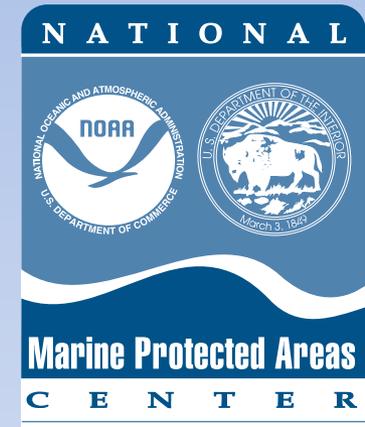


Ocean Uses Atlas:

Informing Comprehensive Coastal and Marine Spatial Planning

NOAA National Marine Protected Areas Center

Charles Wahle
Mimi D'lorio
Nicholas Hayden
Jordan Gass
Cheryl Butner



Marine Conservation Biology Institute

Lance Morgan
John Guinotte
Fan Tsao
Larissa Sano



Northeast CZMA Virtual Meeting
Dec. 1, 2009

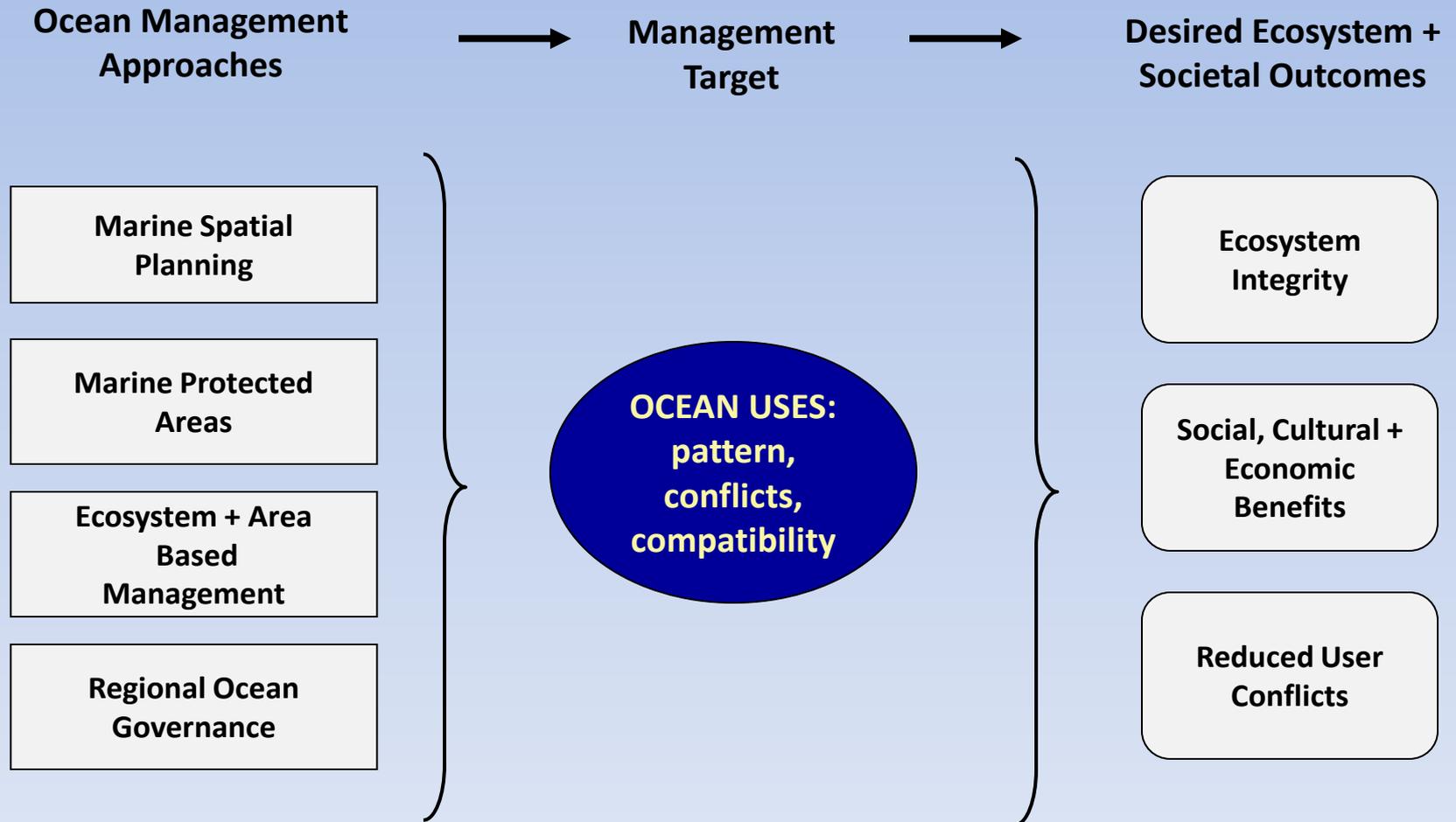
Oceans Are Becoming Crowded Places: *Fishing Uses*



Oceans Are Becoming Crowded Places: *Non-Consumptive Uses*

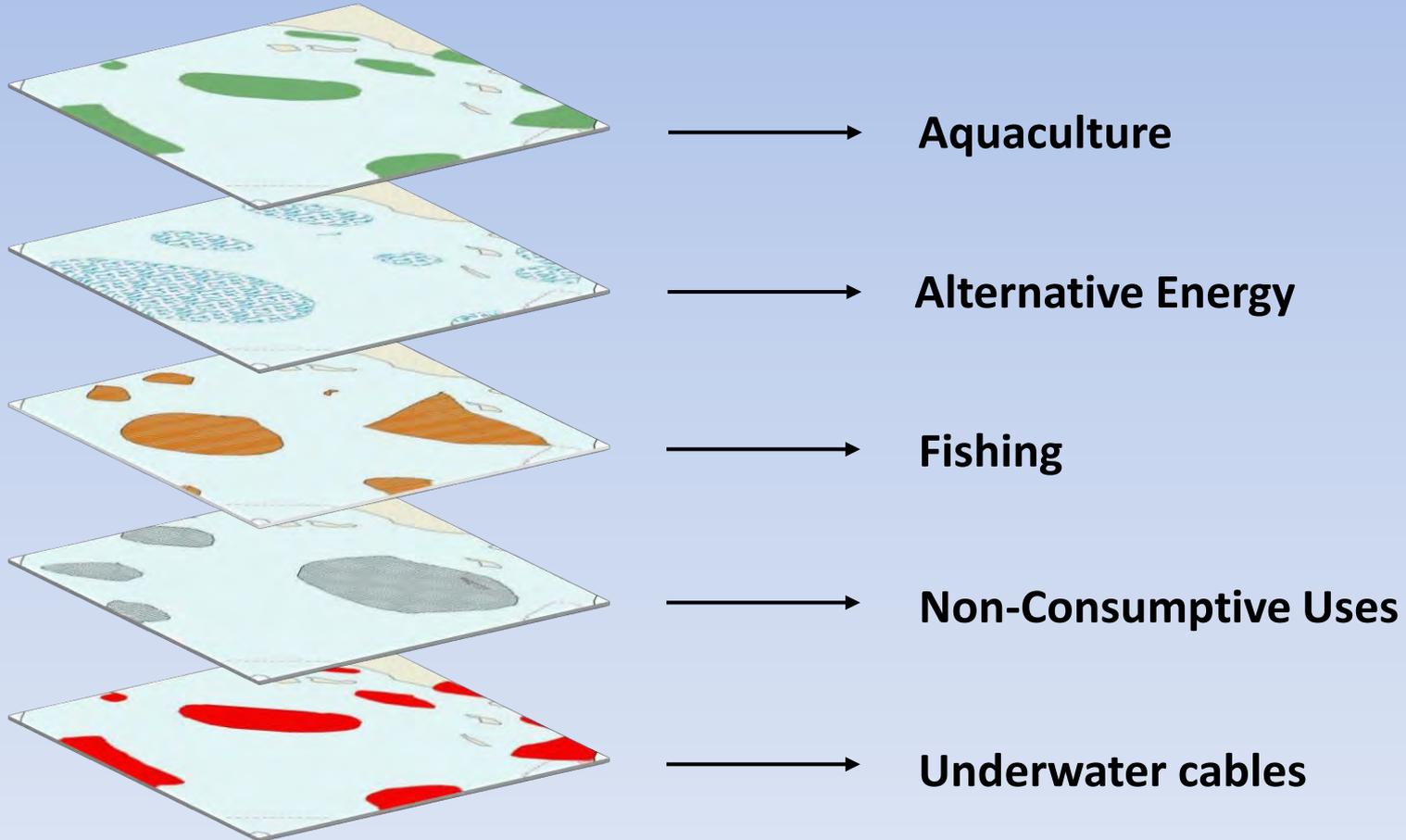


CMSP is Comprehensive and Requires Planning for All Ocean Uses



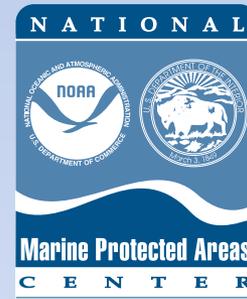
The Missing Puzzle Piece of CMSP:

Comprehensive, Continuous and Consistent Spatial Data on Current and Planned Ocean Uses



Filling the CMSP Knowledge Gap: The California Ocean Uses Atlas

- **Purpose** – to enhance California’s ocean management and CMSP by filling key data gap on the full range of human uses
- **Approach** – participatory GIS mapping of 30 ocean uses in 3 sectors by regional ocean experts
- **Partners** –
 - NOAA Marine Protected Areas Center
 - Marine Conservation Biology Institute
 - *Gordon and Betty Moore Foundation*
 - *Resources Legacy Fund Foundation*
- **Status** – All regions mapped; data being packaged for distribution
- **Timeline** – Jan 2008 – Nov 2009



30 Significant Human Uses Mapped by the CA Ocean Uses Atlas Project

Industrial and Military (8)

Offshore oil and gas
Offshore alternative energy
Mining + mineral extraction
Underwater cables
Maritime shipping
Cruise ships
Military operations
Aquaculture

Fishing (12)

Recreational pelagic fishing from boats
Recreational benthic fishing from boats
Recreational fishing from shore
Recreational dive fishing
Kayak fishing
Commercial pelagic fishing
Commercial fishing w/ benthic fixed gear
Commercial fishing w/ benthic mobile gear
Commercial dive fishing
Hunting
Commercial algae harvesting
Shore-based recreational harvest

Non-Consumptive (10)

Swimming
Surface water sports
Paddling
SCUBA and snorkeling
Motorized boating
Sailing
Tide pooling
Beach use
Wildlife viewing from charter boats
Tribal spiritual/cultural places

Workshop Design and Technology

Process

Participants in **3-4 balanced groups based on expertise**

Groups are paired with a **facilitator and GIS specialist**

Provided **orientation to technology, basemap**



Software

ESRI ArcGIS 9.2

ESRI ArcSketch 1.2 Extension

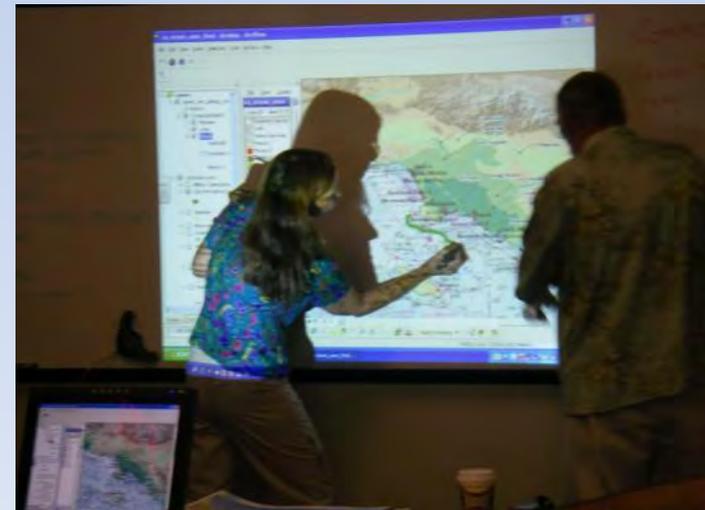
Hardware

E-Beam Electronic Whiteboard

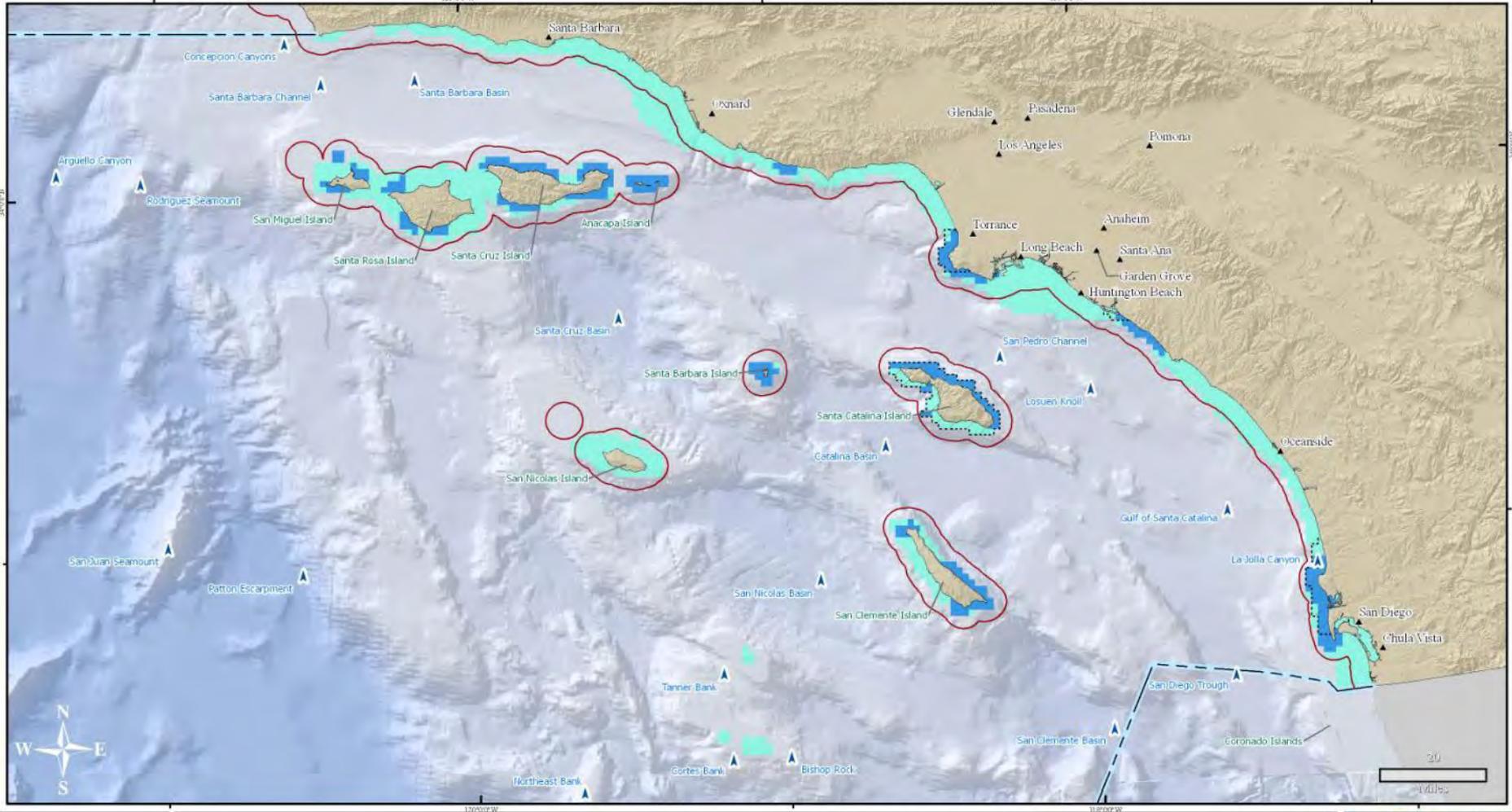
Symposium Digital Tablet

Data

Basemap – bathymetry, cities, coastal access points, underwater features, kelp, shipwrecks, etc.



Sample Product: Single Use, SoCal Region



- ▲ Major Cities
- ▲ Submerged Features
- State Waters
- Atlas Southern California Region
- Workshop Collected Data**
- Dominant Use Area
- Use Footprint
- Future Use Area

All workshop collected data gathered in a participatory GIS setting with regional expert input. Visit <http://mapca.org> for project methodology, GIS data, map products, and metadata.

Ocean Uses Atlas: Southern California Region

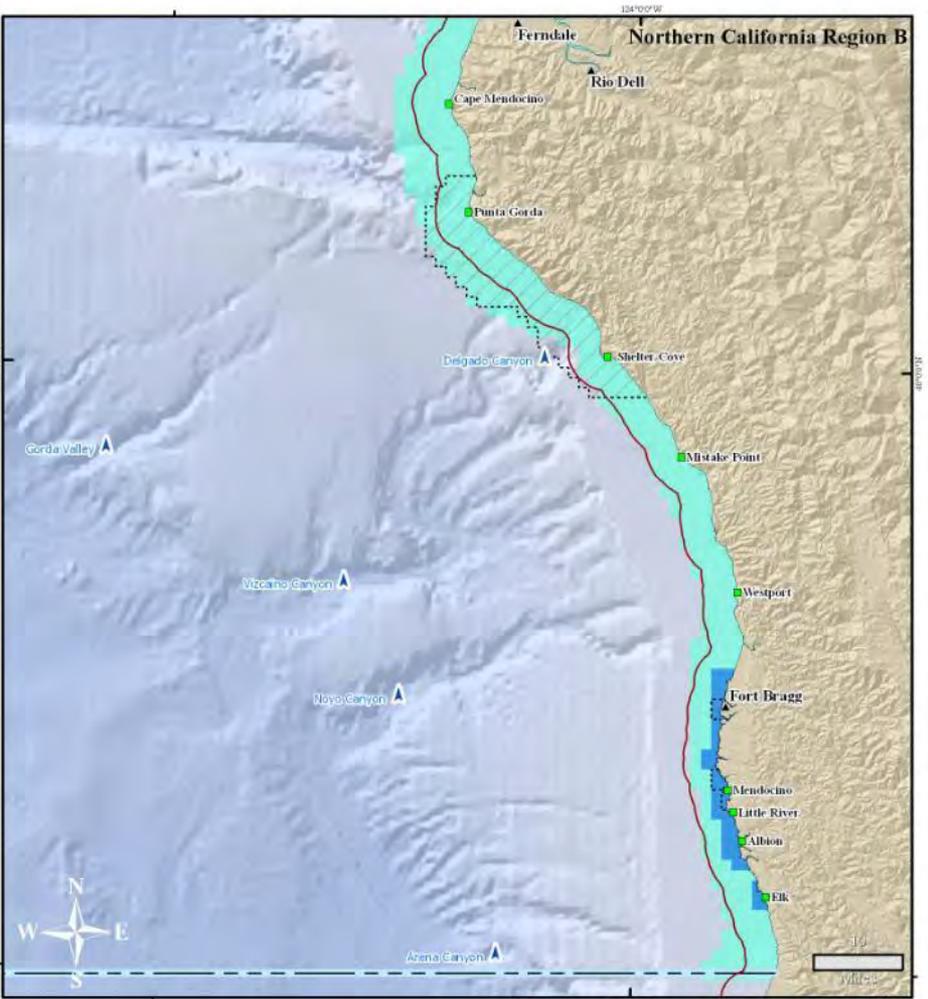
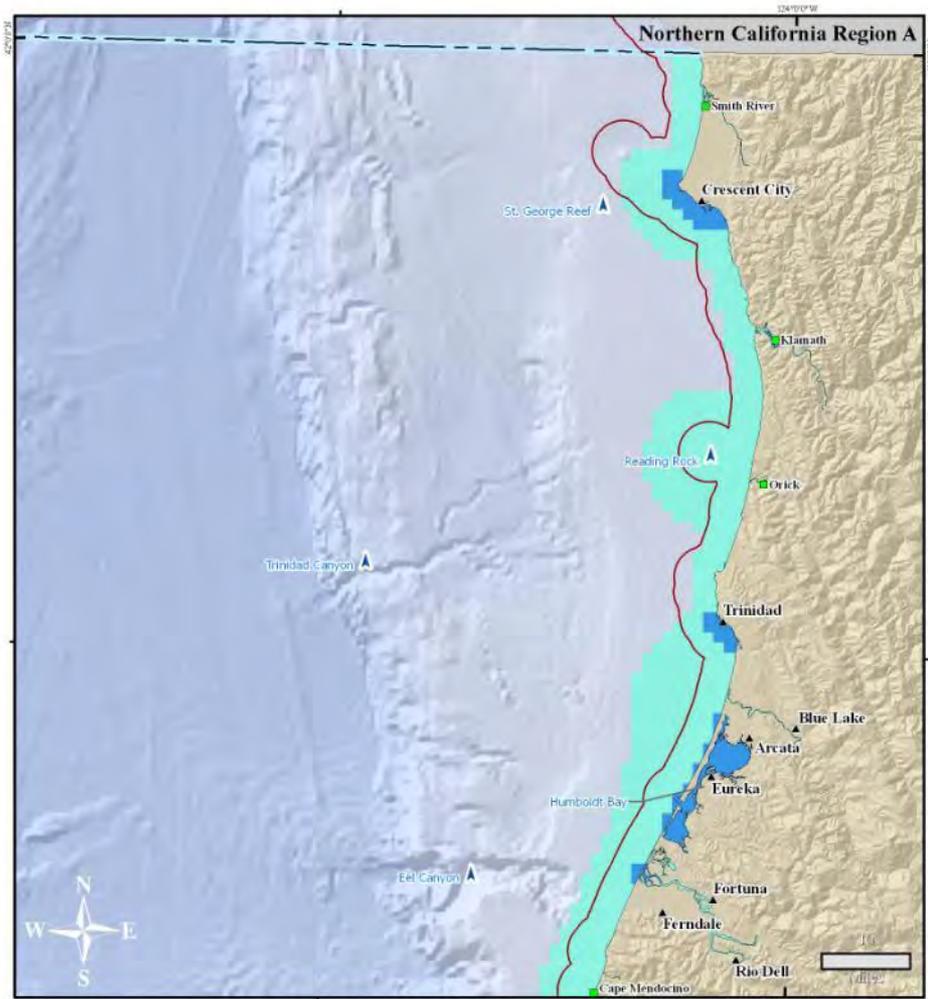
SCUBA / Snorkeling

October 2009

Draft mapping product for the California Ocean Uses Atlas Project. With funding provided by The Gordon and Betty Moore Foundation, The Resources Legacy Fund Foundation and NOAA's National MPA Center.



Sample Product: Single Use, Zoomed In



- Other Landmarks
- ▲ Cities
- ▲ Submerged Features
- State Waters
- Atlas Northern California Region
- Workshop Collected Data**
- Dominant Use Area
- Use Footprint
- Future Use Area

All workshop collected data gathered in a participatory GIS setting with regional expert input. Visit <http://maps.gov> for project methodology, GIS data, map products, and metadata.



Ocean Uses Atlas: Northern California Region
Paddling

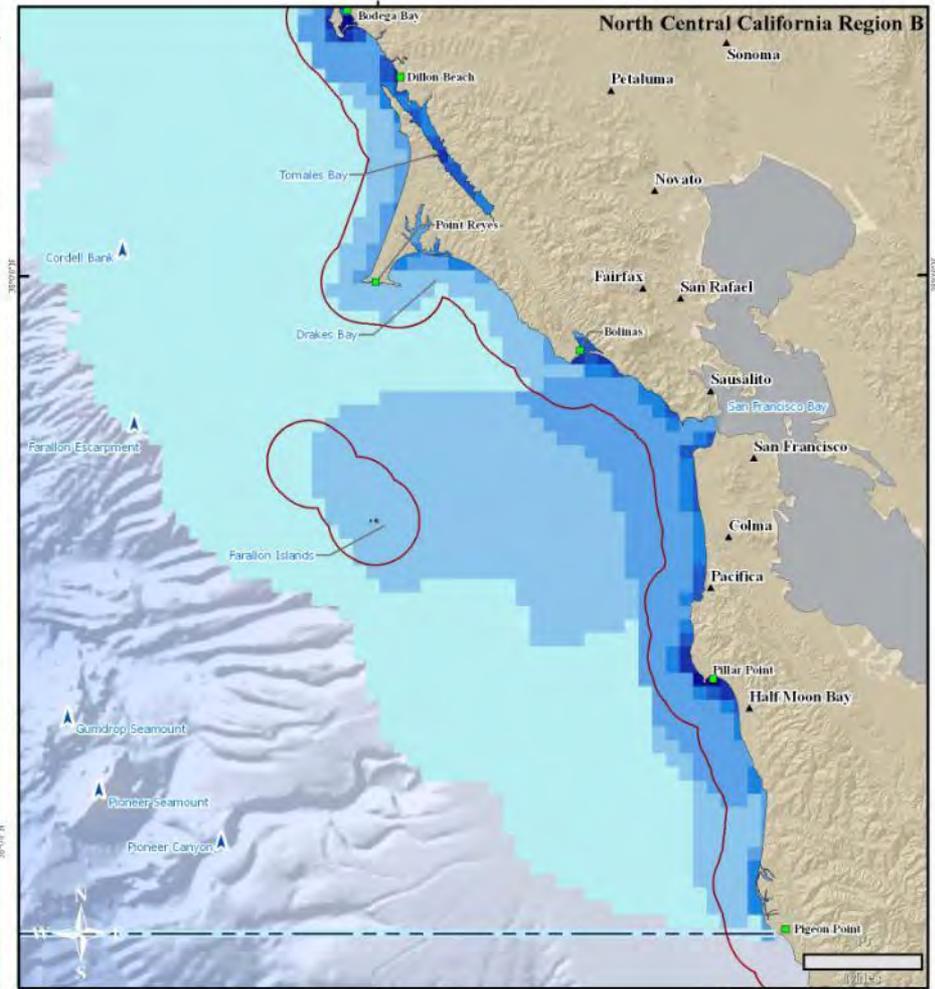
October 2009



Draft mapping product for the California Ocean Uses Atlas Project. With funding provided by The Gordon and Betty Moore Foundation, The Resources Legacy Fund Foundation and NOAA's National MPA Center.



Sample Product: Aggregated Sector, Zoomed In



- Other Landmarks
- ▲ Cities
- ▲ Submerged Features
- State Waters
- Atlas North Central California Region
- Dominant Use Areas - Non-consumptive

All workshop collected data gathered in a participatory GIS setting with regional expert input. Visit <http://maps.gov> for project methodology, GIS data, map products, and metadata.



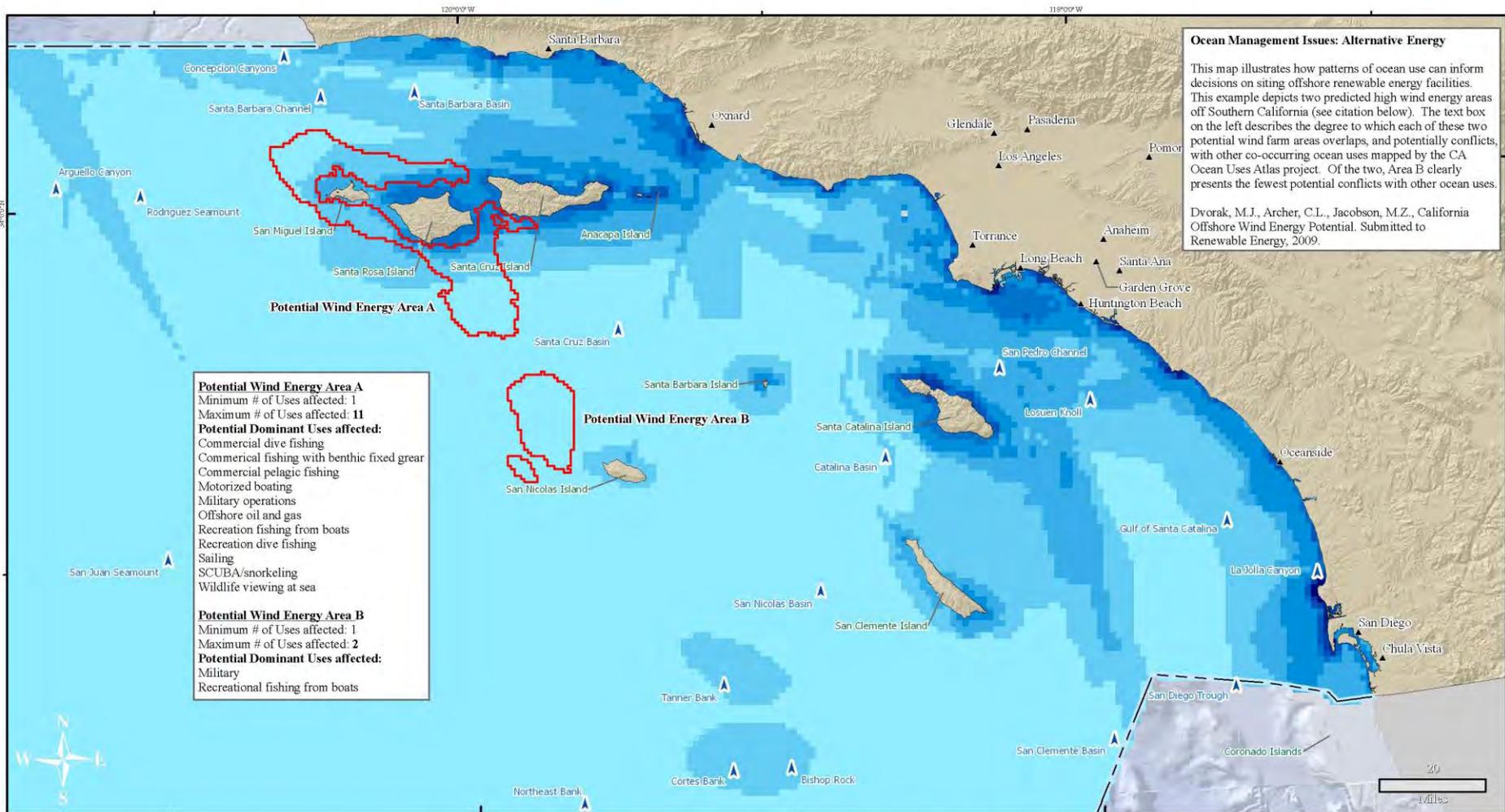
Ocean Uses Atlas: North Central California Region
Dominant Use Areas: Non-Consumptive Sector



Drift mapping product for the California Ocean Use Atlas Project. With funding provided by The Gordon and Betty Moore Foundation, The Resources Legacy Fund Foundation and NOAA's National MPA Center.



Sample Product: Alternative Energy Siting



Ocean Management Issues: Alternative Energy

This map illustrates how patterns of ocean use can inform decisions on siting offshore renewable energy facilities. This example depicts two predicted high wind energy areas off Southern California (see citation below). The text box on the left describes the degree to which each of these two potential wind farm areas overlaps, and potentially conflicts, with other co-occurring ocean uses mapped by the CA Ocean Uses Atlas project. Of the two, Area B clearly presents the fewest potential conflicts with other ocean uses.

Dvorak, M.J., Archer, C.L., Jacobson, M.Z., California Offshore Wind Energy Potential. Submitted to Renewable Energy, 2009.

Potential Wind Energy Area A
 Minimum # of Uses affected: 1
 Maximum # of Uses affected: 11
Potential Dominant Uses affected:
 Commercial dive fishing
 Commercial fishing with benthic fixed gear
 Commercial pelagic fishing
 Motorized boating
 Military operations
 Offshore oil and gas
 Recreation fishing from boats
 Recreation dive fishing
 Sailing
 SCUBA/snorkeling
 Wildlife viewing at sea

Potential Wind Energy Area B
 Minimum # of Uses affected: 1
 Maximum # of Uses affected: 2
Potential Dominant Uses affected:
 Military
 Recreational fishing from boats

- ▲ Major Cities
- ▲ Submerged Features
- Atlas Southern California Region
- # Overlapping Dominant Uses

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

All workshop collected data gathered in a participatory GIS siting with regional expert input. Visit <http://maps.gov> for project methodology, GIS data, map products, and metadata.

Ocean Uses Atlas: Southern California Region Ocean Management Issues: Alt. Energy Siting

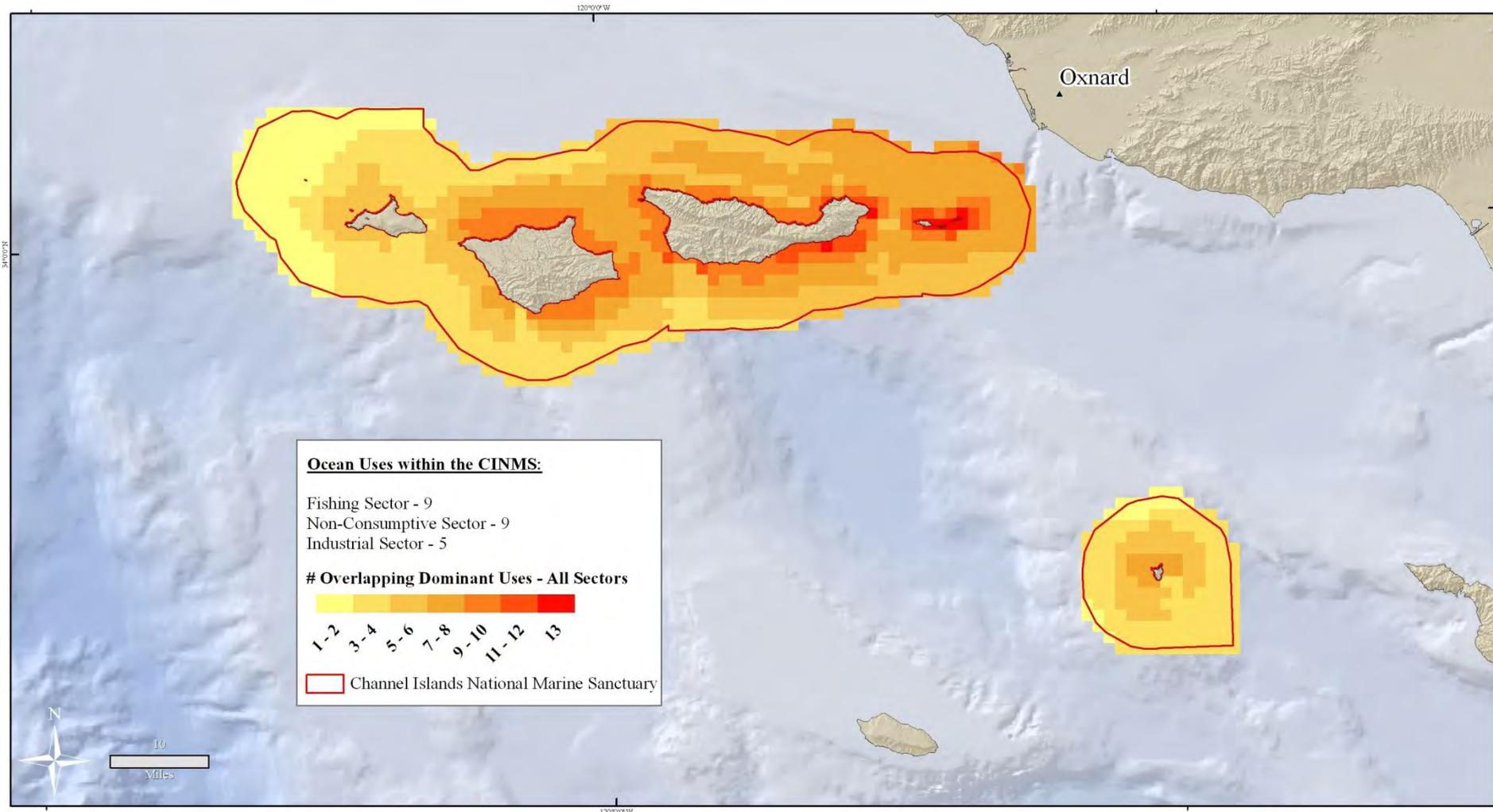
DRAFT
 August 2009



Draft mapping product for the California Ocean Uses Atlas Project. With funding provided by The Gordon and Betty Moore Foundation, The Resources Legacy Fund Foundation and NOAA's National MPA Center.



Sample Product: Overlapping Uses in Channel Islands NMS



Nice Maps, But What Are They Good For?

- **CMSP:** ID areas of potential conflict or compatibility among uses (e.g. Rigs to Reefs)
- **MPA Design and Adptv. Mgmnt.:** siting and restrictions addressing key threats tracked over time (e.g. CA MLPA)
- **Offshore Energy / Aquaculture:** Streamline infrastructure by targeting areas with compatible ocean uses (e.g. current project proposals)
- **Emergency Response:** planning for threats to human uses (e.g. NH/So. Maine)
- **Prioritizing Education, Research and Monitoring** ID key uses and threats and target relevant local user groups and demographics
- **Strategic Conservation Targets:** ID important ocean areas that could be conserved w/out major stakeholder impacts
- **Coastal Economic Development:** ID opportunities for developing coastal economies and infrastructure to support ocean uses

Next Steps for the Ocean Uses Atlas

- CA maps and products disseminated
- Expand to other regions:
 - NH and Southern Maine
 - American Samoa
 - Others as resources allow
- Web site
- Web-based mapping tools
- Syntheses of existing ocean uses data

Contact Information

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