INTEGRATED OCEAN OBSERVING SYSTEM

Central and Northern California Ocean Observing System (CeNCOOS)

2009 Regional Coordination Workshop

Seattle, WA

August 25, 2009

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INTEGRATED OCEAN OBSERVING SYSTEM

Part 1: Project Status Report

CeNCOOS: Long-term monitoring of environmental conditions in support of protected marine area management in central and northern California

Leadership and Coordination of the Central and Northern California Ocean Observing System (CeNCOOS)

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CeNCOOS partners throughout the region

Project Duration: 2008-2010

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Project Status Report

Project Schedule and Milestones – RA Planning Grant and RCOOS:

- Maintain water quality stations in Pan-Regional Backbone (PBR)
- Update MOA and Strategic Plan
- Create state-wide strategic advisory committee (JSAC)
- Complete build-out of Surface Current Mapping (HF radar) network
- Operations and Maintenance (O&M) of surface current mapping network
- Implement standard AUV/glider transects along the California coast
- Design and implement the CeNCOOS DMAC
- Continue new product development for key stakeholders
- Expand professional staff
- Conduct education and outreach efforts in the CeNCOOS community
- Improve wave forecasting in MPAs
- Begin operational coastal modeling
- Begin MPA-targeted process-oriented modeling

Project Status Report

Significant Accomplishments:

- Maintained observations in the sea during a difficult funding period.
- Designed and began implementing a leading-edge, distributed, service-oriented DMAC
- Implemented the PierDAC for water quality stations as an example of what a base-level Data Assembly Center (DAC) should look like.
- Unified, upgraded all CeNCOOS server hardware at MBARI. Installed IOOS THREDDS server.
- Designed and launched all-new CeNCOOS web site
- Launched the educational section of the CeNCOOS web site
- Added several new products (see products slide)
- Published a needs document for baseline environmental monitoring in the State of California's marine protected areas.
- Updated the MOU and the strategic plan
- Hosted national workshop for marine educators
- Started organizing an observing system in the SF Bay

Keys to Success and Potential Challenges

What worked well?

- New web page – Professional design, dedicated effort, financial support from MBARI
- Live ship-tracking page -Clear pull from a customer (marine sanctuaries), Good partnership (Naval PG School), Cheap and easy (low-hanging fruit)
- SF Bayweb – excellent partnership, Navy funding, many interested users
- SF Bay bar buoy, improved bar forecast – clear user need, strong partnerships, CeNCOOS/SCCOOS/NWS cooperation
- Workshops – establish needs, consensus, partnerships, outreach

Describe potential and/or real challenges

- Lack of funding
- Packard Foundation restrictions on lobbying
- All staff overworked
- Need accurate, stable, automated chemical and biological sensors
- Encouraging compliance with IOOS DIF standards

Resolving challenges - How might these challenges be resolved?

- Increase sustained funding
- Independent home office (?)
- Hire more staff
- Transition existing cutting-edge sensors
- Staff assist partners with compliance issues

Current Status: Products

Products	Level One Minimal processing			Level Two Value-added			
	RT Data	Model Outputs	Satellite	RT Data	Decision Support	Maps	Time Series
Ecosystem/Climate Trends	x	x (atm)	x	x		x	x
Water Quality	x	x	x	x	x	x	x
Marine Operations	x	x (atm)	x	x	x	x	x
Coastal Hazards (Innundation)	x	x		x	x	x	x

Directions: Place an "x" in boxes that best describe the kinds of products being developed for the focus areas. See RA Presentation guidelines for terms

Current Status: Product Examples

- Long time series quantify changes for climate forecasts
- Improved forecasts of breaking waves on the SF Bay Bar improves safety for harbor pilots and the general boating community
- Real-time salinity, oxygen, chlorophyll, improves forecasts for yield, harvest time for oysters in Humboldt Bay
- Real-time surface current observations provide transport trajectories for search and rescue; hazardous spill prevention, containment, mitigation; MPA connectivity
- Monitoring ship traffic shows compliance with regulations regarding avian breeding grounds, marine mammals
- One-click access to SST, Chl, visible imagery, shows plankton blooms, MPA water quality, many others
- Educational products bring real-time data into the classroom
- Interactive tracking tool allows users to view transport trajectories
- SF Bay salinity map provides observations and model output for shipping industry. Height at the dock, shoal clearance/maximum load, air-gap at bridges

Current Status: Observations

Variables/ Platforms	Fixed- in water, multi- purpose	Fixed- in water single purpose	Fixed – on land	Transects	Remote Sensing
Physical	12, Many		25	2, Many	SST
Meteorological	1, 10				IR, vis
Chemical	4, 1				
Biological	4, 1				chl
Geological					

Current Status: Modeling and DMAC subsystems

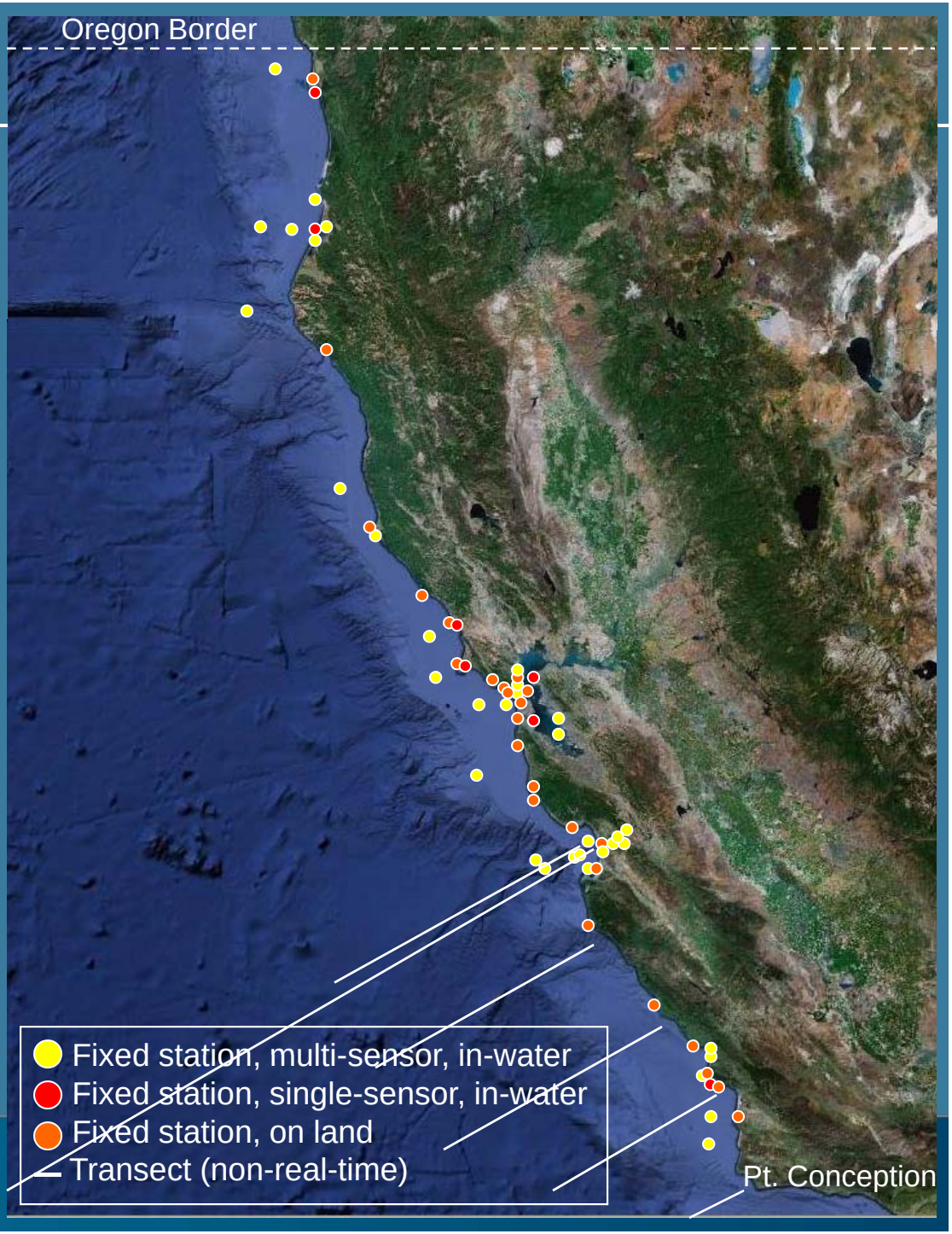
Modeling*	Region-wide**	Sub-region	Not at all
Atmospheric	x		
Circulation			x
Inundation			x
Wave	x		
Hydrological			x
Sediment transport			x
Water Quality/Ecosystem		x	
Fisheries			x

DMAC	Complete	In-progress	Not at all
RA Website that serves data		x	
DIF - working to ensure interoperability	x		
Regional Data Portal		x	

* See guidelines for definitions **Regionwide = entire RA

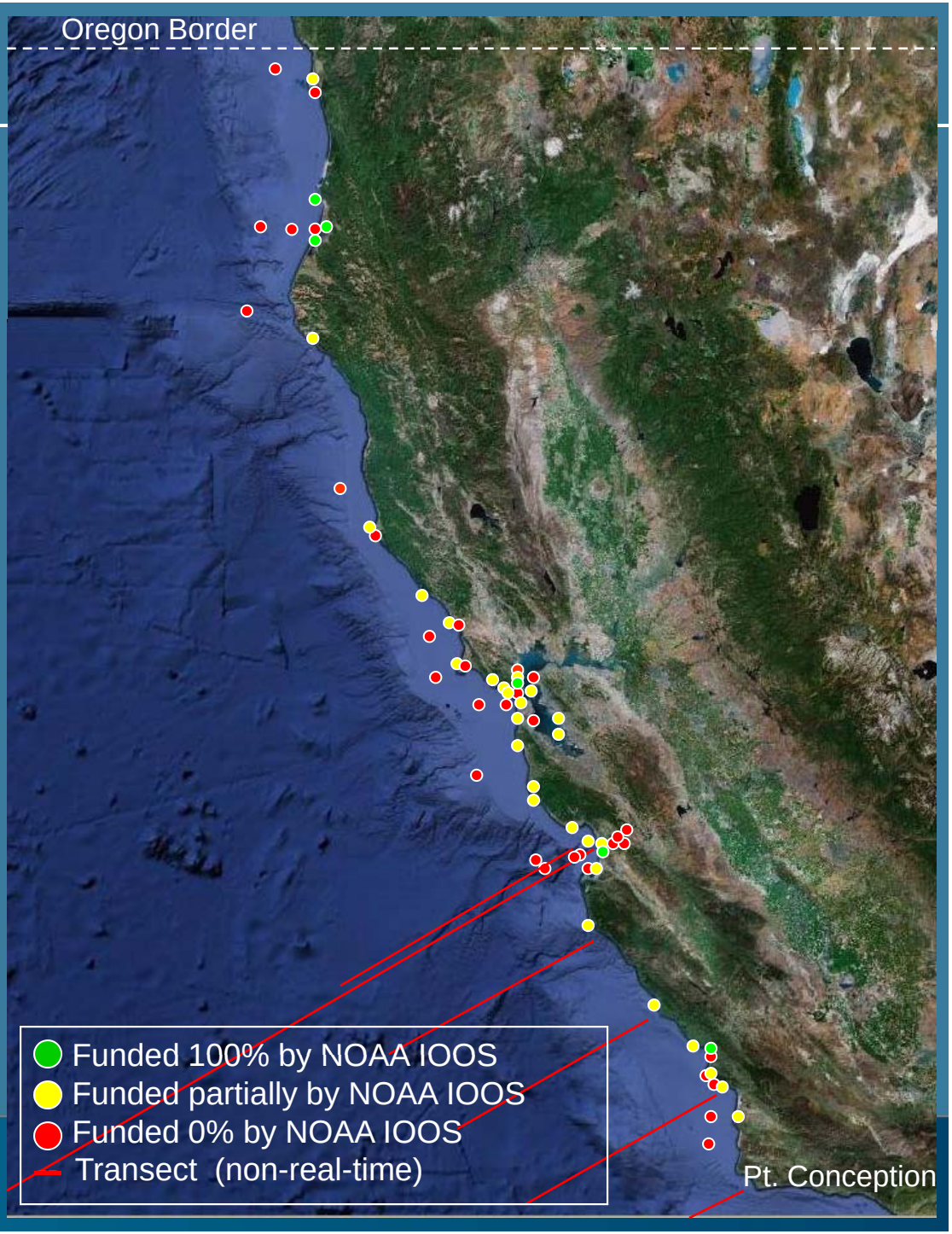
Map 1a.

CeNCOOS Existing Observing Assets - types



Map 1b.

CeNCOOS Existing Observing Assets - funding



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Part 2: Looking Forward: Future Plans

Assuming $5 million of funding per year, please indicate what your future plans are for your RA. The $5 million should cover activities currently funded by the RA Planning Grants and the RCOOS.

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Future Plans: Major Products

Products	Level One			Level Two			
	RT Data	Model Outputs	Satellite	RT Data	Decision Support	Maps	Time Series
Ecosystem/Climate Trends	X	X	X	X	X	X	x
Water Quality	X	X	X	X	X	X	X
Marine Operations	X	X	X	X	X	X	x
Coastal Hazards	x	X	X	X	X	X	x

Check "x" all that apply. In your verbal description, you should point out the major differences between this and the current system

Future Plans: Product Examples

- Real-time surface current observations provide transport trajectories for search and rescue; hazardous spill prevention, containment, mitigation; MPA connectivity (uses complete, hardened network)
- Operational 24/7 coastal circulation model allows predictions of same
- Operational forecasts of HABs improves public safety through safe seafood and beach water quality.
- Marine geospatial information system feeds Integrated Ecosystem Assessment and Ecosystem-Based Management for a healthier ecosystem and improved fisheries management
- Operational data-assimilating community model in San Francisco Bay assists maritime transportation, invasive species distribution and mitigation, habitat restoration
- Inundation forecast for Carmel Lagoon and other bar-built lagoons on west coast warms homeowners, saves lives.

Future Plans: Product Examples

- Numerical forecasts of the real-time salinity, oxygen, chlorophyll distributions in Humboldt Bay allows better planning for yield, harvest time for oysters in Humboldt Bay
- Intuitive, graphical interface combined with CeNCOOS DMAC allows customers to easily build their own products.
- Process-based ecosystem models allow study of MPA health, larval transport, connectivity
- Observations of the integrated heat content, oxygen levels, and ocean acidity in the upper ocean provide quantitative estimates of the rates of change for climate projections
- Educators rely on CeNCOOS to provide live data and information for the classroom and in public venues

Future Plans: Observations

Variables/ Platforms	Fixed- in water, multi- purpose	Fixed- in water single purpose	Fixed – on land	Transects	Remote Sensing
Physical	12 Pier, 12 Buoys	4 wave	35 HF radars	8 glider and AUV 5 ship	SST
Meteorological					IR, visible
Chemical	12 Pier, 6 Buoys			Also on gliders and AUVs	
Biological	12 Pier, 6 Buoys			Ship-based, major bays	color
Geological					

Indicate the # of observations needed for your system

Future Plan: Modeling and DMAC

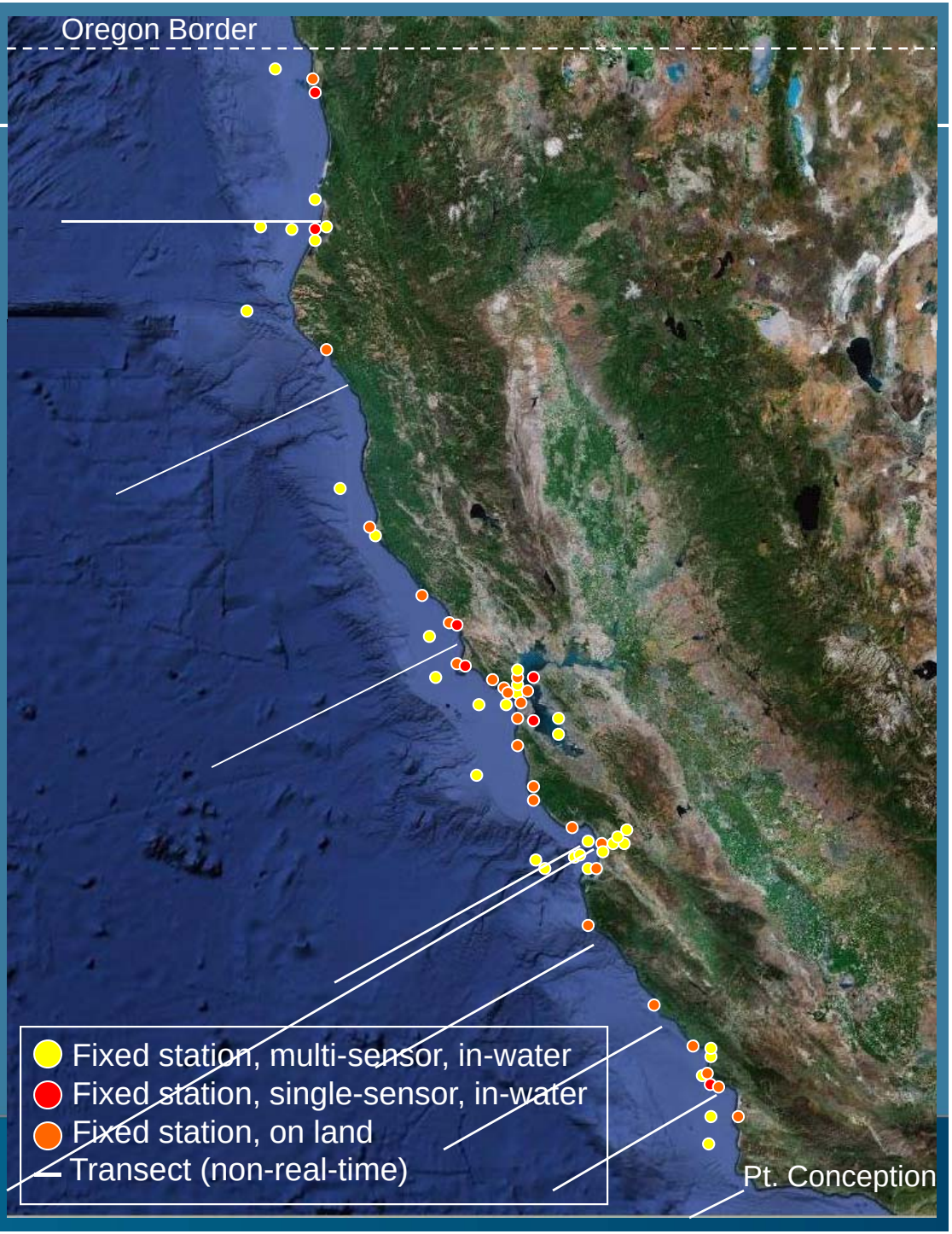
Modeling*	Region-wide	Sub-region	Not at all
Atmospheric	x		
Circulation	x		
Inundation	x		
Wave	x		
Hydrologic			
Sediment transport			
Water quality/ecosystem	x		
Fisheries			Not Sure!

DMAC	Yes	In-progress	No
RA Website that serves data	x		
DIF - working to ensure interoperability	x		
Regional Data Portal	x		

* See Guidelines for definitions ** Region-wide means entire RA

Map 2.

CeNCOOS Observing Assets – Future Plans



Funding Scenario

Briefly describe the major CUTS to the subsystem under the reduced funding scenarios

Funding Scenarios	$3 million	$1 million
Modeling	No nearshore/estuarine piece	No modeling at $1M
Observing	Fewer buoys, no ships, fewer pier stations, still inadequate HF radar	Unable to maintain status quo
DMAC and Product Development	Time line is delayed	Delayed more
RA Management and Outreach	No outreach specialist, people still part time	Dependent on other funding