

Calsim-III Hydrology Development Group

MEETING NOTES

December 1, 2004 (Wednesday)

9:00am - 12:00am

Resources Building, 8th floor conference room

Agenda

1. Review of 11/17/04 Meeting (Kadir)
 2. Briefings on Unanswered Criteria Questions
 - a. Model Dependencies
 - i. CVGSM3
 - ii. WQ, Channel Meander, & Sediment Transport
 3. Comments from Central District on Proposed WMA's and Modifications (Aguilar)
 4. Discussion on Proposed WMAs (Hillaire/Cervantes)
 5. Presentations on Computation of Water Budgets (Draper)
 6. Discussion on Straw Proposal (All)
 7. Items for next Agenda
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Re: 2.a.ii

Tansey relayed NODOS need for daily WQ modeling (I arrived late and didn't hear the context, but I presume it involved resolution of daily NODOS operations...?). Sushil suggested coordination between Tansey's NODOS modeling activities and the daily CALSIM modeling effort being led by DWR (Dan Easton, Sean Sou).

Re: 3. and 4.

Central District was not ready to offer comments on Proposed WMAs. Water Plan team also indicated that they plan to comment on both the Proposed WMAs and straw proposal methodology. Juricich suggested that Water Plan comments might be ready by mid-December. Kadir to follow up with both Water Plan and Central District reviewers.

Comments are still invited on the straw proposal – deadline Dec 20 (Tansey exception).

[Brekke Editorial](#): Based on 12/1 discussion, HDG comments on the straw proposal are intended to steer the skeleton methodology outlined in the proposal. The HDG plans to implement an elaborated version of this proposal,

which won't take shape until implementation begins. This confounds larger-group review of the straw proposal (e.g. WMAs won't be "final" this month, there still isn't a schematic available for commenting).

I heard suggestions that the methodology and WMA details would be addressed by a smaller group of HDG members (e.g., Kadir, Draper, Bourez, Joyce, Leaf, Tansey, ??). [I like this idea](#) – smaller groups move faster than larger groups and CALSIM III development is lagging severely (case in point: the HDG has been talking about WMAs since September, and from my perspective, we're still at square one in this process).

DWR Hydrology Branch should take the lead on this small-group process, particularly since their formulating contracts with key developers (Bourez, Draper). The small-group role relative to the larger-group should be defined and communicated at the next large-group meeting in January.

Re: 5.

Draper presented powerpoint slides – *these slides need to be distributed to the group, as they compliment the straw proposal document distributed on 11/17/04.*

Miscellaneous notes:

- Methodology gives attention to links between CALSIM-CVGSM and CALSIM-(CVPM/CALAG).
- Re: return flow efficiency
 - previous hydrology development efforts involved historical reconstruction of return flow amounts; Straw Proposal: develop water user operational logic that determines return flow
- Re: stream networking in the proposed WMAs
 - Sub-arcs will be used to track ownership and command
- Re: accretion development
 - The straw proposal suggests that accretion/depletions be computed on the DSA level and possibly distributed to several nodes in the CALSIM stream network for simulation (page 14).
 - Draper offered the counter-suggestion that the legacy method for computing accretion/depletion be replaced by precipitation-runoff modeling. The legacy method amounts to "historical residual identification". Precipitation-runoff modeling would be viewed as an error-minimization exercise where attempts are made to explicitly represent the precipitation runoff, seepage, and other flow components that "accretions/depletions" are supposed to

represent. Draper presented conceptual advantages of the precipitation-runoff modeling approach.

- Follow-up: Additional presentations at Jan 13 HDG meeting – (1) CVGSM2's daily precip-runoff model, (2) HEC-HMS applications in the Sac Valley, and (3) NHI Sac Valley model.

Follow-up Brekke Comments on Precip-Runoff Modeling:

- In the legacy method, the water budget residual is identified for a water budget area through comparison of upstream and downstream gages after accounting for internal diversions and returns. This residual is labeled "accretion/depletion". Little attention is given to distinguishing between spatial precip-runoff, seepage, and unaccounted-for flow processes.
- In the precipitation-runoff method, we use parameters to explicitly identify these components. This is an exercise in "residual explanation" with a goal of minimizing unexplained residual. (This would be useful in future CALSIM applications that require WQ mass-routing, where load sources are associated with accretions and sinks are associated with seepage.)
- I'm hearing that residual explanation is desirable because it allows us to "roll back" CALSIM inputs from user-defined accretion/depletion to user-defined precipitation and land use. The latter is preferable for Water Plan studies' flexibility and climate change investigations.
- The necessary tool to enable user-defined precipitation as a fundamental CALSIM starting point, rather than accretion/depletion, is a system of precipitation-runoff models for the valley floor. These models have to be developed at spatial scales no less than that afforded by stream gage availability (probably at scales larger than Proposed WMAs; the straw proposal mentions DSA scale).
- This concept has apparent advantages (Draper presentation).
- The concept could have significant disadvantages that render it infeasible to apply – we don't know at this point – Draper's presentation did not include discussion on disadvantages.
- The following questions need to be answered before pursuing this idea:
 - Do we really save hydrology development time in the long run?
 - What's the initial resource investment to build, calibrate, and apply precip-runoff models for the Sac Valley floor (at WMA, DSA level)?
 - Assumptions must be made to construct each precip-runoff model
 - sub-basin connectivity;
 - sub-basin parameter estimates to describe losses, precip-runoff transform, and baseflow
 - reach parameter estimates to describe flow attenuation when travel times become less than or comparable to the time of concentration (i.e. a few days MAX for the Sac Valley)).

These assumptions all have uncertainties. Do we unacceptably increase CALSIM uncertainty by making these assumptions instead of implementing the legacy approach of imposing a gage-driven accretion reconstruction as a CALSIM boundary condition? (Remember that the gage data would have to be used in either method, either to support calibration of a precip-runoff model or to support residual identification.)

- If we build precip-runoff models for WMA- or DSA-size element, and then calibrate these models to historical conditions during some historical time window (e.g., 1970-2000), how are the parameter estimations for these historically representative models relevant when we impose basin changes due to land use? (e.g., areas of ag-to-urban conversion, or changes in crop cover)

Bottom Line: This is an intriguing idea. I think it needs to be discussed further, and I'm hoping that we can eventually implement a precip-runoff modeling system in the future. However, I'm skeptical that the pros outweigh the cons. I haven't heard adequate discussion on the cons. The questions listed above need to be addressed before the HDG should invest significant resources on this idea. CALSIM III should NOT be held up by implementation of this idea. Providing explicit explanation for accretion/depletion terms in the refined Sacramento Valley hydrology was not regarded as an essential element when DWR/Reclamation developed the CALSIM III work plan. For now, this should be regarded as a long-term development activity.