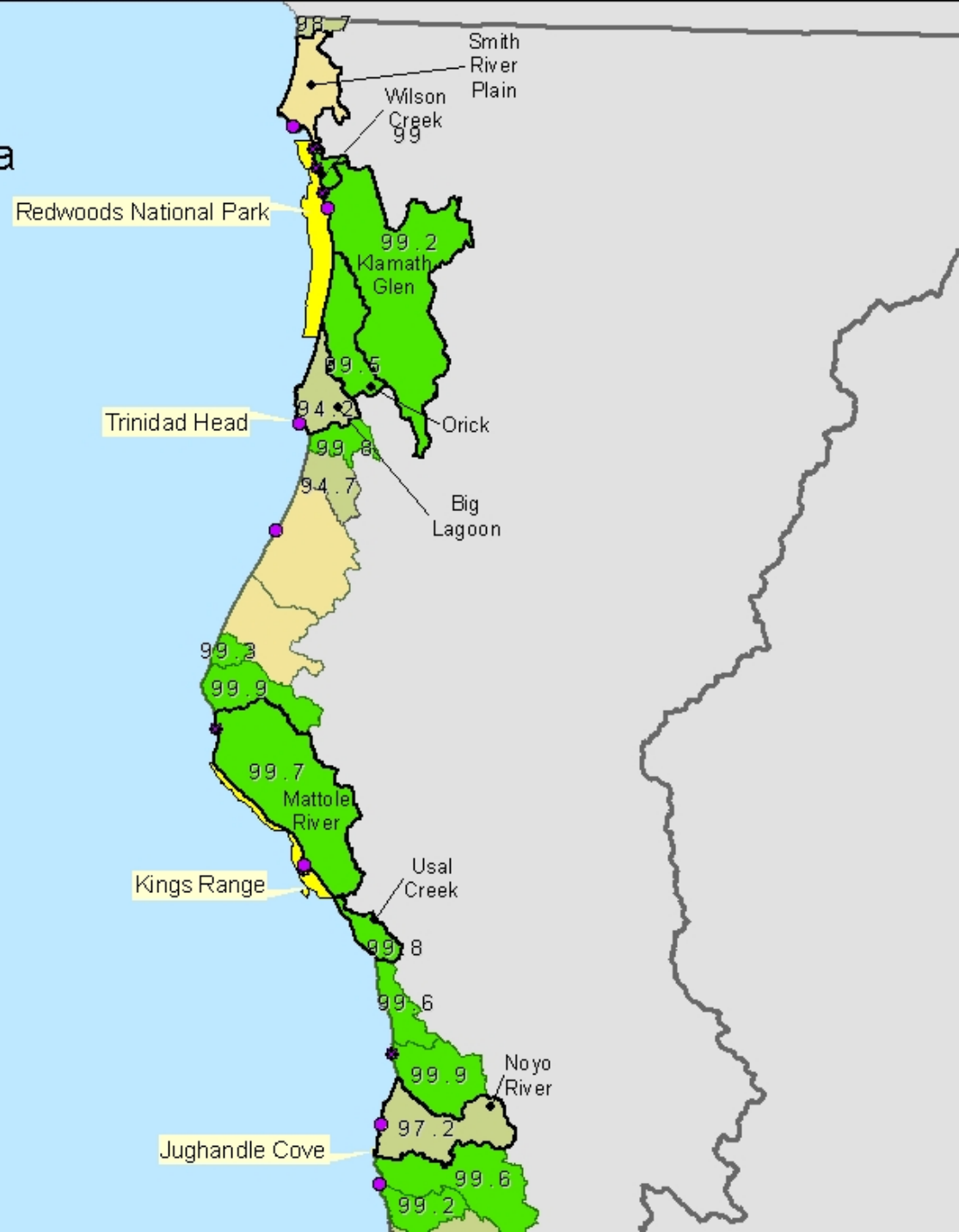
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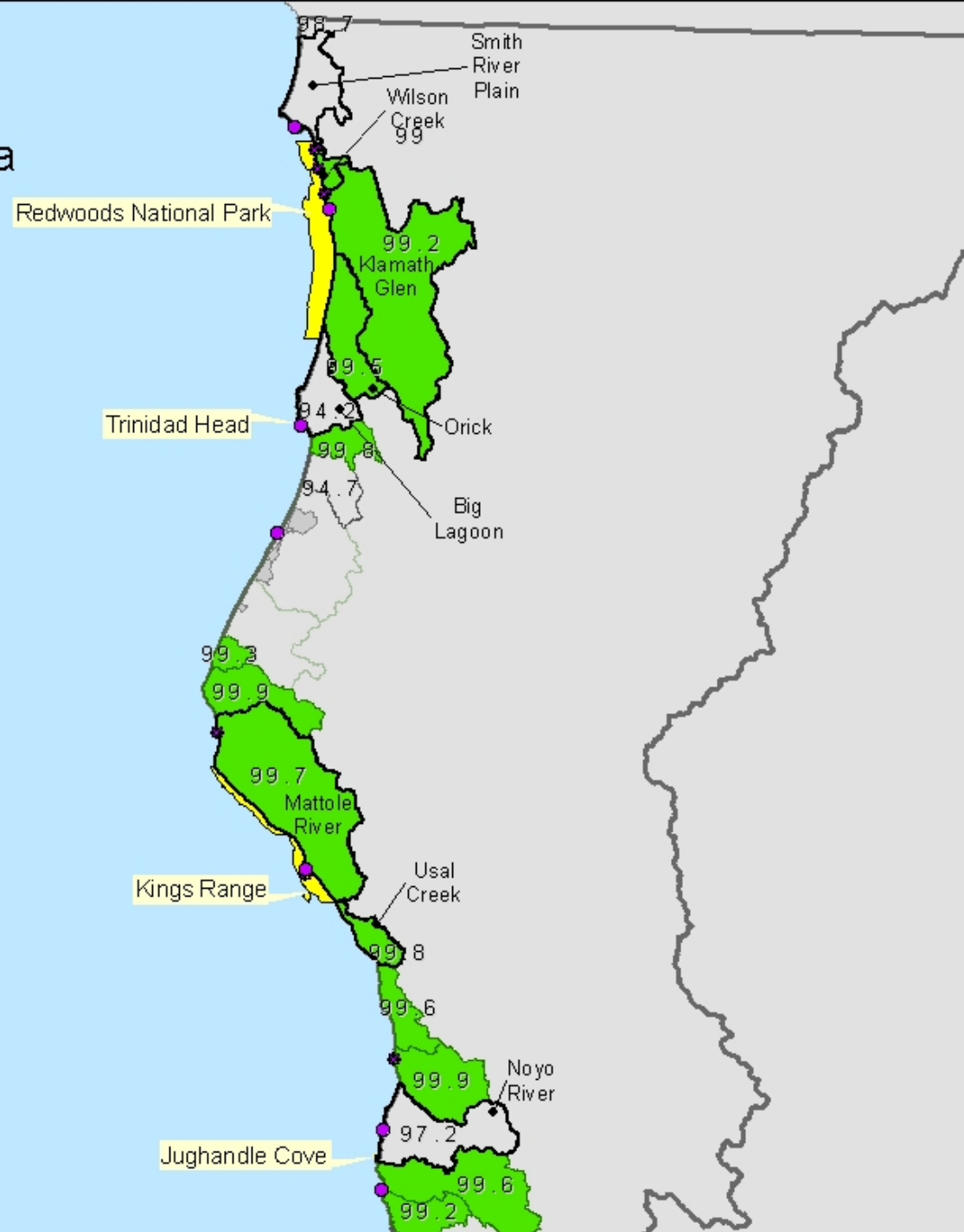
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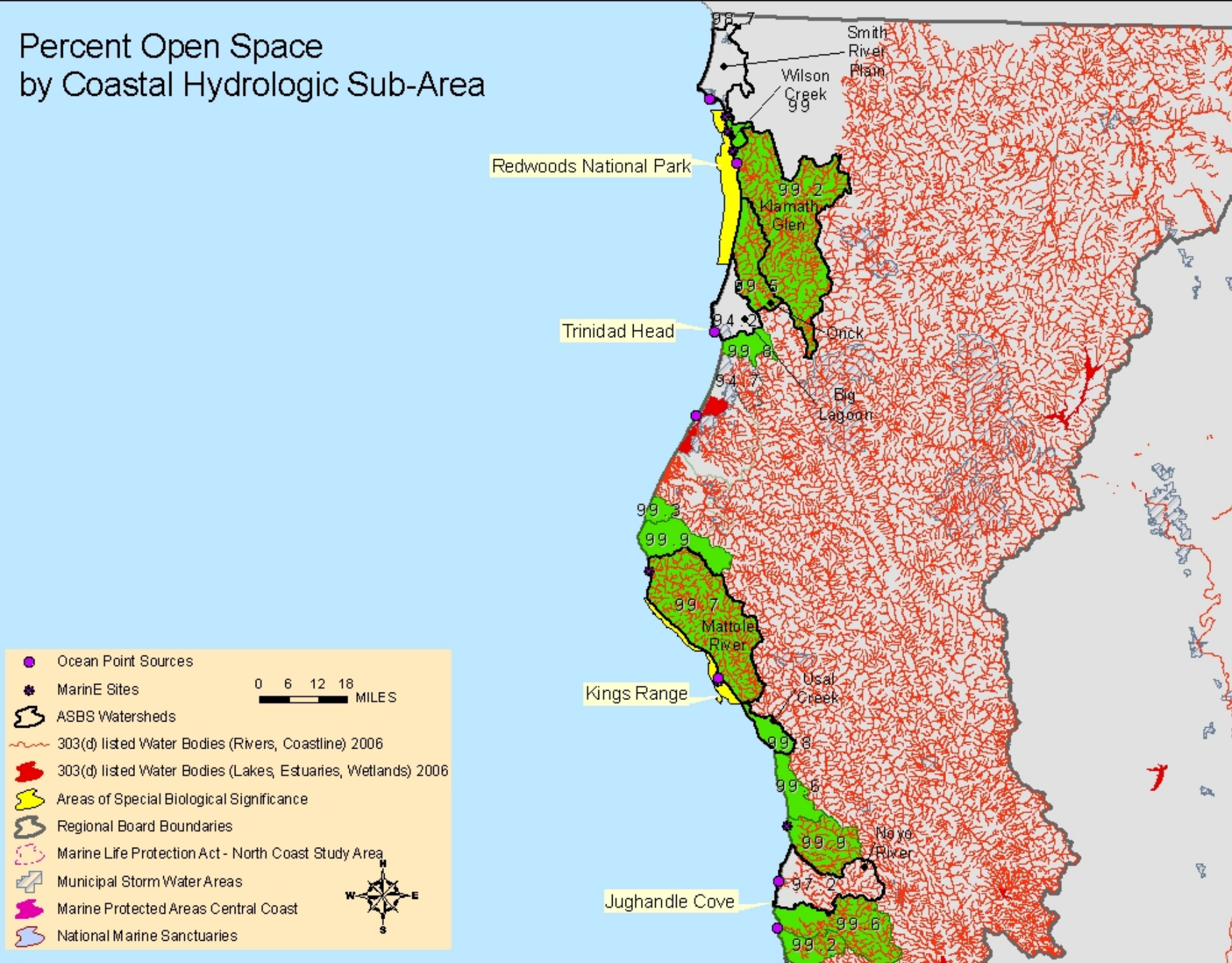
Percent Open Space > 99% by Coastal Hydrologic Sub-Area



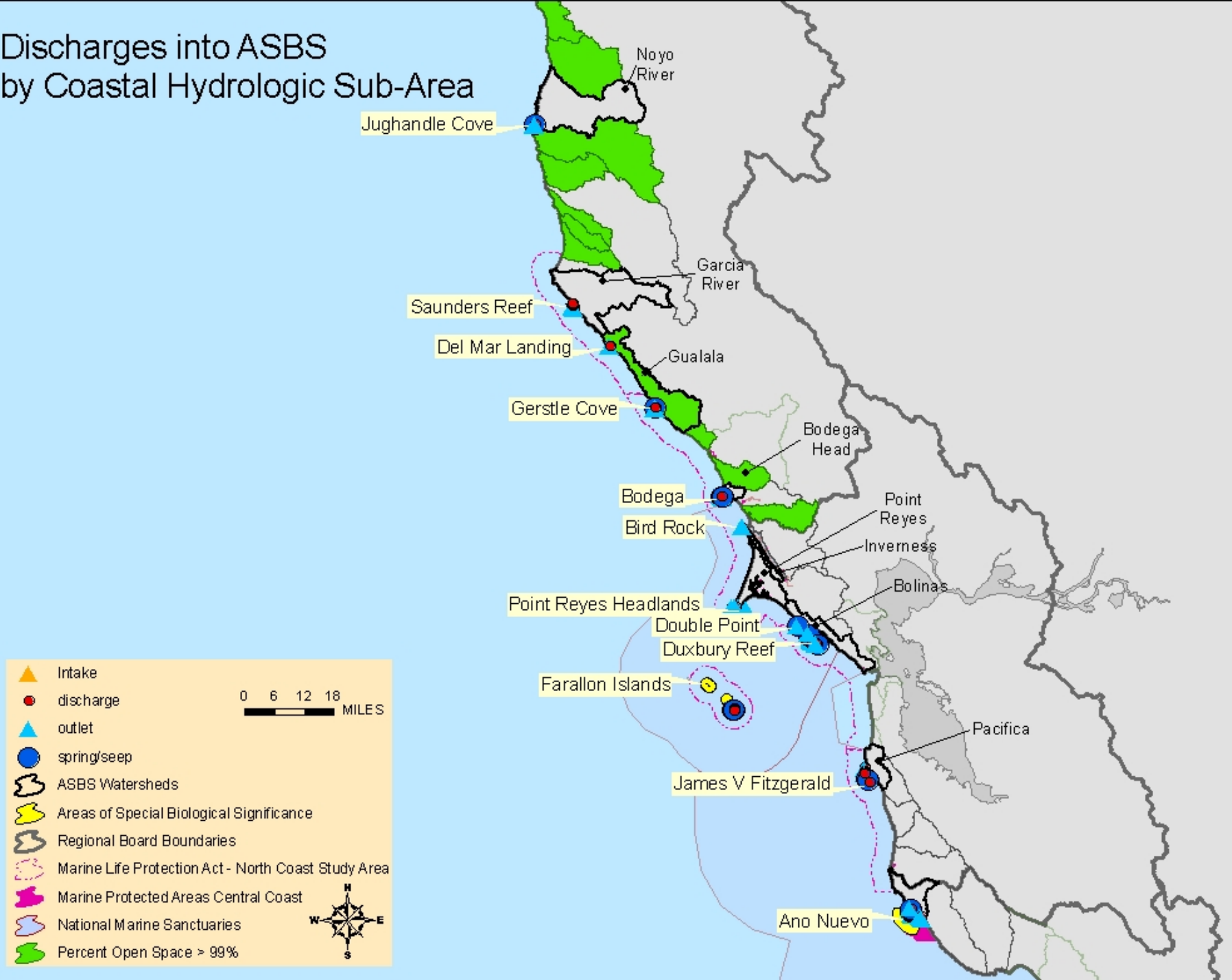
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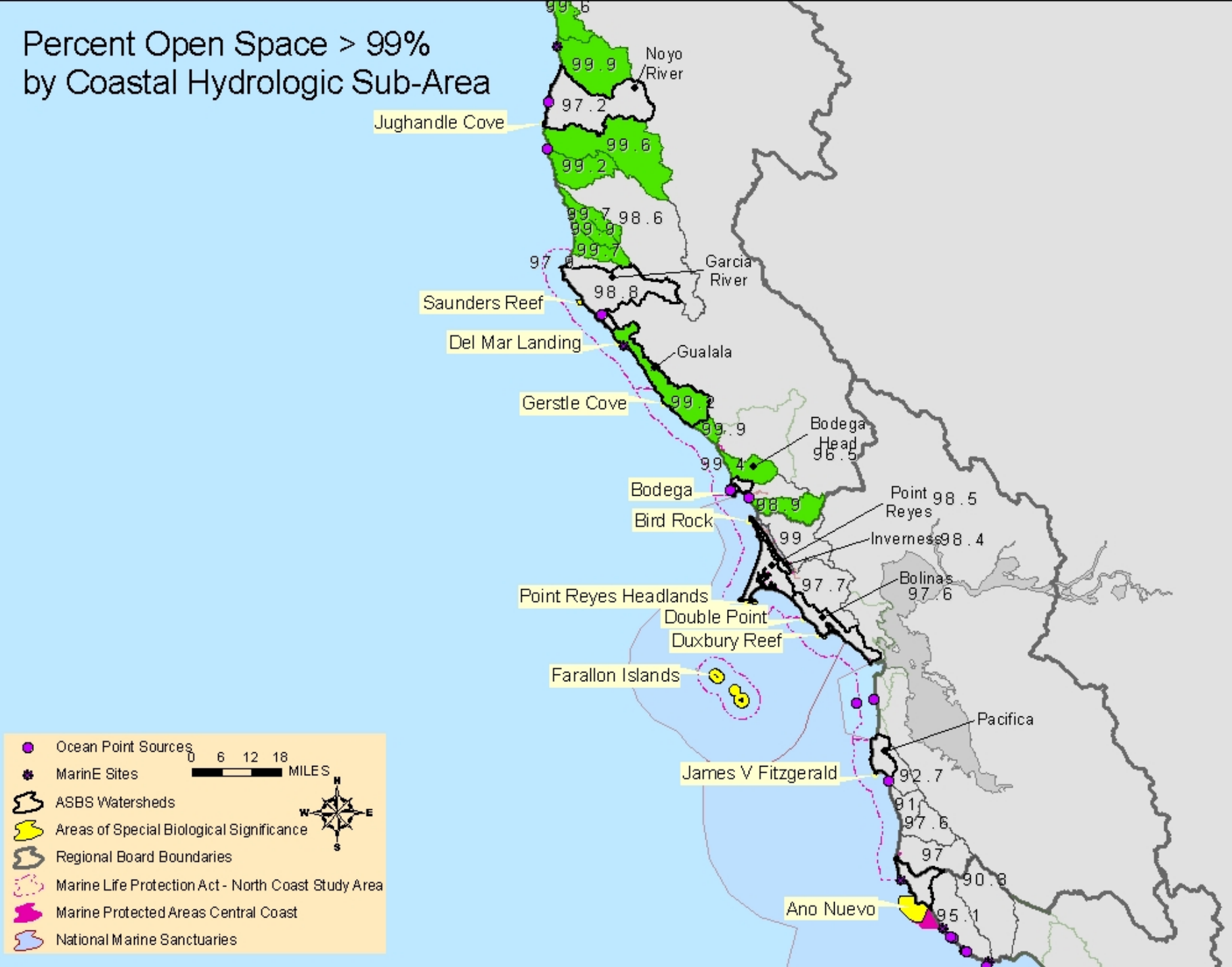
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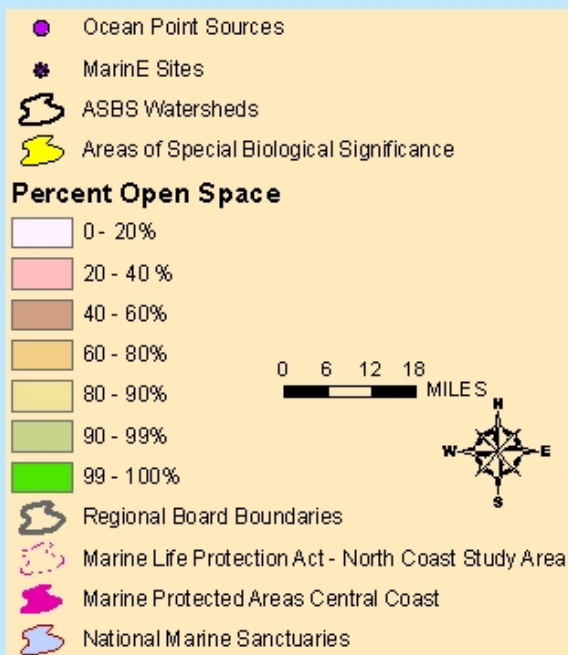
Discharges into ASBS by Coastal Hydrologic Sub-Area



Percent Open Space > 99% by Coastal Hydrologic Sub-Area



Percent Open Space by Coastal Hydrologic Sub-Area



Jughandle Cove

Saunders Reef

Del Mar Landing

Gerstle Cove

Bodega

Bird Rock

Point Reyes Headlands

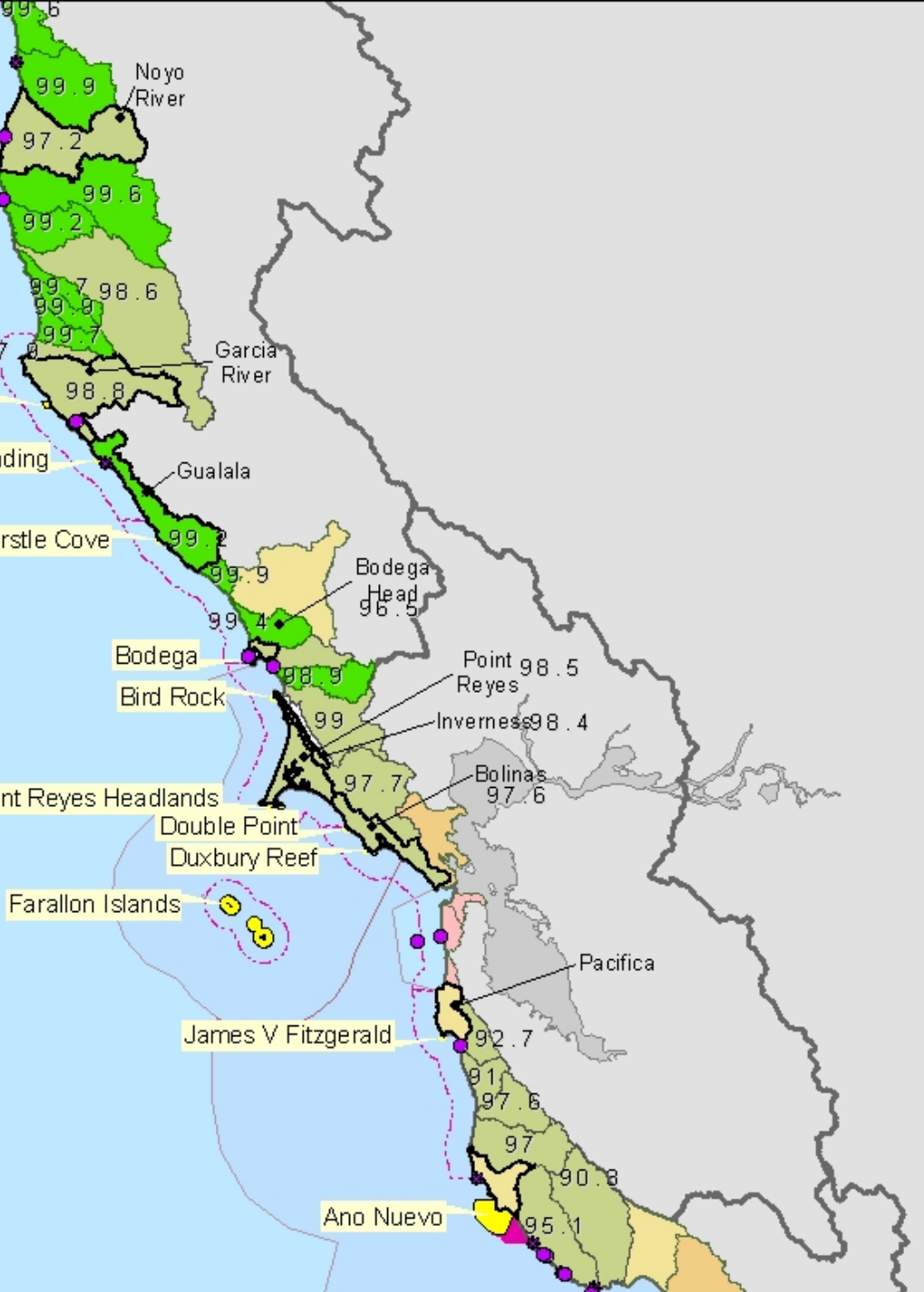
Double Point

Duxbury Reef

Farallon Islands

James V Fitzgerald

Ano Nuevo



Percent Open Space by Coastal Hydrologic Sub-Area

Jughandle Cove

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



Double Point

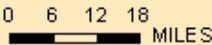
Duxbury Reef

Farallon Islands


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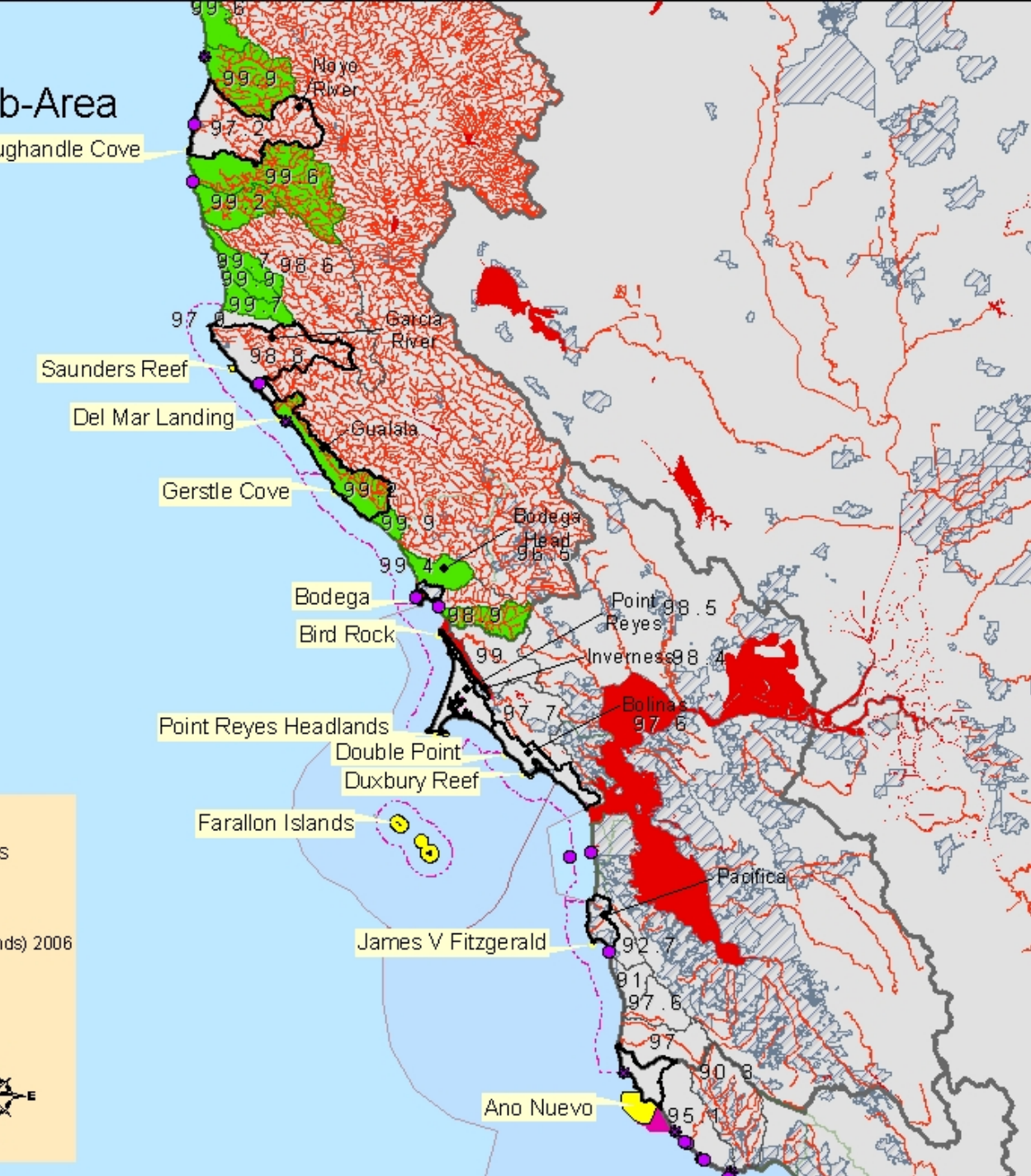
Ano Nuevo

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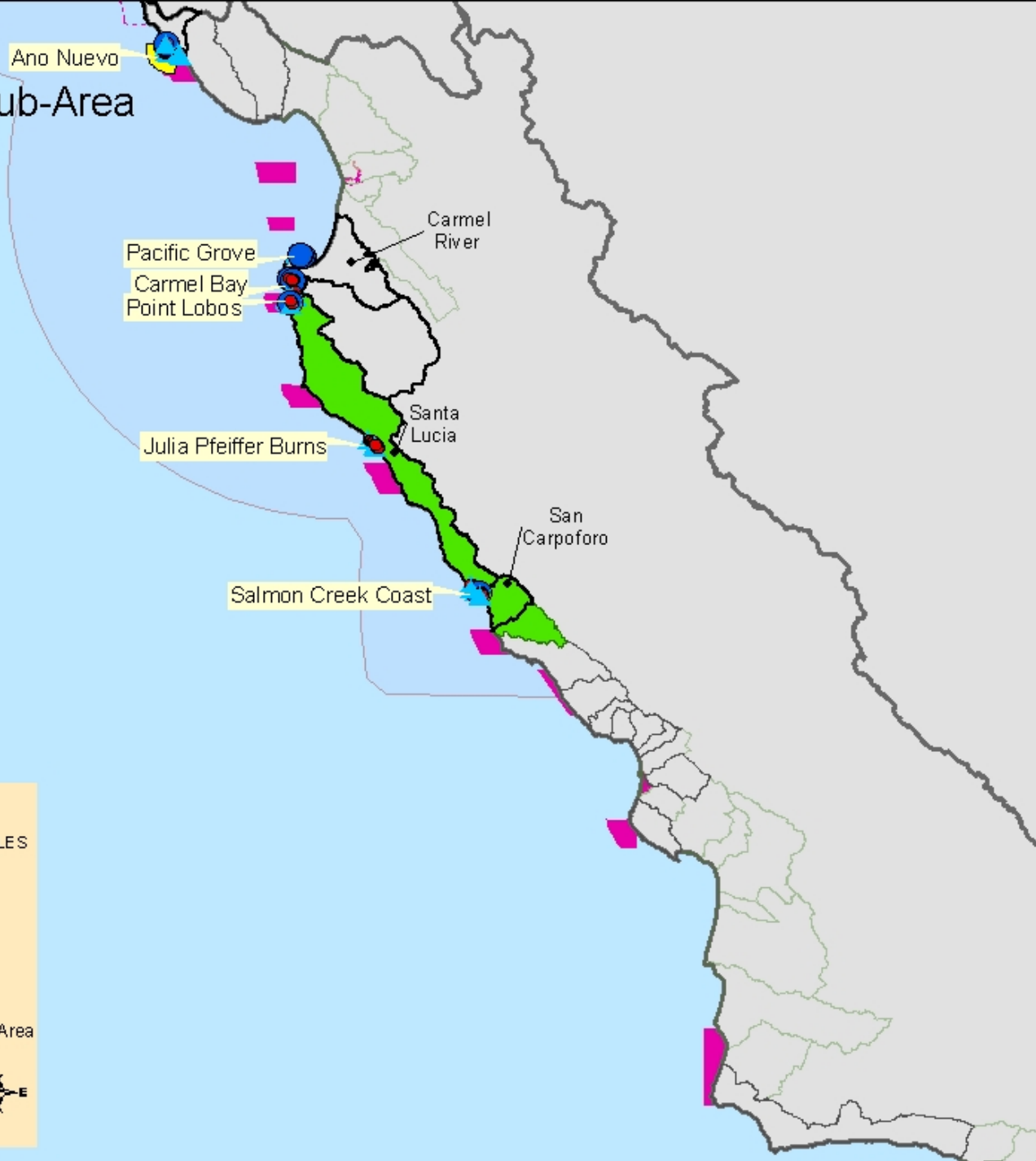


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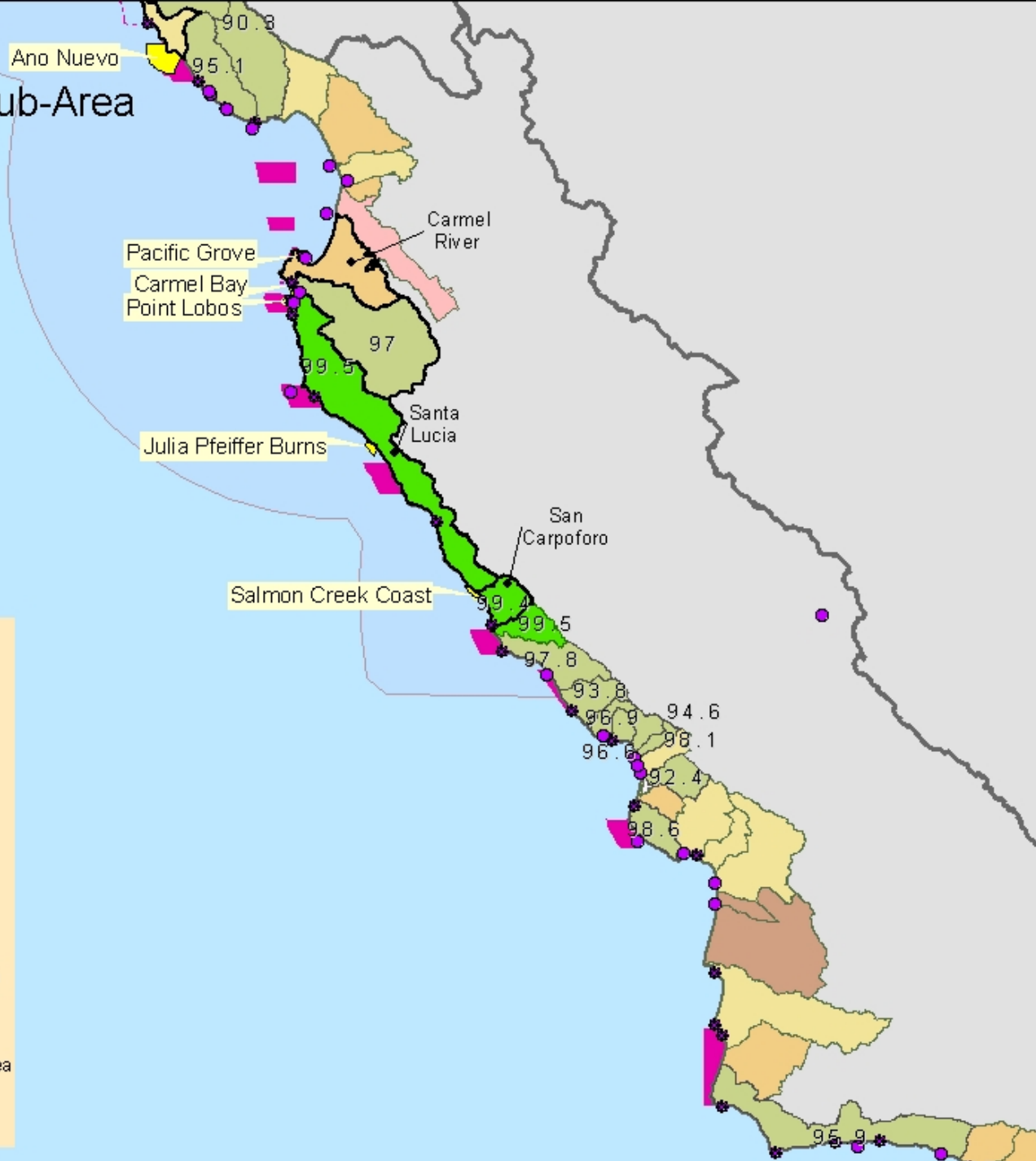
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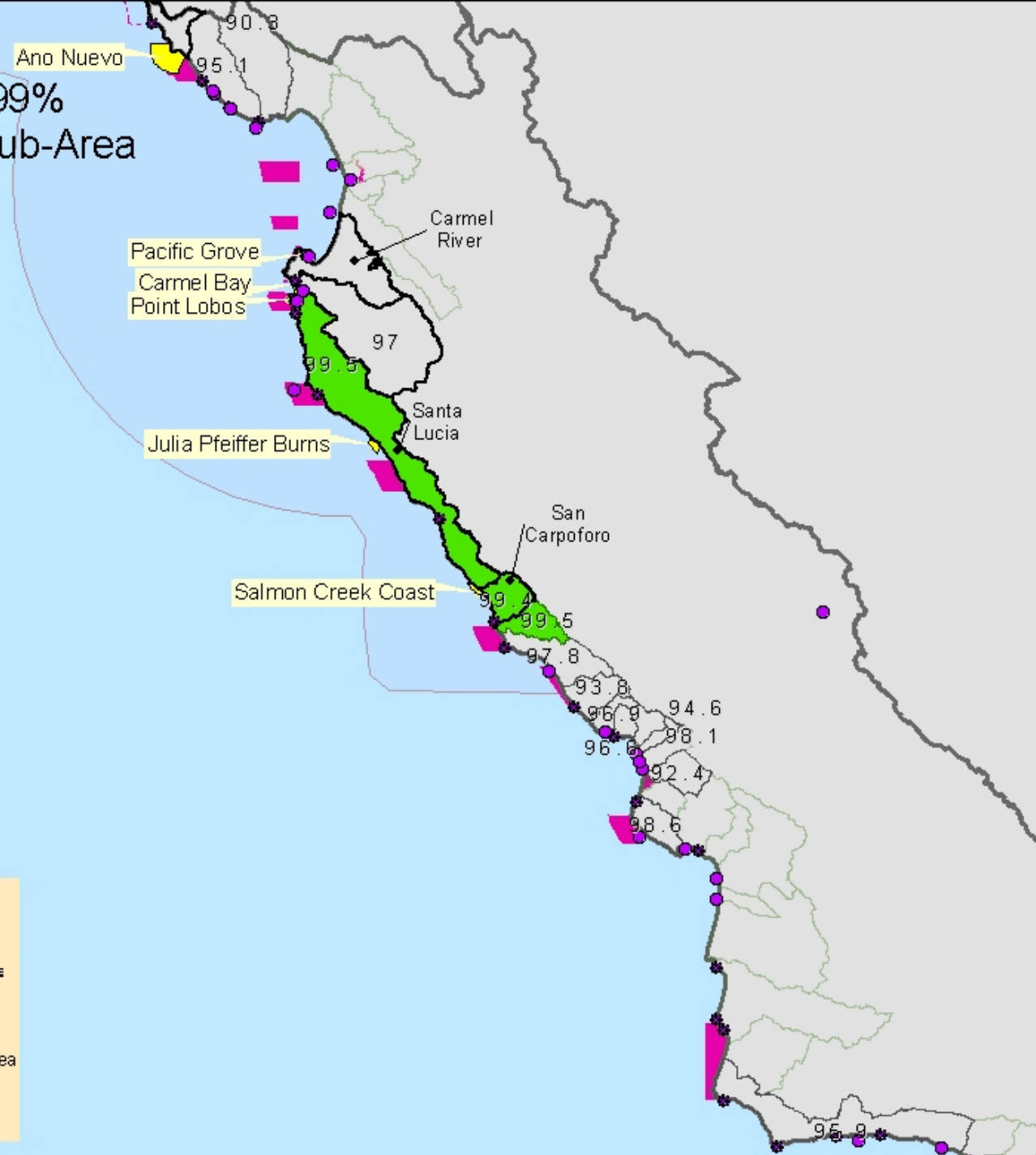
Percent Open Space

- 0 - 20%
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- 99 - 100%

0 6 12 18 MILES

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Percent Open Space > 99% by Coastal Hydrologic Sub-Area



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Percent Open Space by Coastal Hydrologic Sub-Area

Ano Nuevo

Pacific Grove
Carmel Bay
Point Lobos












Julia Pfeiffer Burns

Salmon Creek Coast


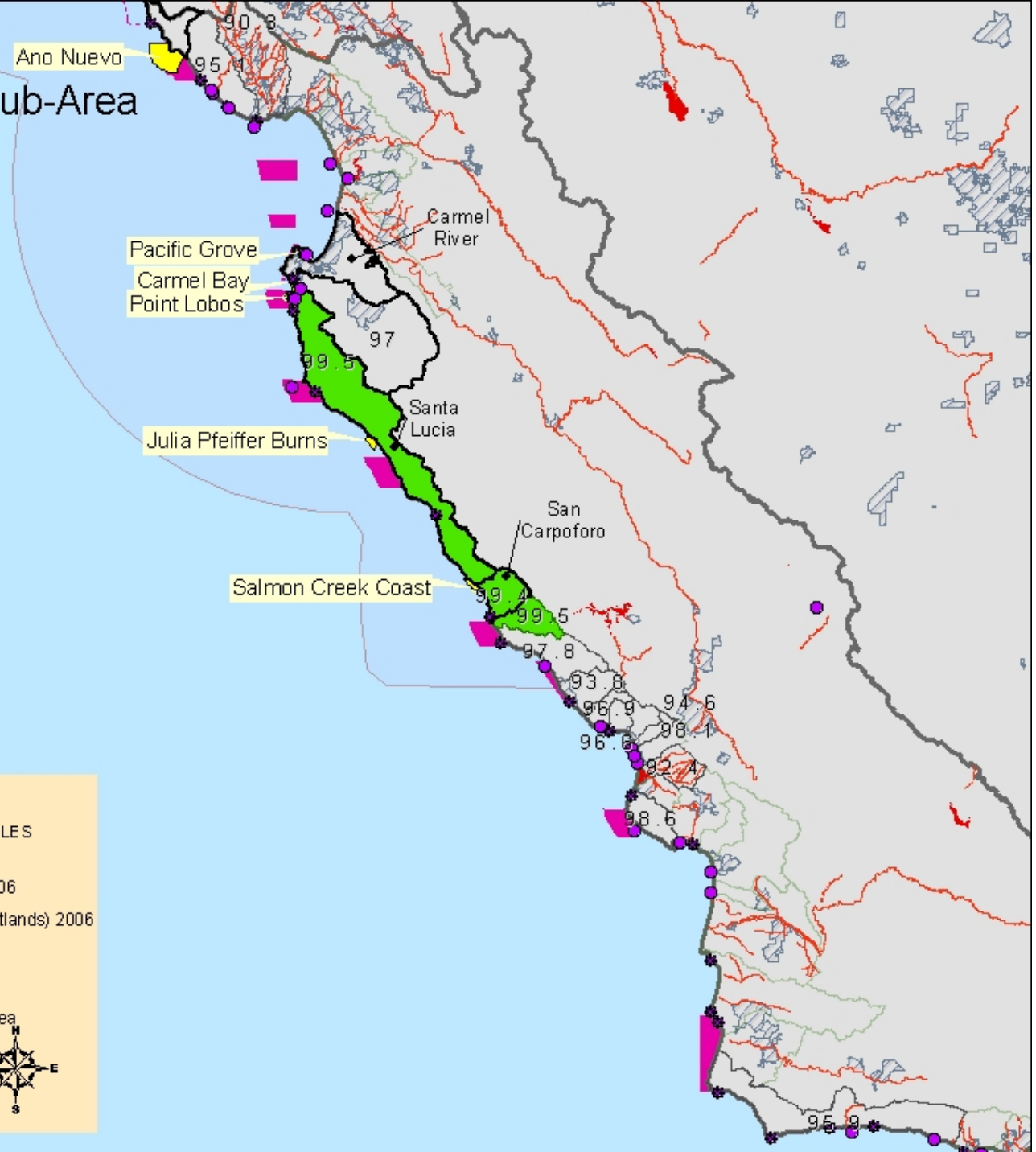
Carmel River

Santa Lucia

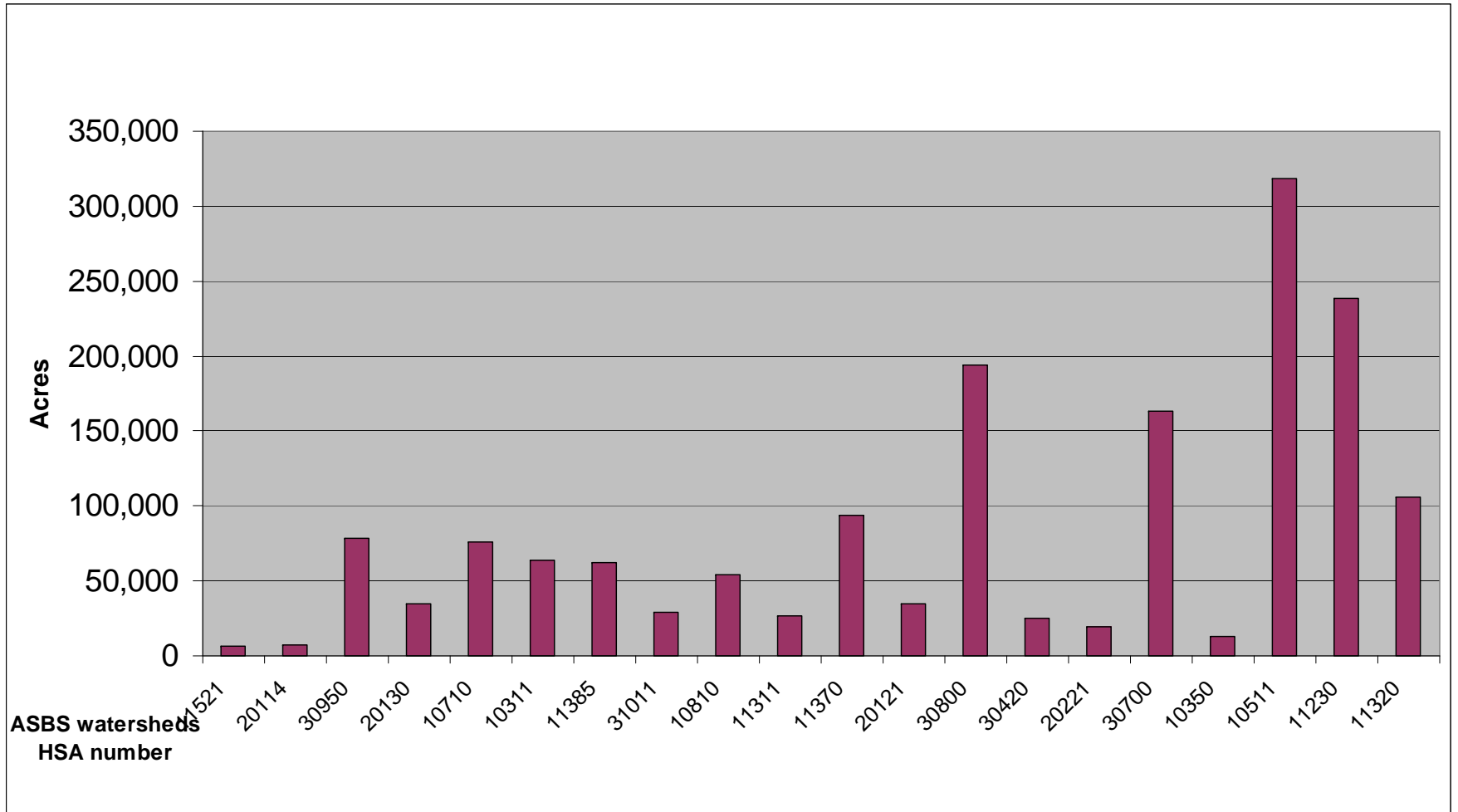
San
Carpoforo

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Size of ASBS watersheds



ASBS Watershed Acres and Percent Open Space

Watershed Name	HSA Number (RB)	Acres	Percent Open
Bodega Head	11521	6,145	96.5
Inverness	20114	6,874	98.4
Monterey Peninsula	30950	78,226	78.4
Bollinas	20130	34,712	97.6
Orick	10710	75,949	99.5
Smith River Plain	10311	63,918	86.1
Gualala	11385	62,236	99.2
San Carpoforo	31011	29,323	99.4
Big Lagoon	10810	53,902	94.2
Usal Creek	11311	26,767	99.8
Garcia River	11370	93,728	98.8
Point Reyes	20121	34,561	98.6
Santa Lucia	30800	193,656	99.5
Ano Noevo	30420	24,668	88.6
Pacifica	20221	19,127	87.4
Carmel River	30700	163,657	97.0
Wilson Creek	10350	12,596	99.1
Klamath Glen	10511	318,363	99.2
Mattole River	11230	238,663	99.7
Noyo River	11320	106,259	97.2

Percent Open Space by watershed (sorted by percent open)

Name	Acres	Percent	HSA	ASBS	ASBS Names	Listing
Capetown	66284	99.94	11220			
Elk Creek	18080	99.93	11362			
Russian Gulch	9813	99.87	11390			
Ten Mile River	82543	99.87	11313			303d
Usal Creek	26767	99.84	11311	ASBS	South of Kings Range	
Little River	29869	99.75	10820			303d
Greenwood Creek	20316	99.74	11361			
Alder Creek	27911	99.68	11363			
Mattole River	238663	99.66	11230	ASBS	Kings Range	303d
Wages Creek	37687	99.57	11312			
Big River	128425	99.56	11330			303d
Arroyo De La Cruz	27779	99.47	31012			
Orick	75949	99.46	10710	ASBS	Redwoods National Park	303d
Santa Lucia	193656	99.46	30800	ASBS	Julia Pheiffer Burns, Point Lobos	
San Carpoforo	29323	99.42	31011	ASBS	Salmon Creek Coast	
Salmon Creek	28382	99.40	11510			303d
Oil Creek	14717	99.26	11210			
Klamath Glen	318363	99.24	10511	ASBS	Redwoods National Park	303d
Gualala	62236	99.23	11385	ASBS	Gerstle Cove, Del Mar Landing	303d
Albion River	43791	99.21	11340			303d
Estero San Antonio	34293	99.20	11540			303d
Wilson Creek	12596	99.05	10350	ASBS	Redwoods National Park	
Walker Creek	63429	98.98	20112			303d
Estero Americano	24825	98.94	11530			303d
Garcia River	93728	98.82	11370	ASBS	Saunders Reef	303d
Winchuck River	11639	98.74	10100			

Garcia River	93728	98.82	11370	ASBS	Saunders Reef	303d
Winchuck River	11639	98.74	10100			
Point San Luis	27592	98.64	31025			
Navarro River	202101	98.58	11350			303d
Point Reyes	34561	98.55	20121	ASBS	Point Reyes Headlands	
Inverness	6874	98.38	20114	ASBS	Bird Rock	303d
Toro	9940	98.09	31018			
Brush Creek	13143	97.91	11364			
San Simeon	51392	97.84	31013			
Lagunitas Creek	69702	97.72	20113			
San Gregorio Creeek	33325	97.59	20230			
Bolinas	34712	97.56	20130	ASBS	Duxbury Reef, Double Point	
Noyo River	106259	97.20	11320	ASBS	JugHandle Cove	
Pescadero Creek	57772	97.02	20240			
Carmel River	163657	97.02	30700	ASBS	Pacific Grove	
Villa	13849	96.89	31015			
Cayucos	11624	96.58	31016			
Bodega Head	6145	96.50	11521	ASBS	Bogeda	303d
Arguello	139412	95.86	31510			303d
Davenport	67699	95.06	30411			303d
Blue Lake	40570	94.65	10910			303d
Old	15345	94.56	31017			
Big Lagoon	53902	94.24	10810	ASBS	Trinidad Head	
Santa Rosa	33194	93.77	31014			
Half Moon Bay	18499	92.71	20222			
Chorro	29906	92.41	31022			303d
Tunitas Creek	21448	91.02	20223			
San Lorenzo	93457	90.34	30412			303d