Hydrol. Earth Syst. Sci. Discuss., 12, C1870–C1871, 2015
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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Reconstructing the natural hydrology of the San Francisco Bay-Delta watershed" *by* P. Fox et al.

Anonymous Referee #2

Received and published: 31 May 2015

On reading the author response I figured out what is bothering me:

The authors are comparing observed current flows to modeled "natural flows". Natural flows are a counter factual scenario created by modelling the recent rainfall record but using historical land use scenarios.

At present, as I see it, the model is an unvalidated one. I had assumed somewhere that if the same ET modelling approach were applied to current land uses it would reproduce current flows within reasonable bounds - hence my questions about urban return flows and groundwater depletion. Now I realize this wasn't actually done. But without this step, the model remains unvalidated.

I think the authors should do this given the controversial claims of the paper. This

should be possible to do this with the data available. Simply put - use the exact same approach to current land uses, show that it replicates current flows and then compare ET today to ET in the natural scenario.

Because the numbers are not communicated clearly, it is difficult to track the pieces. E.g. the paper states that of the 52 billion m3/year of water available (including ∼2 billion m3/year of inter-basin imports and GW depletion) about 32 billion m3/year is used by humans and 20 billion m3/year is outflow to the delta. What I don't understand is how come ET from natural landscapes is currently zero? Does the 32 billion m3/year include native vegetation or is that truly negligible? Is the amount of water consumed for " irrigation, municipal, industrial, and other uses" 32 billion m3/year (Line 14) or 26 billion m3/year (Line 26) on Page 3865? Or is the difference between the two ET from current natural vegetation?

Clear visualization of the break-up of water balance in the three scenarios (current, unimpaired and natural) is critical to making the case to the scientific community and ultimately policy makers. E.g. Pie charts of the 2011 water balance or stacked bar charts over time comparing the water balance components under current, unimpaired and natural scenarios would be helpful.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 3847, 2015.