Identifying Priority Conservation Areas for the Baja California to Bering Sea Region

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MCBI
MARINE CONSERVATION BIOLOGY Institute

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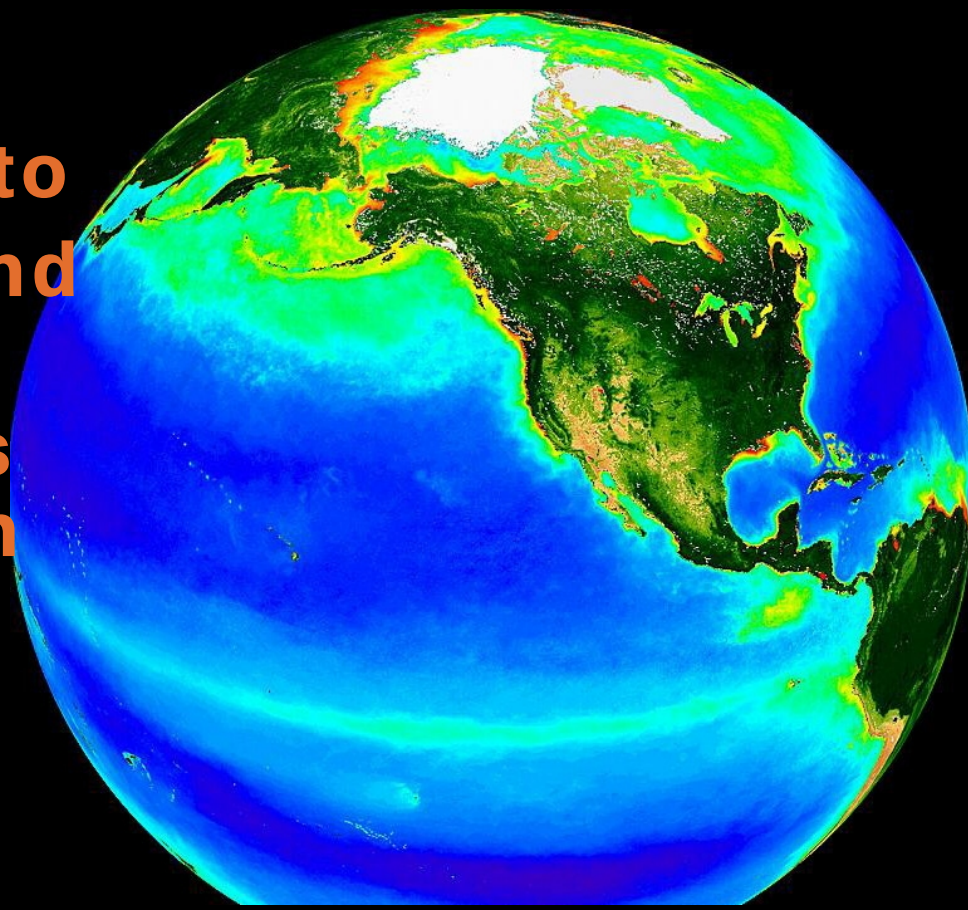
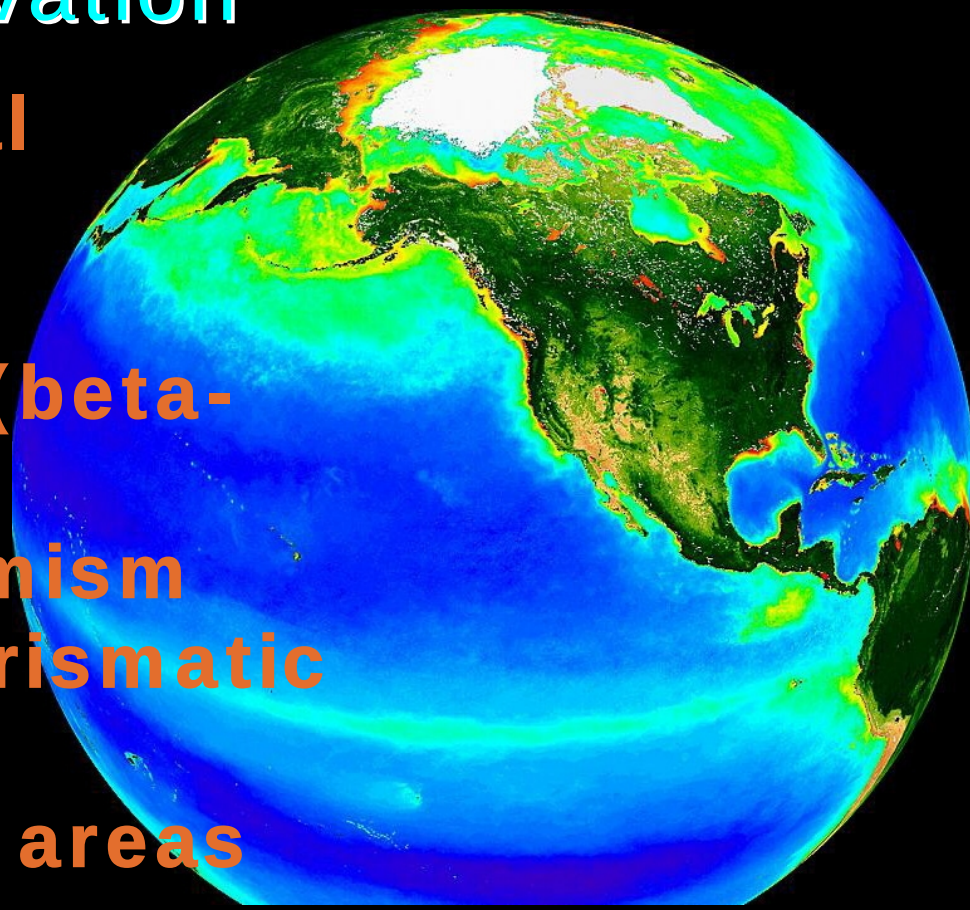
Tri-national Initiative - CEC

The North American MPA Network aims to protect, conserve and enhance the marine environment and its biodiversity through the design and management of a system of MPAs



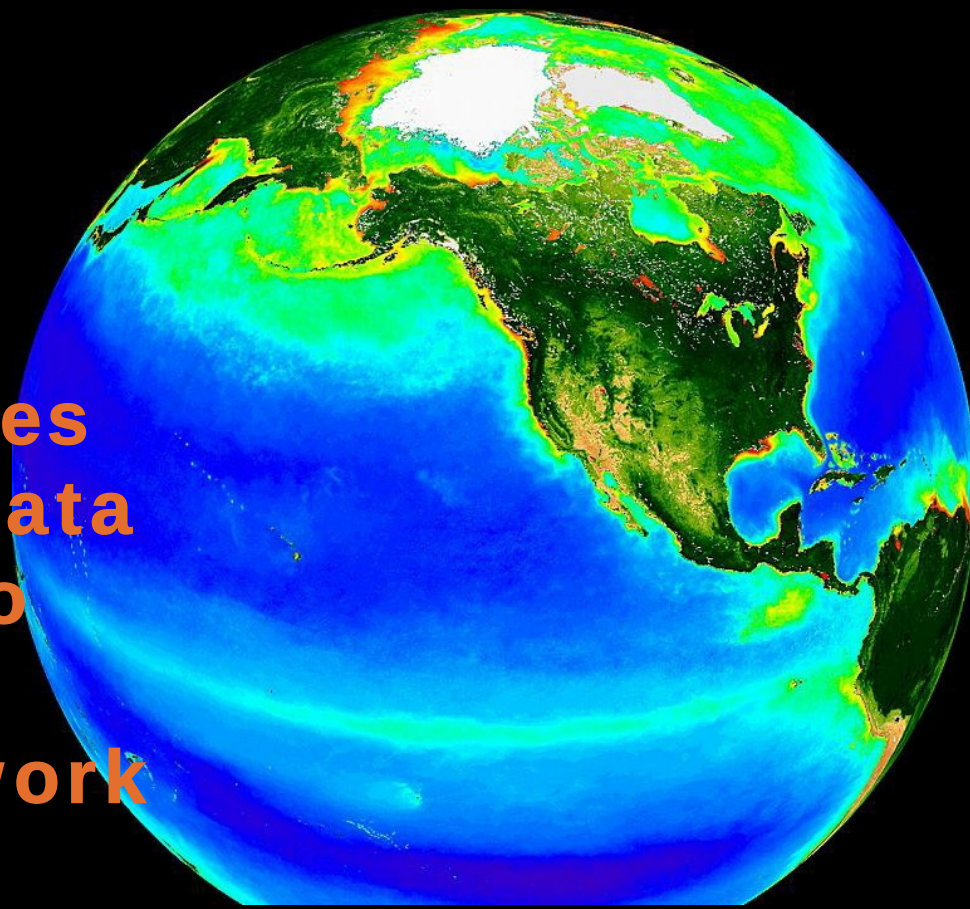
Project Goal: Identify continentally unique areas important to biodiversity conservation

1. areas of high local diversity (species richness),
2. habitat diversity (beta-diversity)
3. continental endemism
4. umbrella and charismatic species (MSCCC)
5. highly productive areas



Project Plan

1. produce map of priority conservation areas
2. work with ongoing conservation initiatives
3. develop common data themes - adaptable to regional initiatives
4. establish a framework for regional efforts



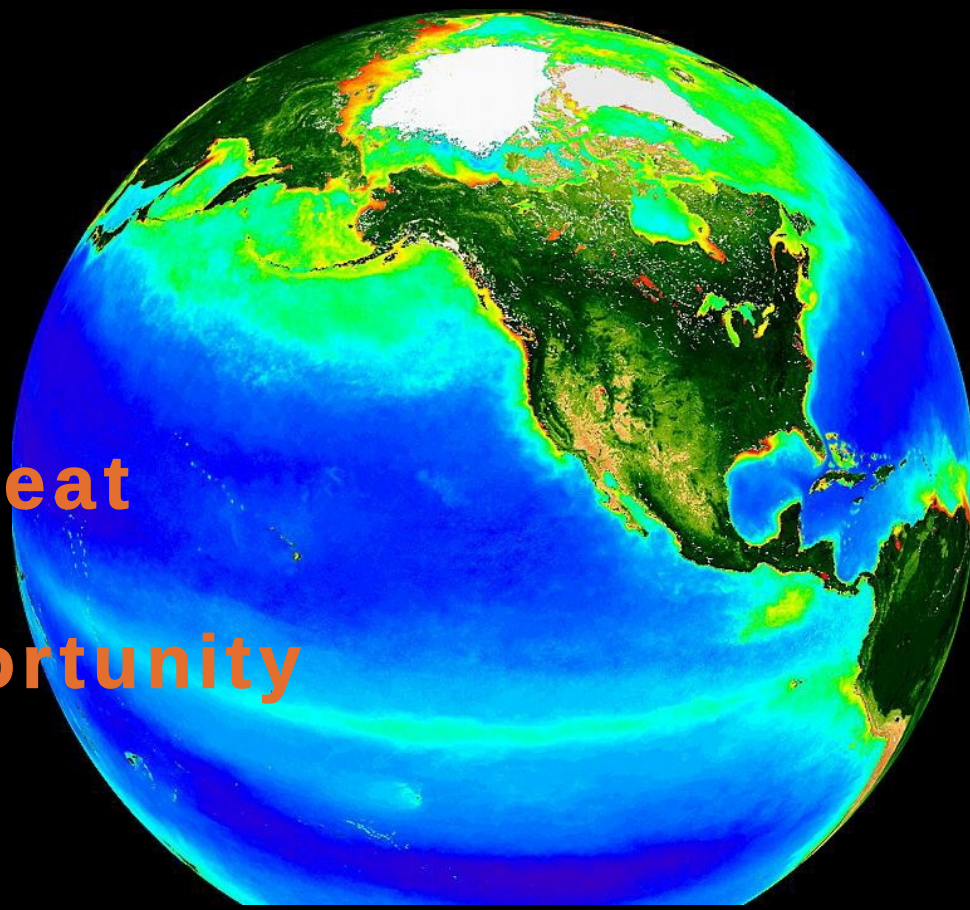
What is a priority conservation area (PCA)?

Area with high:

1. ecological value

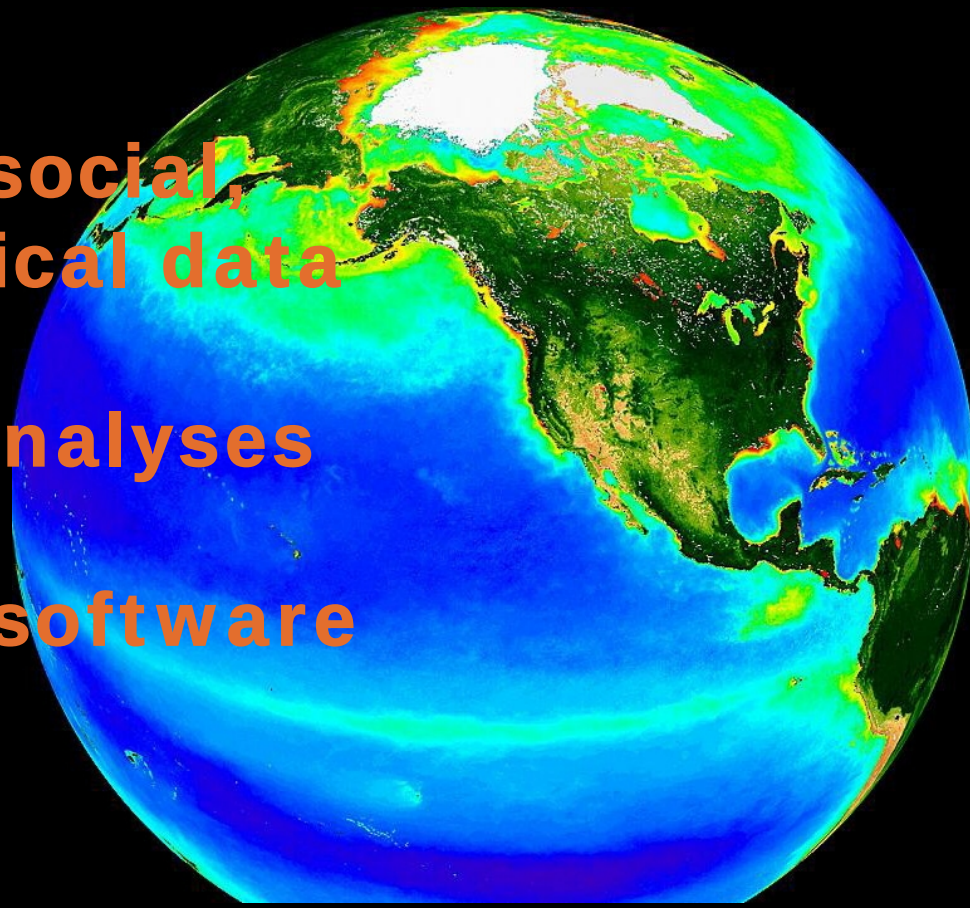
2. anthropogenic threat

3. conservation opportunity

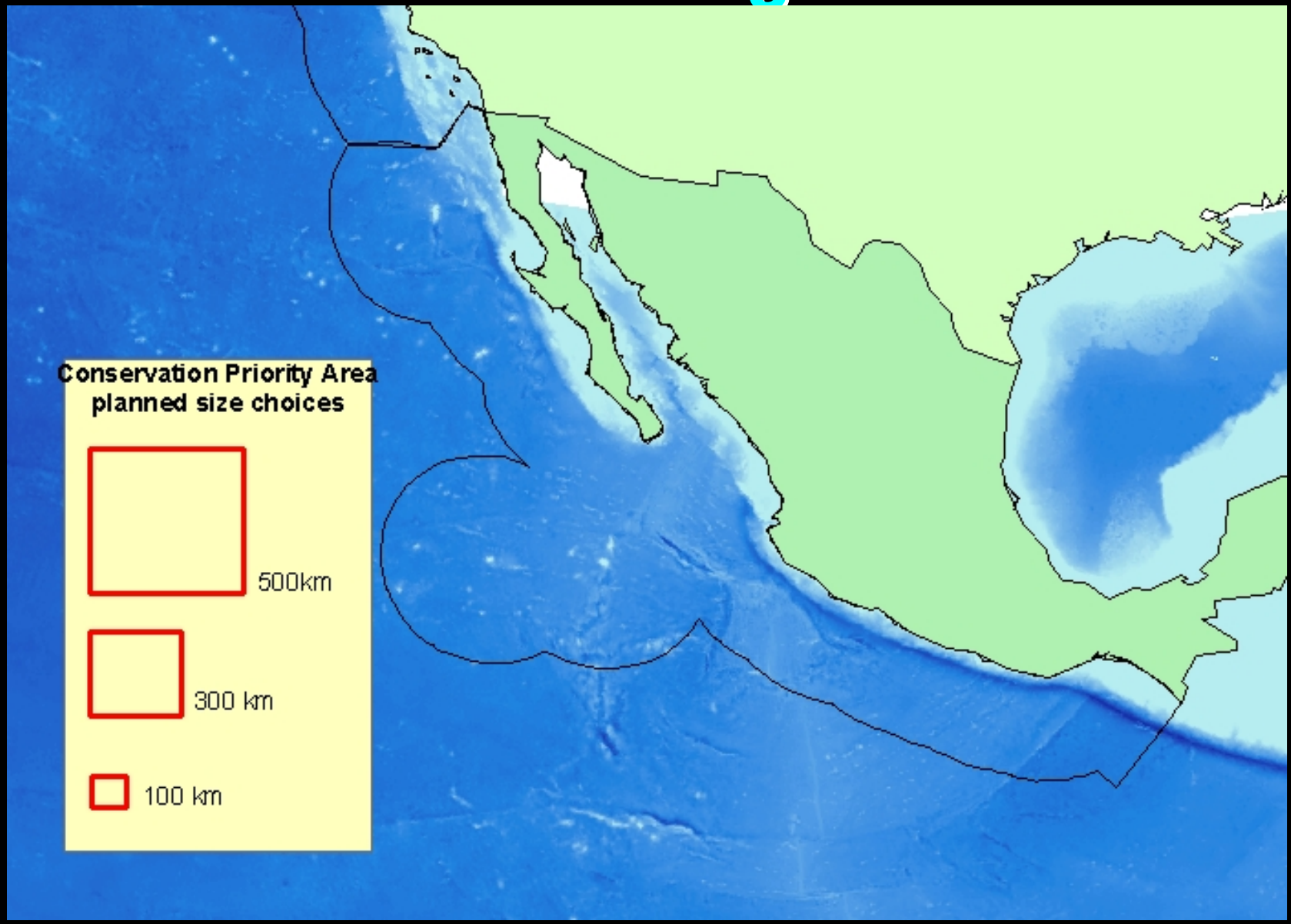


PCA Identification Process

1. develop GIS
2. map layers of key social, physical and biological data sets
3. perform selected analyses
4. expert workshop - Consensus Mapper software



How Big?


Conservation Priority Area
planned size choices
500km
300 km
100 km

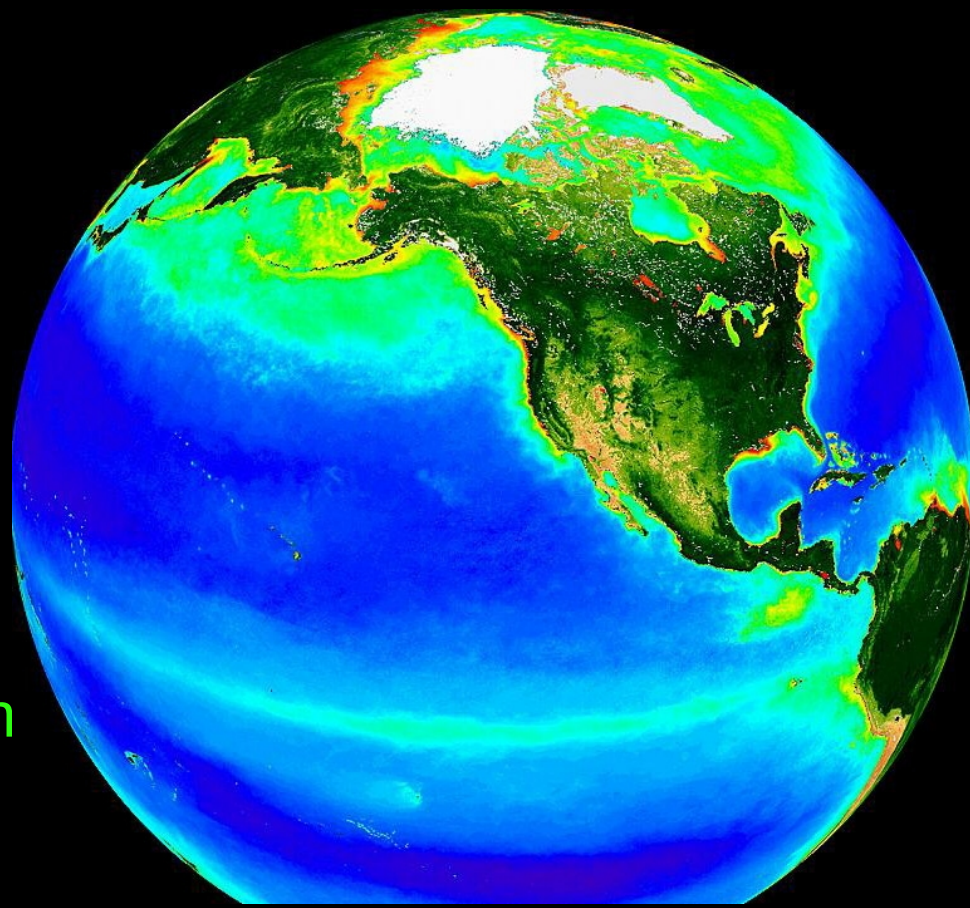
Population Targets

Scale 10-100 sq km:

metapopulation, larval dispersal, home range, migration corridors, feeding areas, nesting areas, concentration areas

Scale 100-1000 sq km:

regional population, migration routes, species' range, larval dispersal



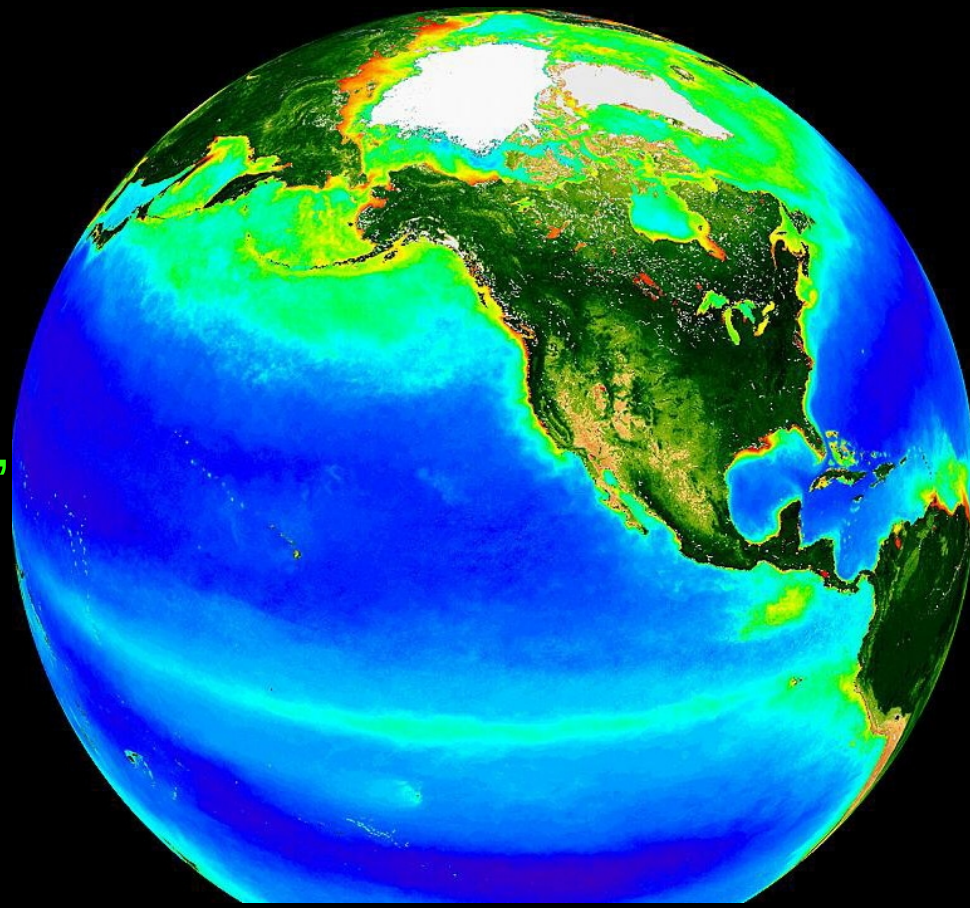
Physiographic Targets

Scale 10-100 sq km:

Anoxic basins, banks, bays, calderas, canyons, escarpments, estuaries, fans, seamounts, hills, headlands, ridges, terraces, troughs

Scale 100-1000 sq km:

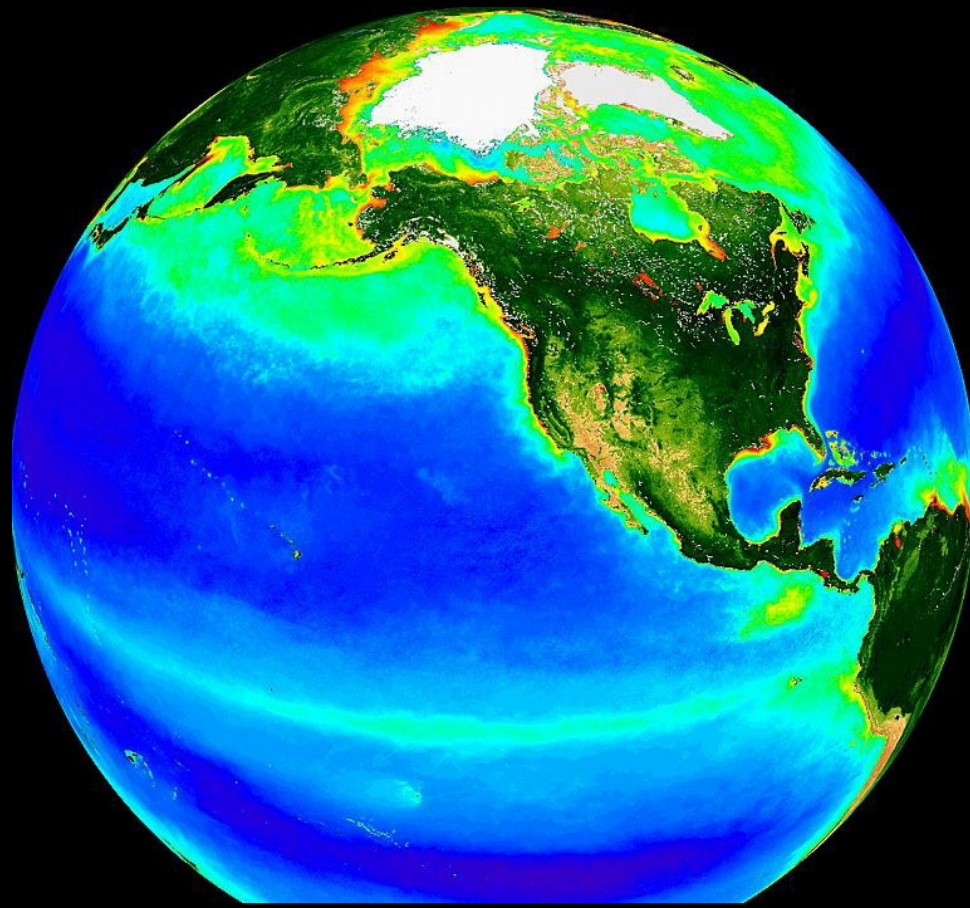
Island archipelagos, ridges, seamounts, trenches



Oceanographic Targets

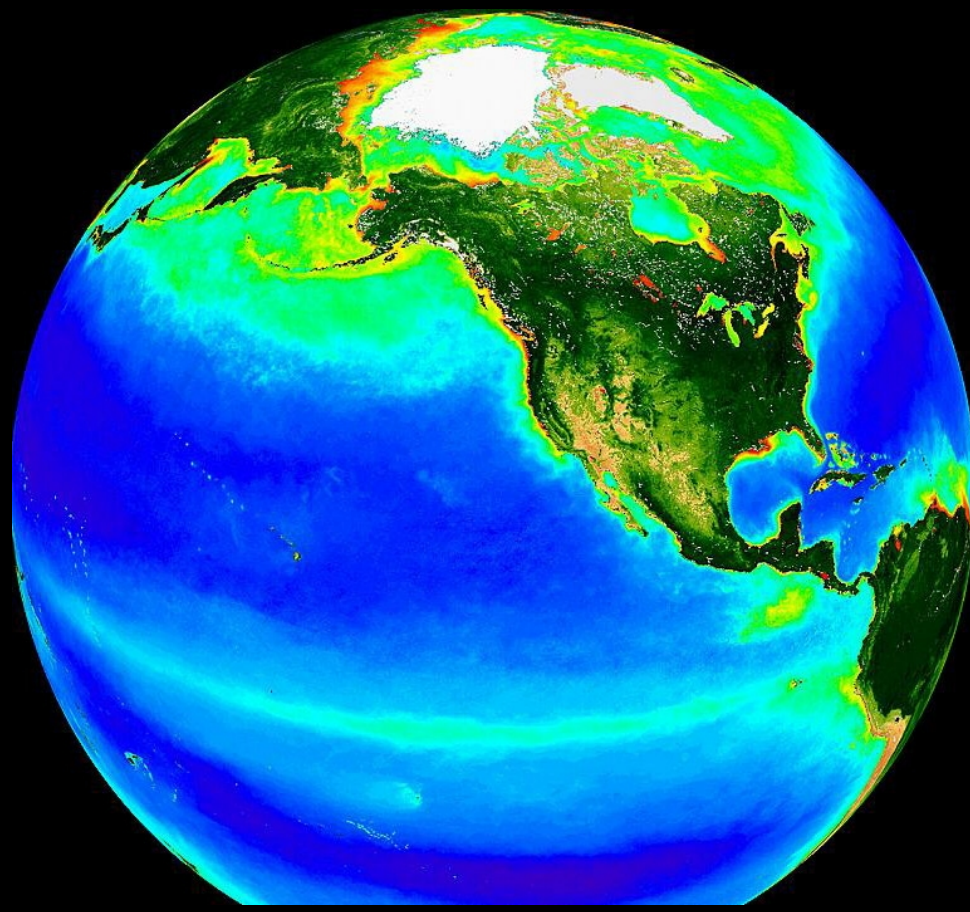
Scale 10-100 sq km:
turbulence (island wakes, headland eddies), estuarine circulation, tides, river plumes, coastal currents, internal waves, upwelling jets, coastal retention zones, fronts

Scale 100-1000 sq km:
mesoscale circulation, fronts, eddies, river plumes

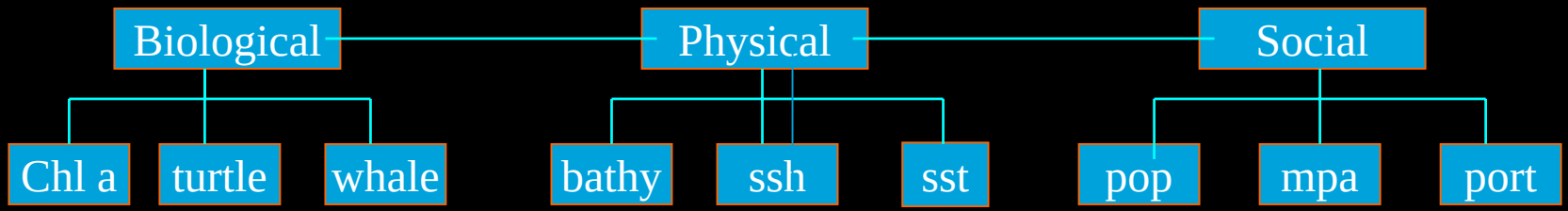


Threats and Opportunities

1. **Threats**
   exploitation, extraction, coastal land-use, pollution, coastline alteration, recreation
2. **Opportunities**
   previous priority setting, sustainable development and management, opportunity for local or regional engagement, funding vehicles



Available data – B2B 1.1



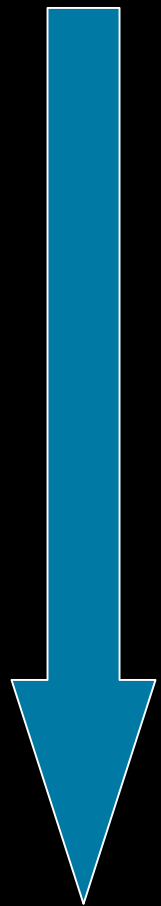
- Biological data
  - chlorophyll A/ cold corals/ whales/ turtles/
- Physical data
  - shoreline/ bathymetry/ currents/ temperature/ seamounts/
- Social data
  - EEZ/ population/ fishing ports/ local priorities/ mpa/

Umbrella Species

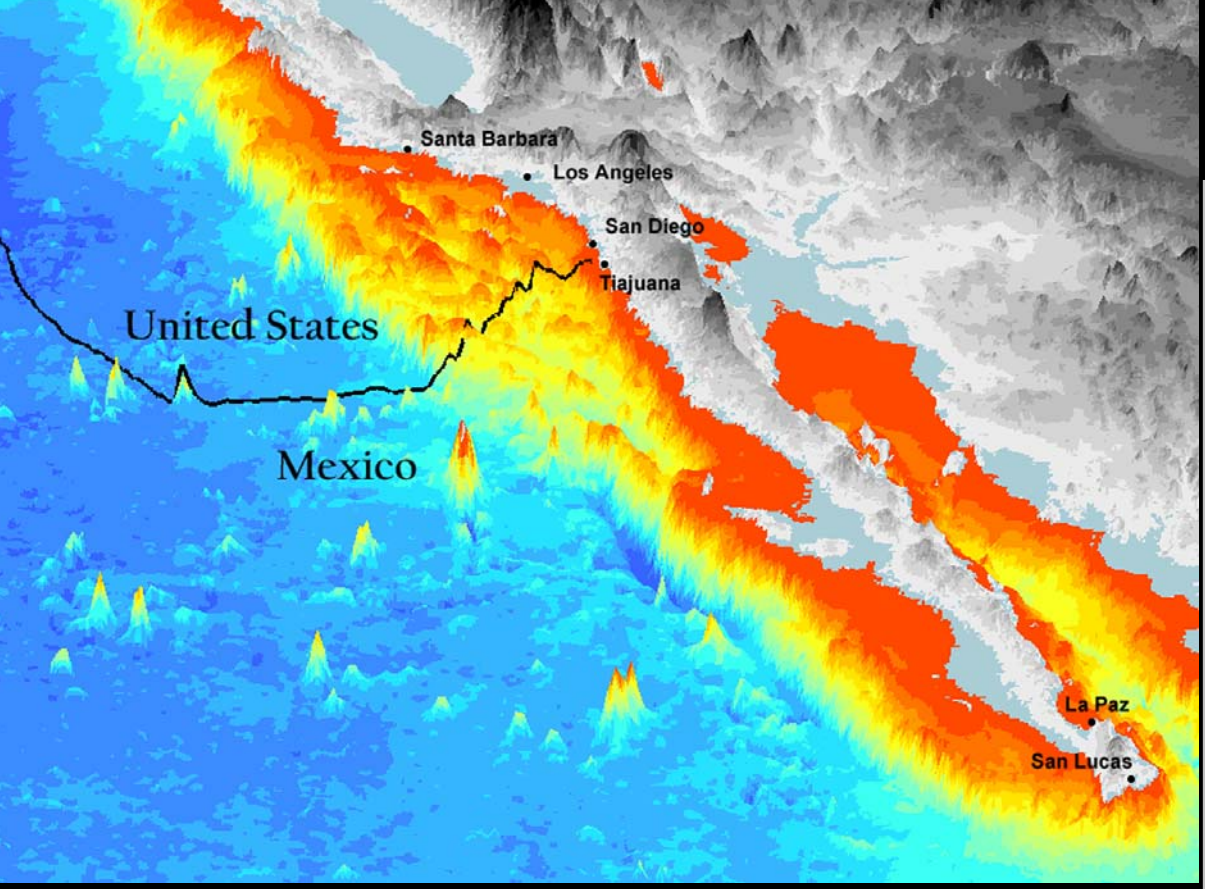
E. Pacific green turtle	Humpback whale
Hawksbill turtle	Blue whale
Kemp's Ridley turtle	Killer whale
Leatherback turtle	Gray whale
Loggerhead Turtle	Right whale
Pink-footed shearwater	Guadalupe fur seal
Short-tailed albatross	Sea otter
Xantus' murrelet	Vaquita

Data Analyses

- Bathymetry
- Seamounts

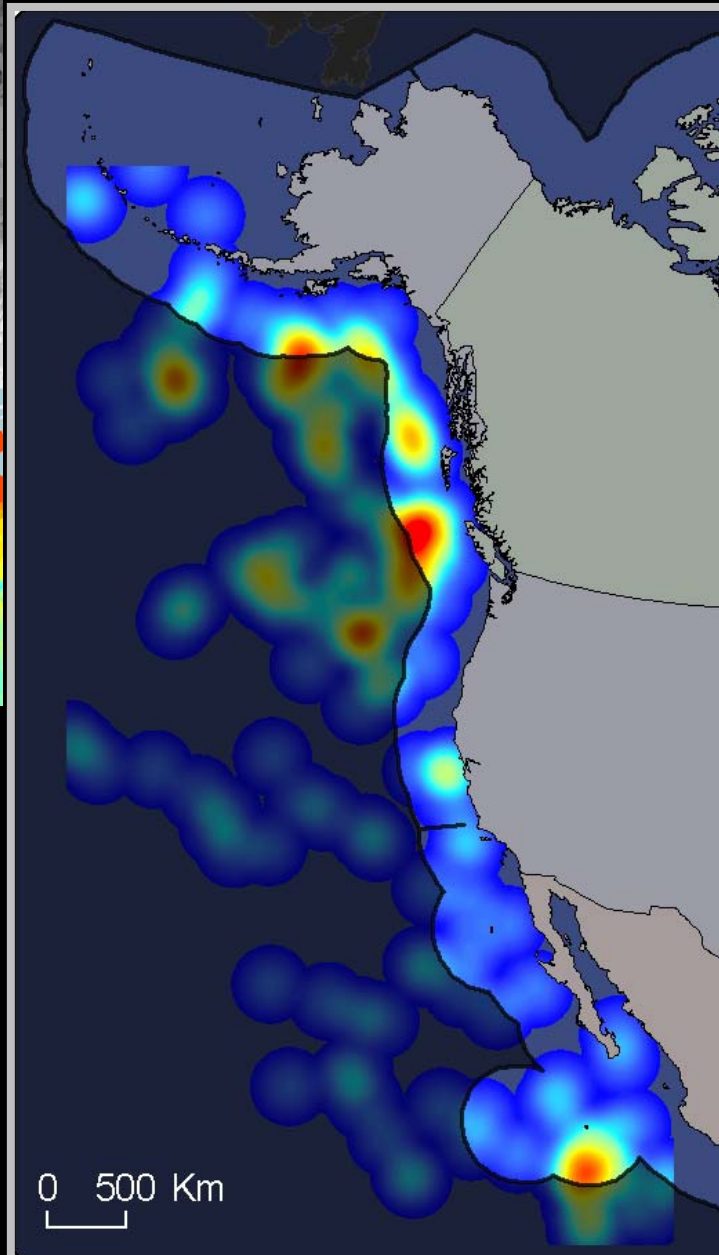


Benthic Features

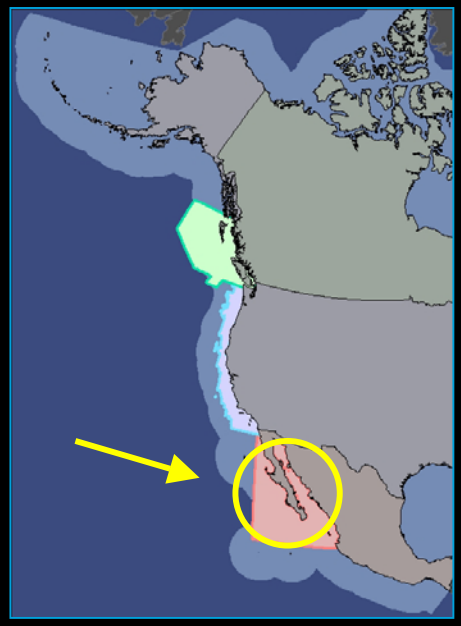


Bathymetry: ETOPO2, regions of higher resolution

At the B2B scale…

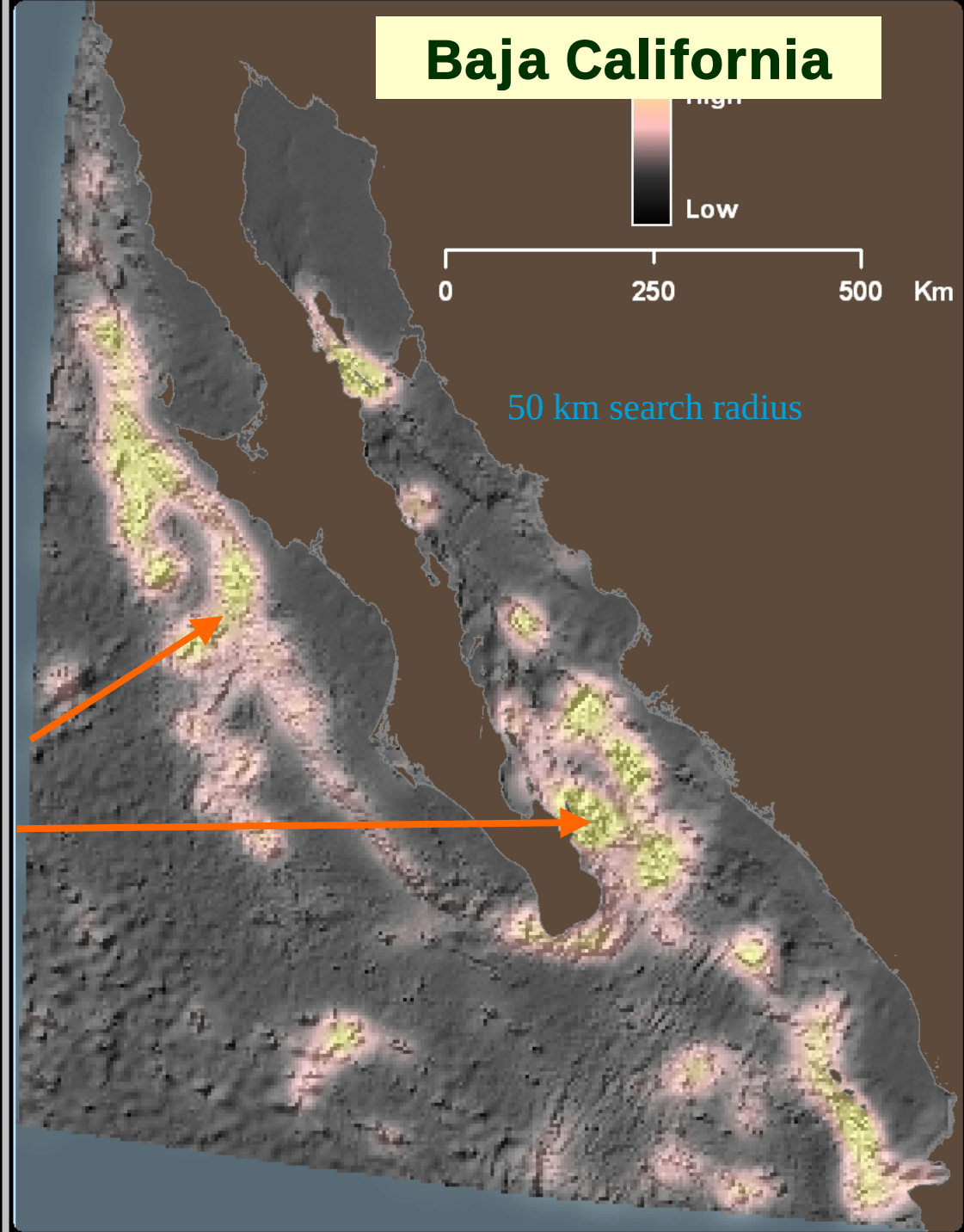


Density of Seamounts: 250 km search radius



Complexity is along the shelf slope, various deep seamounts, and the steps into the Sea of Cortez.

Courtesy of Jeff Ardron, Living Oceans Society



Data Analyses

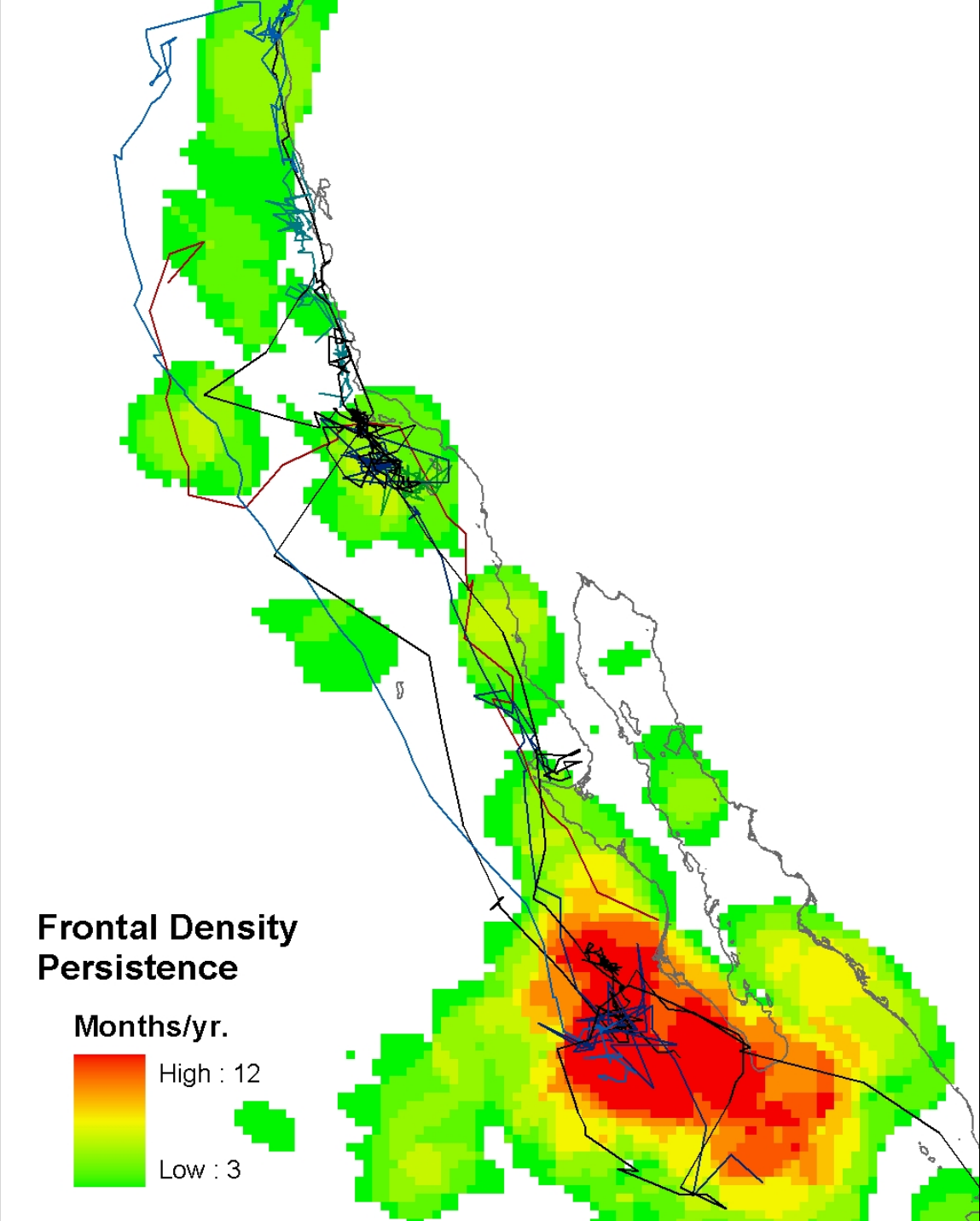
- Sea surface temperature
- Sea surface height (altimetry)
- Primary production

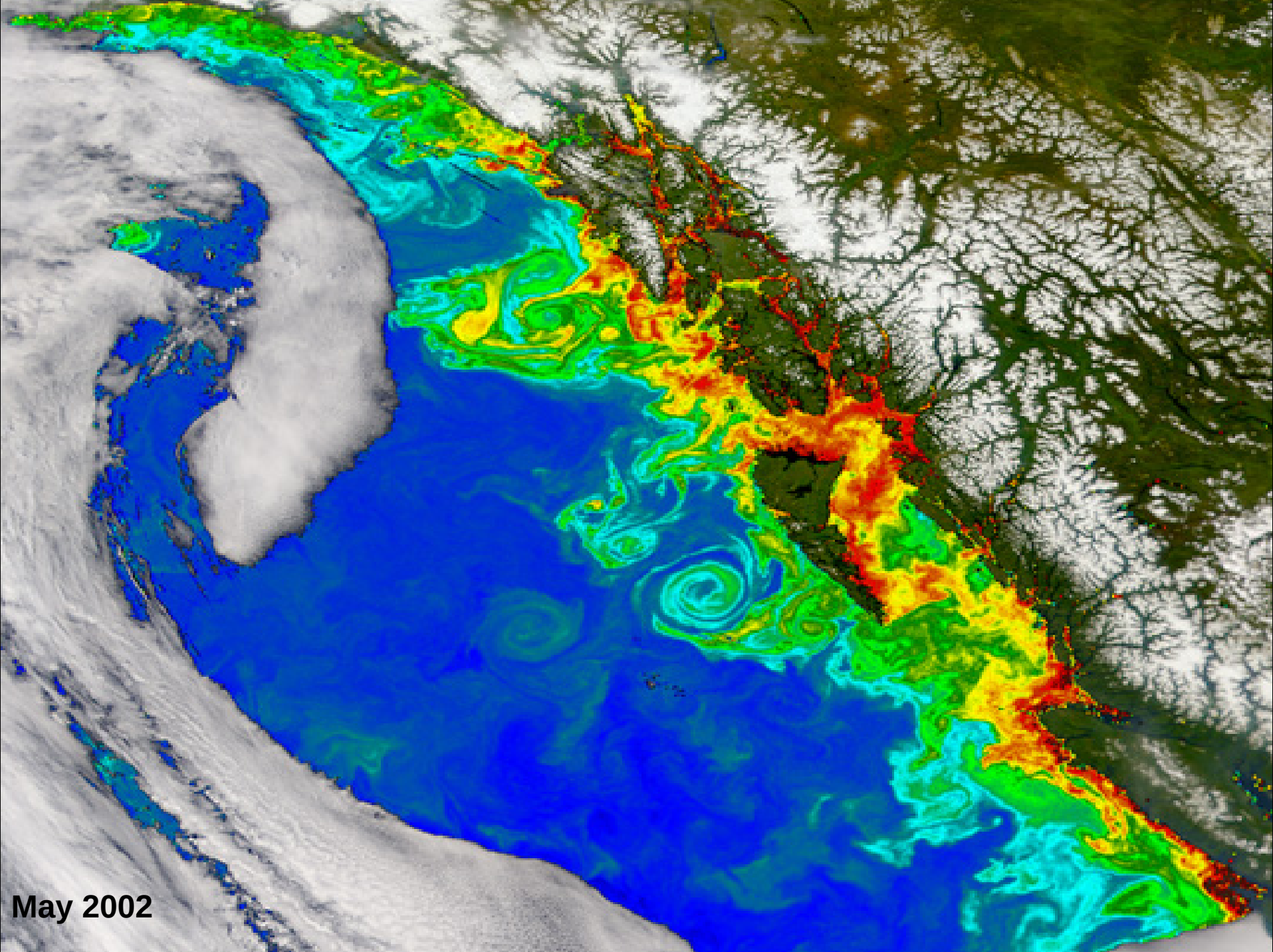
Pelagic Features

Blue Whales Tracks and SST Fronts

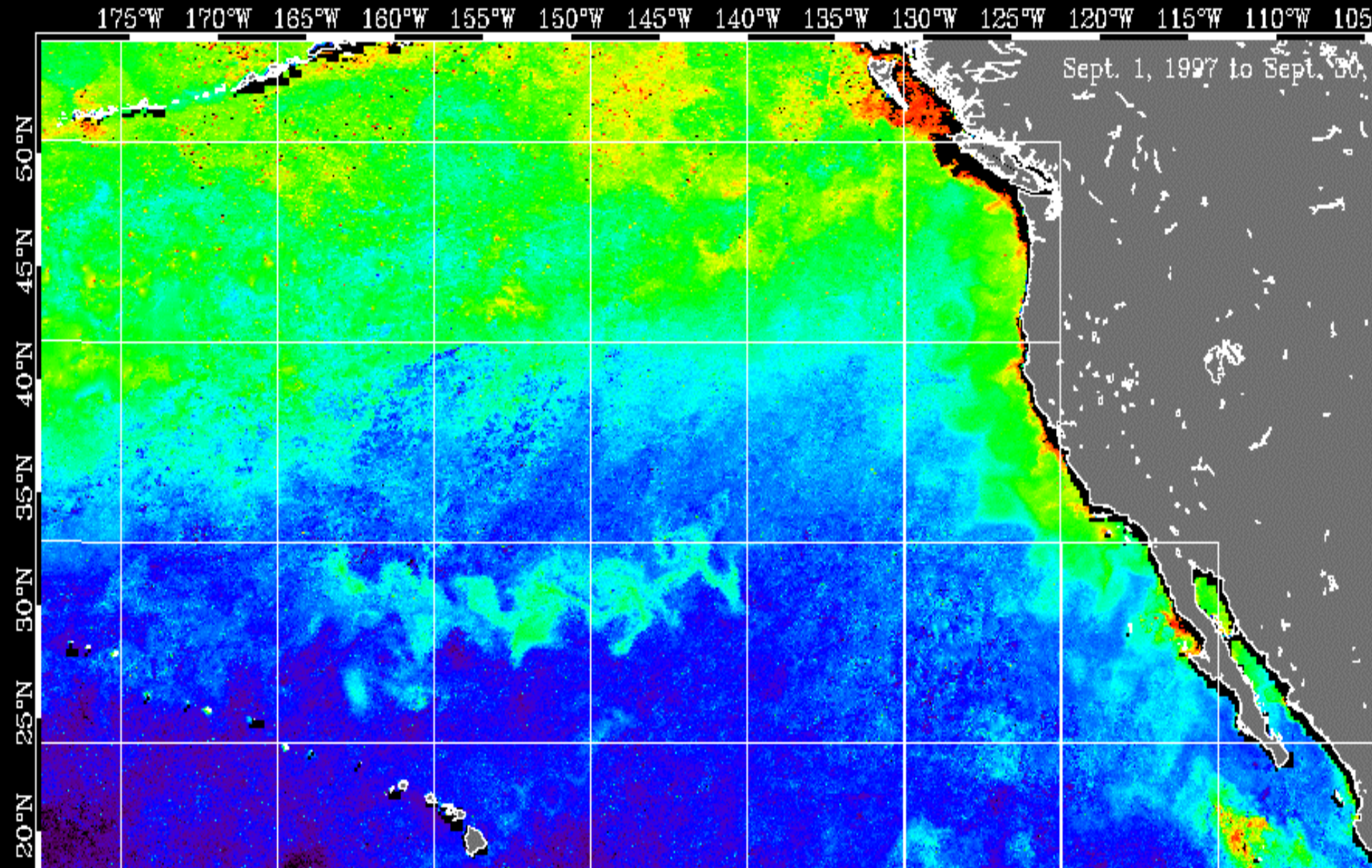
Etnoyer et al. 2004

Blue whale tracks courtesy of Bruce Mate, OSU



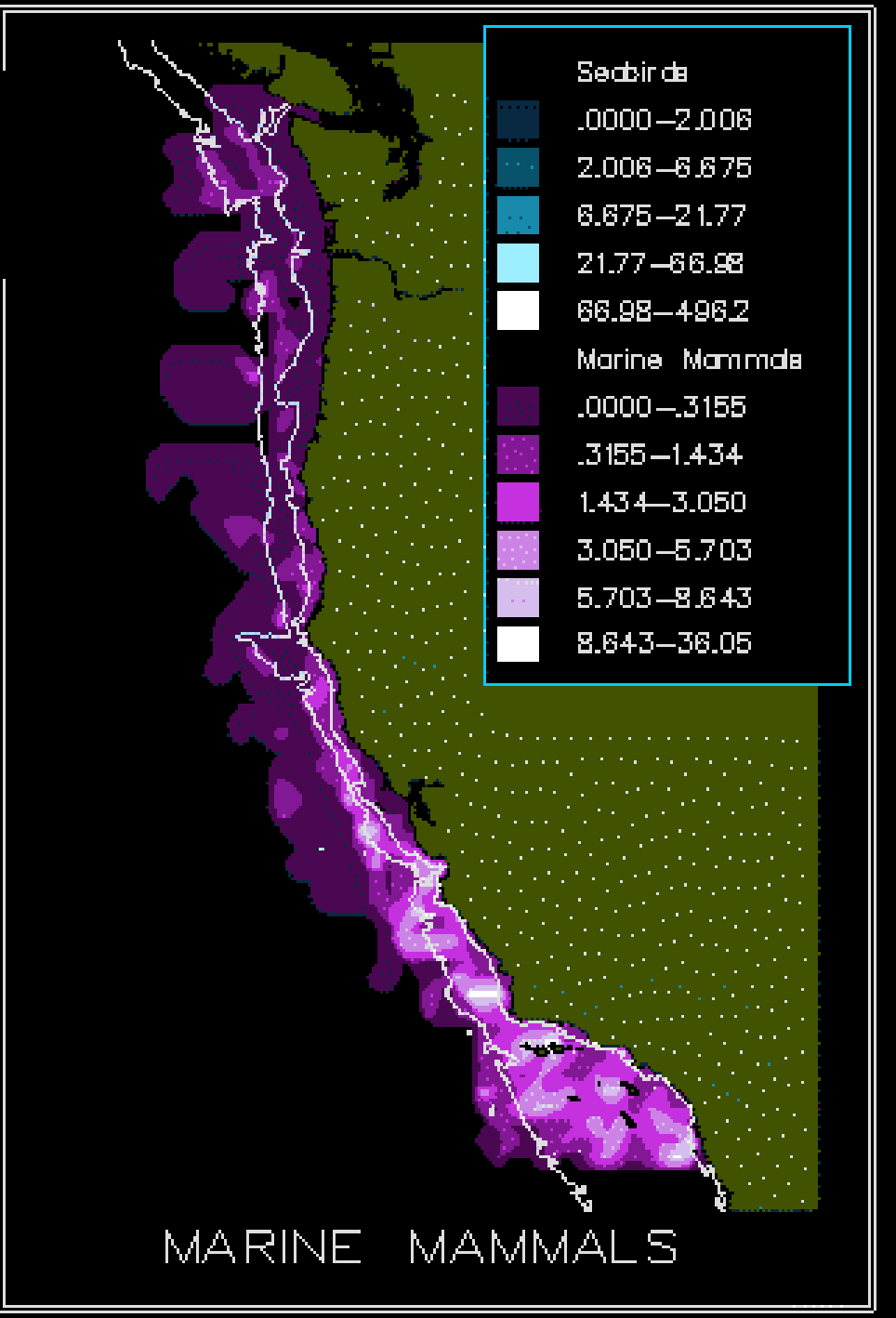

May 2002

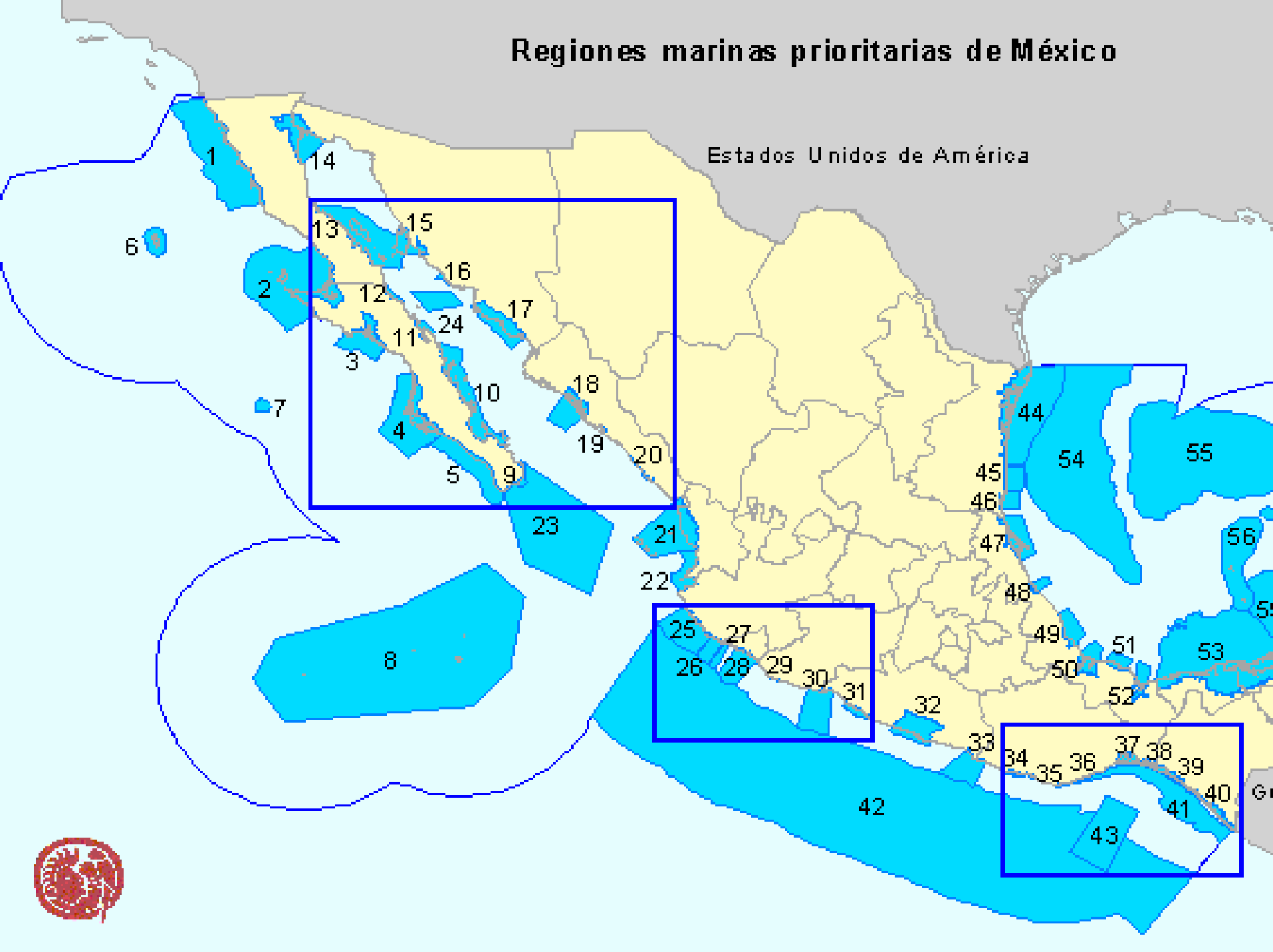
Analyses courtesy of Chuanmin Hu and Frank Muller-Karger, University of South Florida



Biological Hotspots

Courtesy of Glenn Ford, Ecological Consulting, Inc. Portland, Oregon




Regiones marinas prioritarias de México
Estados Unidos de América
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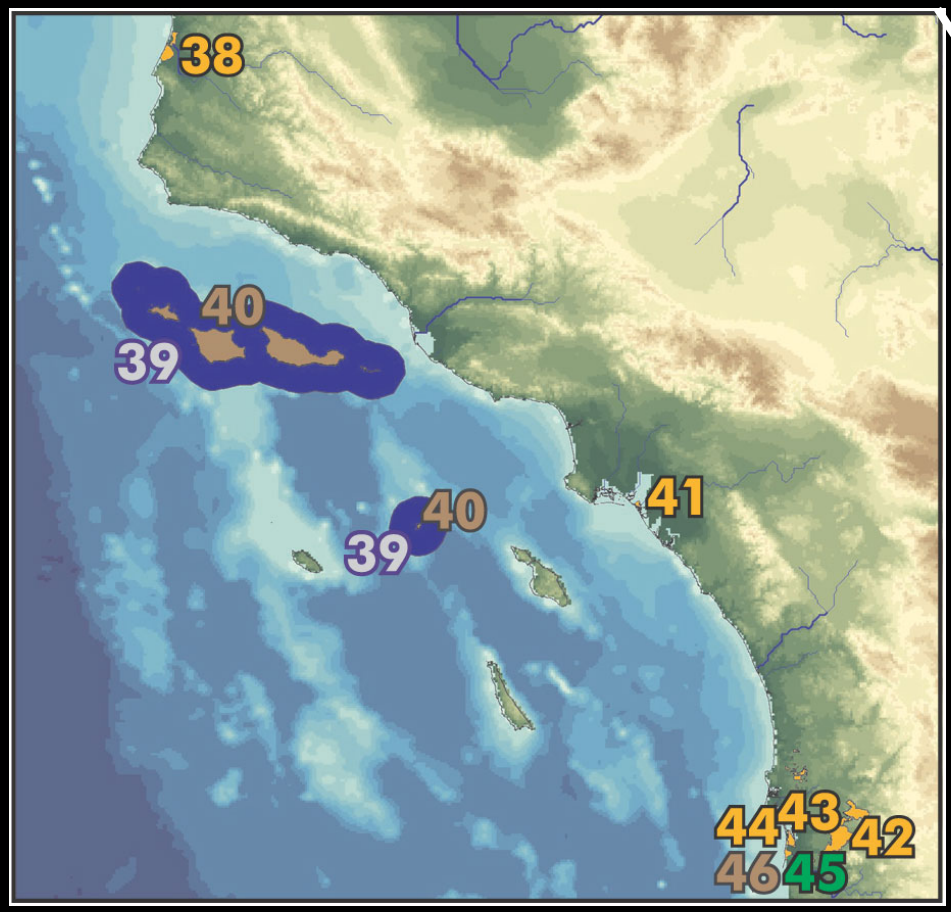
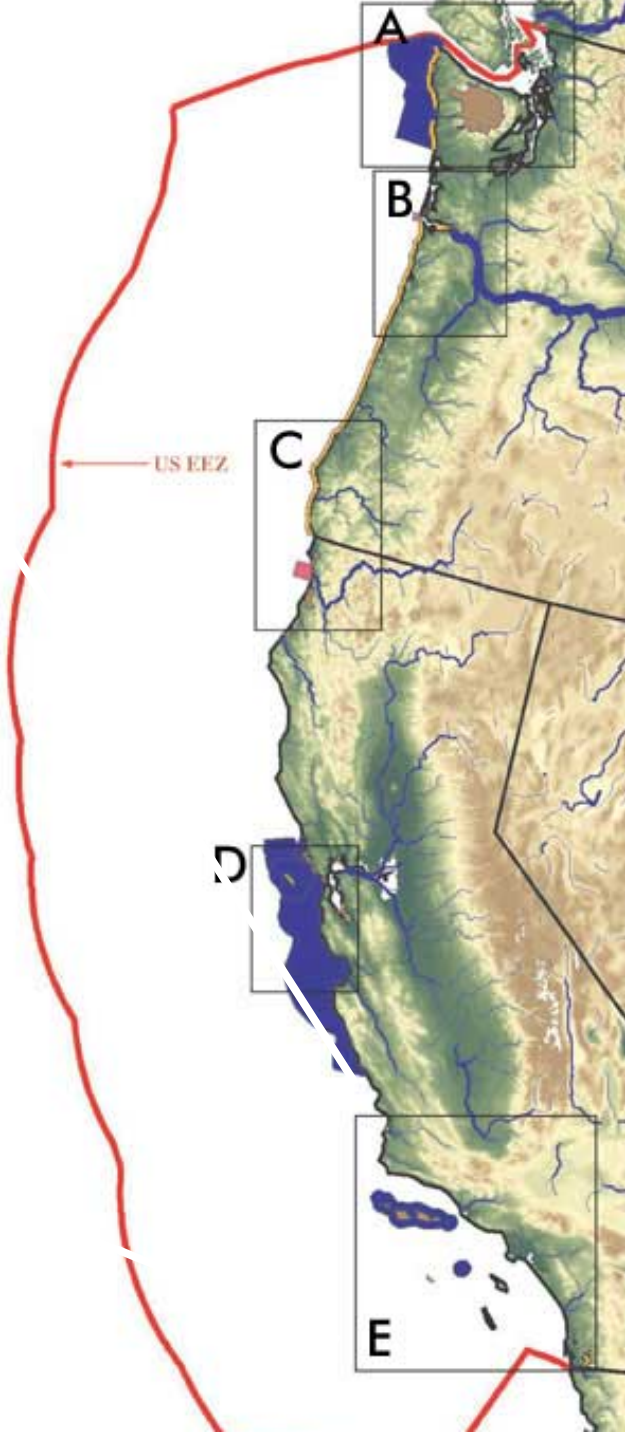
West Coast US MPAs



Southern California Bight



Consensus Mapper – computers networked with GIS software

Experts

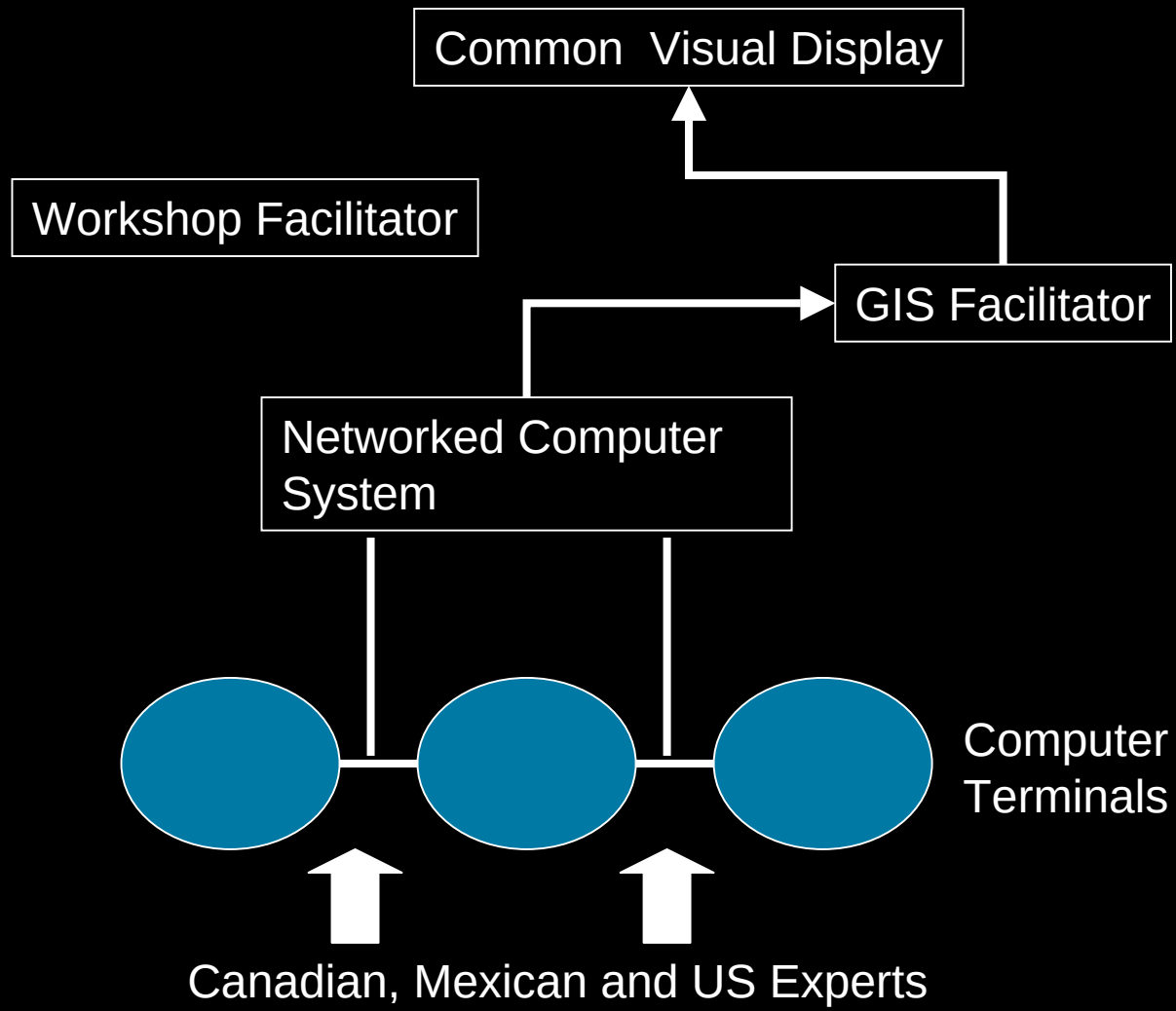
Computer Network

GIS software

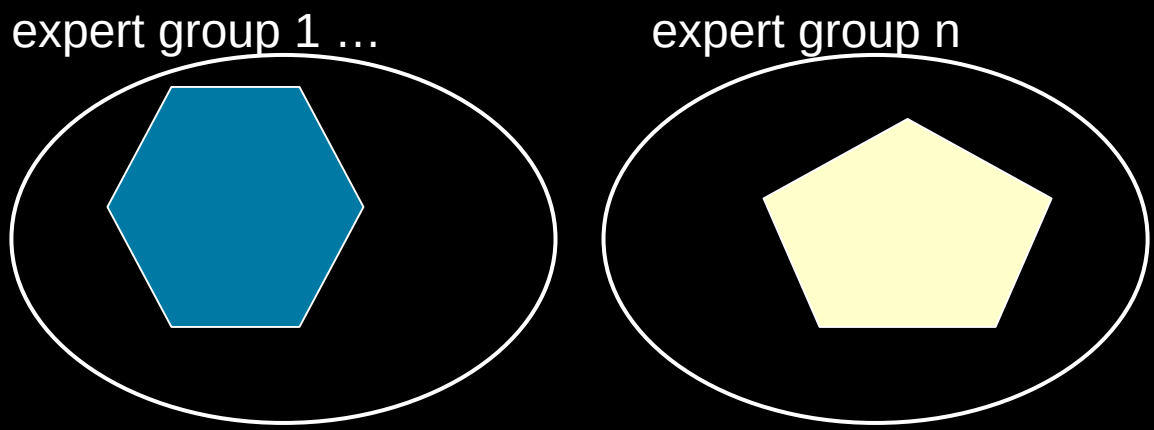
GIS facilitator

Workshop facilitator

Common Display

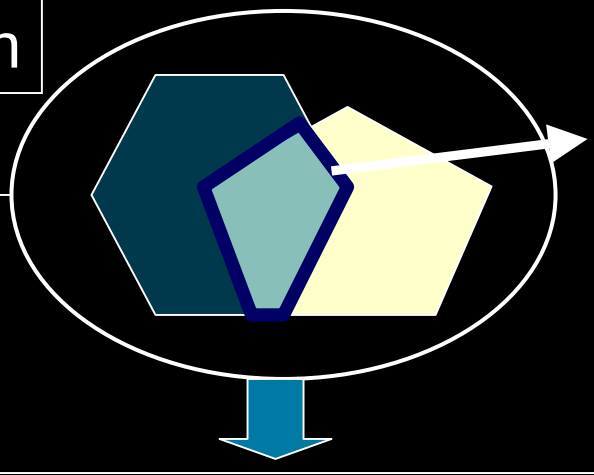


Consensus Mapper Process



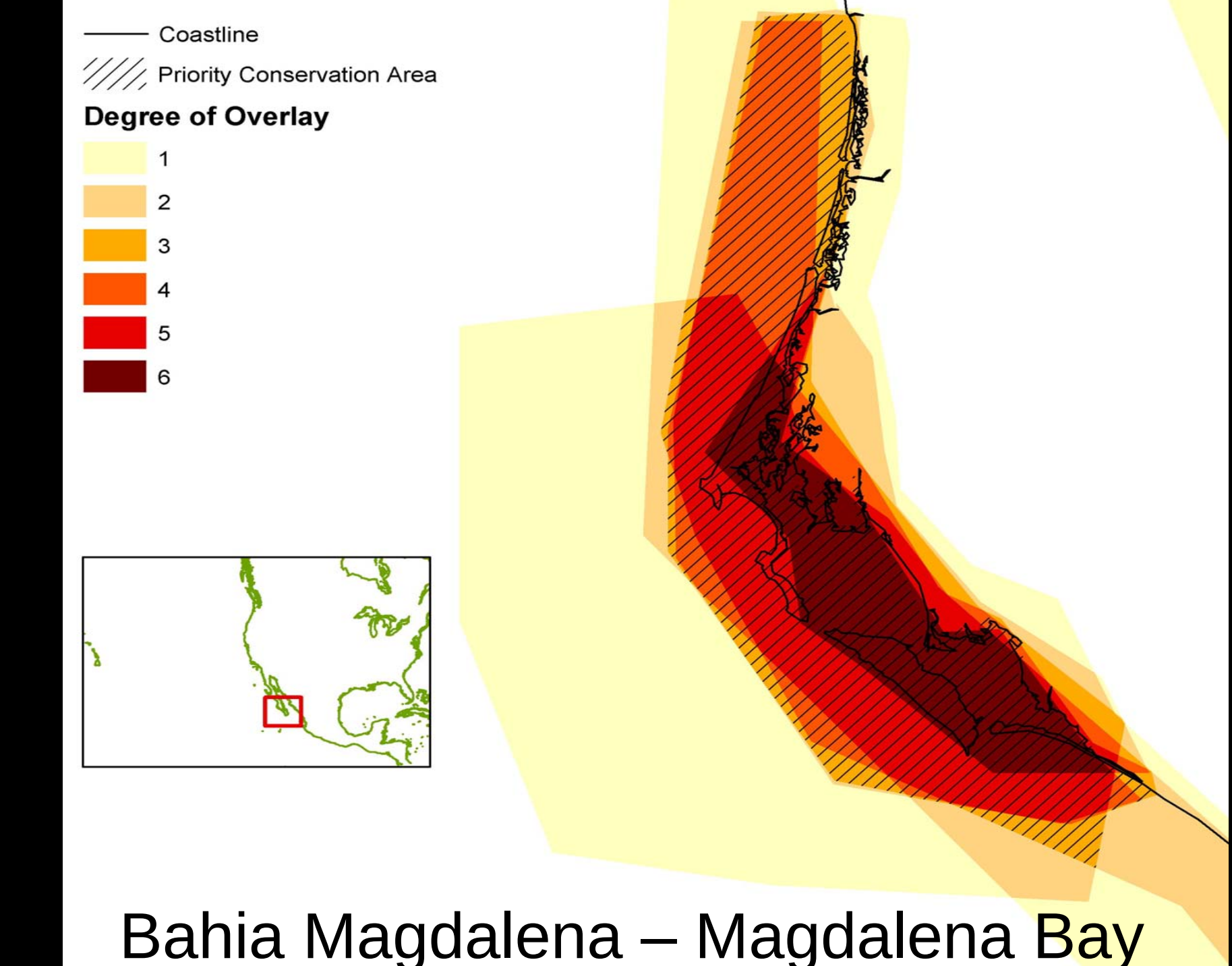
Priority areas chosen by experts

GIS map intersection



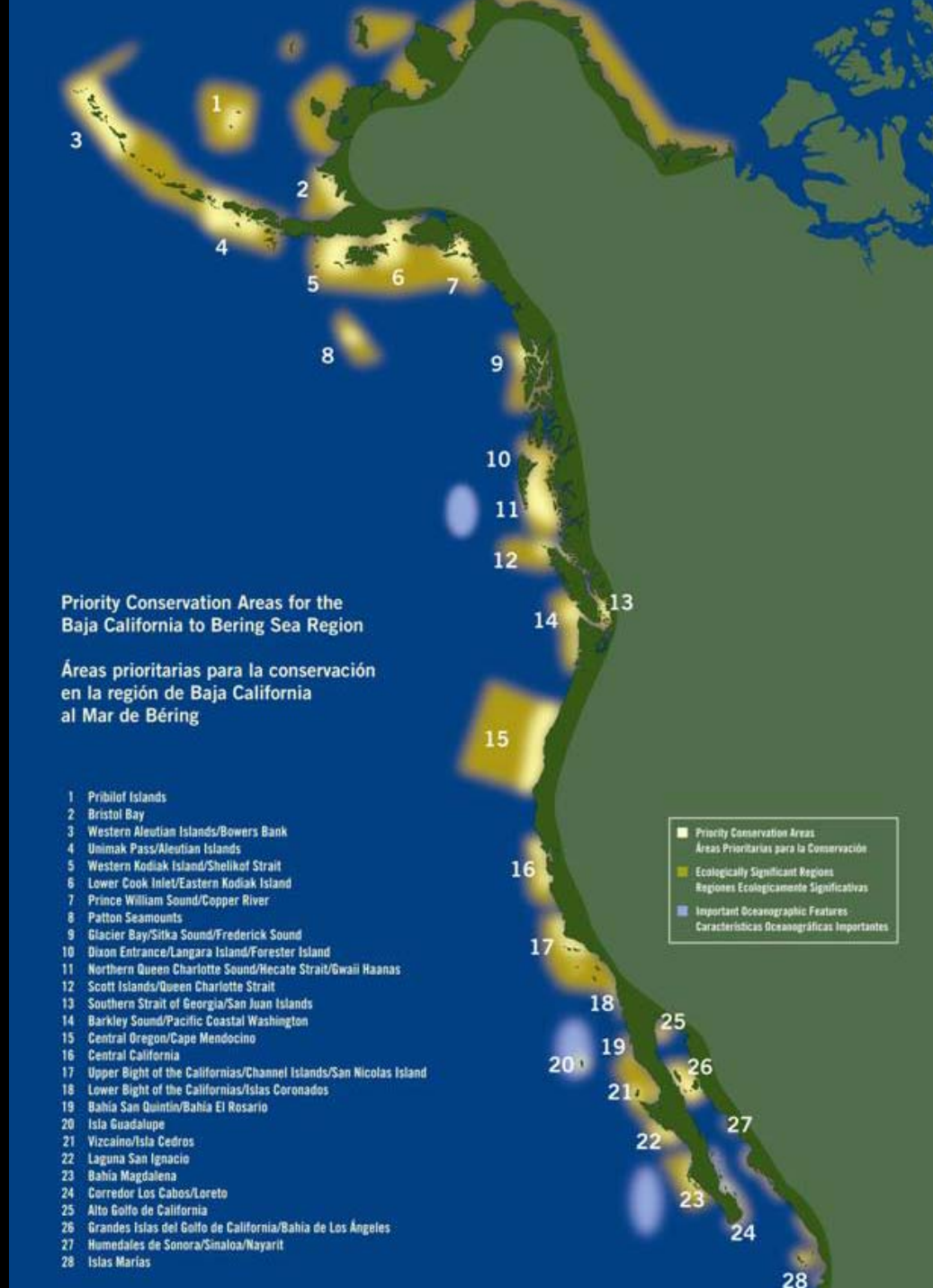
Common area of agreement to initiate discussion

Discussion and verification

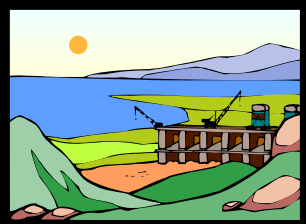


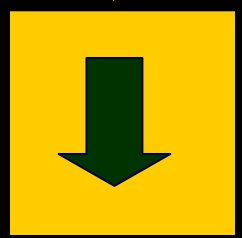
Bahia Magdalena – Magdalena Bay

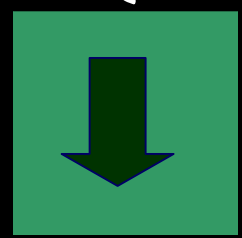
Priority Conservation Areas as identified by experts and adopted by the CEC Council

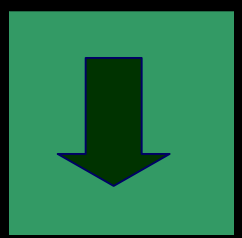


PCA 3. Western Aleutians

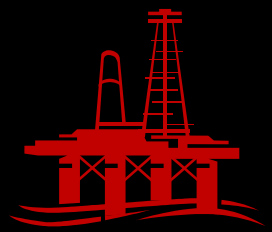


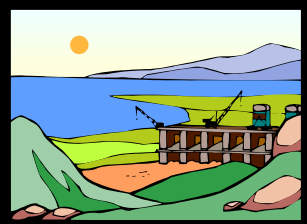


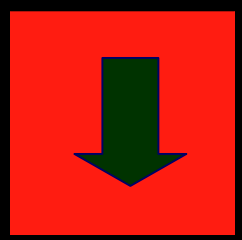


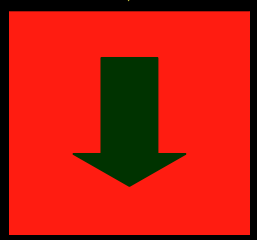


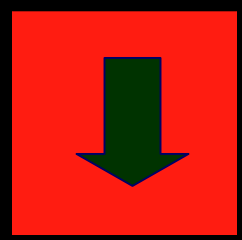
PCA 7. Prince William Sound

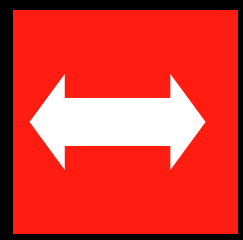


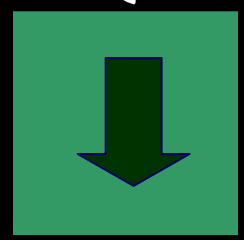


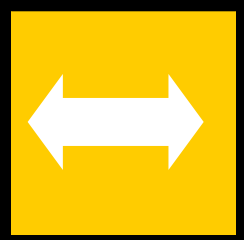




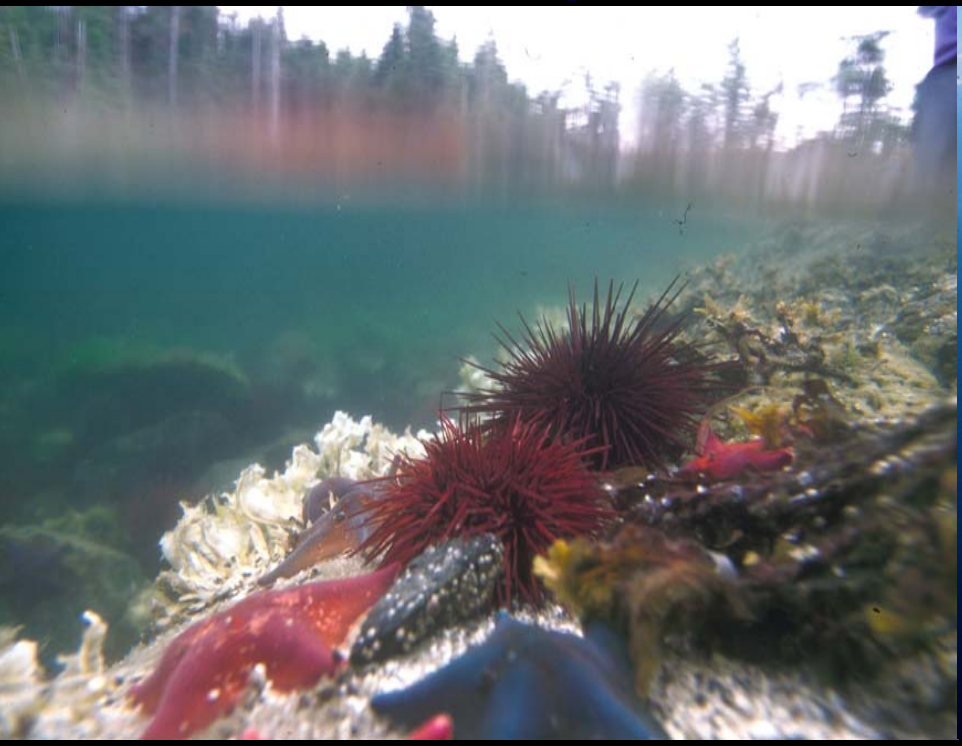


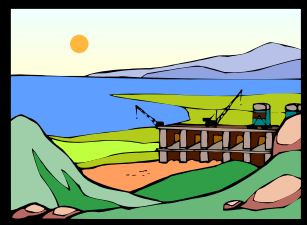




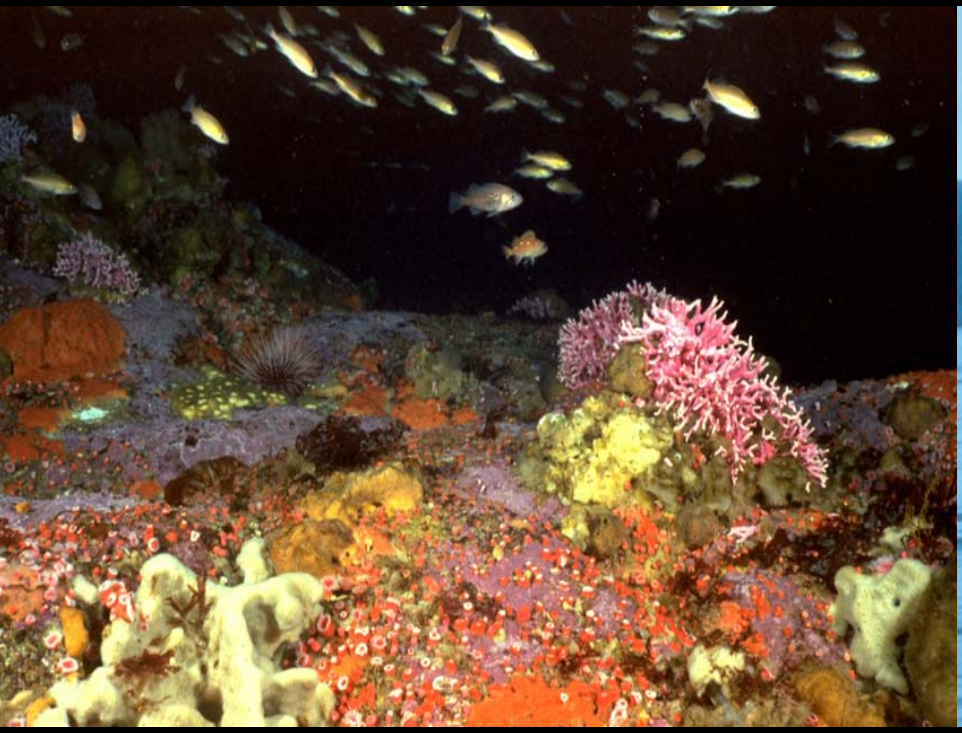


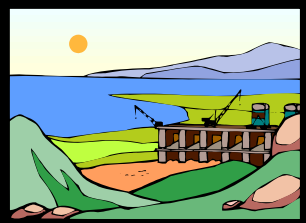
PCA 11. QCI /Hecate St./ Gwaii Hanas

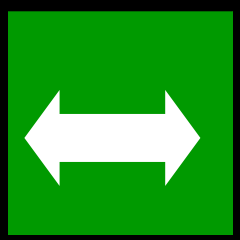


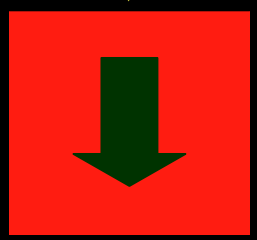


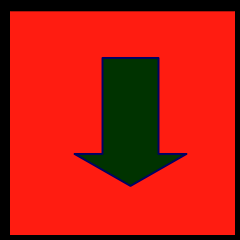
PCA 16. Central California

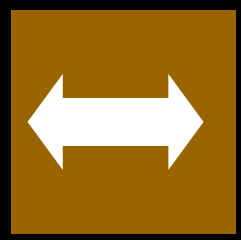


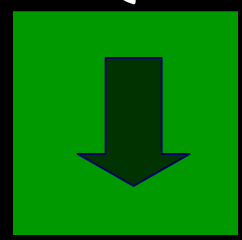


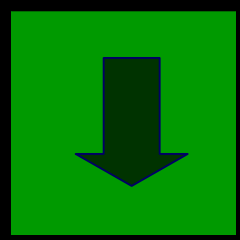




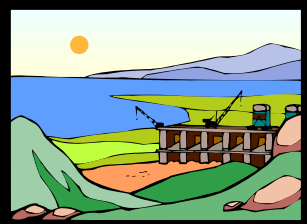


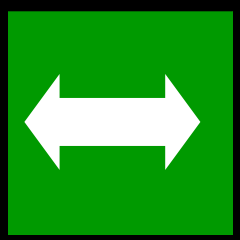


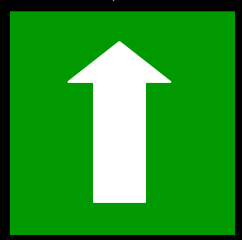


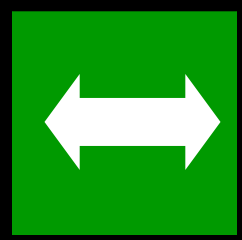


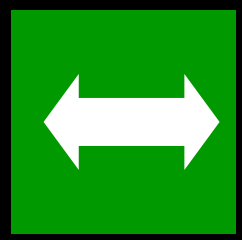
PCA 20. Guadalupe Island

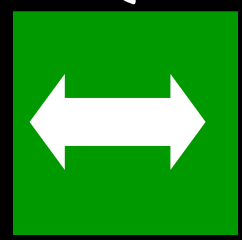


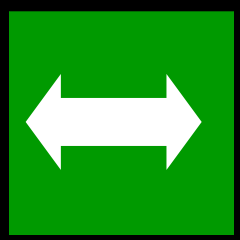




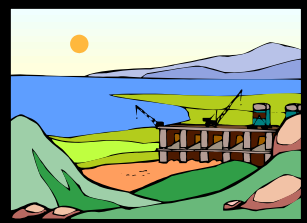


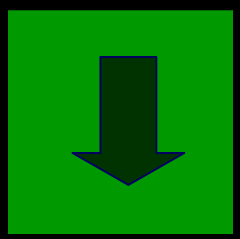


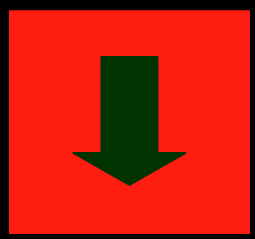


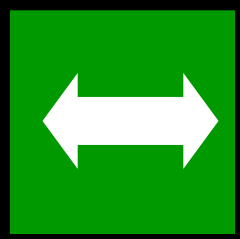


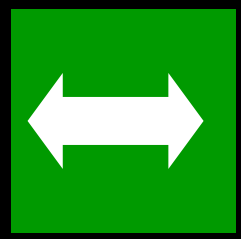
PCA 24. Corredor Los Cabos/ Loreto

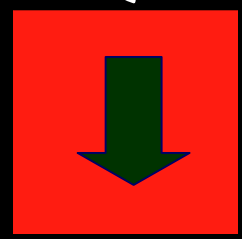


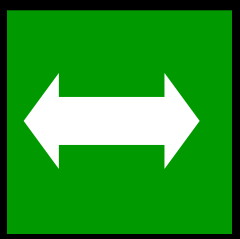












Priority Conservation Areas: The Challenge Ahead

NAMPAN pilot will focus the cooperation of the 3 countries on achievable and necessary actions. The process to narrow the focus and determine priorities and sites will be:

1) product driven,
2) relevant to all three countries,
3) applicable beyond B2B region,
4) builds on existing efforts/ projects, and
5) will benefit from the involvement of the CEC

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Thank you - Mahalo