

# Marine Life Protection Act Initiative



## Introduction to Bioregions in the MLPA North Coast Study Region

Presentation to the MLPA Master Plan Science Advisory Team  
 October 30, 2009 • Eureka, California

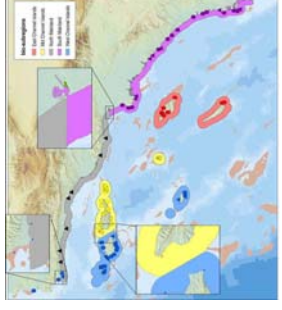
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# Bioregions vs. Biogeographic provinces

- Biogeographic provinces are large-scale areas based on broadly similar species assemblages
- Bioregions are smaller areas within study regions based on subtle differences in community structure or connectivity patterns



West Coast biogeographic provinces



Bioregions in the MLPA South Coast Study Region



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# Introduction to Bioregions

- Bioregions are areas within the study region that exhibit differences in community structure or experience reduced population connectivity
- In past study regions, bioregions were based largely on community structure data from rocky reef habitats



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# Context of the North Coast

- Study region is only one part of the California Current ecosystem
- North central coast MPAs have been adopted
- Oregon is currently undergoing its own MPA process



## How Bioregions are Used

- Groups submitting marine protected area (MPA) proposals are encouraged to include habitat replicates in each bioregion
- SAT evaluations are conducted on each bioregion, providing more information than the study region-wide analysis
- Bioregions could play a role in MPA monitoring programs

## Population Connectivity

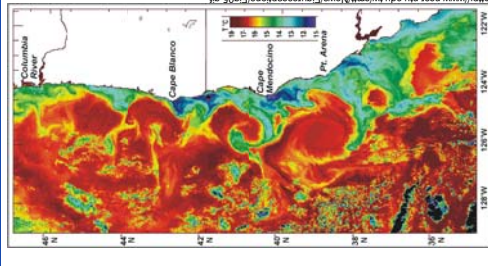
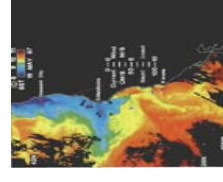
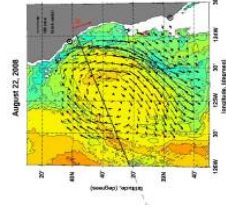
- Several studies have indicated a break in connectivity in the Cape Mendocino area:
  - Dawson et al. 2001 (Tidewater gobies)
  - Cope 2004 (Blue rockfish)
  - Field & Ralston 2005 (Many rockfishes)
  - Broitman et al. 2008 (Barnacles and mussels)
  - Francis et al. 2009 (Numerous fished species)

## Bioregions in the NCSR

- Rocky intertidal community data from NCSR do not show strong evidence for bioregions
- However, other sources of data suggest a break
  - Population connectivity
  - Oceanography
  - Geomorphology
  - Hydrology

## Oceanography

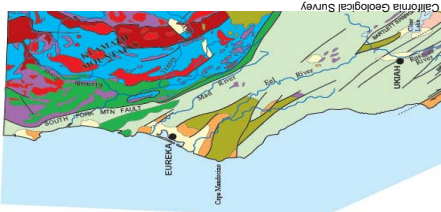
- Cape Mendocino is a major upwelling center.
- Directs upwelled water offshore.
- Offshore eddy could provide a partial barrier to population connectivity.



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## Geomorphology

- Rock type largely uniform from Point Arena to Cape Mendocino
- North of Cape Mendocino:
  - Varied rock types
  - Increased terrestrial sediment inputs
  - Many sandy beaches and dunes




California Geological Survey

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## Potential Locations for Boundary


- Considerations for boundary location
  - Major reef systems
  - Oceanography
- Potential locations
  - False Cape
  - Cape Mendocino
  - Mouth of the Mattole River
  - Punta Gorda



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## Hydrology

- Numerous major rivers north of Cape Mendocino
- Increased sedimentation from terrestrial runoff



http://geology.com/state-map/maps/california-rivers-map.gif

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## Summary

- Evidence suggests two bioregions
- Boundary in the Cape Mendocino area
- Bioregions provide more information during evaluations
- Consider forming a work group