

Adapting To Sea Level Rise and Storm Hazards Along the Outer Coast: Implications for San Francisco Bay

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Climate Driven Ecological Changes: Management Implications I
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OUR COAST—OUR FUTURE:

Planning for SLR and Storm Hazards Along the Bay Area's Outer Coast

Goal

Provide Bay Area coastal managers and planners with science-based, decision-support tools to plan for and respond to SLR and storm hazards along the region's outer coast.

Objectives

Model vulnerabilities to SLR & storm hazards

Assess stakeholder info needs

Map vulnerabilities at appropriate scale for management action

Develop web-based decision support tool to interpret data in context of management decisions

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Team Leads

- USGS: 2 m res seamless DEM; storm and SLR scenarios (0-2 m, 25 cm increments + 5 m extreme) using CoSMoS
- PRBO: online decision support tool with interactive maps
- GFNMS: project management, stakeholder participation

Additional Partners

- National Park Service, Coastal Services Center, EBM Tools Network

Funding

- NOAA Climate Program Office - Sectoral Applications Research Program (SARP)
- 2 Year Project: Nov 2010 to Dec 2012

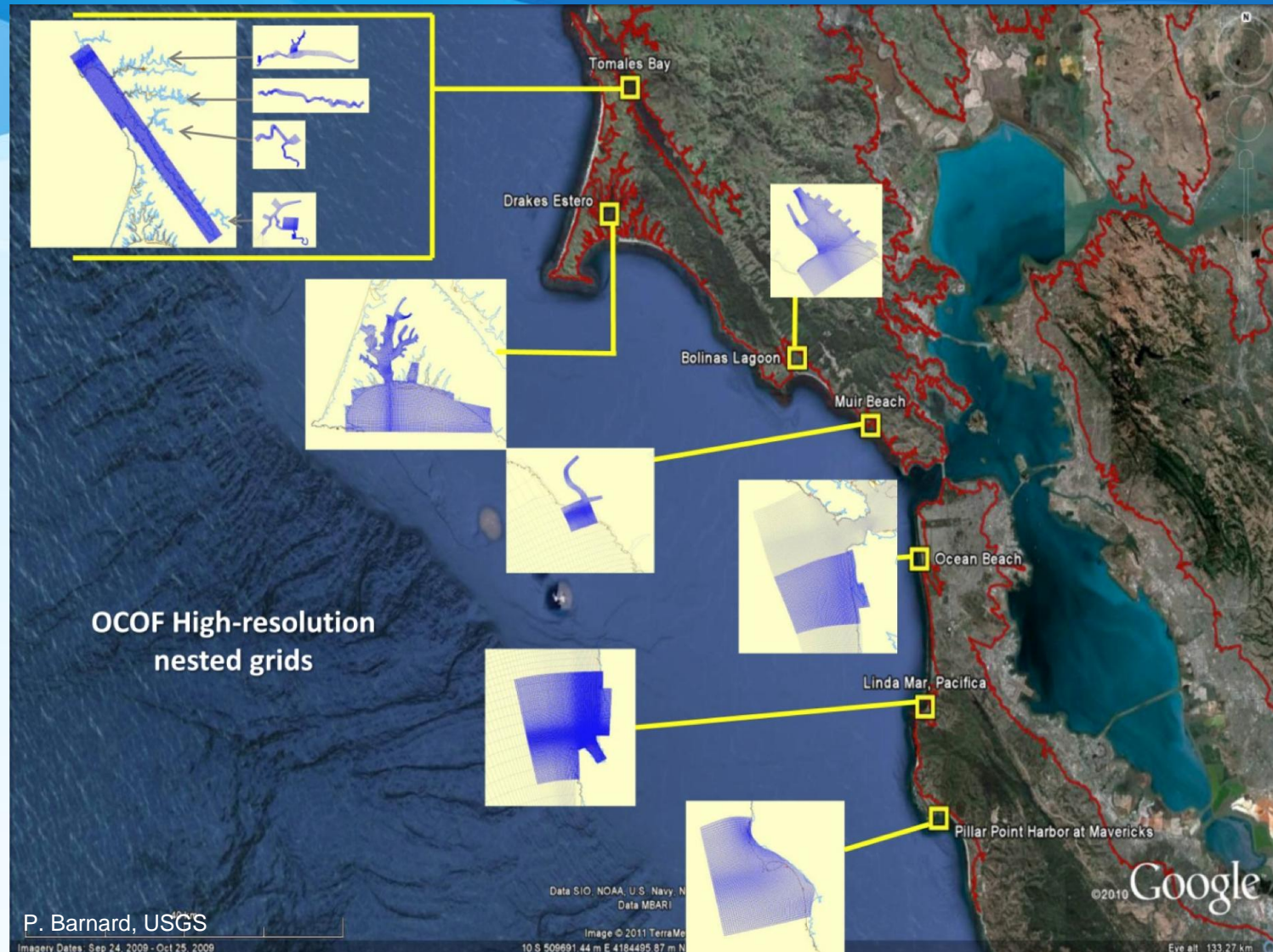
OUR COAST—OUR FUTURE

Current Study Region



Half Moon Bay to Bodega Head

OUR COAST—OUR FUTURE



Predictions every 100 m alongshore, every 10 m for nested grids

COASTAL MANAGER SCOPING WORKSHOPS

Our Coast—Our Future

Planning for Sea Level Rise and Storm Hazards
Along the Bay Area's Outer Coast

Preparing for Tomorrow's Coast

With a changing climate, the California coast faces impacts from sea level rise, increased storm frequency and intensity, and coastal erosion.

To prepare for these impacts, coastal managers and planners need to understand how these future changes affect local ecological systems and human infrastructure.

Gulf of the Farallones National Marine Sanctuary, PRBO Conservation Science, U.S. Geological Survey, and the National Park Service have teamed up to help address the effects of sea level rise and storm hazards from Half Moon Bay to Bodega Head.



Our Coast—Our Future provides Bay Area natural resource managers, local governments and others with science-based, decision-support tools to plan for and respond to sea level rise and storm hazards along the region's outer coast.

Benefits to Our Coast

IMPROVED municipal, county, state, and federal government capacity to respond to rising sea level and storm hazards.



IMPROVED communication between climate change researchers, modelers, and managers.



COORDINATION in developing and implementing adaptive management strategies.

COORDINATION of San Francisco Bay Area outer coast and bay modeling efforts.

ENHANCED use of modeling information to ensure long-term effectiveness for local planning and management decisions such as: determination of infrastructure vulnerability; prioritization and design of habitat restoration and protection projects; and identification of habitats for mitigation.

Dates

August 23, 2011 PRBO, Petaluma

August 25, 2011 San Francisco Federal Building

Goal

Scope info needs for online decision support tool to plan for and respond to SLR and storm hazards from HMB to Bodega Head

Audience

Jurisdiction and legal authority along the north-central CA coast, use SLR and storm data and info in decision-making

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COASTAL MANAGER SCOPING WORKSHOPS

Gain an Understanding of...

Questions related to SLR and storms that could be addressed with a decision support tool.

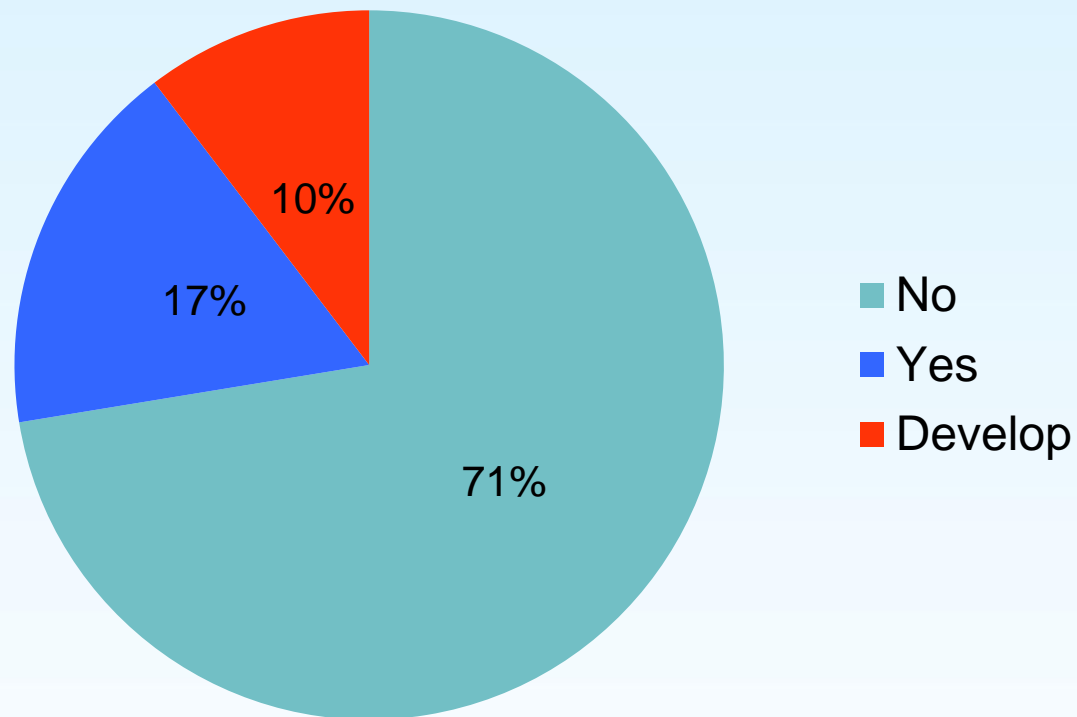
Adaptation, restoration, management planning actions underway or being considered.

Stakeholders' processes for planning for SLR and storms and how to best design and integrate a decision support tool.



WORKSHOP SUMMARY

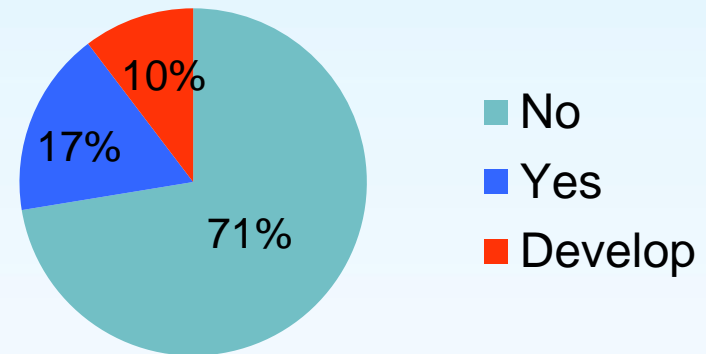
Do you currently use online decision support tools?



WORKSHOP SUMMARY

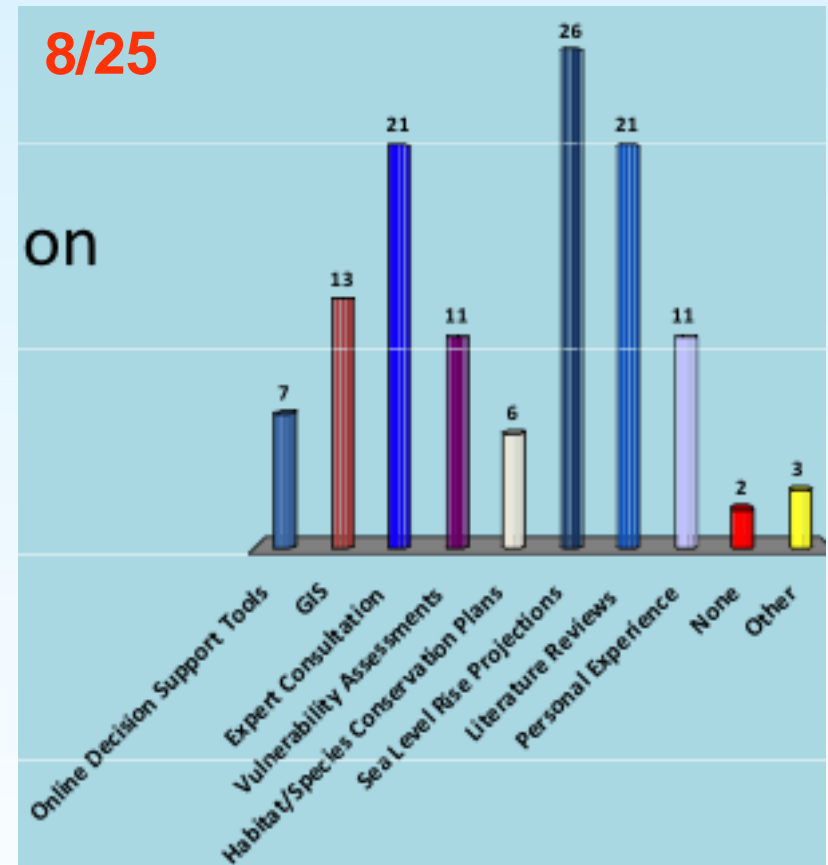
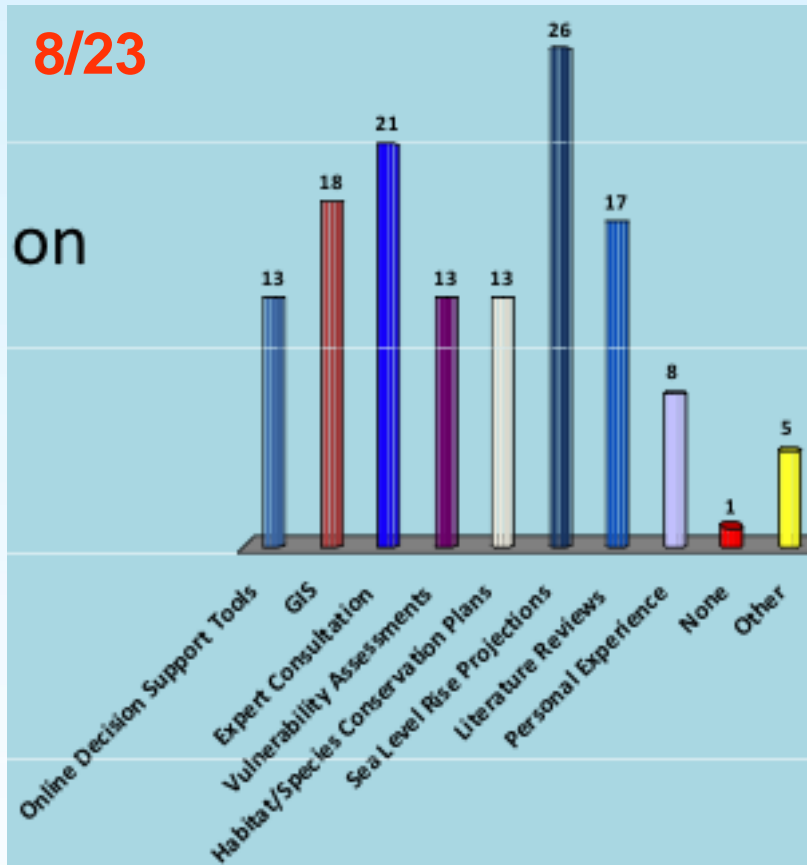
So why not?

- Need both relevant tools and technical training and support
- Significant data requirements; set-up/management by dedicated staff
- Not at spatial resolution needed for my projects
- Most Gulf of Mex or East Coast centric
- Lack of info in the areas I work in
- Too much uncertainty
- Lack of awareness of existing tools
- Lack of time available and training resources
- Too expensive



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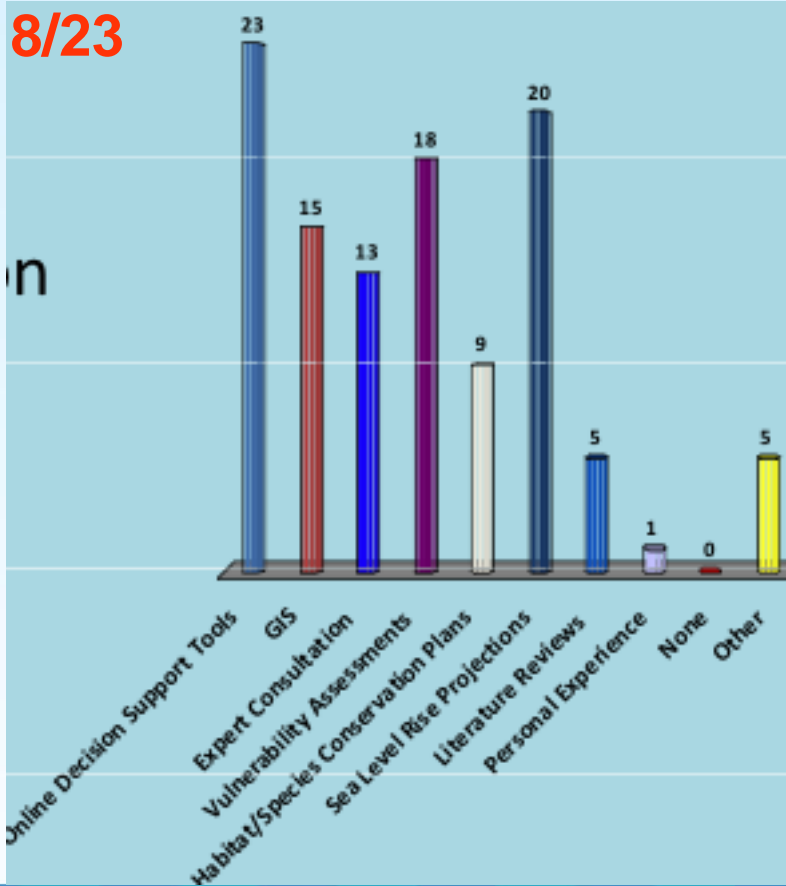
What SLR planning resources do you currently use?



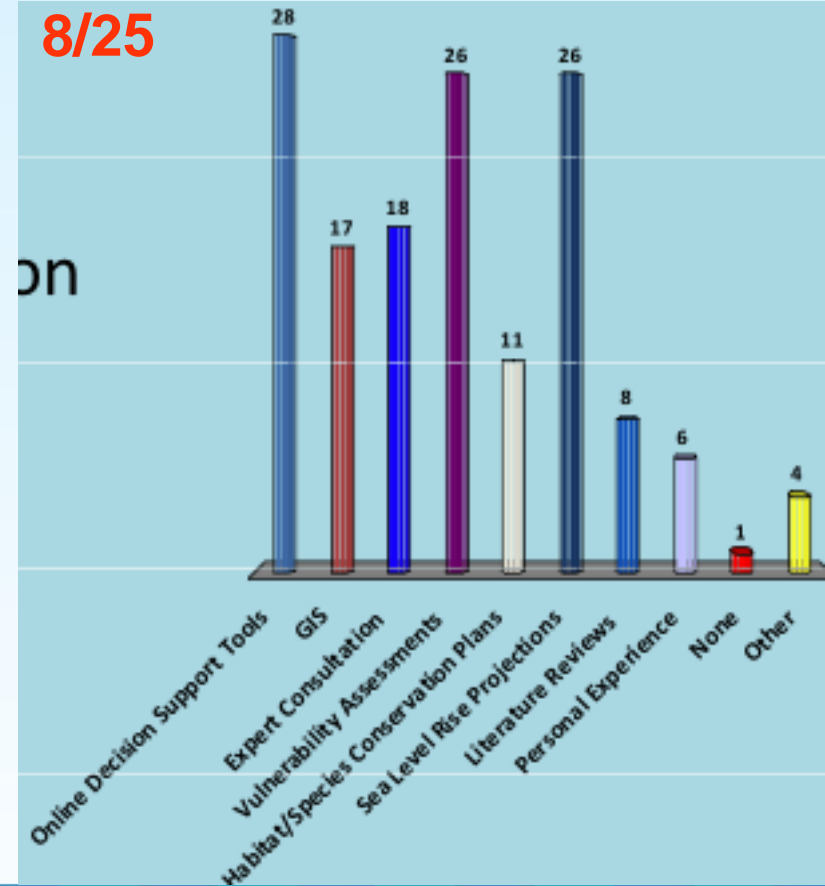
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What SLR planning resources would you like to use?

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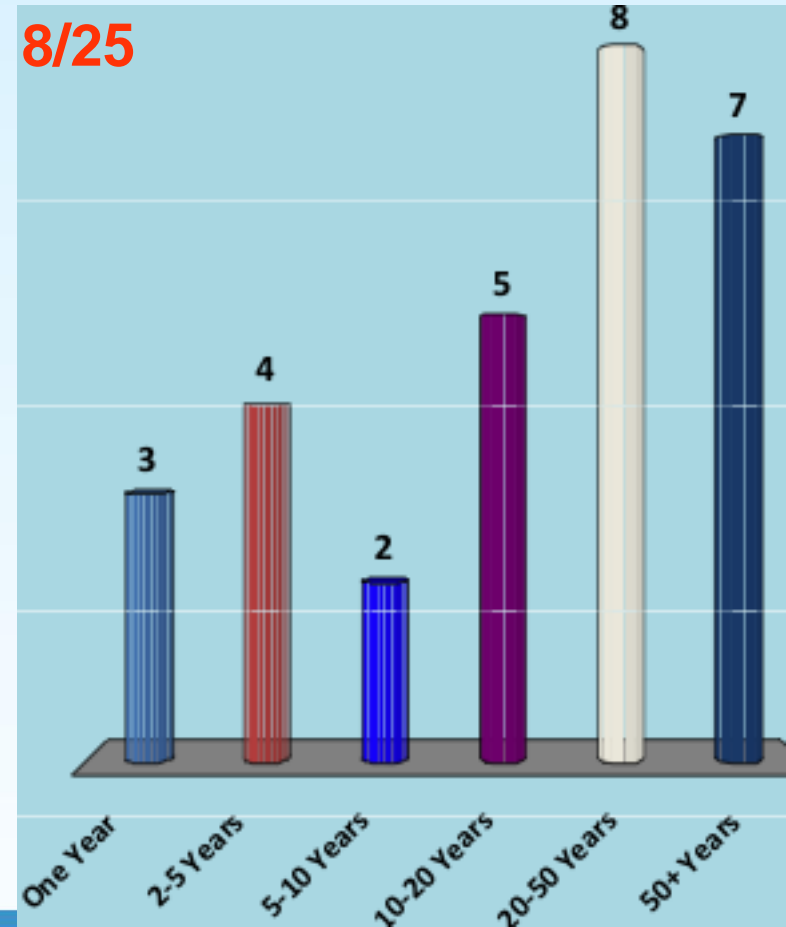
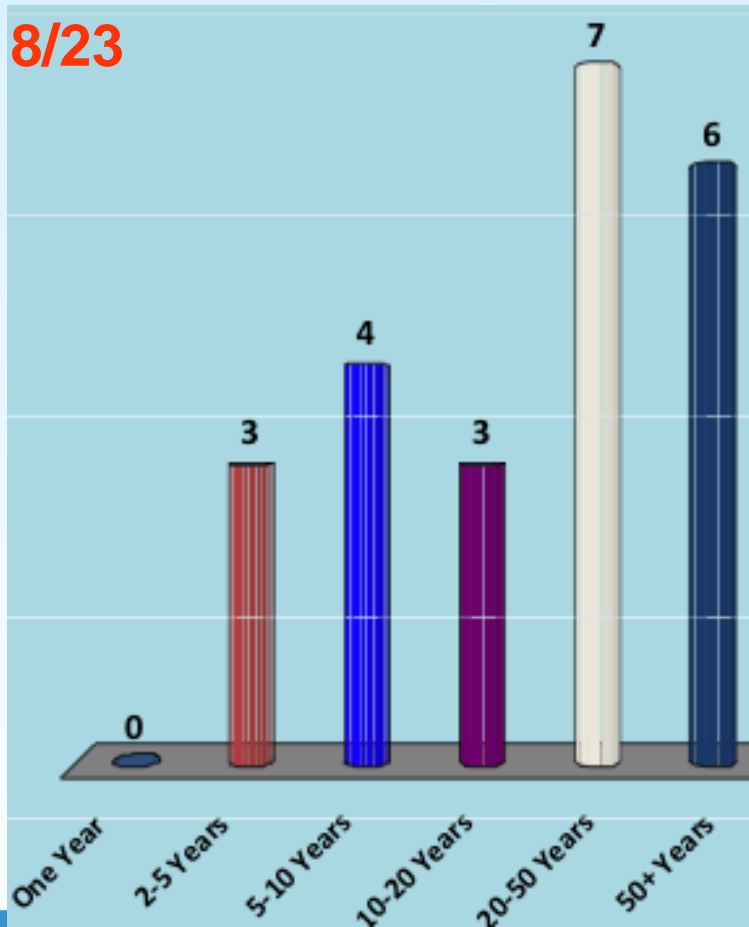


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WORKSHOP SUMMARY

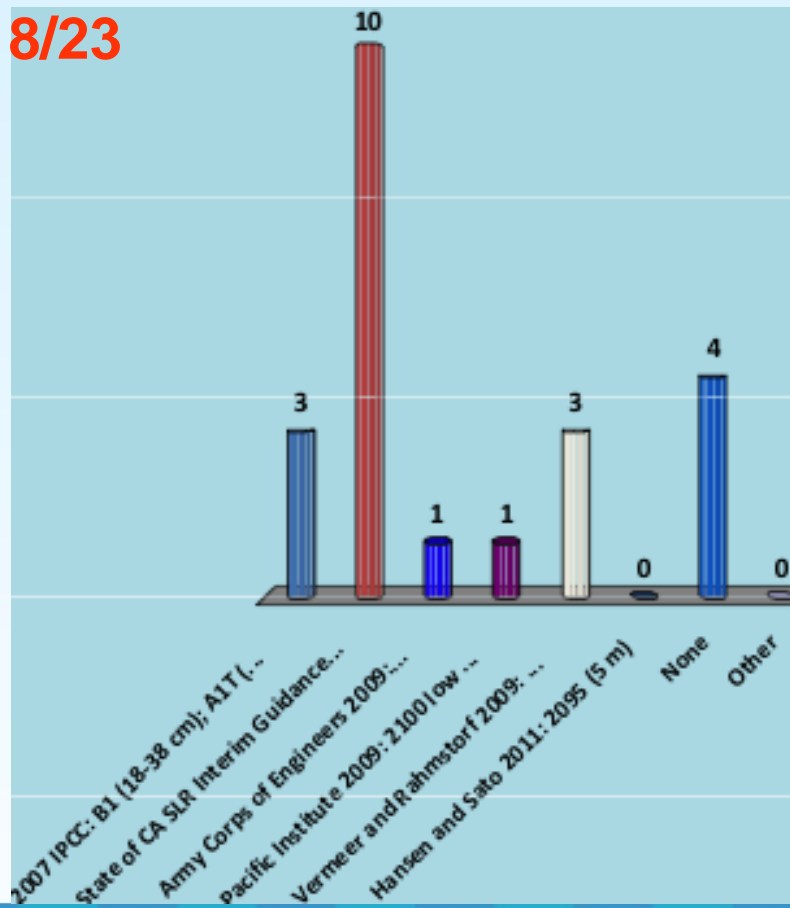
What planning horizon do you currently use?



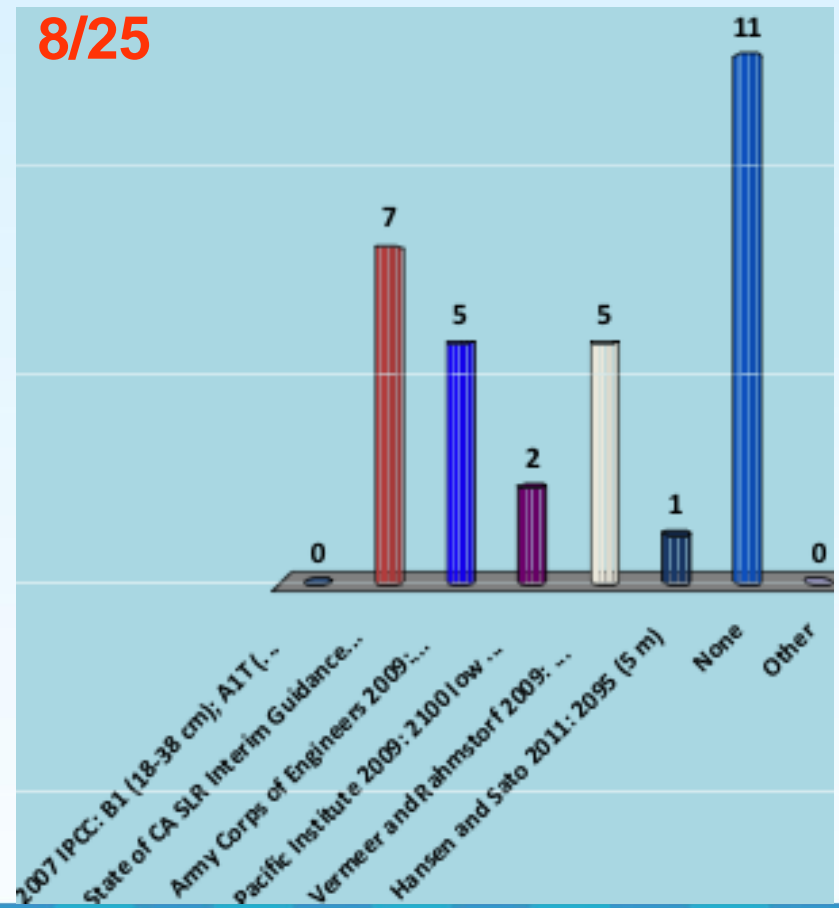
WORKSHOP SUMMARY

What SLR scenario do you currently use?

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WORKSHOP SUMMARY: BREAKOUT GROUPS



Management Questions

- Projected threats to:
 - Infrastructure (sewer/septic, transportation, buildings, residential, armoring...)
 - Recreation (public access, marinas/harbors...)
 - Habitats (loss, migration... esp. wetlands)
- Coastal erosion (when, where, what does it affect?)
- Prioritization of restoration sites (smart investments)
- Multi-hazard impacts (flood, fire, earthquake, etc., same vulnerable area)

WORKSHOP SUMMARY: BREAKOUT GROUPS



Tool Specifications

- Accommodate different user capabilities
- Address data/model uncertainty
- Provide user training resources
- Easy interface (e.g. google maps)
- Accommodate new data; ability to update
- Customize through use of own data
- Ability to upload/download shapefiles
- Make available to the public
- Ability to draw points, lines and polygons
- Ability to generate a report on chosen area

THINGS WE CAN DO

What is the most important thing OCOF can do to best support you in planning for SLR and storm hazards?

- Provide predictions that can be used to anticipate impacts on facilities and resources.
- Make the underlying data (e.g., lidar, gis, etc) available.
- Expedite the identification of impacts so the discussion is focused on how to make long term solutions viable.
- Develop a compelling example of how managers and scientists can work together to "do useful science that gets applied."
- Coordinate with other organizations and projects also trying to support this planning to create broadly valuable tools/resources.

THINGS WE CAN'T DO

What is the most important thing OCOF can do to best support you in planning for SLR and storm hazards?

- Approaches to combating backwater storm drain flooding in low lying areas
- Endorse retreat strategies/recommend adaptation actions
- Support a SLR estimate we can all agree to use
- Determine the impacts of SLR on water quality
- Incorporate future best estimates of temperature, fog, and precipitation change
- Cost effective responses/economic valuation

OUR COAST—OUR FUTURE NEXT STEPS

Project Next Steps

- Workshop evaluation, data layers requested (fall 2011)
- Workshop summary report (fall 2011)
- DEM and scenarios completed (early and summer 2012)
- Data layers gathered, tool and map development (2011-2012)
- Volunteer group to beta test tool (summer 2012)
- Training workshops when tool and maps are finalized (fall/winter 2012)
- Project summary report (winter 2012)
- Seeking funds to expand scope and geographic extent



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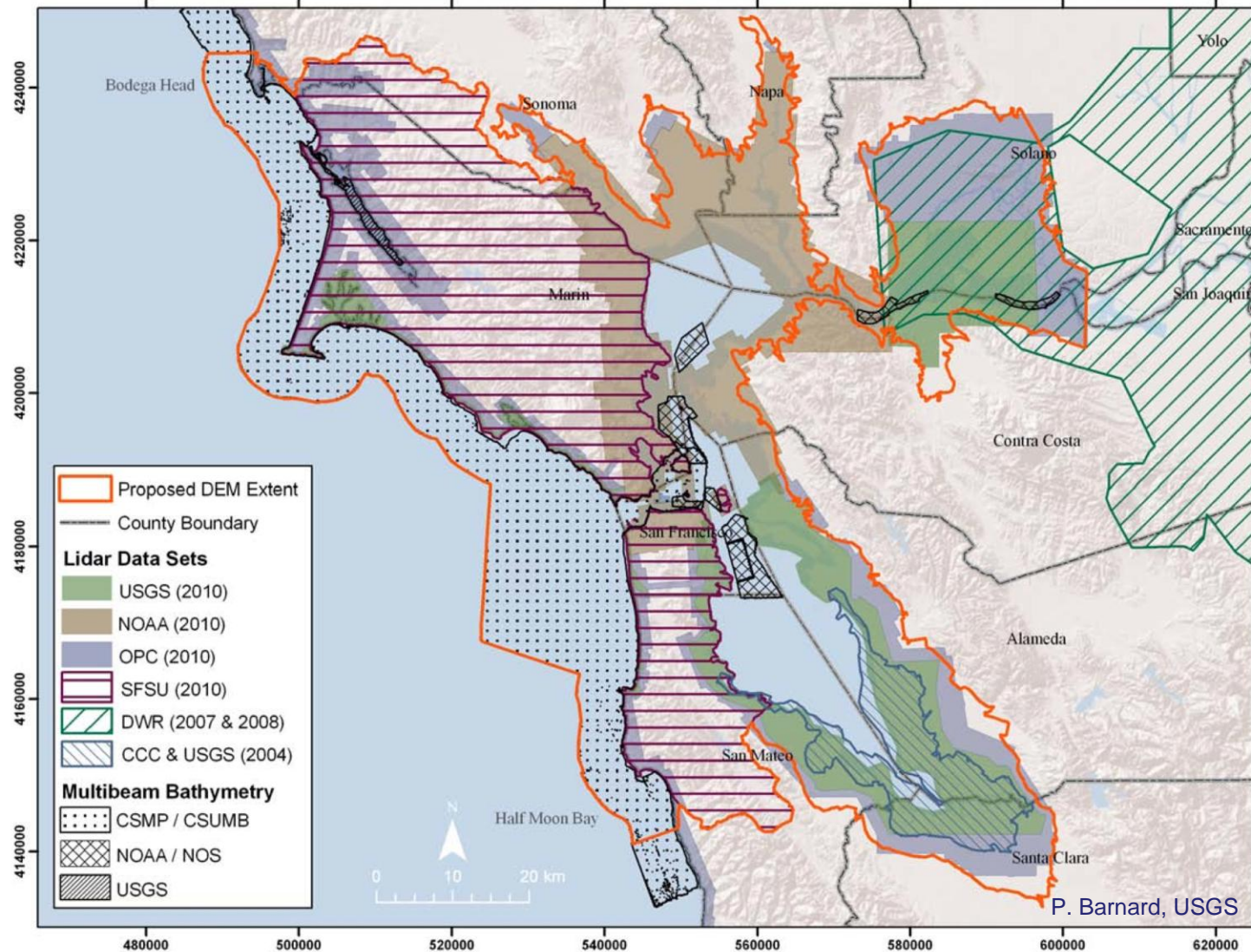


NOAA SF Tide Gauge



Ocean Beach, P. Barnard

OUR COAST—OUR FUTURE NEXT STEPS



OUR COAST—OUR FUTURE NEXT STEPS



OCOF in San Francisco Bay

- High res DEM for SF, San Pablo, Suisun Bays (funded)
- SLR and storm scenarios using CoSMoS for Bay
- User-driven decision support tool for Bay (build on www.prbo.org/sfbayslr)
- In depth technical assistance to group of users in entire SF region
- Evaluation workshop for outer coast tool, inform Bay development
- Training workshops on Bay tool
- Periodically update tools based on user feedback
- Coordinated and cohesive approach to providing regional SLR info (data collection, model, tools)
- Beginning winter 2011 if funded through NERRSSC

THANK YOU!



FOR MORE INFORMATION CONTACT

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