



February 13th SWAN Workshop Notes

A Decision Framework for the CWP 2013 Update - David Groves

- Do the future scenarios consider the value of future agricultural crops and the use water intensity of those crops?
  - Future cropping decisions are based on the Statewide Agricultural Production Model (SWAP), which uses a number of economic assumptions about allocation of water and value of crops. Additional information about SWAP can be found at: <http://swap.ucdavis.edu/>
- Please provide a summary of the scenario data for all 10 hydrologic regions.
  - Scenario data will be provided for all 10 hydrologic regions within the Regional Reports produced for the California Water Plan.
- Does the conjunctive management strategy include groundwater banking projects?
  - Assumptions for the conjunctive management strategies are still being developed, but will draw on the available information on proposed conjunctive management and groundwater banking projects. The resource management strategies will be the subject of a future SWAN workshop.
- Do the future scenarios capture statewide land use policies?
  - Not explicitly. The Growth scenarios capture different assumption about future population growth and development density.
- Do you consider system surplus flows as a performance metric?
  - We have not identified surplus flows as a key performance metric, but information on monthly reservoir spills and monthly outflow to the ocean from the Sacramento-San Joaquin River Delta are available from the WEAP model.
- Please explain how agriculture is included in the future scenarios.
  - The statewide agricultural irrigated area changes in the future scenarios over time as a result of urbanization of agricultural lands under 9 alternative growth scenarios, which consider 3 alternative population growth projections and 3 urban development density projections applied through the urban growth model (UPlan). Additional information on UPlan can be found at: <http://ice.ucdavis.edu/project/uplan>
  - Future cropping decisions are based on the Statewide Agricultural Production Model (SWAP), which uses a number of economic assumptions about allocation of water and value of crops. Additional information about SWAP can be found at: <http://swap.ucdavis.edu/>
- Do the future scenarios consider the effect of economic and population growth cycles?
  - The future scenarios do not predict future short term economic and population growth boom and bust cycles. Instead they are use longer term economic and population growth cycles out to 2050 by the California Department of Finance, and the Public Policy Institute of California. Additional information about the DOF population projections can be found at: [www.dof.ca.gov/research/demographic/reports/projections/](http://www.dof.ca.gov/research/demographic/reports/projections/)



Preliminary Application of the Framework (Introduction to the WEAP Model ) – Andy Draper

- Does the WEAP model quantify the supplies based on actual contractual allocations to meet the modeled demand?
  - The WEAP model application for Update 2013 does not explicitly represent individual water agencies, and so does not base water deliveries on contractual allocations. The analysis uses assumptions about existing and future land use, cropping patterns, population, employment, and housing units to estimates future regional demand for water, and then supplies water to meet those demands subject to hydrologic and regulatory limits on available surface and groundwater. The WEAP model is calibrated to match historical conditions reasonably well on a regional scale.
- Are managed wetlands demands included in the Hydrologic Region model?
  - Managed wetland demands are represented as an existing base period demand and future additional demands to meet Level 4 Central Valley Project Improvement Act targets. Managed wetland demands are not represented explicitly as land use based demands. Instead they are preprocessed.
- Do the Trinity River operations include current Trinity River restoration requirements?
  - Yes.
- Does the WEAP model include the upper watershed movement of water between basins like the Bear and Yuba system and the Yuba River Accord?
  - The WEAP model does not explicitly represent transfers of water between the Bear and Yuba River systems.
- Are the upper watersheds too aggregated to take advantage of the climate data? For example, the WEAP model is using 500 meter bands to track the effects of climate change. Will this result in a break point between rain and snow and significantly affect results.
  - The team has not evaluated the sensitivity of the snowmelt routines to selection of 500 meter elevation sub watersheds.

Preliminary Application of the Framework (Initial results of the Vulnerability Analysis) – David Groves

- Is the future water demand based on contractual requirements or physical demands based on the simulated land use on population?
  - The WEAP model application for Update 2013 does not explicitly represent individual water agencies, and so does not base water deliveries on contractual allocations. The analysis uses assumptions about existing and future land use, cropping patterns, population, employment, and housing units to estimates future regional demand for water, and then supplies water to meet those demands subject to hydrologic and regulatory limits on available surface and groundwater. The WEAP model is calibrated to match historical conditions reasonably well on a regional scale.
- Why is the model showing unmet demands?
  - Under certain hydrologic conditions the model indicates the water management system is unable to meet some water demands. The Central Valley model uses assumptions about existing and future land use, cropping patterns, population, employment, and housing units to estimates future regional demand for water, and then



supplies water to meet those demands subject to hydrologic and regulatory limits on available surface and groundwater. The model places limits on the amount of surface and groundwater deliveries based on historical information.

- How are priorities set to meet water demands?
  - Priorities are set to give instream flow requirements highest priority, followed by urban demands, followed by agricultural demands, followed by wildlife refuge demands.
- How does the Central Valley model account for demands outside the Central Valley like the South Coast and San Francisco Bay Area? Do they have the same priorities as urban uses in the Central Valley?
  - The Central Valley model represents demands outside the Central Valley as exports with priorities set to reflect their priority in the system. So demands from the Hetch Hetchy system for San Francisco have an equivalent priority relative to urban uses in the Central Valley while demands for the South Bay Aqueduct have a lower priority because of they must pass through the Delta export facilities.
- Does the WEAP model have the ability to reduce exports to the South Coast and San Francisco Bay Area?
  - Yes.
- Can volatility in water supplies be used as a performance metric?
  - We have not considered supply volatility explicitly, but it is possible.
- Do you consider local agency plans in identifying future exports? For example, the Santa Ana Watershed Project Authority expects it will double the imports of water.
  - Not at this time, but this could be included as a future resource management strategy.
- The ability of the tool to be used to plan for uncertainty is very useful.
  - Thank you.
- Does the WEAP model capture the effects of irrigation efficiency on the downstream users and the environment?
  - Yes.
- Can you also present results at the Planning Area scale, not just Hydrologic Region scale?
  - Yes.
- Can the WEAP model identify cross regional connections?
  - Yes, but only where they are explicitly represented.
- Can the WEAP model data and results be aggregated to different temporal and spatial scales?
  - The Central Valley model can be aggregated up from monthly temporal scale and up from the Planning Area scale.
- It is surprising that the results show that the 76-77 drought is more significant than hydrology under the global climate change scenarios.
  - This finding will be highlighted in the narrative.
- It is important to consider the economic consequences of incremental changes in conditions like population growth or long term groundwater storage to capture turning points.
  - We have some ability to look at incremental changes.



- Is it possible to include geomorphic goals for instream flow requirements, beyond the minimum flow requirements?
  - We intend to evaluate instream flow targets above current minimum flow targets as part of possible ecosystem restoration strategies.
- Is it possible to do a 5 year drought or use an extended drought from the paleoclimate record?
  - The historical climate record we are using includes a repeat of the 1987-1992 drought, but not a paleo drought. The latter could be added to the analysis with a little work.
- Is it possible to look at differences between the San Joaquin River Region and Tulare Lake Region?
  - Yes. We aggregated these regions for ease of presentation.
- Is looking at data at the Planning Area scale going beyond the accuracy of the model?
  - We are most comfortable with representing data at the Hydrologic Region scale. The Planning Area level doesn't necessarily capture water district specific operations.
- It would be interesting to look at how development density affects system performance.
  - We intend to explore this factor.
- Can you provide information about how climate change is affecting water use today or how agencies are using climate change in the current decision making?
  - This level of analysis is being explored under other parts of DWR's climate change responsibilities.