CCTAG 05202008

Raw notes, Q=question, A=answer, C=comment

(Agenda Item 1) -Water Plan Overview – Kamyar – Handout: CA Water Plan Update 2009 Process Guide
(Agenda Item 4) - TAG expectations – John Andrew – Presentation: Technical Advisory Group Expectations

Announcement!: Contact John to nominate additional members (with technical backgrounds) for the CCTAG

3 areas where CCTAG will provide input to the Water Plan process are:

- **Updating Climate Change Science from Update 2005**
- **Incorporating Climate Change into Scenarios**
- **Developing Adaptation Strategies**
  - **based on the scenarios**
  - **at the regional level?**

2 areas where CC will also be incorporated into the Water Plan

- Assessing the Energy Implications of Resource Management Strategies (working with CEC)
- Developing Water-related GHG Mitigation Measures (through the "WETCAT" and CARB AB 32 process)

Draft AB 32 CAT Scoping Report released in June 2008

First deliverables due the end of August for Pre-Admin draft. The draft will be reviewed and discussed at the Plenary meeting in Sept. 2008. CCTAG should make a formal presentation at Plenary meeting in September.

3-4 meetings planned for 2008.
1st meeting, today, will focus on CC science,
2nd meeting, June 19, will be a joint meeting with SWAN and will focus on the scenarios,
3rd meeting, July ?, will focus on adaptation strategies,
4th meeting, August ?, will bring it all together.
5th meeting, September 18 or 19, CCTAG Members to present draft findings at Plenary Meeting.

***Discussion*:** Where and how should climate change be considered in Update 2009, deliverables needed and timing?
Q: For incorporating CC into the Scenarios, how will the timing work?

A: Narrative work products will come first, and then technical work can be added in a later draft. The Water Plan work is ongoing and will be incorporated as deliverables become available.
Q: What is the timescale for the scenarios?
A: Planning horizon=2050 and decadal reports

(Agenda Item 5) – The Current State of Climate Change Science - Michael Anderson – Presentation: **Climate Change Science and the Department of Water Resources**

Greater hydrologic variability is a recurring theme in the data

Set up of long-term phenomenon for long term drought is still uncertain

Flood peaks needs to be addressed using a basin by basin methodology to capture variability of hydrologic factors.

Moderate winter temperatures will cause:

- "less dense" snow pack with more mid-winter melting;
- soils to be wetter in winter and dryer in summer months;
- frozen ground to increase in during dry winters.

More work needs to be done regarding impacts to groundwater basins due to changes in runoff patterns.

Impacts due to sea level rise also need to be addressed especially for storm surges coinciding with lunar high tides.

Note on slide 14 from Feather and American River 3 day Peak flow legend is possibly reversed.

Question for consideration: What Adaptation Strategies should be considered in the Water Plan and how should climate science be adapted to them?

Various *discussion during presentation*

Q: What is Max Temp Departure?
A: Departure from the mean.
C: Water content slide is not good, better work has been done; there is no need to redo it.
Q: Are you going to be using CALSIM and/or the WEAP model for B160?
A: For the scenarios we are using WEAP, we may be using CALSIM or CALSIM lite model to look at some effects in the delta.
Q: How good of a handle do you have on relative frequency of storms and where they originate from?

A: First cut assessment and report on warm storm frequencies from Mike Dettinger (USGS)
A: Exact storm frequencies you cannot calculate now.
Q: Is that a global increase or a CA increase? A global increase could mean a larger regional increase
A: Would be better to change title of slide from Global increase in temp to Ca mean temp increase.
C: In Feather as temp increases, snow pack changes dramatically. The GIS slide isn't representative of reality.
Q: Is density of snow pack taken into account?
A: Candidate years or typical years take density into account in the regression equations.
Q: Is there a place in Water Plan for climate change impacts that are vague and emerging impacts and elements of CC, like a large scale drought.
A: The Reference Guide can have related, relevant issues.
C: Long range patterns need to be incorporated a bit more.
A: We are looking at climate science of all kinds, not just the result of green house gas emissions.
Flood Peak Assessment slide…?
Q: Feather River Runoff Assessment, Is change in soil moisture taken into account and the effect on water storage?
A: No, not in this slide. But there are some models that do…Mike Dettinger discussed some results.
A: Feather River shows largest flows after ground has frozen. In dryer winters, you see more ground freezing. Fall is very important to determine soil moisture and temperature.
C: CEC is doing some work that includes sea level rise and tidal range and would be a good opportunity for collaboration.
Q: Is what you have discussed here the results of the CAT? (It seems it is.) How does that relate to the Water Plan?
A: It isn't a 1 to1 process, there is more going on than the CAT process. We are trying to keep track of who is doing what, and making sure there is some coordination between activities, and keeping up with division requirements. Which pieces or studies do we focus on or do we leave it at a larger scale?
Q: Concerning monitoring, emphasis at DWR is on shorter term operational aspects of monitoring, but CC puts a new wrinkle on monitoring, detection, attributions, and making better projections. Is there a place in Water Plan or internally within DWR like with Mike A's office to look at that.
A: Yes.
Kamyar: Water Plan is yet another planning effort. We could all come out with diff. reports and leave decision makers scratching their heads. The extent that we can coordinate on the front end, we can help decision makers understand how they all fit together. You have an opportunity to help shape that…not just for the Water Plan but for the State. The Water Plan can help provide that strategic understanding of how all the programs and studies fit together.

Q: In spaghetti plots i.e. Dettinger plots…Temp is pretty well set. What will water temperature changes mean to water management? How do we get a grip on that?
Q: RE: precipitation patterns...what handle do we have on the shifts in patterns?

Lunch

(Agenda Item 7) -Climate Change Science - *Discussion cont'*:

C: Monitoring will play a role in describing climate and helping to watch change as it happens. There are elements other than operational that are impt. To determine the Dept.'s role in monitoring should be discussed. Bringing in assessments that the community has done and including a summary into the Water Plan… B160 can be a good venue and can help keep track of and guide all the fingers.

(Discussion cont')
Flip chart notes for discussion
1) Monitoring
a. Plan
b. Role
2) Assessments
a. Bringing science into B160
b. Emerging science
3) B160 as a framework for presenting climate science and adaptation

C: Monitoring is key for discussion of assessments, bringing science into B160 and emerging science topics.
John Andrew: Describe existing monitoring programs to identify what we do have and what we don't have.
C: Need to know what the information needs are that this is going to require.
KG: SWAN will develop a chapter on monitoring, data and info needs.
KG: Climate will permeate all parts of the Water Plan. Climate could well be the integrating aspect of Update 2009 and I encourage you to look at it in an integrated way.
Q: Who else is doing scenarios other than DWR?
A: CAT, CEC…
Q: Is CEC focused on impacts or emissions reductions?
A: Both. We are trying to institute action through policy. With PIER the emphasis is shifting to adaptation.
A: Other agencies are involved Cal EPA, etc…
Q: Is this sufficient or do we need to reach out to other agencies? DFG, etc…
A: We should look at the state agency companion plans to see which ones have a climate linkage.
Q: Do people have a sense of the scope of monitoring that we are talking about?

A: Monitoring over years and decades, for the purpose of improving weather forecasting over days and a few days, knowing where the water is in real time.
John: We are going from the science to maybe a recommendation about the science and monitoring. Is there a need to describe the current system of monitoring?
C: Identifying information needs is impt.
C: Report by National Academy just released on this very topic (remote sensing, etc.).
C: The real time data sets are impt for calibration work on rainfall runoff models. Natural gages in the Sierras could be helpful. More snow data and more gages representing the variety of flows in the Sierra.
C: We really don't know the variability in historic temperature b/c stations have moved or been encroached on. There are fundamental measures that we are not very certain about. You can't separate meteorology with hydrology. Info is a resource and will be used either by us or next generations; it is an investment in the future. Monitoring is something that we really want to support and we want to sell that to the readers of the report.
C: Two diff large scale NSF projects:
Critical Zone Observatory
National Ecological Observatory Network- climate change and land use changes effects on ecology.
C: Accurate info about GW use, any monitoring or investments should be sold in the bulletin.
Q: How do we treat emerging science? How many and which ones? Aerosols issues? Black carbon issues?
A: There could be some sort of review process to go through the literature. There is lots of aerosol work emerging. Several studies have been funded through PIER. Other things need to be looked at…old and new water.
A: CO2 fertilization of plants…not a pure temp-ET relationship with vegetation. Would be nice to unravel some of those issues.
Q: How will Water Plan Update deal with GW in its assessments? Not clear on how far you would go…
A: Need to reinforce the importance of gw mgmt. and surface and gw interaction and climate change makes it more urgent to emphasize it.
A: We need monitoring of all gw use in CA., will help us with ag water use and et estimates.
A: B160 won't be the next B118 update.
C: It makes sense for the science and also for mgmt. that monitoring for quality and for supply are impt.
C: Last B160 did a good job in identifying what we have and what we don't have, we should continue that.
C: Monitoring for operations is impt. also.
C: Propose adaptive mgmt. and research pilot partnerships. We need to have a way for the people we want to participate to benefit.

Next Steps: Outline and overview of topics discussed today and circulate amongst CCTAG.

Q: Would it be helpful to update 2006 Climate Report, chapter 2 on state of science and chapter 6, state specific elements projections?
A: Yes.
Q: How much of the new science has to be in the literature? Aerosols implications in CA probably aren't developed in the literature yet.
C: Lisa Sloan should be in this group. She is doing some work on crops and ET.
A: Updating chapters 2 or 6 from 2006 Climate Report, and what is already in Update 2005 and incorporating the IPCC report, and adding on peer reviewed items would be a good start.
A: If we focus on fringe items, it may impede us moving forward. The Water Plan isn't a science journal. Maybe emerging issues could be a box or a sidebar.

(Agenda Item 7b) -Incorporating Climate Change into the Update 2009 Scenarios; the Water Evaluation and Planning Systems Model (WEAP) – Rich and Davids – Presentations: Incorporating Climate Change in the Update 2009 Scenarios and the Water Evaluation and Planning Systems Model (WEAP)

Reminder for workshop on June 19th

Question for consideration: Using WEAP as a tool for incorporating climate change into Update 2009 scenarios. How would you (CCTAG) like to interact with us on the scenarios?

Discussion-
Q: Slide 11 - How many is a large ensemble of scenarios?
A: It depends…between 10 and 100, there will be a small subset of CEC runs plus some runs tweaking some other factors.
Q: How does CALSIM and CALVIN get incorporated to B160?
A: We are using WEAP as a regional application. We would like to tie in the regional application to the statewide (operational) system through a link to CALSIM.
A: In this cycle and next of the CWP, we will not have the analytical tools that we would like to have to evaluate the scenarios. We are developing a long-term work plan. For this update, we have an interim solution b/c we still need to do some high level quantification.
A: We have a catalog of all the models that are available online and we will maintain and update that.
Q: Are there going to be other analytical representations in the plan?
Q: Is CALSIM going to be used to quantify water supply?
A: Part of the proposal is to link water supply output from CALSIM with the WEAP analysis.
David Yates – Overview of WEAP

A: There needs to be some advances within WEAP: gw and snow.
DP: Made a dynamic link between WEAP and MODFLOW but probably won't exercise the linkage for the Water Plan study.
Q: Can you operate reservoirs to a storage driven demand instead of using climatic drivers?
A: It is possible to constrain the reservoir object to put in reservoir operating rules.
Q: What is the extent of the documentation for WEAP?
A: Davids have the answer…there is a website, user manual, publications, model methodology.
A: There is a Water Plan proposal that gives specifics for this study.
Q: Why couldn't the hydrology be linked to CALSIM lite?
A: We want to drill down to regionally specific information, factors like population and land use and allocation decisions are not easily changed in CALSIM lite.
C: Bob W. is pleased we are proceeding with this. It is complementary to some of the other modeling efforts but it is different and good.

What add'l info would you like to hear from Rich and Davids?
How would you like to interact with us?
Q: Are you going to look at case studies? Where you select extremes like very dry cases or extended droughts? Look at the joint occurrence of an extreme drought with a degree and a half warmer? Make 2050 a soft cutoff. You may want to look at the flood issue in the same manner.
A: Will look at individual results of interest that either come out of a model run or will come out of a discussion forum just like this.
C: It is under the extreme events where it is important to look at different combinations.
C: Understanding normal inter-annual variability with a warming temp or another extreme is a key issue. Use a long climate simulation with normal inter annual variability…how does that look in a warmer climate?
C: Spatial and temporal requirements and constraints won't allow looking closely at flooding. The uncertainties are going to be significant.

(Agenda Item 8) – Handout **- DWR Climate Change White Paper** – John Andrew –
Mitigation has been the focus and we need a companion focus for adaptation. The white paper is an attempt at starting that conversation.
Statewide and regional themes
Comments are due back the end of May 2008 from the CCTAG, DWR Climate Matrix team, and Water Plan SC.

Discussion: Opportunity to comment upon the draft climate change white paper and connect it to Update 2009 and the Governor's Climate Action Team 2008 Report

C: Needs careful insertion of citations to the literature. Where are the references?
C: Water quality needs to be added and treat water supply and water disposal separate.
C: Focus on impacts on the environment…we need to promote the importance of ecosystem and environmental stewardship. Looking for that in section/strategy 6.
C: Improving efficiency, water quality, how climate change can exacerbate existing stresses on systems.
C: Will you be including natural and beneficial functions of floodplains? (Hasn't read it)
C: Strategy 10 – Is that as far as you can go? Does the entire determination rest with the State legislature? Or is there something that DWR can do?
C: Under water conservation…no reference to water conservation in the agricultural sector
C: Strategy 4 – a Peripheral Canal, or other transport systems, are not explicitly mentioned but maybe they should be.
C: Strategy 10 – add a bullet saying part of AB 32 program under CEQA baseline and mitigation analysis would be to have an aggressive adaptation program.
C: Delta Vision report does discuss dual conveyance (Peripheral Canal). In this report, I don't see anywhere that conveyance is discussed. We could at least quote what DV says in their report.
C: Doesn't address problems of governance that impedes many of the issues and strategies. Maybe add a sidebar on governance barriers.
C: Is there reason why regional strategies are before statewide strategies? It seems like it should be the other way around.
C: There isn't much talk about failure…results of not accomplishing a strategy. What happens if there is a Delta failure? What is the result of non-action?
C: Drought is not mentioned directly.
C: Strategy 5 – rule curves and operational considerations under uncertainty
C: Strategy 4 – missing opportunity of gw recharge
C: changes in ag due to changes in energy prices
Q: (about scenarios) Would you consider a world where the cropping patterns were very, very different?
A: We can change the mixes of crop acres.

(Agenda Item 9)-Coordination and Next Steps – John Andrew

Public Comment: none

Next meeting will be June 19 on Scenario Planning Process.
-See Water Plan calendar for details coming soon…
July meeting will be set up by Tom Filler via email.
WETCAT summary