Meeting Summary
Focus Group Meeting (#1)
Sea–Level Rise and Floodplain Management

October 6, 2014
California Natural Resources Agency, Sacramento California

This was the first in a series of meetings convening a Focus Group to guide the proposed outputs and products of a NOAA-funded project aimed at incorporating new sea-level rise and zone of flooding information into coastal planning. This project is being led by the Department of Water Resources (DWR) with support from Scripps Institution of Oceanography (SIO) and the California Ocean Science Trust (OST). The Focus Group includes local floodplain managers, coastal flooding and hazard mitigation program coordinators, coastal policy/decision-makers and other subject matter expert. Participants were selected based on feedback from a Scoping Meeting (May 2014) as well as a through a Science Needs Assessment process.

Meeting Goals

- Develop an outline of the proposed DWR Quick Guide supplement
- Define technical modeling parameters
- Identify evaluation metrics of success

Project Review

Lauma Jurkevics, DWR

Lauma Jurkevics (DWR) began the meeting by welcoming participants, leading a round of introductions (in the room and on the phone) and presenting the meeting's goals.

The meeting focused on identifying key components of a coastal flooding/sea-level rise supplement to DWR's *National Flood Insurance Program California Quick Guide* (Quick Guide Supplement), drawing from relevant findings identified in a Science Needs Assessment conducted by the California Ocean Science Trust (OST). Additionally, the meeting captured feedback to refine the modeling and technical outputs that will be conducted by researchers from the Scripps Institution of Oceanography (SIO) in support of this project.

Lauma J. introduced staff from David Ford Consulting. David Ford staff will create user-friendly

Project Components

- ❖ Interview key stakeholders to develop insights on the challenges and opportunities for developing effective information/guidance products.
- ❖ Convene a Focus Group of floodplain managers and coastal decision-makers to provide guidance on the proposed project outputs.
- ❖ Develop potential coastal flooding indexes at five representative locations across California.
- ❖ Prepare a non-regulatory supplement to DWR's existing publication *National Flood Insurance Program California Quick Guide* (2007), focusing on coastal areas.
- ❖ Hold workshops to release the guidance product and answer questions about its use.

text and figures that translate and adapt the modeling outputs from SIO for the Quick Guide Supplement.

Aaron McGregor (OST) provided additional context and motivation for the day's discussions, noting that this project will produce a specific non-regulatory guidance product with applications to the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). The product is intended for local floodplain managers, though the application and utility of Quick Guide Supplement and this process could extend well beyond this audience to include many who are involved in planning and management at the coastal fringe.

Focus Group participants are tasked with helping to determine how to build and frame a final product that meets the goals and expectations of the proposed project, while considering applications to their own work and the work of their respective partners. In addition, the process for developing this product is intended to be iterative, with opportunities for participants to engage and shape the product as it evolves. A second Focus Group meeting will be held in early 2015.

Assessing User Needs

Marisa Villarreal, OST

Marisa Villarreal (OST) gave an overview of the project's science needs assessment, presenting key findings that will guide the development of the project's final products. Building off of existing studies that address and explore the needs of coastal managers, the goals of this needs assessment were to: (1) develop insights on the various challenges, barriers and opportunities for developing and implementing effective information and guidance products that address sea-level rise and associated responses (e.g., flooding, erosion); (2) develop further understanding of the processes through which sea-level rise information products are developed and used, and (3) evaluate the utility of existing sea-level rise information products.

At the scoping meeting in May, 2014, capturing views of other coastal management/planning perspectives beyond those of local floodplain managers was deemed important, to increase the utility of potential products. As a result of this feedback, interviewees included local floodplain managers, long-range planners, resource managers, coastal flooding and hazard mitigation program coordinators, coastal policy/decision-makers, and physical process and engineering experts. In total, thirty interviews were conducted, representing twenty-four unique departments, organizations, cities and counties, etc.

It is important to note that this science needs assessment interviewed a subset of organizations and communities. A number of these entities demonstrated the capacity to address and implement sea-level rise policies, many of which have already taken measures to do so. There may be additional needs and priorities for groups across the state, that are still developing their capacity with regards to sea-level rise planning and management. Efforts will be taken to identify these needs and operationalize them in the final products, using the Focus Group participants as conduits to their broader communities of practice.

Relevant findings

The findings from the science needs assessment were broad, and varied across departments, institutions and communities. In general, the findings indicate that a lack of program support and institutional capacity at the local levels poses the most significant barriers to integrating sea-level rise information into

management/planning processes. However, interviews revealed both a demand and political will for the provision and adoption of useful sea-level rise guidance and information in a number of local contexts. To that end, existing pathways, such as regulatory frameworks, and incentive-based mechanisms like grant programs provide opportunities to address this demand and integrate sea-level rise information into coastal management and planning.

Other key findings from the needs assessment include:

- **Modeling results and technical information should be relevant to management timescales**. Management timescales vary across departments and across specific management/planning activities. Developing products that can account for these inconsistencies will help to maintain their relevancy and utility.
- **Include information on shoreline erosion and geomorphic responses, in the context of sea-level rise**. Shoreline change is inextricably linked to sea-level rise impacts. Interviewees noted a lack of geomorphic response information such as erosion and shoreline change in existing sea-level rise guidance products, and that having improved information on this dynamic is critical for both near-term and long-term planning.
- **Balance sophistication with simplicity in developing effective guidance/information products.** Sea-level rise guidance and tools have varying levels of sophistication and complexity. Information products that serve a broad range of users require a balanced approach, incorporating the complexity desired by entities with greater institutional capacity, while embodying the simplicity required by entities with limited institutional capacity or less familiarity with these issues. To achieve this, it's helpful to have products that can provide varying levels of information, i.e., demonstrating sophisticated modeling techniques in conjunction with general concepts and guidance that can be applied more broadly.
- **Co-produce products with potential users:** Products are more useful when they're developed, informed, and tested by potential users, practitioners and other relevant stakeholders. Building processes to facilitate co-development of products can also help in the dissemination of products to their intended users. Ensuring that the developers can engage with users throughout the lifecycle of the project can also help to increase the uptake and continued use of products.
- **Identify institutional pathways and opportunities to incentivize the use of sea-level rise information in local decision-making processes:** There is cross-cutting demand for information and guidance to address sea-level rise at the local level. Communities that are incorporating sea-level rise information into their planning and regulatory mechanisms are often harnessing incentive structures like state and federal grant programs to support such work. Clearly identifying and linking incentives for utilizing this type of information in the context of the NFIP could help to support the uptake and use of proposed output(s).
- **Limited familiarity with the *NFIP California Quick Guide:*** *The Quick Guide* provides general, simplified guidance for NFIP compliance, targeting local floodplain managers. Many of the entities interviewed were not very familiar with the *Quick Guide* and are utilizing resources (guidance, tools, etc.) that provide more nuanced information on this issue. This is a reflection of the interviewees not being limited to floodplain managers, as well as their sophisticated awareness of the issues surrounding sea-level rise and coastal change and the resources available for addressing

this challenge. Identifying additional information needs, where feasible, and being strategic in the dissemination and outreach of the Quick Guide Supplement will be important in ensuring its use and application.

These findings demonstrate the complexity of information needs around sea-level rise across the state. The breadth of these findings is helpful in identifying key characteristics of useful guidance and information products and drawing out common information needs. The challenge will be to onboard these broader findings in developing the Quick Guide Supplement, recognizing project's narrower scope and focus.

A useful supplement to the *Quick Guide* will need to consider how balance the needs of varying end-users, and account for the differing levels of capacity to use and implement guidance and information products. Participants discussed developing a supplement that could be "multi-dimensional", organized or tiered to provide different levels of information for different audiences. The highest level guidance could focus on presenting general concepts, and other relevant information to set the context. An additional level could provide more specific detail around the modeling methods, and analysis. A final level could be a repository for raw data and other resources.

OST is working to finalize a document that summarizes the science needs assessment process and key findings. This document will be disseminated to partners and be accessible to the broader public on OST's website. OST and DWR will work closely with David Ford Consulting (consultants to DWR) to consider and integrate (where appropriate) the relevant findings from the needs assessment into the structure and content of the Quick Guide Supplement. While the science needs assessment will be finalized and disseminated as a report, Focus Group participants identified future opportunities to collect additional feedback from interviewees and other potential end-users of the envisioned product(s). One instance where additional feedback may be helpful is in the translation of the project's technical outputs i.e., discussing the relative value of producing a coastal flooding index vs. maps that document future flooding conditions.

Building the Quick Guide Supplement

Jim Eto, DWR & Aaron McGregor, OST

Jim Eto (DWR) briefly introduced *DWR's NFIP Quick Guide* - a resource for floodplain managers that provides high-level guidance to support compliance with FEMA's NFIP program. The *Quick Guide* can be interpreted as a basic introduction of a variety of topics related to floodplain management and the NFIP, including basic floodplain morphology, permitting processes, building and development guidelines, and zone of flooding information for insurance rate maps. The *Quick Guide* also focuses primarily on floodplain management of riverine systems; there is only a page dedicated to floodplain management in the coastal zone. In developing the Quick Guide Supplement, it will be critical to consider the pros and cons of generating content in a highly simplified format similar to that of the *Quick Guide* in light of the findings from the needs assessment and the opportunity to expand the conversation around floodplain management at the land-sea interface.

Developing non-regulatory products

Jim E. noted the challenges and sensitivities that come with addressing sea-level rise in the context of the NFIP – a regulatory program. The Quick Guide Supplement will be a non-regulatory, informational resource, as sea-level rise is not a requirement within current NFIP policies. Clearly articulating the non-regulatory nature of any products generated from this project is critical, while also acknowledging that communities can adopt regulatory policies that account for future conditions at their own discretion.

Exploring connections with the NFIP

Currently, the NFIP does not require any consideration of sea-level rise in local floodplain maps. Though there are clauses within the NFIP that allow for participating communities to consider "expected future conditions" such as sea-level rise in these products. Presently, these clauses primarily address hydrologic conditions of riverine systems, though there is work underway to provide technical guidance on how to address future conditions in coastal systems.

If a community participates in the NFIP, they can qualify for Community Rating System (CRS) points; credits to communities that can result in reduced flood insurance premiums. Participating NFIP communities can apply to the CRS program and commit to implement and certify activities that contribute to reduced flood risks and exceed the minimum NFIP requirements (e.g., Activity 410 - providing additional flood data, and Activity 430 – adopting higher regulatory standards[1]). Sharing and/or implementing guidance from this project could potentially qualify a community for CRS credit for meeting higher standards of floodplain management and preparedness, and result in lowered insurance premiums.

Focus Group participants from FEMA supported the notion of the CRS program providing an incentive pathway for communities to use and adopt the type of information detailed in this kind of guidance product. The Focus Group also discussed that other potential incentive pathways exist through FEMA (e.g., hazard mitigation grants) to support this kind of proactive planning. This reinforces a key finding from the science needs assessment that communities are looking for incentivize-based opportunities to feed sea-level rise information through existing institutional decision-making frameworks.

Building an outline: key components of the QG Supplement

During discussion for this agenda item, meeting participants identified potential components to include in the Quick Guide Supplement, in addition to a description of the technical outputs and methodology of SIO's work. These include:

- An explanation of current conditions mapping and future conditions mapping as it relates to the NFIP.
- An explanation of FEMA Flood Insurance Rate Maps (FIRMs), how they were generated and what they can display.

[1] National Flood Insurance Program Community Rating System: Coordinator's Manual (2013): http://www.fema.gov/media-library-data/1406897194816-fc66ac50a3af94634751342cb35666cd/FIA-15_NFIP-Coordinators-Manual_2014.pdf

- A discussion of the ways in which other sea-level rise planning tools and resources could support future condition mapping in the context of the NFIP.
- A discussion of coastal flood hazards which are not included in current FIRMs.
- Informational resources and conceptual diagrams of coastal erosion and shoreline change and how these processes relate to coastal flooding from sea-level rise.

A useful resource for communities

The goal of the supplement is to support local communities in taking sea-level rise information into account as a part of assessing risk of coastal flooding. While the suggested components above can help achieve this goal, future discussions should address the feasibility of incorporating these suggestions into a supplement. The *Quick Guide* discussion reiterated the underlying challenge of developing content that maintains the scope of the proposed supplement while promoting the application of this product to broader actors and processes across the state.

Technical modeling requirements

Peter Bromirski, SIO & Dan Cayan, SIO

Dr. Peter Bromirski and Dr. Dan Cayan presented their approach for generating projections of wave runup. These projections can be used to generate coastal flood indices, or ranges of flooding, for five representative locations[2] across California. The presentation highlighted current modeling methods, trends, and projections of sea-level rise for California. They concluded their presentation by posing a series of questions to participants in order to identify values for their modeling parameters and to guide the presentation of their results.

General questions included:

1) How to characterize and explain uncertainty and modeling assumptions/constraints; and

2) How to display and package coastal wave run-up results.

More specific questions around the parameterization of the modeling included:

1) How many sea-level rise scenarios to model;

2) How many individual simulations to run;

3) What the time series of the model output should be; and

4) How to graphically represent model outputs.

Coordinating with FEMA - similar modeling efforts

During the initial Scoping Meeting for this project, FEMA Region IX described a pilot study in the San Francisco region to create non-regulatory flood maps that account for sea-level rise. The pilot project was discussed again, briefly in the context of this technical discussion, where FEMA described their modeling methods and objectives, noting the similarities between their activities and those proposed by SIO in this

[2] These areas are: (1) A portion of Silver Strand Beach north of the Mexican border; (2) La Jolla Shores in the northern part of the City of San Diego; (3) Santa Cruz Boardwalk in Central California; (4) Ocean Beach in San Francisco; and (5) 2 beach and harbor locations at Crescent City in northern California.

project. Dr. Bromirski and Dr. Cayan will continue to collaborate with FEMA as their work progresses, and capitalize on opportunities to build consistencies in their modeling approach and methods.

Discussion of modeling outputs

Participants briefly discussed the questions posed by Dr. Bromirski and Dr. Cayan, providing feedback and suggesting additional items to consider in their modeling and presentation of results. The key ideas presented in this discussion follow:

- **Account for the effects of erosion, shoreline change and other geomorphic processes in the modeling methods**. Specifically, participants suggested providing graphical representation (a functional response curve) of the relationship between total water level and landward extent.
- **Highlight the significance of run-up in projecting flood indices from sea-level rise**. Describe why sea-level rise on the west coast is run-up dominant, highlighting the underlying coastal processes that contribute to this condition.
- **Demonstrate the relationship between wave run-up and slope.** Create an adjustable parameter for beach slope and include a graphic representing the relationship and effect of slope on run-up. In addition, presenting the tradeoff between vertical and horizontal land movement under the same wave conditions is beneficial.
- **Use sea-level rise projection values from the 2012 National Research Council Report** (*Sea-Level Rise for the Coasts of California, Oregon, and Washington)* for sea-level rise modeling scenarios as these values are consistent with those presented in California's state guidance on sea-level rise. Participants suggested modeling two scenarios for each timescale presented in the report: the middle projection value, and the high value of the projection range (middle projection value plus one standard deviation), for year 2030, 2050 and 2100, respectively.
- **Present modeling parameters and methods in a way that is easy to understand and replicable to potential users of the Quick Guide supplement**. Best modeling practices for these efforts are scalable, replicable and applicable across geographies. This requires accessible descriptions of modeling parameters and methods so that a diverse set of Quick Guide users (including floodplain managers, city and county planners, engineers, consultants etc.) can achieve reliable results.
- **Reference parallel modeling efforts,** and provide an explanation of the similarities and differences between them. These include FEMA's pilot study, Our Coast Our Future's Coastal Storm Modeling System (CoSMoS), and NOAA's Digital Coast Sea Level Rise Viewer.
- **Provide a digestible comparison of existing storm surge models**, explaining the differences and similarities in their approaches, and how they can be applied to decision-making and planning.

Dr. Bromirksi and Dr. Cayan will work in collaboration with consultants from David Ford to determine how to best address and incorporate these suggestions in the context of the Quick Guide supplement.

Evaluating success

Aaron McGregor, OST

Due to time constraints, this agenda item was not fully addressed. Aaron McGregor (OST) briefly noted the broader project goals and indicators of success in the beginning of the meeting. These include:

1) Increased support for California coastal planners in fulfilling a state mandate that sea-level rise be considered in planning activities;

2) Better collaboration with FEMA on incorporating sea-level rise into floodplain management policies; and

3) Enhanced working relationships between coastal management agencies to collaborate more effectively on coastal adaptation issues.

Subsequent Focus Group meetings will help outline an evaluation process for determining success and develop qualitative and quantitative indicators to execute this.

Next steps

- David Ford Consulting will develop an annotated outline or potential straw-man of the Quick Guide Supplement, incorporating key points and relevant feedback from this meeting's discussions. DWR, OST, and SIO will review. DWR will then disseminate the draft to Focus Group participants for review and feedback.
- SIO will follow-up with FEMA's San Francisco pilot project leads to gather additional information on the specifics of their modeling methods and approach. Where appropriate SIO will work to ensure that methodologies are consistent and aligned.
- OST will generate and circulate a short report on the Needs Assessment.
- OST will furnish additional information on evaluation parameters, which were not discussed in detail because of time constraints, at the next Focus Group meeting.

Appendix 1: Agenda

Sea Level Rise and Floodplain Management Project

Focus Group Meeting Draft Agenda

October 6th, 2014, 9:00 am – 1:30 pm

Department of Water Resources, California Natural Resources Agency,
1416 Ninth Street, Sacramento, CA 95814
Room 1404-17, The Redwood Training Room (14th Floor)

Host: California Department of Water Resources

Meeting Goals:

- Develop an outline of the proposed DWR Quick Guide supplement
- Define technical modeling parameters
- Identify evaluation metrics of success

9:00	***Coffee and Pastries***
9:30	**Welcome and Introductions**
9:45	**Project Review** Review project goals and objectives
10:00	**Assessing User Needs** Presenting key findings from a stakeholder needs assessment Discussion
10:45	**Quick Guide Supplement** Outline coastal supplement Discuss intersection with other initiatives and potential for leveraging product(s)
11:45	***Working Lunch (provided)***
12:00	**Technical Modeling Requirements** Wave runup projection inputs Discussion
1:00	**Project Evaluation** How to define and measure success
1:15	**Additional Discussion and Next Steps**
1:30	***Meeting Close***

Appendix 2: Meeting Participants

Lauma Jurkevics	Department of Water Resources
Maria Lorenzo-Lee	Department of Water Resources
Aaron McGregor	California Ocean Science Trust
Marisa Villarreal	California Ocean Science Trust
Ryan Meyer	California Ocean Science Trust
Peter Bromirski	Scripps Institution of Oceanography
Dan Cayan	Scripps Institution of Oceanography
David Ford	David Ford Consulting
Steve Cowdin	David Ford Consulting
Rhonda Robins	David Ford Consulting
Jim Eto	Department of Water Resources
Gregor Blackburn	Federal Emergency Management Agency, Region IX
Ed Curtis	Federal Emergency Management Agency, Region IX
Bob Battalio	Environmental Science Associates
Vince Geronimo	AECOM, Floodplain Managers Association Representative
Justin Vandever	AECOM, Technical lead for FEMA Open Coast Mapping
Jami Childress- Byers	California Office of Emergency Services
David Behar	San Francisco Public Utilities Commission

Participating via webex

Beth Chopp	City of Chula Vista
Lee Alexanderson	County of Los Angeles
Jack Liebster	Marin County
Kent Edler	Santa Cruz County
Becky Smyth	National Oceanic and Atmospheric Administration
John Rozum	National Oceanic and Atmospheric Administration
Rob Cifelli	National Oceanic and Atmospheric Administration