Bay Area Ecosystems Climate Change Consortium

Thursday, April 25, 2013 10 a.m. – 2 p.m.
Conference room, 26th Floor, Bay Conservation and Development Commission
50 California St., San Francisco, CA 94111
Meeting Summary

Attendees:

Sarah Allen, *National Park Service*
Louis Blumberg, *The Nature Conservancy*
John Bourgeois, *CA Coastal Conservancy*
Maria Brown, *GFNMS*
Chris Choo, *Marin Co. Flood Control*
Ellie Cohen, *PRBO Conservation Science*
Liz Exell, *The Bay Institute*
Jenn Fox, *Bay Area Open Space Council*
Doug George, *ESA-PWA*
Matt Gerhart, *CA State Coastal Conservancy*
Wendy Goodfriend, *BCDC*
Robin Grossinger, *S Estuary Institute*
Andy Gunther, *BAECCC*
Kelley Higgason, *GFNMS* (via teleconference)
Sara Hutto, *GFNMS*
Tom Kendall, *USACE*
Gary Knoblock, *Gordon and Betty Moore Foundation*
Tom Kimball, *USGS* (via teleconference)
Carl Morrision, *BAPFAA* (via teleconference)
Roger Leventhal, *Marin County* (via teleconference)
David Loeb, *Bay Nature*
Sara Moore, *Sonoma State University*
James Muller, *SFEP*
Elizabeth Murray, *USACE*
Heidi Nutters, *SF Bay NERR*
Marina Psaros, *Coravai*
Sarah Richmond, *BCDC*
Bruce Riordan, *Joint Policy Committee*
Nancy Schaefer, *Land Conservation Services*
Katherine Smetak, *CEMAR*
Becky Smyth, *NOAA Coastal Services Center*
Mendel Stewart, *USFWS* (via teleconference)
Caitlin Sweeny, *S F Estuary Partnership*
Linda Tandle, CEMAR
Rebecca Verity, *URS*
Seth Willey, *USFWS*
Erica Yelensky, *US EPA*

1. Introduction of participants and their BAECCC-related projects

Participants introduced themselves and the interests of their organizations in BAECCC.

2. Review Agenda

No new items were added to the agenda. Andy Gunther announced that Joe LaClair of BCDC is now a member of BAECCC's steering committee.

3. Group discussion: Climate change impacts for Baylands restoration

Sarah Richmond of BCDC presented findings from the Innovative Wetland Adaptation Techniques in the Lower Corte Madera Creek Watershed project, which began in 2008 with funding from the USEPA through SFEP's Estuary 2100 project. The purpose of the project is to increase the region's understanding of how to improve the resilience of baylands to sea level rise, thereby protecting the ecosystem service of flood risk reduction through wave attenuation. To

achieve this purpose, the Corte Madera Baylands in Marin County were selected as the study site to examine two overarching questions:

1. How is wave attenuation at the Corte Madera Baylands sensitive to sea level rise?
2. What management measures would improve the resilience of the Corte Madera Baylands to sea level rise and thereby maintain their ability to attenuate waves and reduce flood risk?

The Corte Madera site was chosen for study because it contains natural and restored marsh, has monitoring data going back more than 30 years for one of its three marshes (Muzzi Marsh), and has a nexus with the Marin Countywide Plan. In December of 2010, the USGS deployed a suite of instruments to measure wave attenuation throughout the Corte Madera Baylands, from Corte Madera Bay onto the marsh.

Wave heights decreased by as much as 80 percent as they traveled across Corte Madera Bay before they reached the marsh edge. Because significant wave energy on the marsh did not occur during instrument deployment in the winter of 2010, the 1-D WHAFIS and 2-D SWAN wave models was used to expand the understanding of wave attenuation benefits of marshes and examine the potential impacts of higher water levels and wave heights associated with extreme events and sea level rise. Water level was found to be the controlling factor for wave attenuation. For example, WHAFIS modeled attenuation of a 2-foot wave at water levels of 7 feet and 9 feet, and found that wave height was reduced by 70% at the marsh edge in the first scenario and by 17% in the second. Although the WHAFIS model suggests wave attenuation is insensitive to vegetation species, SWAN demonstrated that vegetation plays an important role in attenuating waves; without vegetation wave attenuation was half as much at the 10-foot water level. The accuracy of both models would be improved by observations of wave attenuation on the marsh during high water when there are large enough wave events where waves cross over the marsh. Modeling results also suggest that marsh width is an important factor in attenuating waves, and is more important to overall flood risk reduction at higher water levels. At the 9 foot water level, which is expected to occur more frequently with sea level rise, additional width will be needed to provide current wave attenuation benefits, in particular if water depth over the marsh increases and it cannot accrete sediment fast enough to keep pace.

Findings from both the measured wave observations and modeling efforts are consistent with the general understanding of coastal processes, whereby: 1) water depth determines wave attenuation, where more wave attenuation was observed at shallow water depths (depth-limited breaking); 2) bottom friction in shallows and mudflats cause significant wave attenuation in addition to depth-limited breaking; and 3) waves rarely reach the tidal marshes, but at extreme tides, e.g., King Tides, tidal marshes can attenuate waves due to depth-limited breaking and vegetation-induced friction.

An examination of historic and current sediment dynamics demonstrated that the mudflat and marsh edge are eroding. Additionally, in the near-term, the marshes are keeping pace with sea level rise, but vertical accretion rates are decreasing, with short-term rates less than long-term measured rates. The Corte Madera Baylands system appears sediment limited with no room to

move landward. Therefore, in order to keep pace with sea level rise, it will need to accrete faster in the future.

A suite of potential management measures were considered, including:
1. Reduce near shore wave energy
2. Stabilize with coarse beach, e.g., preserve marsh width
3. Recharge mudflat and marsh with sediment (address sediment-limited system by increasing local sediment availability)
4. Improve sediment pathways (get more sediment into the marsh by increasing channel network density and complexity to increase vertical accretion)
5. Enhance sediment trapping (slow the flow of water to increase vertical accretion)
6. Increase the transition zone (create a horizontal levee) to make room for upland transgression
7. Realign levees

Four of the seven measures were selected in the development of a conceptual sea level rise adaptation strategy for the Corte Madera Baylands. A conceptual model was developed to guide the selection of the measures. The conceptual strategy demonstrates the kind of information and the process that can be used to select management measures to improve baylands resilience but is not intended to be a strategy that will be implemented. The four measures include (2) stabilize with coarse beach, (3) recharge mudflat and marsh, (4) improve sediment pathways, and (6) increase the transition zone. Information about the opportunities and constraints, natural analogs, and experience implementing each measure was presented, and the project findings and recommendations summarized. The project report and all of the supporting research will be available on the BCDC website in early June 2013.

DISCUSSION

Robin Grossinger noted that marsh scarp evolution is complex. SFEI is beginning to develop a conceptual model to represent this process it in more detail.

Wendy Goodfriend noted that both water level and wave height factor into erosion. The co-occurrence of really high water level and huge waves is rare. There is a realistic wave climate in the Bay that is likely to occur, and much of the wave attenuation is a result of depth-limited breaking. The key issue is to understand what wave height occurs at what water level rather than the height of the wave.

Rebecca Varity noted that fetch must also be considered. Wind that blows a long way across water has the potential to create high-energy waves that cause drastic erosion, as occurred in San Francisquito Creek in December.

Andy asked if there is a need to monitor big wave events to measure the shoreline before and after an extreme event? Could one big storm wipe out a beach? Roger Leventhal noted that shoreline systems are dynamic, but in most systems the beach does not just wash away during big events. Aramburu Island withstood much bigger wave heights than Corte Madera in

December 2012 and survived the storms. The coarse-grained part of the beach reacts differently than the sandy portion, and wave orientation to the shoreline is an important factor in determining movement of beach sands.

Wendy Goodfriend highlighted the need to focus on making observations and measurements during high tides and storm winds to further calibrate models that help quantify how baylands attenuate waves at high water levels.

Tom Kendall noted an experiment in Bodega Bay, consisting of the Coast Guard using boats to generate 5-foot waves to test impacts to the marina, which inadvertently tested the ability of mudflats to absorb waves. The waves did not reach the marina because they were attenuated by the mudflats.

Robin Grossinger noted that in better understanding shoreline dynamics, it is tempting to take inferences from other systems, but all systems are very different. Tidal marshes, for example, are very different than rivers (which we understand better) in that tidal marshes regularly receive sediment whereas rivers get a mass influx during storm events.

Wendy Goodfriend posed four questions to help guide the second half of the discussion:

1) What constraints (*e.g.*, scientific understanding, technical feasibility, policy barriers) does the region need to address to manage baylands in the face of accelerating rates of sea level rise and declining sediment supplies?
2) What are the opportunities to test new and innovative management measures? Does there need to be regional monitoring or coordinated performance evaluations?
3) How does the region ultimately evaluate and select management measures given trade-offs between competing uses, short and long term potential impacts, and differing priorities regarding ecosystem services benefits?
4) Does the region need to develop a new "Community of Practice" to ensure co-benefits and robust decision making?

<u>In response to Question 1:</u>

John Bourgeois noted one challenge the South Bay Salt Pond Restoration project faces is launching into a regulatory structure that may not be able to think experimentally. Staff members of some agencies recognize the need for and benefit of scientific experimentation, but actually getting a permit can be problematic. Attaining a general scientific consensus around these issues will give more weight to moving forward more effectively through regulatory processes. Examples of experimental measures being taken as part of proposed projects include use of wastewater for marsh development/nutrient removal at Oro Loma, temporary storage of stormwater in managed ponds, filling the edges of the Bay to create large ecotone areas, and building a land mass at the western edge of Eden Landing to provide flood control protection.

The Bay Area Flood protection agencies are in a similar situation. They have talked about using sediment from channels to recharge mudflats and restore marshes, and they would like to help regulators find a way to make this possible. Mitch Avalon noted that the hurdle is getting the

permits. Can we get a regional group to meet with regulatory agencies to communicate that some risks are necessary to learn what works and what doesn't in a testing phase?

Ellie Cohen noted that applying something like Safe Harbor to permitting and regulating is a potential solution.

Rebecca Verity noted that in permitting a new ferry, the permitting agency wants mitigation for dredging in the Bay (a new requirement), but is opposed to any mitigation that involves research.

Bruce Riordan noted that in developing the JPC needs assessment there was interest in bringing the discussion to the "powers that be" in the region because political push is needed.

Robin Grossinger noted the Flood Control 2.0 project anticipates the problem of using fill creatively in Bay and includes policy, regulatory and economic analyses.

Andy Gunther noted that people are approaching BAECCC who are pursuing shoreline/wetland projects and are concerned about the response they will get from permitting agencies. There is the potential for all of this work to be conceived of as one big regional experiment essential to developing evidence required to support the major shoreline modifications that sea level rise will require. He noted that BAECCC might be able to provide a forum outside of the regulatory environment to develop solutions that allow for experimentation while respecting the existing regulatory structure. For example, wetlands restoration for flood risk reduction and wastewater treatment might also contribute to implementing habitat recovery plans. This approach has the potential to steer the conversation away from conflicts like people vs. endangered species.

Ellie Cohen recommended BAECCC develop a list of agencies and potential roadblocks.

<u>In response to Question 2:</u>

Matt Gerhart noted the Baylands Ecosystems Habitat Goals update as a whole can identify adaptation strategies but will not provide specific detail about how to implement a project in a particular place. Can we, as a community, find locations to implement the needed demonstration projects?

<u>In response to Question 3:</u>

Roger Leventhal noted the engineering and design community is concerned about the liability associated with pilot projects that don't work. This is important when considering how to develop a community of practice.

Doug George from ESA-PWA suggested BAECCC would be a good forum to bring together research and monitoring information from Bay region studies to promote the learning that is part of successful adaptive management.

Chris Choo commented another round of IRWMP funding for monitoring is coming at the end of the year. An interesting project might be developed to study and learn from roadblocks.

In response to Question 4:

John Bourgeois noted the South Bay Salt Ponds project is looking to the BAECCC community as a mechanism to approach regulators with concepts for changes in policy.

Wendy Goodfriend noted that when the Baylands Goals update is done, there will be a number of management measures suggested. A valuable objective for BAECCC would be to facilitate the process for working through the barriers and constraints to implementation for a few of these measures. Andy Gunther noted that opportunities to bring people together are at the heart of BAECCC's mission.

4. Updates

a. Bay Area Adaptation Action Plan (Bruce Riordan)

The Joint Policy Committee finished a five-point action plan to accelerate and strengthen adaptation planning in the nine-county Bay Area for the Kresge Foundation, which is looking for places in the U.S. to fund multi-sector/jurisdictional adaptation projects. The JPC is shopping the action plan to other funders and potential partners. The reaction from Kresge so far has been good. Although there is no answer yet in terms of moving forward, the JPC hopes for a substantial investment. Bruce thanked the BAECCC community for its help in developing the recently completed needs assessment.

The JPC is working to acquire regional funding for adaptation planning that includes the development of an adaptation center, a coordination council, a leaders' campaign, and a vulnerable communities' initiative. Bruce noted these efforts must be tied to GHG reduction.

Existing JPC funding will be used to develop the following three products: 1) an expanded inventory and project map of over 100 regional projects that identify adaptation efforts in various sectors, 2) a climate change narrative (the last deliverable for Kresge) for the Bay Area in four themes that provides a consistent, compelling story to obtain support and funding from elected officials for adaptation planning now; and 3) a workshop in June with the Institute for Sustainable Communities that examines the intersections between different sectors (public health, energy, climate).

The JPC is keeping track of efforts outside of the Bay Area (*i.e.* Sacramento, Washington). Bruce noted the ICLEI is producing a document with a call to action for climate preparedness. He noted that in other areas of the country, adaptation initiatives move forward faster than in the Bay Area because there are dominant cities to lead the way. The challenge for the decentralized Bay Area is to build the regional collaboration that will be important for major progress on adaptation.

5. Group discussion: Bay Area climate change communications tactics and messaging

BAECCC, the SF Bay Joint Venture, and the Coastal Conservancy are organizing a day long workshop to advance coordination and collaboration among professionals who develop and

deliver messages about climate change in the region. The workshop has the following objectives: share knowledge of current climate change communications efforts across sectors and geographies, identify opportunities for collaboration, and refine tactics and messaging for specific projects. Marina Psaros led a discussion about how to move forward with a climate change communications strategy for the group. To start the discussion, she posed the following questions:

1) How can natural resources communities better communicate with each other and outside groups about communicating local climate change impacts and solutions?

2) How can we develop a more cohesive set of messages?

3) What do we want people reading the local newspapers to come away with?

4) How can we be strategic about garnering public support?

Matt noted the decision makers are the key audience and people who pay attention to the general public, rather than the general public itself. Several people noted the importance of bringing messages to the general public. David noted that policy makers either feel political pressure or they don't. The Bay Area has a relatively educated public and bringing the message to the public is a way to educate decision makers.

Other comments and ideas from the group included:

Maria Brown commented on the need to educate people who process permits, and communities where work is being done. For example, in the Bolinas lagoon, she noted the community doesn't understand the value of research and monitoring prior to restoration action, and NOAA is trying to communicate this value.

Bruce Riordan reminded the group that a major messaging campaign requires funding. We need to attract the attention of elected officials who would respond to data showing constituent interest and/or concern about the issue, evidence of big economic impacts (ports, airports, bridges), and actions that make a difference. If the workshop could help craft this message it would be valuable to many in the region. He noted that while one doesn't find opposition to climate adaptation in the Bay Area, it is not a priority. Work on elevating the issue to a priority should be the goal.

Andy Gunther suggested all messaging does not have to be perfectly aligned, but we can focus on core themes (*e.g.*, why action is needed now). These core themes can be built into everybody's messaging (ecosystems, public health, etc.) over a wide range of sectors.

David Loeb noted some messages require more education of the audience (for example, very few people know about the San Francisco Bay Restoration Authority). Successful messages will include the idea that we can make a difference through adaptation actions, and we should consider incorporating an "ask" (*e.g.*, what do we want our audience to do?).

Marina noted we have examples of successful messaging focused around a particular type of project. For example, messaging differently about the floodplain has been successful. We need to think about what are we saying and the most important things to say.

Carl Morrison noted messages for politicians need to include the idea that the cost to address these issues now is less than the cost of addressing them in the future.

Doug George suggested the workshop include some media training so that a message is crafted to address what the media is looking for and how to best deliver messages.

Heidi Nutters suggested people want to hear the climate change story from the members of the public who are being affected by climate change. She also noted that workshop attendees would benefit from training on how to tailor a message.

Jenn Fox asked that people come to the workshop having considered how to distill climate change information at the right level for our target audience. She noted that Susan Hassol (climatecommunications.org) has some excellent materials about this topic. Ellie noted that talking to rangeland managers and ranchers about their bottom line, values and needs (not climate change), is how to be effective in this community. They are paying for water now and they pay for hay, and climate change will influence these bottom line issues.

Matt suggested it would be useful to have a shared technical product (basic info about impacts) that can be refined by different messengers for different audiences.

Sarah Richmond noted that due to the wide range of future climate projections, we need to help people work with this wide range of possibilities—help engineers and builders design when there aren't narrowly defined specifications.

Marina thanked everybody for their input, and encouraged them to contact her (marina@coravai.com) with ideas for speakers and breakout sessions or with any additional feedback.

6. Updates (continued)

a. Local Coastal Program Sea Level Rise Adaptation Grant Program (Matt Gerhart)

OPC's recent grant round, specific to outer coast sea level rise adaptation work, is meant to allow for technical development, preplanning, actual planning, tool development or related work that localities need to update local coastal programs to comply with the Coastal Act. There is not a fixed award maximum or minimum, but awards will likely be in the range of $50,000 – $200,000, with a total of up to $2.5 million to be distributed. Applications must come from one of the jurisdictions that have planning responsibility under the Coastal Act.

The Coastal Conservancy will soon announce a concurrent round of $1.5 million statewide for projects addressing a wider range of climate change impacts than sea level rise. Proposals to address sea level rise inside the San Francisco Bay will qualify as well. The focus will be on

climate adaptation analysis, products, and test strategies that lead to on-the-ground work. An announcement will be sent the BAECCC list serve.

b. Upcoming BAECCC workshops on climate-smart actions (Nancy Schaefer)

Surveys circulated by BAECCC and TBC3 at the BAECCC workshop held in November helped determine the topics of three upcoming half-day workshops to be held by BAECCC: 1) climate change overview and case studies of projects underway or completed, 2) climate-smart wetlands restoration, and 3) climate-smart grazing/range management. Nancy noted many traditional ranchers have doubts that "holistic" grazing practices (such as grazing for water retention) are effective, highlighting the case for developing a communication product targeted to this group.

A workshop committee call is being organized for May.

c. Ocean Indicators Working Group, Our Coast Our Future (Sara Hutto)

Our Coast Our Future. Since the launch of the OCOF north coast decision support tool in February 2013, two training webinars on the tool have been held. The last webinar, hosted through the EBM tools network, had attendance from all over the US and from several other countries. Directed trainings will be offered. The digital elevation model for the San Francisco Bay tool will be available this spring, and the mapping tool will be available in 2014. The second advisory committee meeting for the project was held in April, and the next meeting will be held in July.

Ocean Indicators Working Group: The final indicators have been developed and a monitoring plan will be completed by September 2013. PRBO Conservation Science is collaborating on the project. The indicators working group would like to tie the ocean indicators into the Bay. Benét Duncan, who worked to develop the indicators, has been selected to serve as expert on an indicators team that is reporting to the National Climate Assessment and Development Advisory Committee.

7. Review of action items, other business

Andy Gunther noted BAECCC's new strategic plan, currently under development, will organize future activities around four key outcomes. A plan summary will be available in the next few weeks. The plan will be used to revamp the BAECCC website.

Louis Blumberg noted The Nature Conservancy will hold a symposium in Sacramento on May 20th on how natural systems can address climate change. This symposium is part of an effort to get funding for natural resource conservation from AB 32.

David Loeb noted Bay Nature has funding for three more articles related to climate change in the Bay. The next two issues will focus on fog and ocean acidification; information about future articles will be sent to the BAECCC group.

The California State Assembly has created a Select Committee on Sea Level Rise and the Economy. A list of members will be sent to the BAECCC group. The next meeting will take place on May 15th and time will be allotted for public input.

Heidi Nutters noted SF Bay National Estuarine Research Reserve will host a series of field trips to see examples of tidal marsh restoration.

Elizabeth Murray noted the Army Corps of Engineers is linking its national adaptation work to efforts in Bay Area. A recently funded USACE project will create a GIS map of the bay of showing projects related to resilient shorelines. Elizabeth will contact the BAECCC group to obtain information on ongoing projects.

8. Adjourn

The meeting was adjourned at 2:00 PM.