



Central Valley Flood Protection Plan

DRAFT Meeting Summary

Lower San Joaquin Regional Management Actions Work Group Meeting #1

Climate Change Work Group Meeting #2

Time: August 23, 8:00am-12:00pm
Location: MWH
 3321 Power Inn Road, Suite 300
 Sacramento, CA 95814

MEETING ATTENDANCE:

Present:

Name	Organization
<i>Susan Sherry</i>	Center for Collaborative Policy (CCP)
<i>Erin Mullin</i>	Department of Water Resources (DWR)
<i>Mike Anderson</i>	DWR
<i>Matt Young</i>	MWH
<i>Yung-Hsin Sun</i>	MWH
<i>Stacy Cepello</i>	DWR
<i>Abdul Khan</i>	DWR
<i>Andrew Schwarz</i>	DWR
<i>Nathan Pingel</i>	David Ford Consulting
<i>Robin Webb</i>	National Oceanic and Atmospheric Administration (NOAA)
<i>Marty Ralph</i>	NOAA
<i>David Raff</i>	US Bureau of Reclamation (USBR)

WORK GROUP ACTION ITEMS/HOMEWORK

ACTION ITEMS:

1. Nathan Pingel will develop a two-pane schematic incorporating two versions of the flow chart discussed below and send to Yung-Hsin Sun for incorporation in the climate change threshold approach.
2. David Raff will share relevant data from the USACE CWMS model with the Climate Change Thresholds Approach Work Group (CCTAWG).
3. CCTAWG members will submit comments on the threshold approach to Matt Young. MWH staff will incorporate comments and distribute a revised version to the CCTAWG on Monday, August 30th.

GROUP PURPOSE AND RECAP: (meeting highlights for use by Work Group partners in their communications based on Work Group Charter)

The Climate Change Thresholds Approach Work Group (CCTAWG) met for its second of two meetings to further develop the concept of threshold analysis approach recommended by the Climate Change Scope Definition Work Group (CCSDWG) in Phase 1 of the Central Valley Flood Protection Plan (CVFPP).

The CCTAWG was chartered as a technically-focused work group assisting with development of an evaluation framework to incorporate climate change planning considerations into the CVFPP. The work group will provide external expertise on this emerging scientific subject. The group will focus on application of the science in the most uncertain element in the existing climate change scenario analysis, extreme atmospheric and hydrologic events.

SUMMARY:

****WORK GROUP CHARTER AND ALL PRESENTATIONS AND MATERIALS
AVAILABLE ONLINE AT www.water.ca.gov/cvfmp****

Welcome and Business Items

Susan Sherry opened the meeting and led CCTAWG members in a round of introductions. She then provided a review of the agenda and overview of all materials. She explained that the focus of the meeting would be a review of the proposed threshold analysis and the overall threshold approach, with specific emphasis on the sampling methodology and hydraulic modeling. After opening remarks from Erin Mullin, the following discussion was recorded:

Discussion:

- A participant asked if all comments from CCTAWG meeting #1 were recorded into the threshold approach document. Matt Young responded that not every metric discussed was included, but generally all other comments were incorporated.

Threshold Analysis Presentation

Yung-Hsin Sun delivered a presentation regarding the threshold analysis and context for how climate change information will be used in the CVFPP. The CVFPP is essentially the state's vision for future investment in the Central Valley flood risk management system. The 2012 CVFPP will focus on system-wide changes throughout the Central Valley, while the larger FloodSAFE effort will include programs to look at site specific flood risk management efforts.

The focus for the climate change threshold analysis is to develop a critical threshold that is likely to be exceeded in the CVFPP 50 year planning horizon. It should be noted that although the planning horizon is 50 years, most of the infrastructure in the flood risk management system has a longer projected lifespan. The threshold will be used to develop an investment strategy that takes into account the stressors on that system due to climate change. The 2017 CVFPP will include a more quantitative threshold analysis than the 2012 CVFPP.

Discussion:

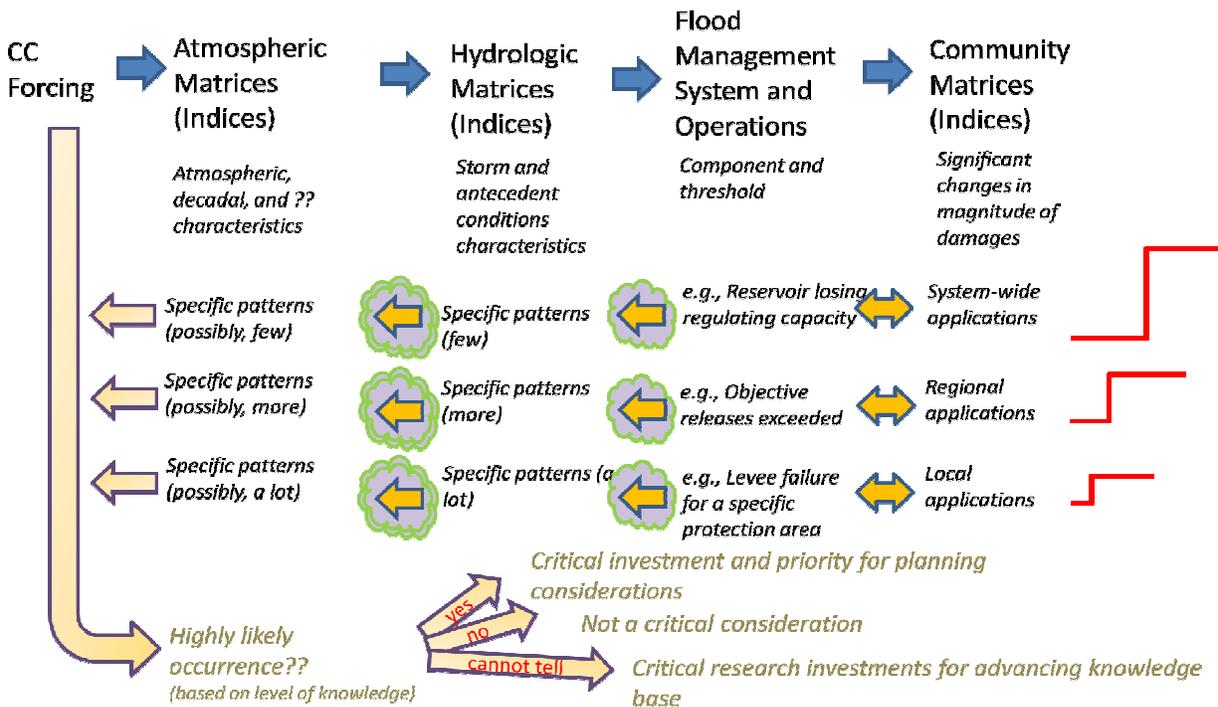
- CCTAWG members asked how staff distinguishes local from regional specificity in the CVFPP. Mr. Sun responded that the regional and system-wide focus of the CVFPP focus on the entire

State Plan of Flood Control (SPFC) and associated upstream areas. Any actions taken outside of the SPFC must improve the flood system within the SPFC. The SPFC is not a “plan” in the usual sense, but rather a consolidation of all flood risk management activities and facilities within a legally defined area in the Central Valley. This system is outlined on page 2-4 of the threshold analysis. Ms. Mullin added that “local” generally refers to local political entities such as SAFCA, SJAFCA, reclamation districts (RD), cities, etc.

- A participant asked if the CVFPP will serve as a nexus between future feasibility studies and the requirements of SB5, and whether things like interagency coordination, reservoir operation, and strengthening levees are on the table at the policy level. Mr. Sun responded that the CVFPP will be a strategy level document, and that all of the things mentioned are already captured in the current suite of management actions.

Definitions and Flowchart Discussion

Mr. Sun laid out a preliminary conceptual diagram of the climate change threshold approach (shown below). The flowchart starts in the upper left hand corner and runs counter clockwise. A series of atmospheric, hydrologic, flood management and community metrics are used to define likelihood and severity of climate change-based flood events based on the available level of knowledge about each metric. Discussion on the flowchart is recorded below the figure. The chart is intended to convey the concept of a “bottom-up approach to climate change



Discussion:

- A participant outlined an email sent August 22 related to the diagram, and suggested that the “flood management” column presents scenarios that are “nested” within each other (i.e., objective releases will be exceeded if a reservoir loses its regulating capacity, and levee failures are likely in the event that objective releases are exceeded). He approved of the illustration above, and

suggested that it's similar to the USGS 1331 Circular. One concept that could be added in is the idea of "robust decision making."

- Members asked if the hydrologic and atmospheric matrices should be specific patterns. Mike Anderson responded that atmospheric matrices rely on patterns, while actual conditions are more appropriate metrics for the hydrologic matrix.
- Mr. Sun suggested that an additional "cloud" could be added to the diagram between community matrices and flood management.
- Participants noted that climate change will affect other water issues besides flood management, including integrated regional water management and ecosystem effects. All participants acknowledged that during a flood event, flood management issues trump all other uses. Issues such as water supply for human consumption and the environment must be considered before and after a flood event. A suggestion was made to explicitly state this in the threshold approach.
- Participants generally agreed that providing additional definition of each column heading could be useful. One participant suggested creating a two-pane schematic showing the flowchart as written in one pane and moving in reverse on the other. Nathan Pingel will send the revised sketch to Mr. Sun for incorporation (**see Action Item #1**). Another member suggested that a bi-directional sketch be created to represent system-wide redundancy.
- A participant commented on the idea of starting at the local level and working up to atmospheric issues. Specifically, he cited the Jones Tract case, noting that as a result of flooding, increases upstream were released to deal with salinity intrusion. By doing this, critical riparian habitat was flooded. In this case, local occurrences had system-wide consequences. Mr. Sun and Mr. Anderson responded that since climate change has such a complex network of potential effects, you could conceivably start with any point on the flowchart. The important thing from a planning perspective within CVFPP is to create an "anchor point" that recommendations can be built off of. This will allow the creation of demonstration projects to "make the process real."
- One member made a general comment that the flowchart could be simplified to make it more easily digestible by the general public.

Definitions Discussion

A number of comments were made specific to definitions provided to the CCTAWG in a PowerPoint. The following information is a record of that discussion. For a copy of the presentation, please refer to the website listed above:

- A member suggested removing "that" from slide 3 and substitute, "further worsening of which..."
- Nearly all participants agreed that slide 4 should be revised to read, "thresholds that may be exceeded in 50 years..." A dissenting opinion was offered to revised slide 4 to include a caveat that these things must be *highly likely to occur within 50 years* in order to be seriously considered for changes in investment strategy and flood management operations. Further definition of "highly likely" may be needed.
- A participant noted that Slide 2 should be revised to strike out the phrase "likely to be exceeded" and include in its place "...to identify critical thresholds warranting changes..." It is important to note that the concepts presented are critical thresholds as opposed to esoteric concepts.
- Participants generally agreed that all CCTAWG definitions should avoid mention of "risk analysis" whenever possible, as the threshold approach goes beyond typical probability/consequence analysis. In the broader FloodSAFE effort, staff has been careful to separate the consequences and probability of flooding into separate efforts. It could be useful to determine some type of "baseline risk" to measure off of. Participants ultimately settled on an approach that addresses three separate components: thresholds, consequences, and likelihood.

- Participants generally agreed that terms such as “unacceptable,” “likely,” and other subjective terms should be avoided in the threshold approach wherever possible to limit the amount of interpretation needed by the legislature as future laws are needed to enact CVFPP recommendations.

Worksheet #2 Discussion

Key Question: What is an appropriate methodology for sampling extreme events from a projected future distribution?

Mr. Anderson asked participants to consider which elements should be sampled within the threshold approach within the broad array of climate change issues. Specifically, should these elements be taken from a subset of GCMs or use the “ensemble-informed approach.” He suggested using a pro/con analysis as a starting point for the discussion.

Discussion:

- A member commented that running 112 different GCM simulations may be too difficult to do. Mr. Raff agreed, and noted that the matrices that have been used in the past should be revised to avoid decadal projections of temperature change.
- Mr. Anderson suggested that the group should avoid using average changes in precipitation for CCTAWG work and average change in temperature instead.
- Participants suggested that downscaling is needed to reduce GCMs to more useable information specific to California.
- One person suggested that multiple methodologies may be needed: using a specific subset of GCMs could limit the options available for the threshold approach. A challenge is that there is no consensus on the correct methods or models: using an analysis that uses both GCMs and regional downscaling statistics could be more appropriate.
- Participants asked how downscaling could affect GCM data. Mr. Anderson responded that downscaling must occur by looking at larger data sets from both a temporal and geographic point of view.
- Mr. Sun suggested that using both methodologies on a few test cases and comparing the results for accuracy could be the best way to determine which the preferred method is. If the results are close enough, the simpler method should be used from there out.
- A member asked whether existing data sets are adequate to use both the GCM and informed ensemble methods. Mr. Anderson responded that it may not be, and could require doing dynamic simulation for the Sierra Nevada and Central Valley. Mr. Sun added that identifying where modeling information is inadequate is also an important data point. The Bay Delta Conservation Plan (BDCP) ran into similar issues with CALSIM and DSM-2 at the beginning of its work. Another member noted that from the simplest levels, if hydrologic modeling is not overly sensitive, you could book end the results by inputting the most extreme examples. One participant remarked that it is unlikely that there is any correlation between how models perform using past events vs. using them to project future changes.
- A member commented that a process must be defined for downsizing GCMs to region-specific models similar to the BDCP modeling efforts. In this case, the lack of data requires the selecting of enough different data sets that information has multiple biases and is not weighted in one particular direction.

Worksheet #3 Discussion

Key Question: Does the work group recommend any specifications of capability that CVFPP needs to have to successfully implement the Threshold Analysis approach?

Discussion:

- One participant noted that the selection of the timeframe could affect your subset analysis.
- Another participant noted that on the question of hydrologic operation modeling, it's important to remember that MWS-RSS is a "lump" type model that does not carry soil moisture. For the purposes of the CVFPP, it could be useful to use physical based models in addition to RSS. CWMS should also be used; this model allows you to integrate results from the various USACE models to design systems for a variety of variables. This will help answer which parameters are needed to more accurately answer questions about the adequacy of GCMs going into the future. He agreed to share relevant data with the CCTAWG for future discussions (**see Action Item #2**).
- Participants noted that additional hydrologic models could be needed for the CCTAWG threshold approach. In particular, USBR Live Model could be helpful. Staff will discuss the possibilities of using Live Model for climate change work.
- A member noted that it could be a good idea to have some sort of parameter sensitivity analysis to ensure proper model calibration.

Worksheet #1 Discussion

Key Question: Which method for identifying critical system components should be used (uncontrolled reservoir release, levee failure, or chokepoint identification)?

Discussion:

- A participant asked whether critical thresholds should be thought of as uncontrolled release or exceedence of downstream capacity. Mr. Anderson responded that it is both: at some point you can lose control of release but still be within downstream capacity. In addition, at some point you will exceed downstream capacity. This is characterized as chokepoint identification.
- A member commented that "high-consequence flooding areas" (such as urban Sacramento) and downstream control mechanisms should be taken into account. These are to some degree captured under chokepoint identification.
- One person noted that the idea of chokepoint identification can be confusing and is different than exceedence of channel capacity. Chokepoints are areas that could force a tradeoff in operations (i.e., Folsom releases could interfere with Shasta releases). Mr. Sun generally agreed, noting that chokepoints could be better characterized as "objective releases." Exceedence of channel capacity could be thought of as the point at which a levee fails. Levee failure could be due to a number of different factors though, and may not be the appropriate place to start a threshold analysis.
- Participants noted that uncontrolled reservoir release is clearly tied to climate change, and that there are situations where a reservoir's spillway capacity is greater than the channel capacity downstream. He agreed with Mr. Sun that levee failure does not have as clear of a climate change nexus.
- One member suggested that addition clarity be developed for the definitions of uncontrolled release, levee failure, and chokepoint identification.

Wrap up and Next Steps

Mr. Young agreed to connect with Mr. Raff regarding the "robust decision making" issue, and invited anyone else to send him specific revisions to the threshold approach text no later than Friday, August

27th. A revised version of the threshold approach will be released Monday, August 30th (**see Action Item #3**).

Adjourn