



**Central Valley Flood Protection Plan
Climate Change Scope Definition Work Group
Summary of Meeting #2 – September 17, 2009**

September 17, 2009, 1:00-5:00 pm

**Location: American River Room, MWH
3321 Power Inn Road, Suite 300, Sacramento**

MEETING ATTENDANCE

Present:

Name	Organization	Status
Curtis Alling	EDAW/AECOM	Team
Debra Bishop	EDAW/AECOM	Team
Charlotte Chorneau	Center for Collaborative Policy (CCP)	Facilitation Support
Stephen Crooks	National Blue Ribbon Panel: Wetlands Restoration Greenhouse Gas Mitigation Emission Offset Protocol	Member
David Curtis	Carlton Engineers	Team
Michael Dettinger	U.S. Geological Survey (USGS)	Member
David Edwards	California Air Resources Board (ARB)	Member
Gary Hester	DWR	Central Valley Flood Management Program (CVFMP) Program Manager
Alexa La Plante	MWH	Team
Roger Lee	DWR, Central Valley Flood Protection Office (CVFPO)	CVFPO Representative
Nay Seavy	PRBO Conservation Science	Member
Mary Selkirk	CCP	Facilitator
Yung-Hsin Sun	MWH	Technical Lead, CVFMP Consultant Program Manager
Michael Tansey	Reclamation	Member
Susan Tatayon	The Nature Conservancy (TNC)	Member
Stu Townsley	U.S. Army Corp of Engineers (USACE)	Member
Robert Webb	National Ocean and Atmospheric Administration	Member

Absent:

Michael Anderson	Department of Water Resources (DWR)	DWR Lead
Elizabeth Patterson	Solano County Water Agency Board	Member
David Raff	U.S. Bureau of Reclamation(Reclamation)	Member

Kelly Redmond	Western Regional Climate Center	Member
Mark Schwartz	UC Davis	Member
Terry Root	Stanford University	Member

Observers:

Tom Filler	DWR	Observer
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WORK GROUP HOMEWORK / ACTION ITEMS:

1. Project Team will clean up Worksheet #4 and send out to the CCSDWG for review. (Done)

FUTURE MEETINGS SCHEDULE:

The Climate Change Scope Definition Work Group (CCSDWG) will meet four times total.

Upcoming meeting schedule:

- Meeting #3 will be October 8th 9:00-1:00pm at MWH.
- Meeting #4 will be October 20th 9:00-1:00pm at MWH.

MEETING OBJECTIVES:

1. Discuss/seek agreement on definitions for the priority topic areas identified on the Mind Map at Meeting #1
2. Discuss trial balloon conceptual model
3. Generate first cut at checklist of climate change considerations
4. Provide feedback on the draft reference list

SUMMARY:

POWERPOINTS AND DOCUMENTS REFERENCED IN THE SUMMARY ARE AVAILABLE ONLINE at www.water.ca.gov/cvfmp

OPENING REMARKS:

Gary Hester, CVFMP Program Manager, provided a brief update on the overall program progress. He explained that the five Regional Conditions Work Groups (RCWGs) are holding their fourth meetings this week. Mr. Hester mentioned that the planning team is looking to streamline the process and keep the target date of December for the draft Regional Conditions Summary Report (RCSR).

Yung-Hsin Sun, Technical Lead, CVFMP Consultant Program Manager, mentioned that he will be sending notification to the Work Group members of the formulation of an agriculture subcommittee as results of recommendations received. The agriculture subcommittee will operate much like a topic work group with the objective to address the agriculture scope definition of the Plan.

WELCOME AND GREETINGS:

Mary Selkirk welcomed the group and reviewed the objectives for the second of four meetings on climate change as it relates to the Central Valley Flood Protection Plan (CVFPP). Group members introduced themselves.

Ms. Selkirk asked the group if the members would be opposed to having the draft meeting summary posted on the website before the work group members are able to provide comments. She explained the reason the project team would like to do this is to provide feedback to the RCWGs as they are meeting on a more regular and fast past schedule. No one in the room or on the phone objected to posting the draft summary, as it would be clearly marked "draft".

REVIEW: FloodSAFE AND THE CVFPP:

Mr. Sun reviewed the introductory PowerPoint presentation of the FloodSAFE program, the CVFPP, and the context in which the Work Group is working. He reviewed the overall CVFMP products and schedule. He explained there is nearly a draft complete of the first product the state plan for flood control descriptive document. The next deliverable is the flood control system status report planned for 2010 and the first draft of the CVFPP is due by 2012, and needs to be finished in late 2011 for CVFP Board adoption within 6 months. The planning process is to outline the vision for the flood control system and not a feasibility study. The planning process will identify the objectives and then move into solving the problems and assembling a solution plan. All of the current work groups, both regional and topical will feed information to the RCSR. The RCSR, to be complete by the end of 2009, will outline the underlying problems and what makes sense to be address in the 2012 Plan.

Mr. Sun explained that the CCSDWG will meet two more times, and that the project team will then report back to the Climate Change Technical Advisory Group (CCTAG) under the CA Water Plan. In response to concerns raised by CCSDWG members about how the topical work group deliverables will be incorporated into the RCSR, the project team will host a public forum in January to facilitate cross work group discussion. Although it is not in the CCSDWG Charter that members review the draft RCSR before it is released publicly, Mr. Sun explained that this could be an added step in November if the members so preferred. There could possibly be a meeting or conference call for Q&A on the draft RCSR. CCSDWG members agreed that they would like the opportunity to review the draft RCSR before it goes public.

Discussion: Key Aspects of Climate Change Affecting Integrated Flood Management in the Central Valley. Review of Reconfigured Mind Map:

To begin the conversation in Meeting #1 on the key aspects of climate change affecting integrated flood management in the Central Valley the planning team put out categories including physical processes, ecosystem restoration, socio-economics, and management policy and adaptation strategies. After going through the mind map exercise it was evident that there were linkages between the different categories, as well as the priority areas. A better definition for terms and key aspects to capture the context was identified as a need. A conceptual model was shared in the first meeting as one way to organize the information as drivers, and pressures. Mr. Sun explained he took that concept and the key aspects that the work group generated and reconfigured the Mind Map, organizing the factors into four main topics: great complexity and uncertainties, increase in temperature, sea level rise and changes in precipitation. Priorities identified in the first meeting are articulated in the reconfigured Mind Map through symbols of stars and low priority as red x's. Overall the content is the same, it is only reorganized. Ms. Selkirk asked the group if this makes sense as a conceptual communication of the aspects of climate change affected integrated flood management to the CVFMP Team.

Discussion:

- Some of these branches flow to specifics on how climate change might affect flood by changing the threats on levees, etc. Yet, some of these things do not lead directly to flood. CCSDWG members wondered how narrowly they should be thinking in terms of flood. Mr. Sun explained not all the recommendations the group comes up with will be

- included in the plan verbatim. Throughout the discussions that have already taken place there have been aspects identified as out of scope. The branches of the Mind Map will depict direct, indirect or related connections to integrated flood management; they can even go all the way to problem statements. The exercise was meant to capture the landscape of aspects, look at priorities and begin to group things; Mr. Sun hoped that the group kept the list of references in the back of their minds as they look at the aspects.
- CCSDWG members acknowledged that the reconfigured Mind Map does capture what was discussed in the first meeting. There should be a caveat included that this does not capture the universe.
 - Members expressed concern and questions about how the Mind Map would be used.
 - One member mentioned that the CEC Climate Change symposium Benjamin Brooks from the University of Hawaii spoke about measuring changes in elevation of the Delta. Through his studies he observed that the Delta surface is subsiding due to compaction and groundwater extraction. The Delta flood risk is a huge issue it is not specific to climate change but something which should be captured within the process.

Issues with Mind Map

- Members pointed out that the direction of change depicted in the Mind Map appears to be one directional. The landscape needs to address the alternatives and the possible changes in the opposite direction and what implications those changes will have. For example where does plus and minus rainfall fit into the picture? Or changes in seasonality of rainfall and the positive affects that could have on some industries.
- An issue with the Mind Map is that with 60 branches the important and useful items get lost. Members were not sure how useful the information is in this format. There needs to be a way to communicate what branches within this tree are more defined and which include much uncertainty. There is a different scale of variability in climate change that should be reflected in the Mind Map.
- There is a fundamental difference in the topography of the Mind Map done during Meeting #1 and the reconfigured map. The reconfiguration took something that had a lot of interconnections and made it into something flat.

Restructuring Ideas

- In thinking about planning for adaptation and measures of success and how to account for uncertainty, one member suggested three main groups are the parameters for analysis: changes in exposure, changes in sensitivity, and changes in resiliency.
- One member suggested that out of the four main categories there are really two issues: scientific and planning/regulatory.
- Change “changes in precipitation” to “uncertain changes in precipitation” because change implies a projection.
- In the original Mind Map socio-economic and policy had an equal place with the physical process and with the reconfiguration structure socio-economic and policy gets lost as those aspects are broken into smaller pieces within the Mind Map structure.
- There are some considerations that if the wording was changed they could be priority considerations.

Issues with Policy

- It is difficult to know how to manage now in light of the uncertainty. The report should outline the actions that can be taken now, and the policy changes that should or can be made, however the uncertainty around intensity of storms makes it difficult to say anything for certain. The report from the CCSDWG needs to convey why climate change affects on policy are so uncertain.
- Members of the RWGs are familiar with flood issues in their regions and know what has happened in the past and what the response has been. There has been discussion of climate change in the RWG meetings, but they are looking to this group with specialized

knowledge to provide recommendations to the regions on future challenges and the range of changes anticipated to inform policy decisions.

- Members discussed that the role of the CCSDWG is not to answer the uncertainties but rather to encourage that there be flexibility in the system and to build specific adaptation points into the plan.
- The RWGs would like to hear answers however the outcome of the uncertainties has to be up front plans for flexibility and capacity.

Ms. Selkirk asked the group that given the imperfection of the reconfigurations and the comments received to make changes, does this Mind Map do a good enough job at identifying the central areas that will be impacted by climate change. Overall the group was turn, many people felt that the Mind Map was acceptable representation of the considerations, and frames the issues but should not be shared with the RCWGs. One member suggested that it could be used to write or identify issues but should not be released to other groups.

Existing Problems and Future Challenges/Opportunities

Ms. Selkirk introduced both the handout for worksheet #4 and Worksheet #4. The handout is the list of problems and challenges which the group began in Meeting #1. To make the list of problems and challenges generated by the CCSDWG more accessible the project team asked that the statements be put into categories. From the RCWGs and from the CCSDWG the project team presented a list of possible categories in Worksheet #4.

- Flood system performance (*channel capacity, levee structural integrity, hydraulic features, operation, insufficient level of protection*)
- System maintenance and repairs
- Habitat quality, quantity, and connectivity (*loss and degradation of habitat and species, lack of natural process*)
- Policy and institutional issues (*Fed/State/Local coordination, liability, funding*)
- Water supply and quality (*conflict of management policy, flood-induced water quality concern*)
- Level of protection
- Land use
- Emergency response and post-flood recovery
- Information and education

The CCSDWG then worked through each category as a full group offering problem and future challenges statements. The recording of the problem and future challenges statements was done real time so that participants could see what others were saying. The statements were then edited and sent out to the group for review. What was sent out to the CCSDWG appears below.

Flood System Performance

- There is a lack of resiliency, adaptability and flexibility in the flood control system due to the current configuration of infrastructure.
- Levee stability is more difficult to maintain due to impacts from sea level rise.
- Flood system performance is more difficult to manage due to uncertainties in the intensity, duration and frequency of precipitation events.
- The current flood forecast and warning system, including data monitoring components, may be inadequate in handling the changing climate.

- Levee stability is more difficult to maintain with land subsidence resulting from reduced precipitation, and thus make it more difficult to provide for flood protection.
- Modification to levee heights or configurations will modify downstream or system-wide hydrographs.
- Current flood system operation rules may become less appropriate due to sea level rise and changing flood frequency, size and seasonality.

System Maintenance and Repairs

- Current flood infrastructure operations and maintenance (O&M) practices do not provide for flood control system adaptation and resiliency to climate change impacts.
- The frequency of flood infrastructure repairs may change with wetter, dryer, and warmer climate conditions. Changes in flood hydrology and other factors (e.g. vegetation) may require increased maintenance funding.
- More resources may be required for future flood management O&M with a fragmented system and increased demand on local reclamation agencies and levee maintaining agencies.
- Increased flood management O&M may be needed with worsening interior drainage capabilities from urban land development.

Habitat Quality, Quantity and Connectivity

- Changing physical conditions due to climate change, such as increased water temperatures, may affect species habitat, including the status of ESA-listed species.
- Changes in the quantity of cold water storage may result in a decrease in the quality and quantity of aquatic species habitat.
- The separation of the floodplain and channel disrupts natural floodplain processes, such as the moderation of water temperatures and wetland habitat.
- Changes in the magnitude of streamflow from spring snowmelt may impact the establishment of riparian vegetation and the out-migration of juvenile salmonids.
- Habitat fragmentation changes how ecosystems respond to climate change.
- Historical reference conditions no longer provide a guide for restoration.
- Levee building in response to sea level rise prevents habitat migration.
- Increased stresses on the flood control system could exacerbate conflicts between providing for habitat protection and system operation.
- It will likely become more difficult to have enough water to manage and establish wetlands with climate change impacts.
- Subsidence of land and sea level rise will make wetland restoration more difficult in the future.

Policy and Institutional Issues

- Conflicts among water supply management, flood system performance and maintenance, and water quality objectives will be exacerbated with climate change.
- Changes in flood characteristics may require changes in land use policy, new reservoir flood operations, and new storage requirements (i.e., tensions between the flood storage and water supply issues).
- Uncertainties in climate change will complicate future land use decisions.
- Climate change adaptation strategies at the local level should be coordinated so as not to further exacerbate problems due to climate change. Currently, there are several different potential policy directions that may conflict with each other.
- It will become increasingly important to reduce the potential for flood management operations and technology to increase GHG emissions.
- Most current policy assumes that climate conditions will remain the same, and thus does not provide for flexibility in adapting to climate change.

Policy and Institutional Issues (cont.)

- Most assessment tools for investment decisions (cost benefit analysis tools etc.) assume that climate conditions will remain the same, and are not designed for multi-scenario analyses.
- Future political considerations may/can override scientific recommendations.
- Uncertain climate change impacts on flood hazards will complicate liability issues in the event of a damaging flood event.
- Publicly funded infrastructure need to account for climate change vulnerability.
- Iterations of floodplain development do not consider the full cost of projects, such as the potential need for removal of infrastructure. This should be internalized at the beginning of the process.
- The ability to balance changing water requirements for agricultural and M&I use vs. ecosystem sustainment will become more challenging.

Water Supply/Demand and Quality

- Water demands from different sectors, such as agriculture and the environment, may change under climate change.
- Increased precipitation from rainfall in the fall and winter months will lead to reductions in water supply under current reservoir operation regulations. Balancing multiple water demands will become more difficult in making both water management and policy decisions. Increasing conflicts in water supply allocation are tied to increased water demands.
- There is concern about the possibility that prolonged drought episodes interrupted by flooding will enhance stormwater runoff and thus increase water quality impacts from pollutants in the watershed being carried by that runoff.

- Climate change aggravates the need for water temperature management.
- Changes in both hydrology and vegetation may result in changes in the stream sediment loads and and sediment transport during flood events.
- Sea level rise will lead to deterioration of water quality in the Sacramento-San Joaquin Delta by increasing salinity levels, among other effects.
- The current system does not have the ability to regulate flows to meet both water supply and flood management objectives.
- It is uncertain at what level changing water requirements for agriculture and M&I need to be balanced against ecosystem requirements or how agriculture demands and ecosystem demands will change.

Level of Protection

- Changes in hydrology redefine the level of protection of flood infrastructure.
- Level of protection should be risk-based.
- The desired level of protection of flood infrastructure will carry a different meaning in light of climate change; LOP becomes a “moving target” in that it constantly changes as hydrology changes.
- Climate change may affect the ability of historical records to characterize level of protection and the economic response.
- Current modeling scenarios should incorporate 200-year flood protection.
- Sea level rise may directly affect the level of protection of flood infrastructure situated in tidally influenced areas.

Land use

- SB375 may increase the consequences of flooding because of development in floodplains. It will be difficult to coordination between SB 275 (i.e., Sustainable Community Strategy (SCS)) and floodplain protection.
- Climate change may require more frequent revisions/updates of FEMA maps and affect the cost of projected flood damages.
- Climate change conditions could increase conflict in areas of land use including agriculture, flood management and development.
- Urban encroachment and conversion of fields to permanent crops will make it more difficult to adapt to climate change.
- Sea level rise will further endanger Delta communities.
- Land use decisions under climate change could exacerbate difficulties in maintaining water temperatures and quality.

- Climate change impacts may increase the disproportionate effects of flooding on certain populations of the State due to land use decisions.

Emergency Response and Post-flood Recovery

- Climate change may impact decisions on rebuilding floodplain (and other) communities.
- Climate change may change the magnitude and frequency of events requiring flood response.

Emergency Response and Post-flood Recovery (cont.)

- Current emergency response plans and agencies may not account for adequate resources (staff and budget) to manage the magnitude and frequency of events requiring flood response.
- Climate change may reduce the resiliency of ecosystems and agriculture for post-flood recovery.

Information and education

- It is difficult to communicate climate uncertainty to the public. Climate change uncertainties will require increased investment in research, flood mapping, and agency coordination to effectively improve the understanding of climate change and ability to convey that information to the public.
- In some cases, the public perception is that there are no problems related to climate change.

Next Steps

The Work Group felt their time was best spent working through the problem and future challenges statements and did not get through the entire planned agenda. Ms. Selkirk mentioned that at Meeting #3 will concentrate on the considerations checklist and the reference list. One member asked how to the Work Group members are to address the reference list. Mr. Sun suggested as an example when members review Worksheet #4 to think of references that would support the statements being made.