

# Open OceanMap and MarineMap: Decision Support Tools to Better Understand and Facilitate MPA Planning

Charles Steinback, Ecotrust

Start Where You Are: Building Marine Protected Area Networks

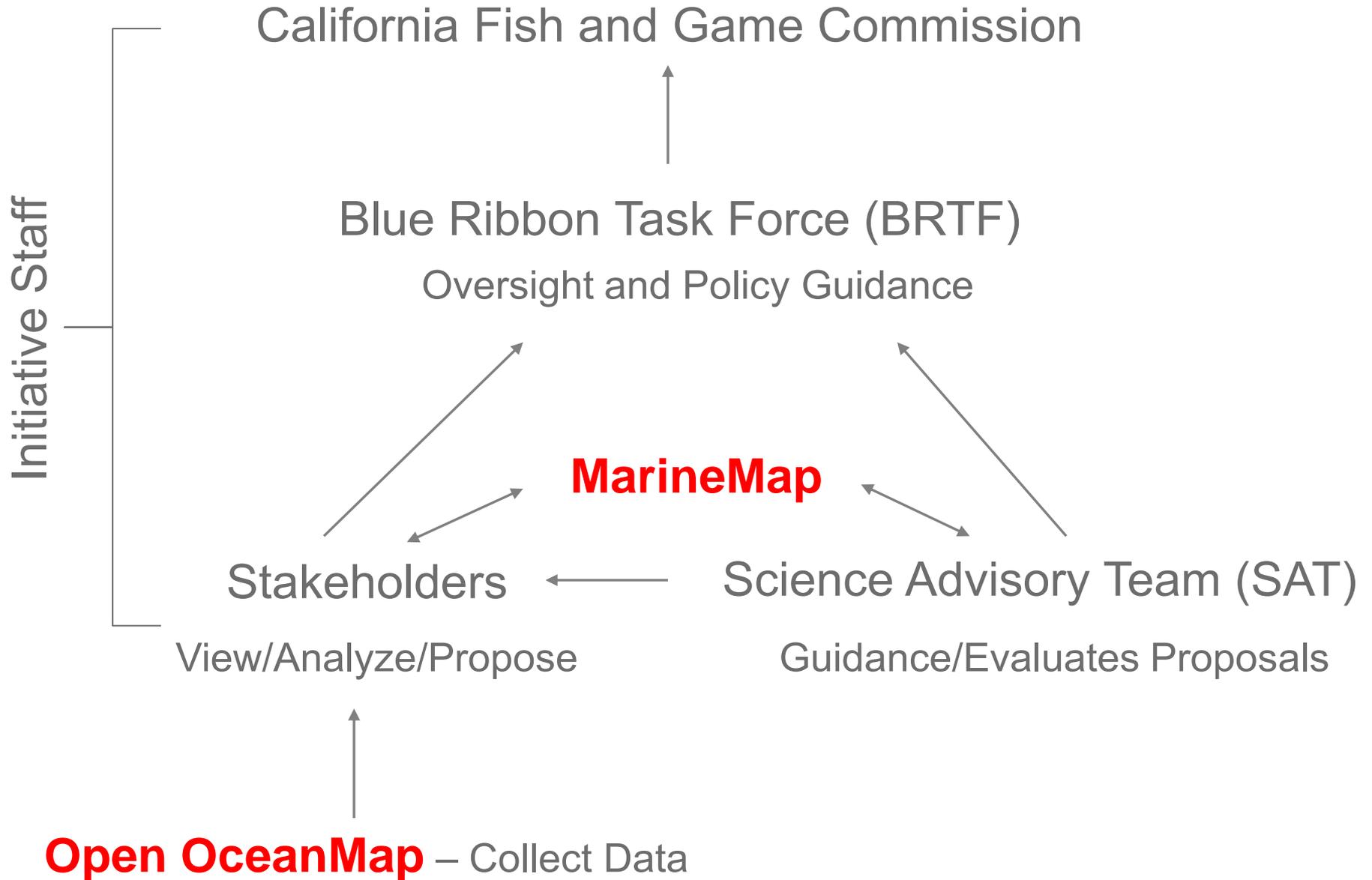
June 22, 2010 - Tiburon, CA

# Outline

- California's Marine Life Protection Act
  - Project background and context
- Open OceanMap
  - Addressing the human dimensions of marine protected area planning
- MarineMap
  - Facilitate a participatory and collaborative marine protected area planning design process

# Marine Life Protection Act

- California's MLPA mandates the establishment of a managed network of marine protected areas (MPAs) to:
  - Protect marine life, habitat, ecosystems, and natural heritage
  - Improve recreational, educational, and study opportunities provided by marine ecosystems
  - Must use best readily available science to guide decisions



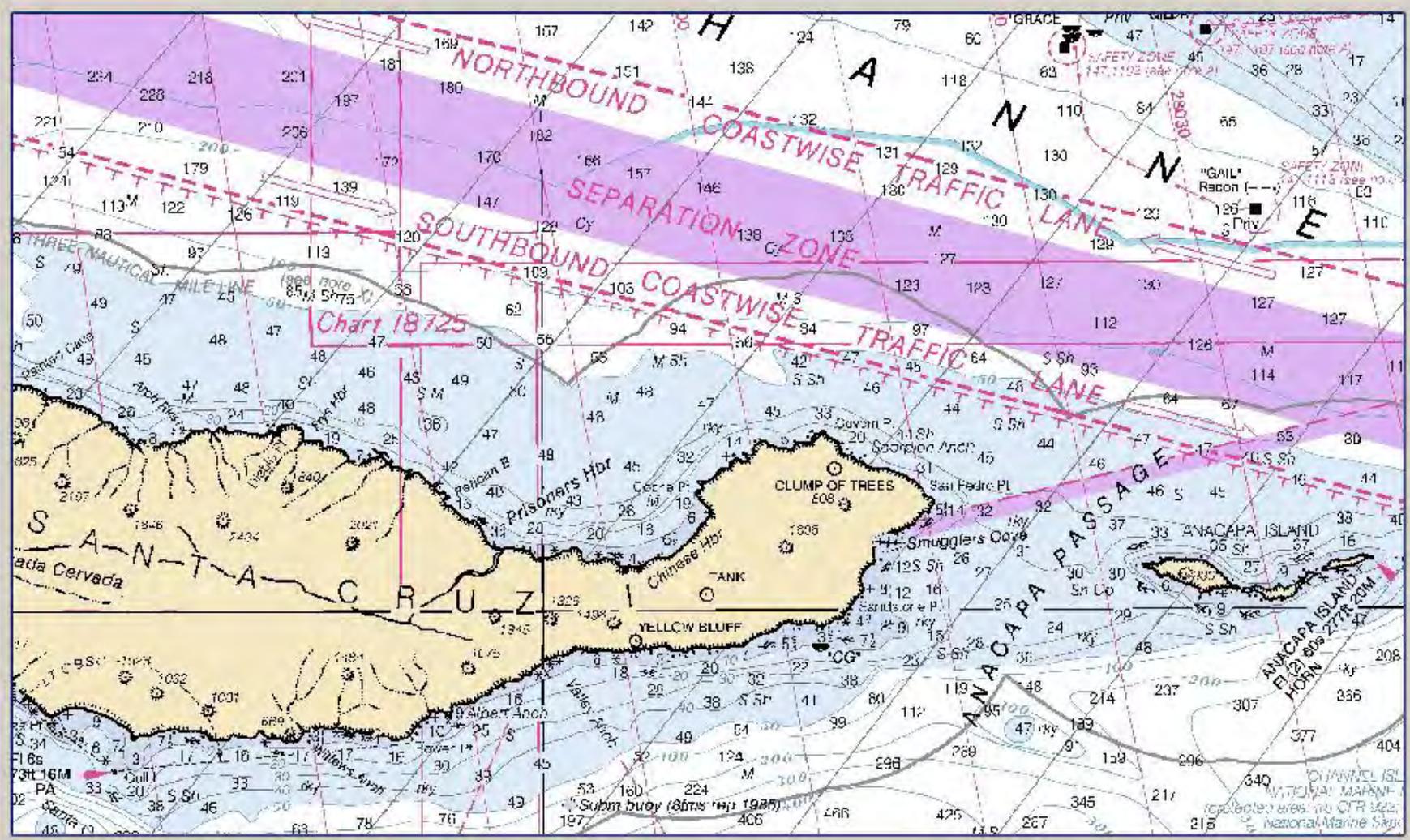
# Open OceanMap

- Developed and refined Open OceanMap through use in several projects.
  - West Coast California National Marine Sanctuaries (2003-2005)
  - Port Orford Ocean Resource Team (2005-07)
  - California's Marine Life Protection Act (2005 – present)
  - Loreto National Marine Park Region of Baja California (Mexico) (2008 – present) – Spanish version
  - Oregon's Territorial Sea Plan (2009 – present)
  - Massachusetts Ocean Partnership (2010)
  - St. Kitts and Nevis Marine Zoning (2010)

# Open OceanMap

- Data collection tool used to effectively collect local expert knowledge in support of marine spatial planning.
- Standardized survey procedures and methods for collecting and analyzing user generated data.
- Engages local stakeholders about the value they place on specific areas of the ocean and how it relates to marine spatial planning.



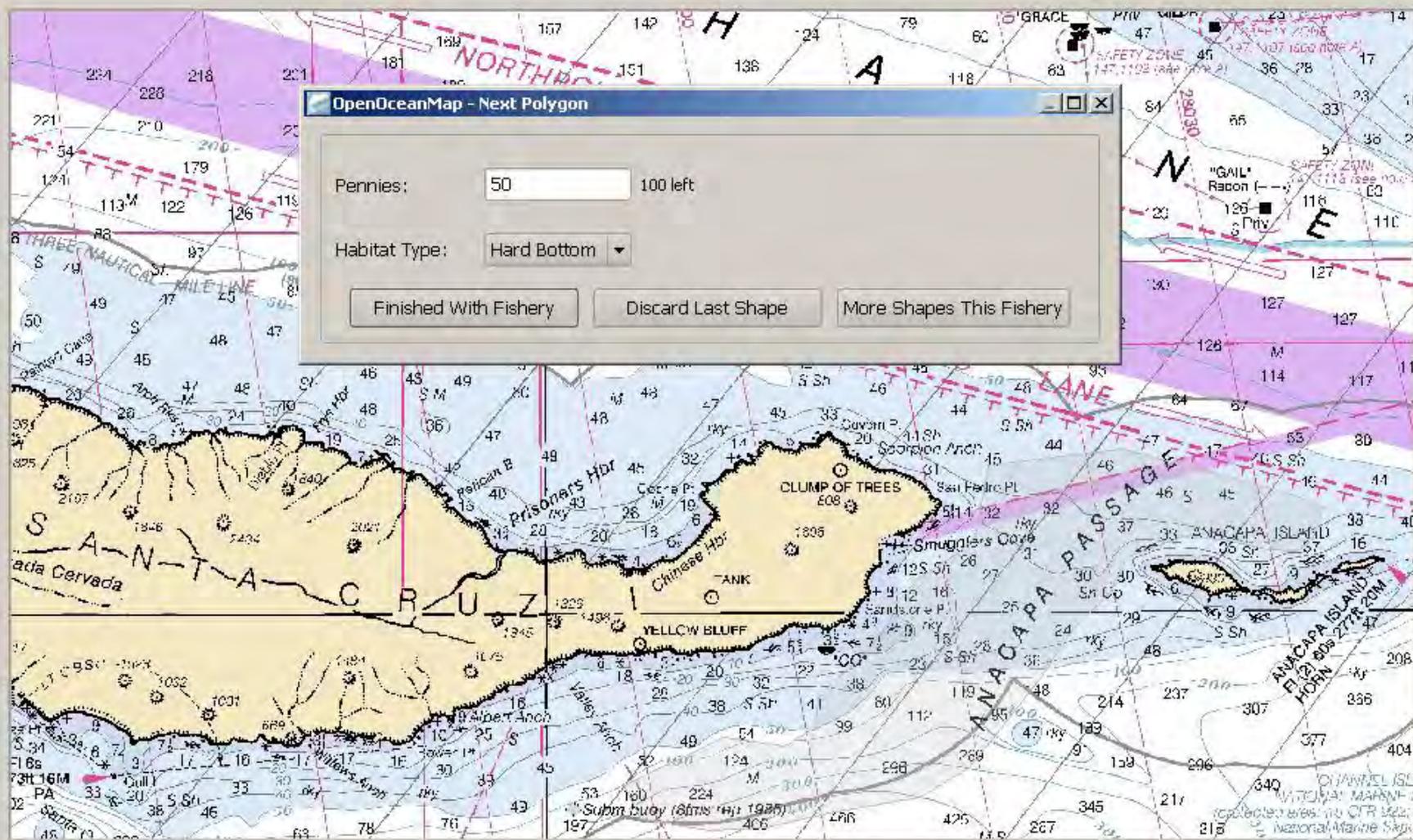




OpenOceanMap - Interview

Interviewee		Commercial Fishing Information	
First Name:	<input type="text" value="Carissa"/>	Years experience:	<input type="text" value="12"/>
Last Name:	<input type="text" value="Klein"/>	% income from fishing:	<input type="text" value="75"/>
Age:	<input type="text" value="30"/>	Fisherman License ID:	<input type="text" value="K9U777"/>
Gender:	<input type="text" value="Female"/>	Federal Vessel ID:	<input type="text" value="F89409"/>
City of residence:	<input type="text" value="Santa Barbara"/>	State vessel ID:	<input type="text"/>
Interviewer		Vessel length :	<input type="text" value="27"/>
Interview Date (mm/dd/yyyy):	<input type="text" value="09/24/2008"/>	Vessel motor (HP):	<input type="text" value="500"/>
First Name:	<input type="text" value="Charles"/>	Haul Capacity (Kg):	<input type="text" value="5000"/>
Last Name:	<input type="text" value="Steinback"/>	Home Port:	<input type="text" value="Santa Barbara"/>
Interviewer Mood:	<input type="text" value="7"/>	Landing Port 1:	<input type="text" value="Santa Barbara"/>
		Landing Port 2:	<input type="text" value="San Pedro"/>
		Landing Port 3:	<input type="text"/>
		Landing Port 4:	<input type="text"/>

Cancel Select Fishery



# OREGON RECREATIONAL FISHING SURVEY



1. Select Species → **2. Navigate** → 3. Draw Introduction

[Go To Main Menu](#)

Nautical Charts

### Instructions

First, navigate the map to the general area of your primary *Salmon* fishing ground as a *sport boat fisherman*.

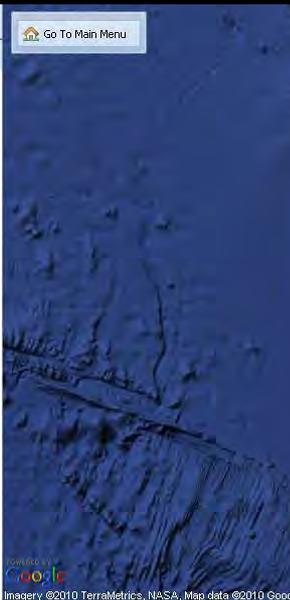
a. To move the map, use the blue arrow buttons. To zoom the map in and out, use the blue '+' and '-' buttons.

b. To turn on 'Nautical Charts' use the selection window on the top right. Click the checkbox to turn them on or off.

c. Get as close as you can to your fishing ground, then press the continue button.

[View Video Demonstration](#)

[Go Back](#) [Continue >>](#)



2. Navigate → **3. Draw Introduction** → 4. Penny Introduction

[Go To Main Menu](#) [Cancel Fishing Ground](#)

### Instructions

Draw your **first** sport boat fisherman *Salmon* fishing ground on the map. (You'll be able to draw more)

a. Click once on the map to create the first point.

b. Move mouse and click to create a second point.

c. Continue tracing being as accurate as you can.

d. Double-click the last point to complete your fishing ground.

e. If you make a mistake, click the 'Cancel' button at the top.

f. You can control the map while you're drawing.

[View Video Demonstration](#)

[Go Back](#)



4. Penny Introduction → **5. Penny Allocation** → 6. Finish Species

[Go To Main Menu](#)

### Instructions

a. Click 'Edit Pennies' below and give each of your fishing grounds a penny value. You must use all 100 pennies.

b. Click 'Go Back' if you need to change your fishing grounds.

c. Click 'Continue' after you have allocated 100 pennies.

[View Video Demonstration](#)

Your Salmon Fishing Grounds			
	Pennies		
1	40	<a href="#">Edit Pennies</a>	<a href="#">Zoom To</a>
2	25	<a href="#">Edit Pennies</a>	<a href="#">Zoom To</a>
3	0	<a href="#">Edit Pennies</a>	<a href="#">Zoom To</a>

[Show All](#)

Remaining: 35  
Status: Incomplete, use all 100 pennies

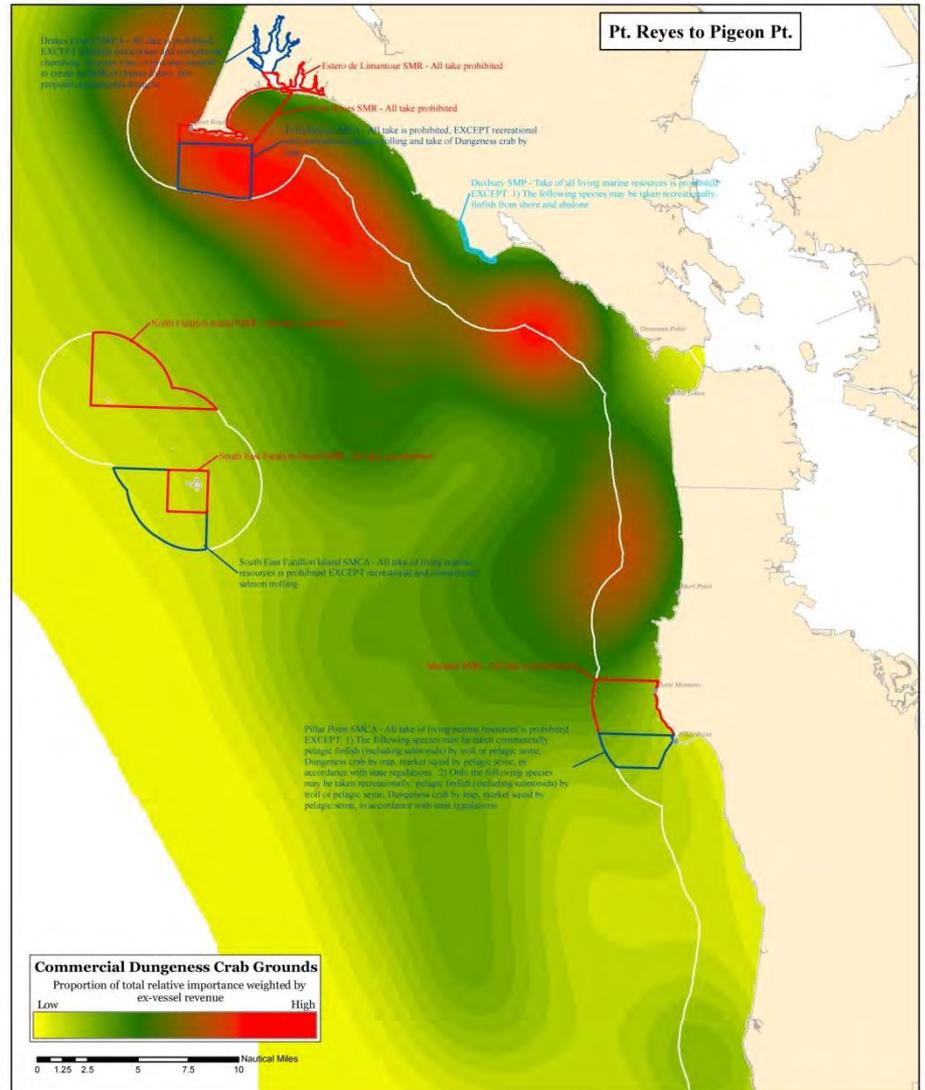
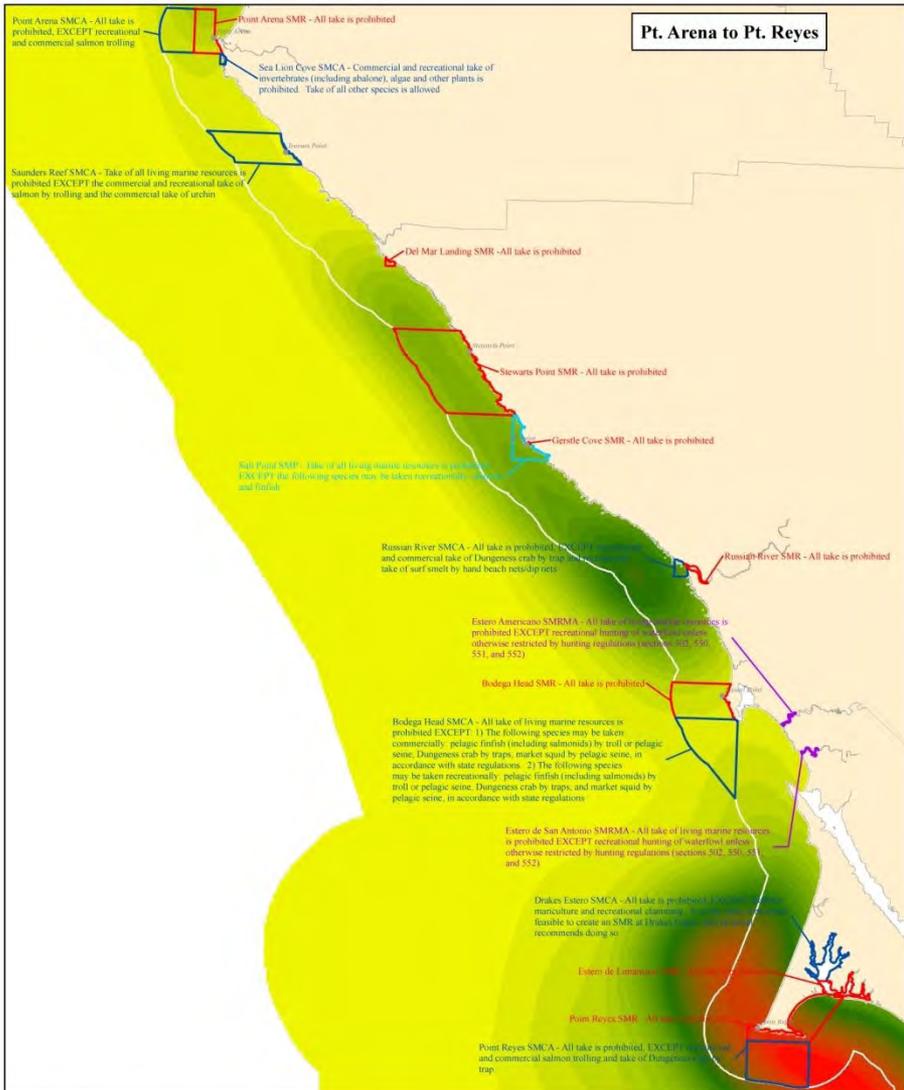
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# Spatial Analysis

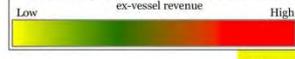
- Create a weighted surface that represents the stated importance of different areas for each fishery
  - Measure of weighting: multiply the stated importance values by the proportion of in-study region landings (ex-vessel revenue per fisherman) specific to each fishery/port
- Attribute a fisherman's grounds to each port at which s/he has landed over the last 9 years (2000-08)
  - Example: If Fisherman A landed Dungeness crab in both San Francisco and Bodega Bay, his/her shapes are used in both maps and weighted based on the percentage of landings reported to each port over the last 9 years

# MLPA North Central Coast, Integrated Preferred Alternative MPA Proposal Compared to Study Region Commercial Dungeness Crab Grounds\*\*



## Commercial Dungeness Crab Grounds

Proportion of total relative importance weighted by ex-vessel revenue

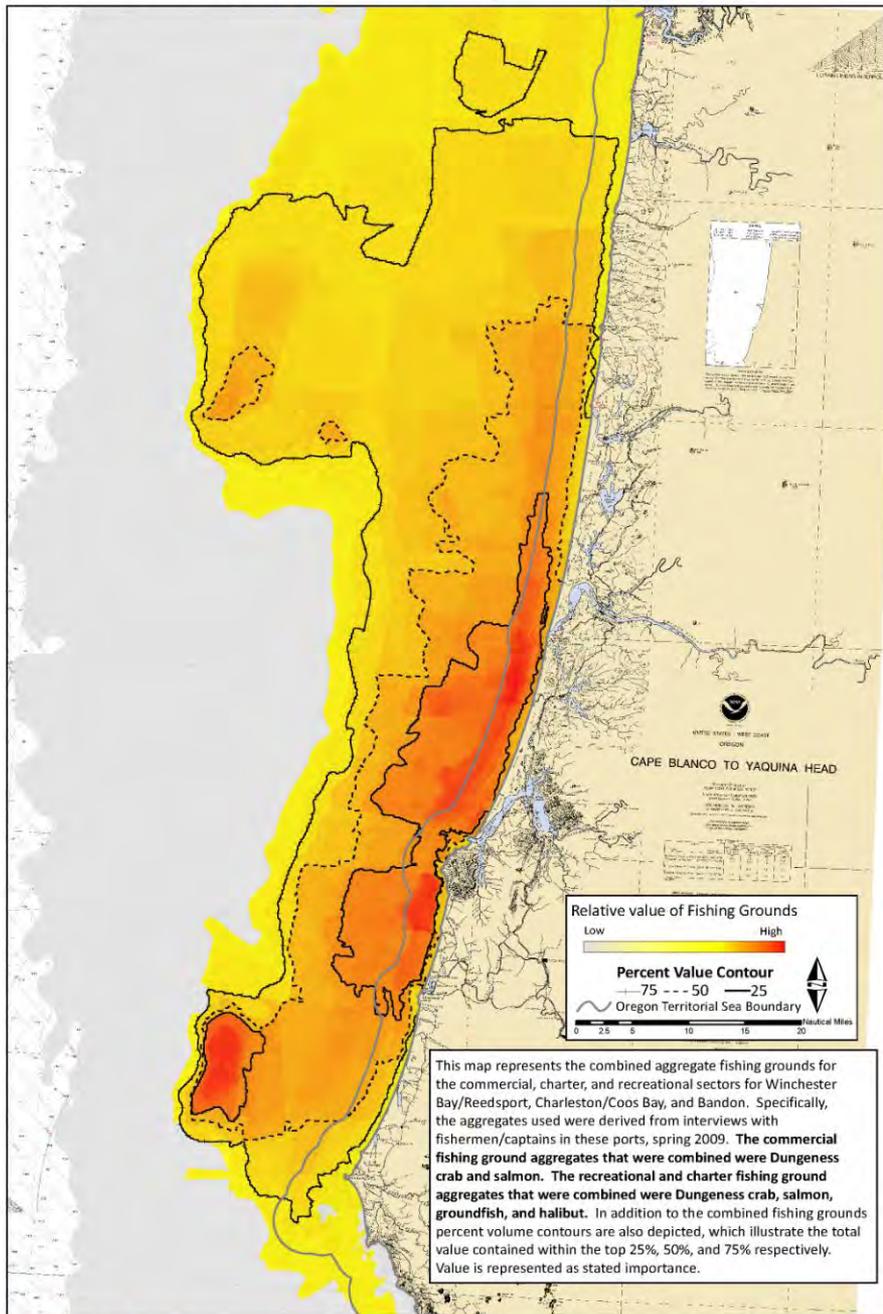


0 1.25 2.5 5 7.5 10 Nautical Miles

\*\* North Central Coast Integrated Preferred Alternative - April 24, 2008. Commercial fishing grounds identified through local knowledge interviews, summer 2007. Scholz, et al. 2008. Commercial and recreational fishing grounds and their relative importance off the North Central Coast of California (Draft).

## Southern Oregon Ocean Resource Coalition (SOORC) Pilot Project Combined Value Fishing Grounds

All landings (Winchester Bay/Reedsport - Charleston/Coos Bay - Bandon), All sectors (commercial, charter, recreational sport boat)



## Cross Sector Aggregate Map

Produced maps by fishery for each sector and through numerous reviews and iterations with SOORC, the fishing community, and the State arrived at this aggregation which was approved at the December 2009 SOORC mtg.

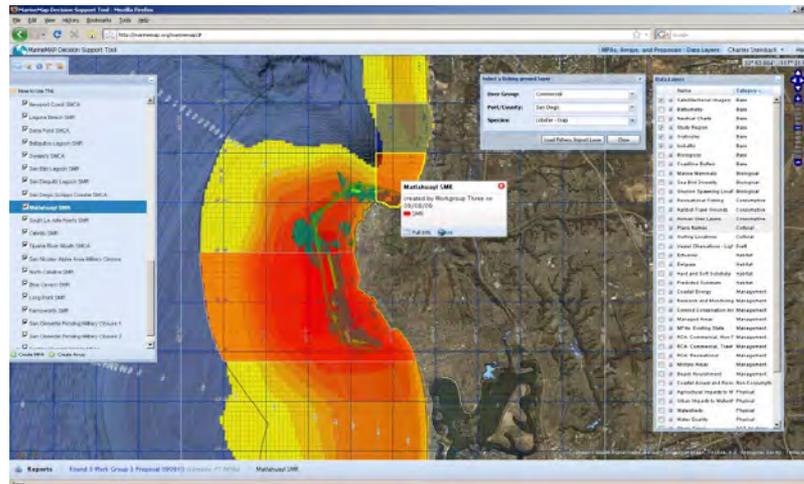
Combines all three sectors by giving equal weighting to each fishery in a sector and across sectors.

Within each sector:

- Commercial weighted by ex-vessel revenue
- Charter weighted by gross revenue
- Recreational weighted equally

# Open OceanMap Summary

- Results allow for cross-comparisons within users groups and across user groups
- Data can support the identification of use-space conflicts and quantify potential impacts or benefits to different ocean user groups and communities
- Opportunity to engage and educate stakeholders about the marine planning process



# MarineMap Consortium



Decision Support for Marine Spatial Planning

Decision Support Tool Services In Press/On Display FAQ

MarineMap is a web-based decision support tool for open and participatory spatial planning in the marine environment. MarineMap offers a simple, flexible and powerful means of gathering expertise from resource managers, scientists, stakeholders and public in a process of collaborative decision making.

The MarineMap Consortium brings together personnel and skills from UC Santa Barbara, Ecotrust, and The Nature Conservancy. We create open-source spatial tools that integrate and illuminate the human dimensions of marine science and policy.

**Twitter Updates**

MarineMap v2 (code name Lingood) will use Google Earth API and Google Wave technologies. 2 days ago

We have launched the new MarineMap.org website:

*"MarineMap gets people honestly talking about where they can find common ground."*

— Ken Wiseman, Executive Director, Marine Life Protection Act Initiative

# Stakeholders

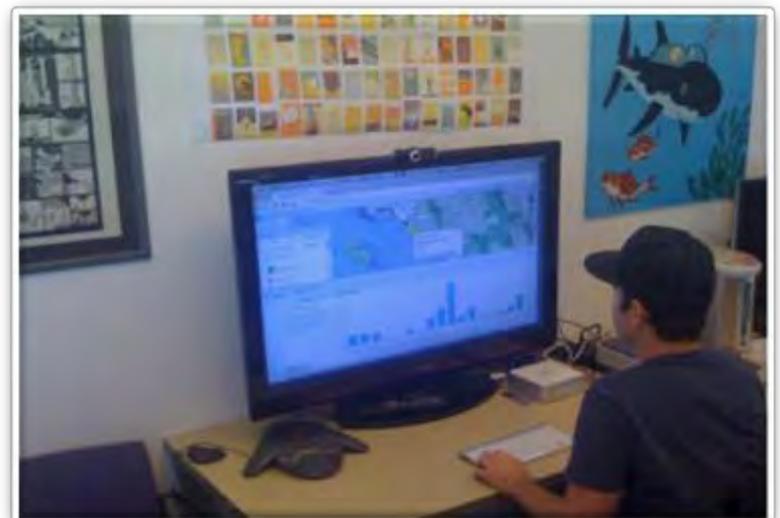


# MPA Design Criteria

- MPA networks are evaluated on the basis of MLPA goals and objectives
  - Boundaries should fall on **straight lines**
  - Adequate **representation** of habitats
  - Habitats should be **replicated** within **threshold distance**
  - Should achieve **maximum level of protection** where possible
  - **Minimize socioeconomic impact** (commercial / recreational fishing and other uses)
- Geospatial data: habitats, biological, physical, cultural, socioeconomic (e.g., fishing grounds captured using Open OceanMap)

# Participatory MPA Design

- At stakeholder meetings
  - Real time collaboration
  - High pressure
  - “Horse trading”
- At home
  - Prepare for meetings
  - Low pressure
  - Consult constituents
  - Collaborate





# Evolution of Technology

2005

2010

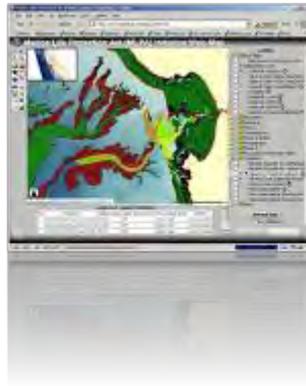
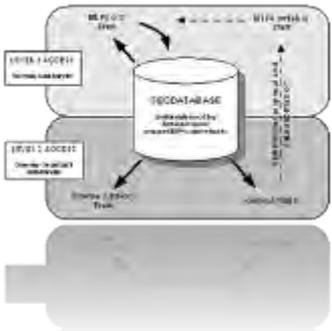
Database

Internet Map Server

Doris

MarineMap  
v1

MarineMap  
v2



# How is it working?

- Very positive feedback from stakeholders
  - Helps build consensus
  - Public communication tool
- Very heavy usage
  - Over 5,000 MPA concepts drawn over
  - All proposal concepts developed and submitted via MarineMap
- Performance is good – fast with broadband or better
- U.S. Institute for ECR – Inaugural award for “Innovation in Technology and ECR”
- Currently developing Oregon MarineMap for renewable energy and marine protected area planning

# Lessons Learned

- Successful design informed by a real-world planning process
  - Participation, collaboration, and communication
  - Science-based decision making
  - Transparency
  - Speed and efficiency, real-time feedback
- “Adaptive development”
  - Embedded team of experts
- Consistent funding
- Open source software



# Additional Messages

- Develop engaging, **simple tools** that meet your precise needs to facilitate participation
- If possible, use **embedded technologist** with experience in marine spatial planning.
- **Do not delay** project scoping and development.