



Habitats and Ecosystems of North Central Region

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Stakeholder Group
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The Skinny



Why ecosystems and habitats ?



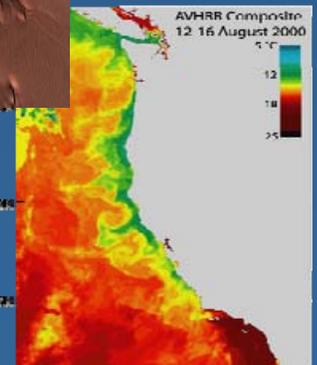
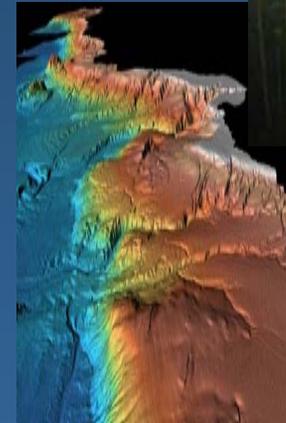
What is an ecosystem ?



Critical habitats in the North Central Coast
Region

MLPA Goals - Habitats

1. To protect the natural diversity and function of marine ecosystems.
2. To help sustain and restore marine life populations.
3. To improve recreational, educational, and study opportunities in areas with minimal human disturbance.
4. To protect representative and unique marine life habitats.
5. Clear objectives, effective management, adequate enforcement, sound science.
6. To ensure that MPAs are designed and managed as a network.



What Is an Ecosystem?



A dynamic complex of plant, animal and micro-organism communities and the non-living environment interacting as a functional unit



Humans are an integral part of ecosystems



Ecosystems vary greatly in size

Large-Scale Marine Ecosystems



Smaller-Scale Marine Ecosystems

Shallow Pelagic

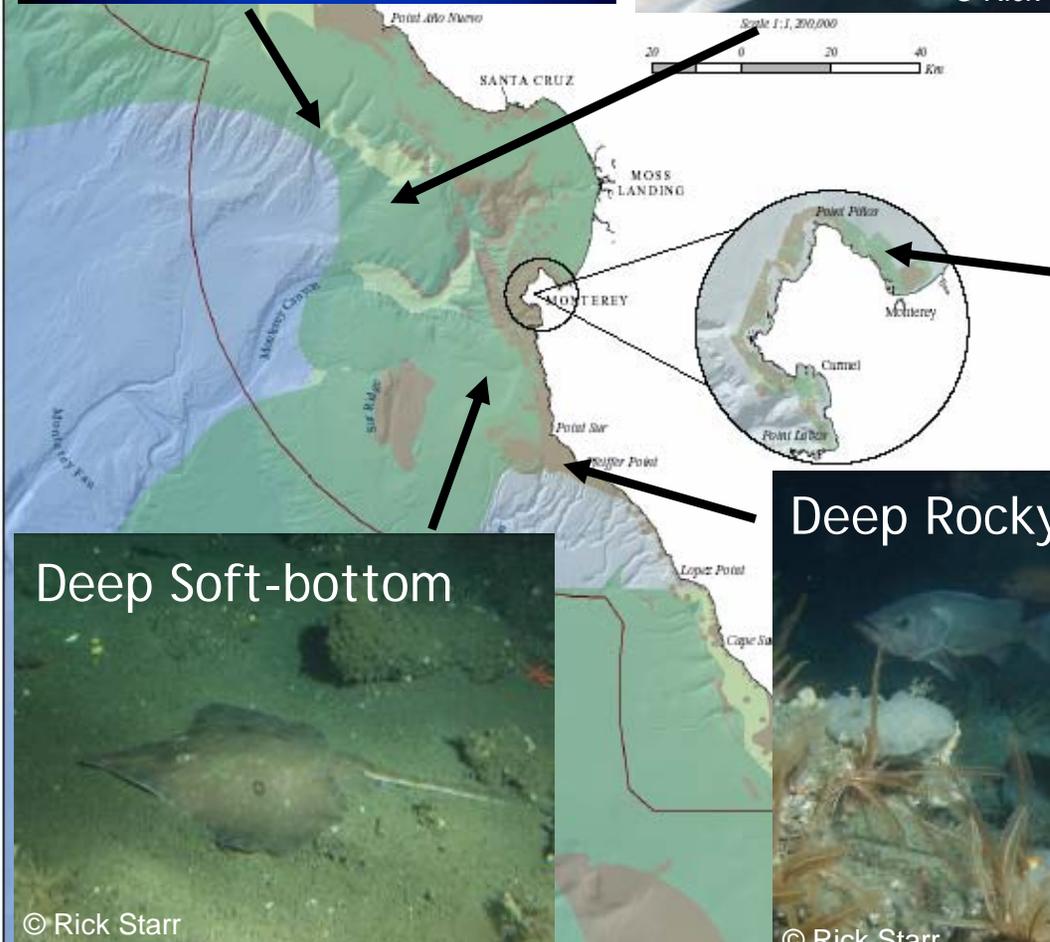


Deep Pelagic



Defined by:

- geological features
- depth
- oceanography
- biological community



Deep Soft-bottom



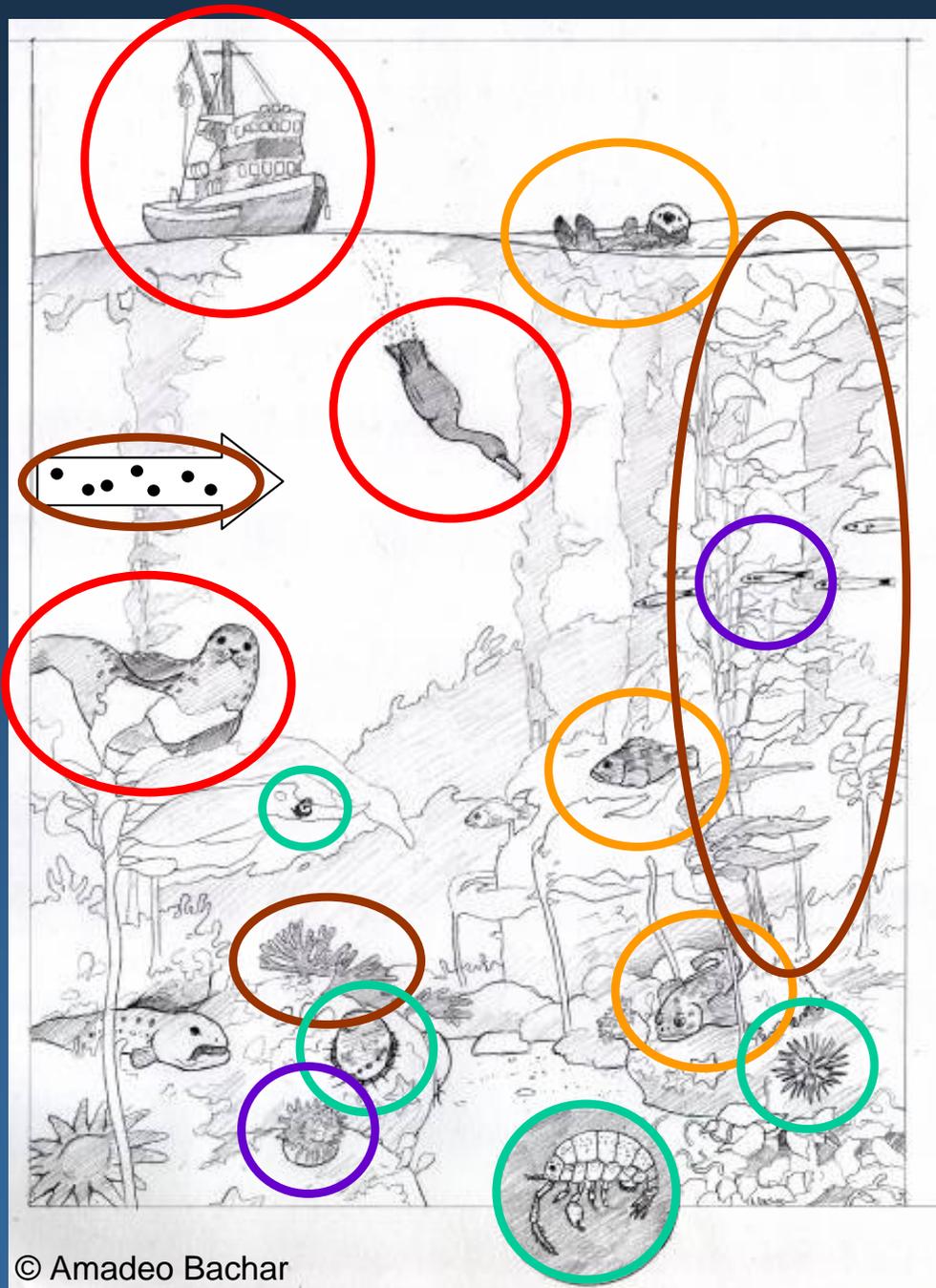
Deep Rocky Reefs



Shallow Rocky Reefs



Attributes of Ecosystems

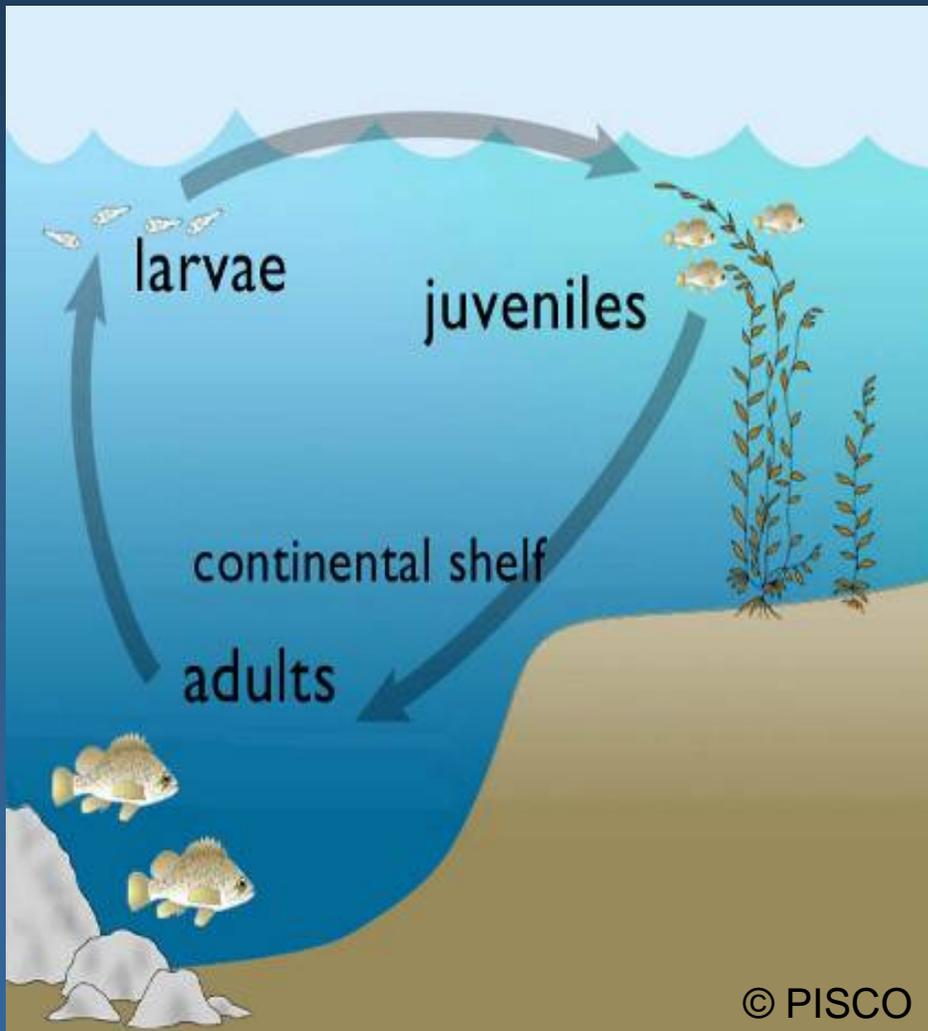


Structure

- Environmental features
 - geology, oceanography
- Species composition
- Species diversity
- Trophic levels - composition
 - primary producers
 - grazers, detritivores
 - planktivores
 - primary consumers
 - secondary, tertiary consumers
- Species that connect ecosystems

Attributes of Ecosystems

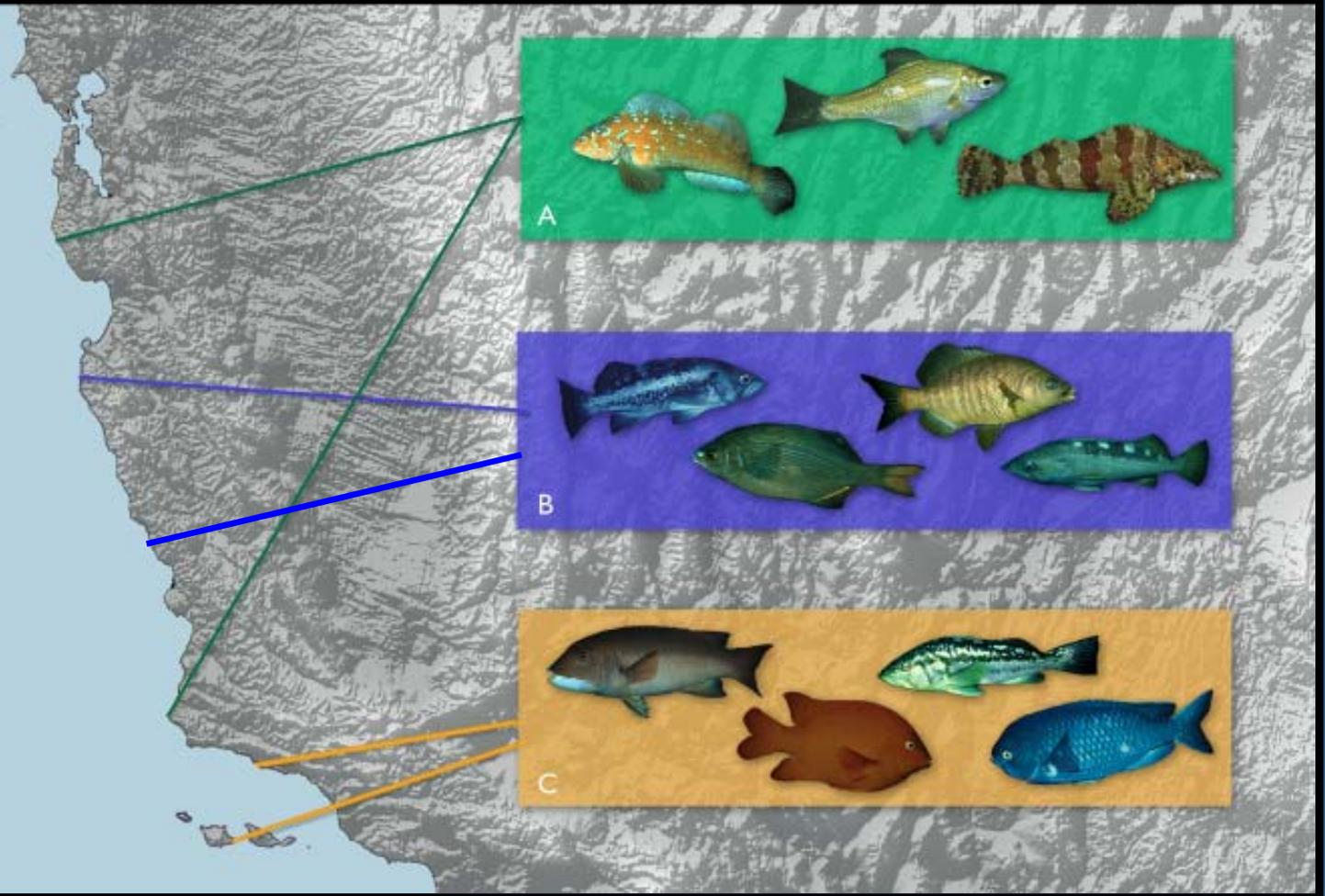
Functions



- Energy flow
- Productivity
- Trophic interactions
- Nutrient export and exchange
- Nutrient cycling
- Other species interactions (e.g., kelp produces habitat)
- Nursery habitat
- Larval production and export

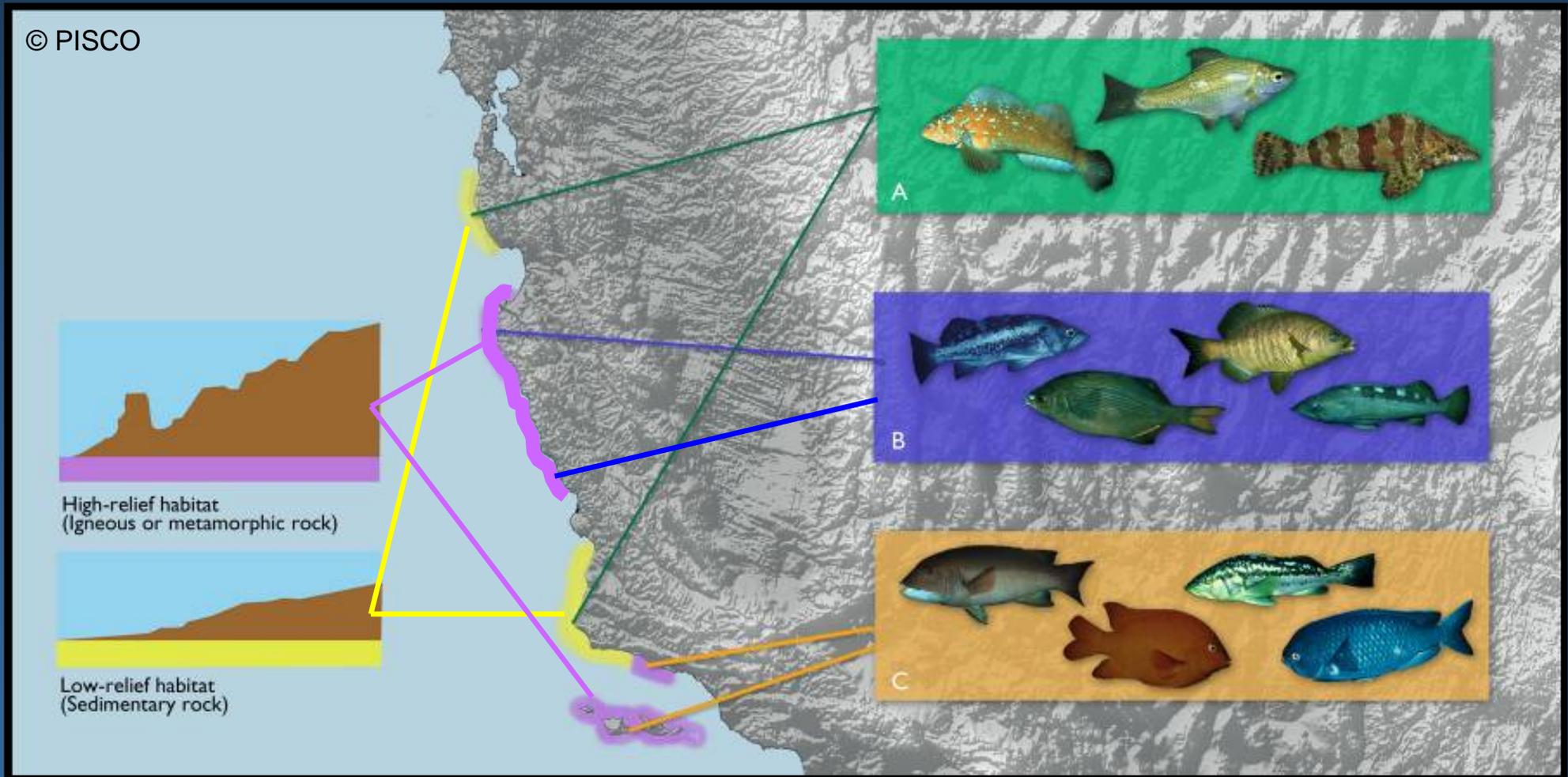
Ecosystems are variable

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Ecosystems are variable

e.g. rock type affects species composition



MPAs along the coast protect diversity of an ecosystem

Ecological Setting: Habitats

Habitats that must be represented under the MLPA:

"...rocky reefs, intertidal zones, sandy or soft ocean bottoms, underwater pinnacles, seamounts, kelp forests, submarine canyons, and seagrass beds." [Fish and Game Code, Section 2856(a)(2)(A)]

Recommendation of SAT for additional habitats that should be represented:

- Five depth zones: intertidal, intertidal to 30 meters, 30 to 100 meters, 100-200 meters, and deeper than 200 meters
- Centers of upwelling typically associated with major points and headlands
- Plumes associated with streams and rivers
- Retention features characterized by restricted ocean currents such as gyres, eddies, or regions in the lee of headlands

Key Marine Habitats

Seafloor Habitats

- Rocky reefs
- Intertidal zones
- Sandy or soft ocean bottoms
- Underwater pinnacles
- Submarine canyons

Oceanographic Habitats

- Upwelling areas
- Freshwater plumes
- Retention zones

Depth Zones

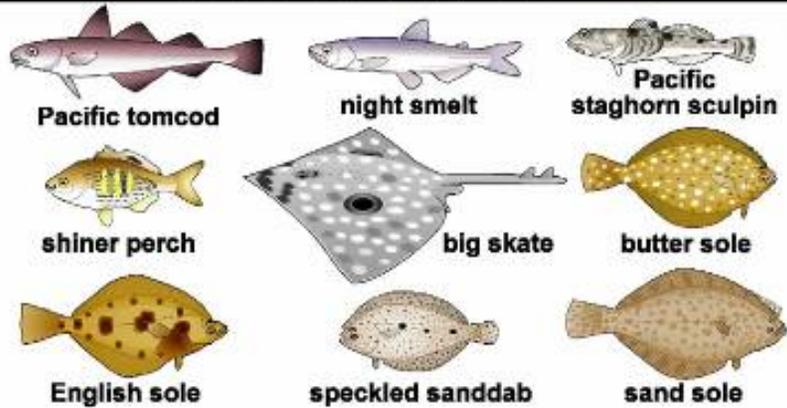
- Intertidal
- Intertidal to 30 m
- 30 to 100 m
- 100 to 200 m
- 200 m and deeper

Biogenic Habitats

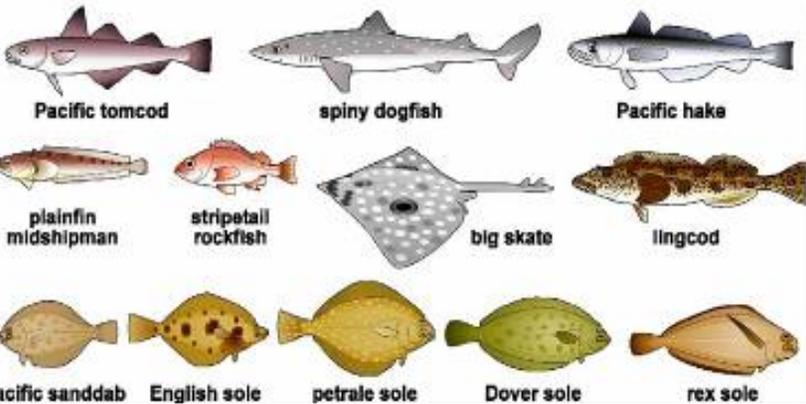
- Kelp forests
- Seagrass beds

Soft Bottom

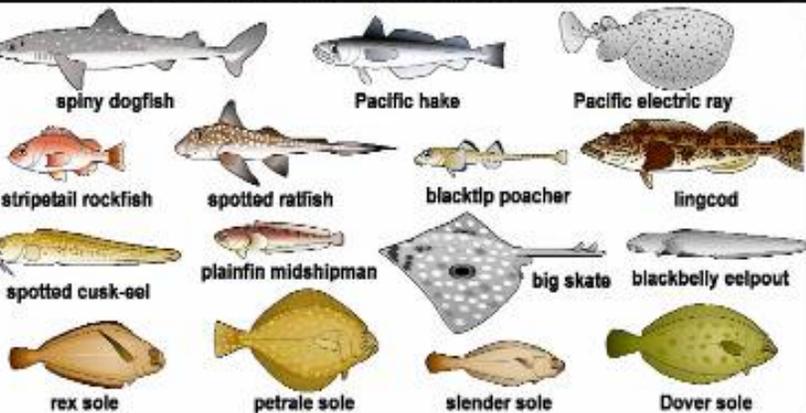
INNER SHELF



MIDDLE SHELF



OUTER SHELF

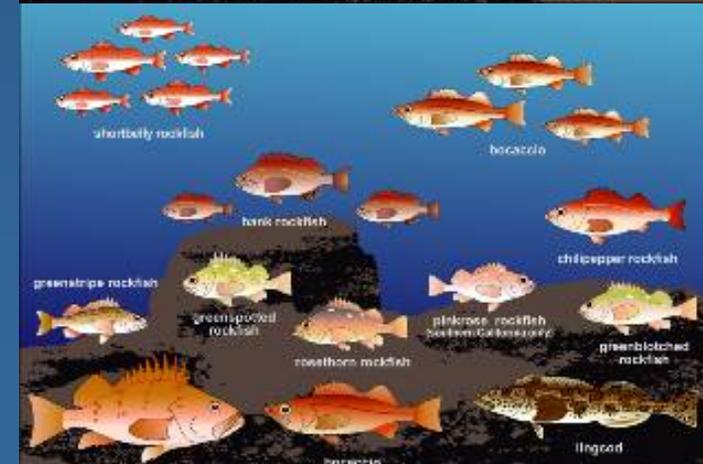
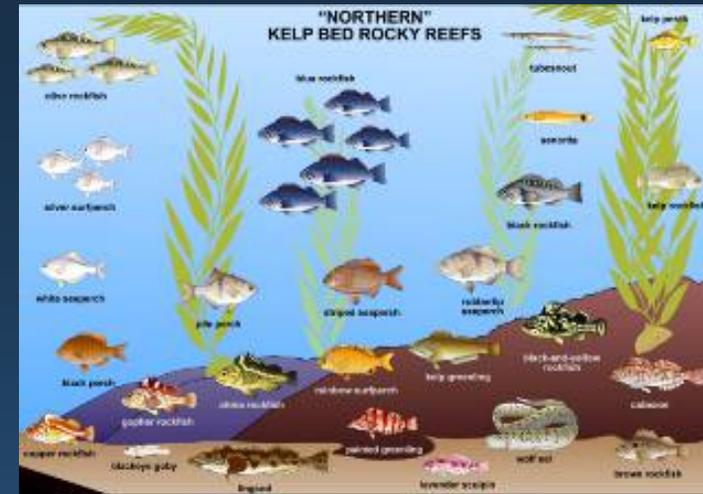


0-30 m

30-100 m

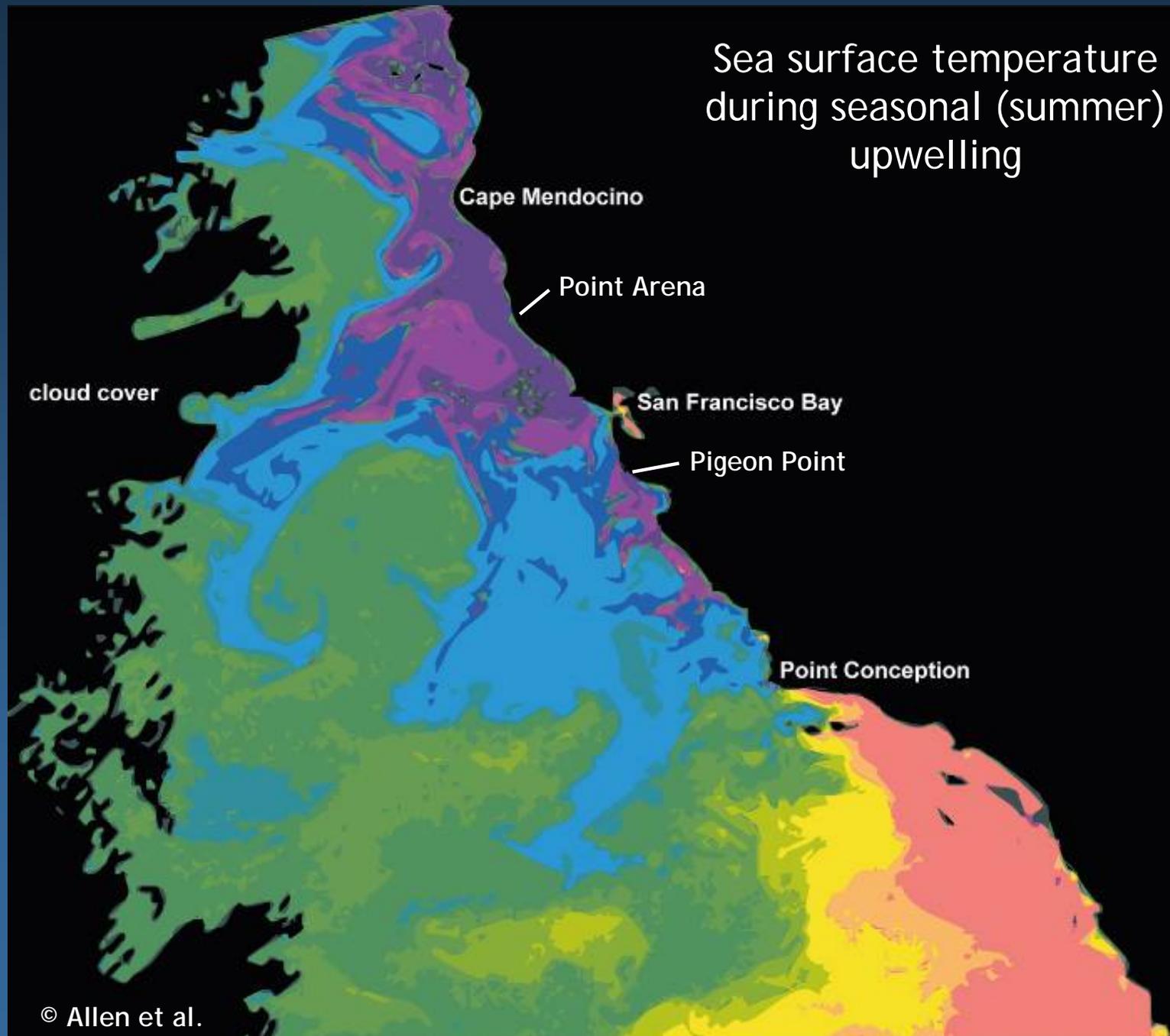
100-200 m

Rocky Bottom



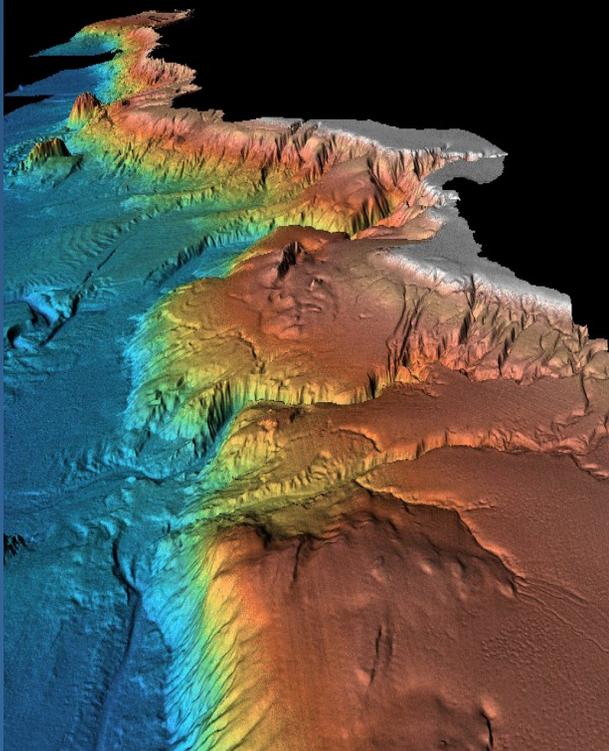
Oceanographic Habitats

- Seasonal upwelling throughout northern half of region
- Fuels highly productive coastal and pelagic ecosystems

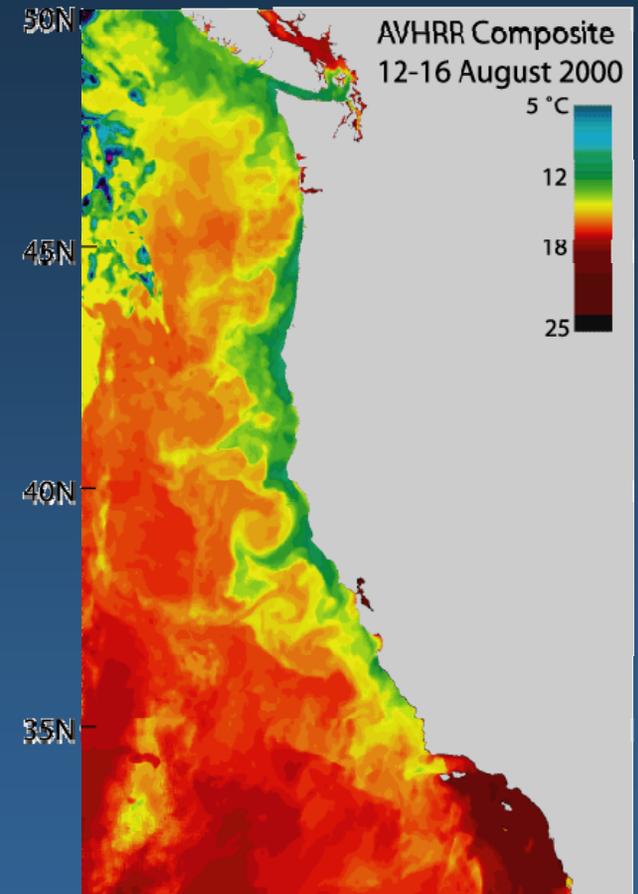


Key Habitats

- Identified Key Habitats Using
 - Bottom Type and Depth Categories
 - Biogenic Habitats
 - Oceanographic Features



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Shoreline Habitats

Rocky shores

- ~46% of shore length
- Predominant north of Russian River
- Surfgrass ~19% of shore length

Shallow (0-30m) rocky reef

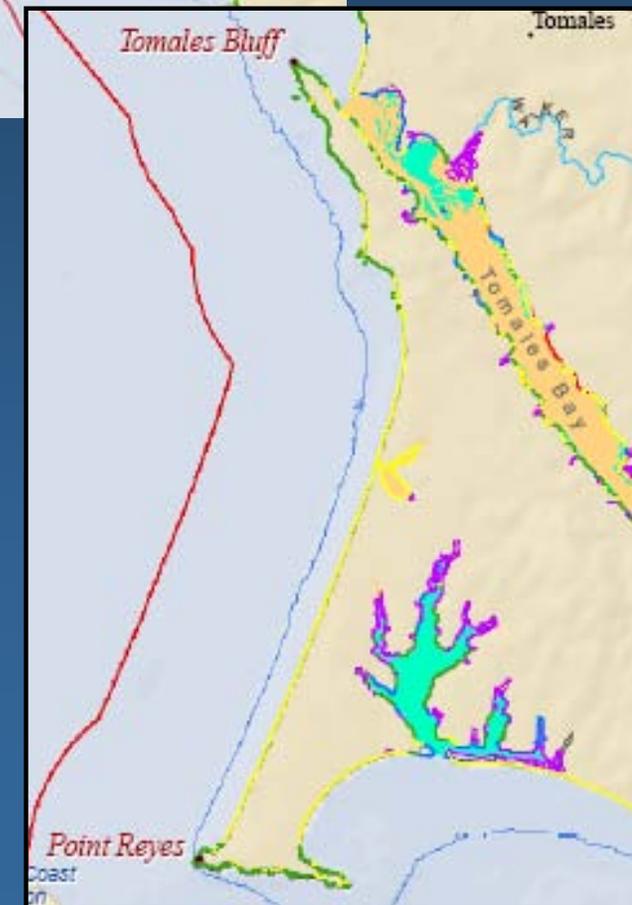
- Dominated by bull kelp (*Nereocystis lutkeana*)
- Kelp more abundant in northern half

Sandy beaches

- ~ 51% of shore length
- Predominant south of Russian River

Estuaries and Lagoons

- ~ 20 sq. miles or 2.5% of area
- Mainly in central study region



Estuary and Lagoon Habitats

Coastal Marshes

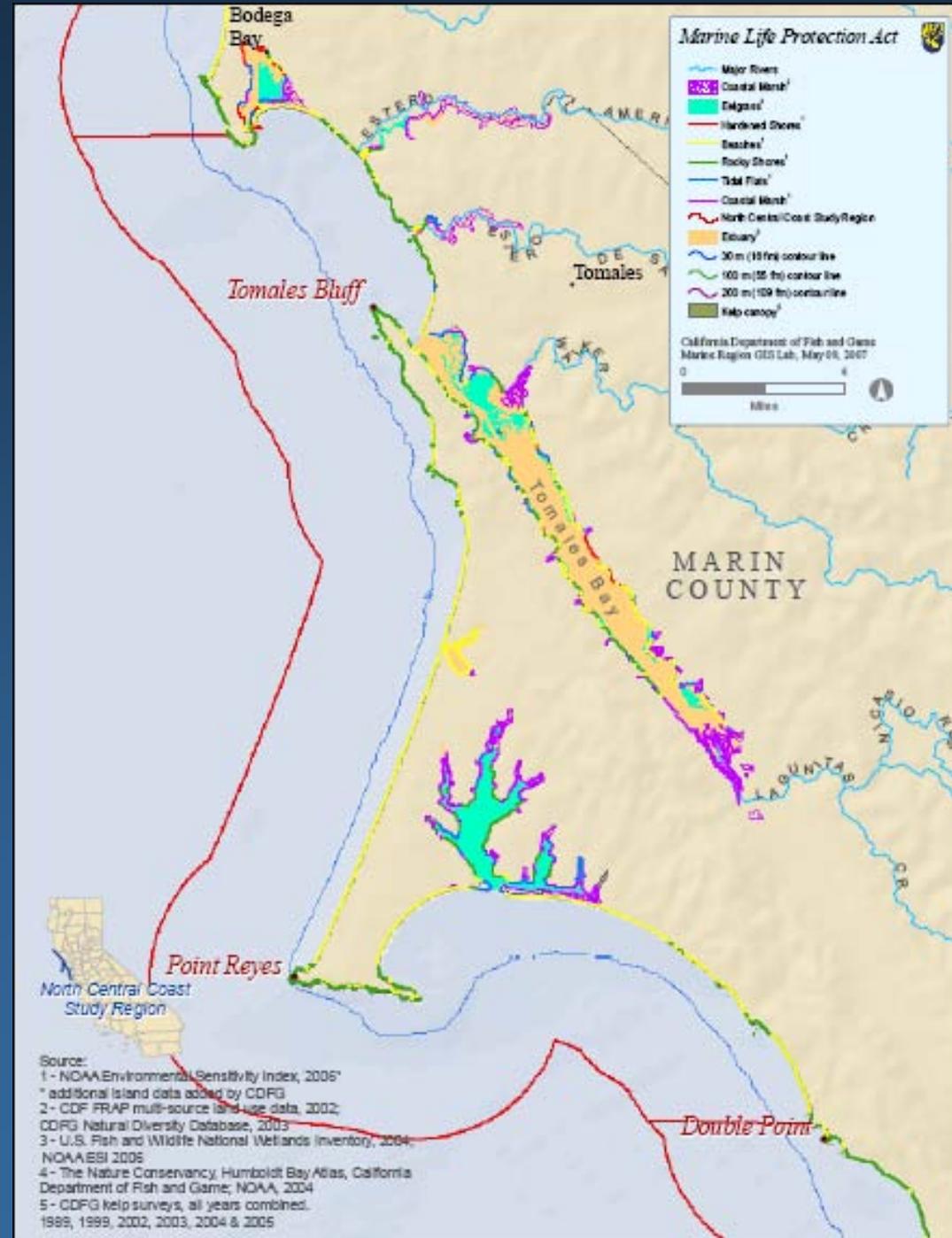
- ~14% of shore length
- Salt and brackish

Tidal Flats

- Exposed ~ 3 % of shore
- Sheltered ~14% of shore

Eelgrass

- ~ 1% of study area
- mostly in estuaries



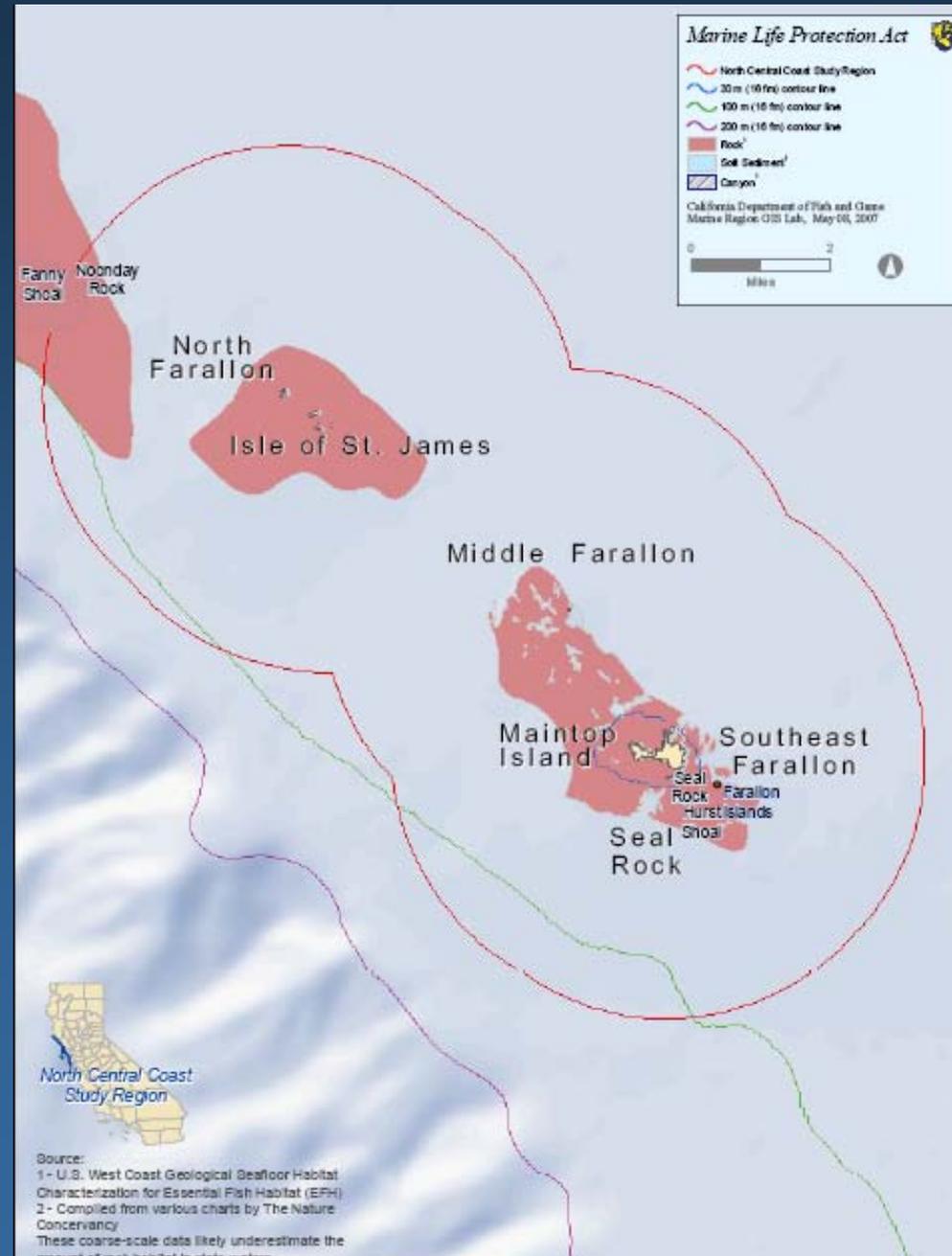
Seafloor Habitats and Depth Zones

Study region is generally shallow

- 39% at 0-30m depth
- 60% at 30-100m depth
- 1% 100-200m depth

Seafloor habitats not present in region:

- deep water habitats (> 200m)
- submarine canyons
- seamounts

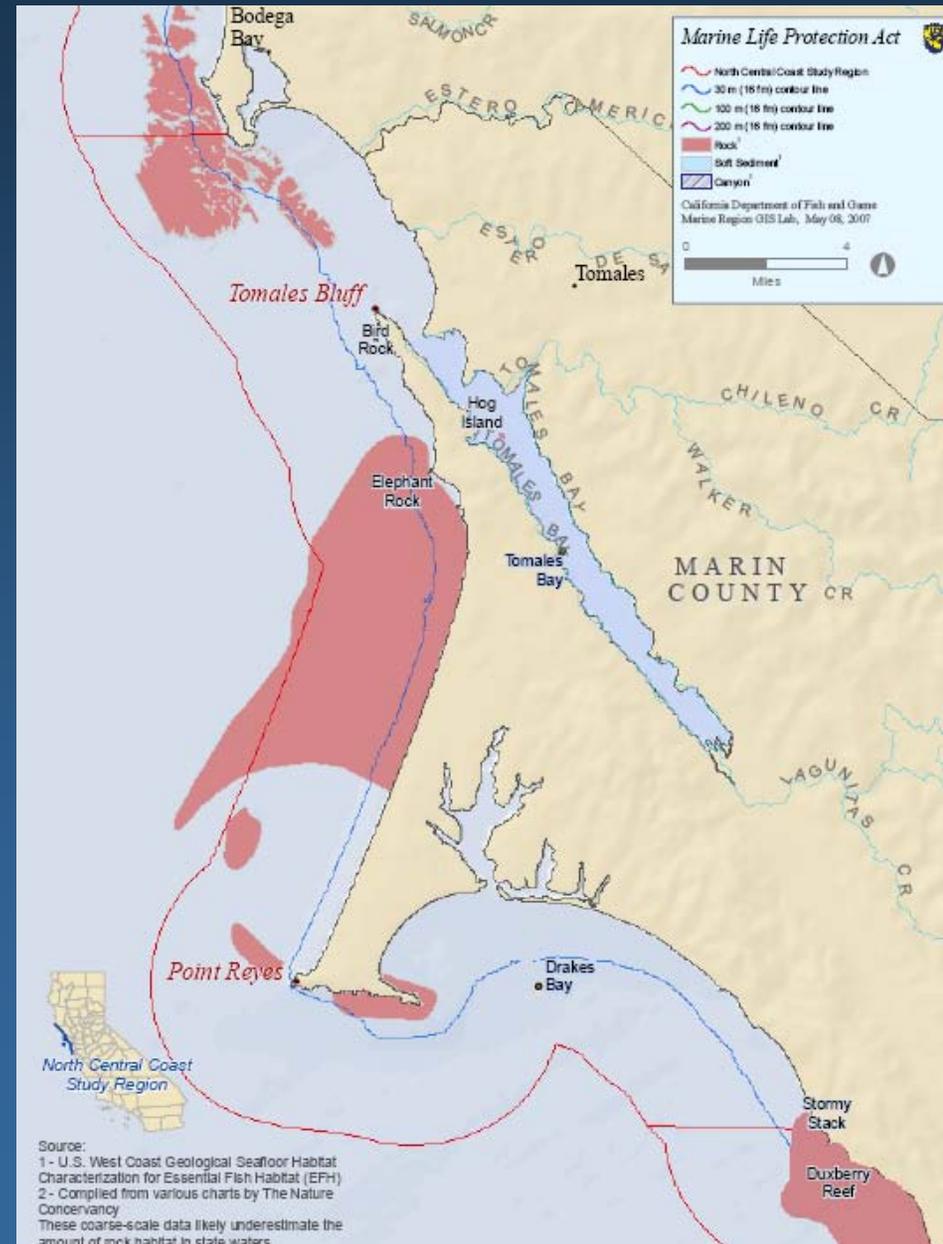


Seafloor Habitats and Depth Zones

High resolution seafloor mapping underway; current analysis based on existing coarse-scale data

Soft bottom more abundant than hard bottom: 15% hard / 85% soft overall

- 0-30 meters: 21% hard / 79% soft
- 30-100 meters: 12% hard / 88% soft
- 100-200 meters: 100% soft



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