Hydrol. Earth Syst. Sci. Discuss., 12, C1909–C1911, 2015
www.hydrol-earth-syst-sci-discuss.net/12/C1909/2015/

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.

B. Herbold

bherbold@gmail.com

Received and published: 2 June 2015

This paper builds on exciting work that has been done reconstructing the primeval ecology of California's Central Valley. Their technical work in that regard seems relatively strong to me, although they focus on flows rather than salinity. We have much documentation, contained in the same fundamental work they cite often in support of vegetation mapping etc. (Whipple et al. 2012), which document substantial salinity changes. Early explorers often speak of drinkable water in places which are now usually too salty for agriculture and the upstream invasion of marine fouling organisms that coincide with changes in upstream flows. This increase in the eastern limit of salt water intrusion may be attributable in part or in whole to changes in bathymetry, but the

authors should address it in more detail.

The discussion of current regulatory and management and their conclusions about how their results pertain to regulation and management strike me as far off the mark. The paper would be greatly improved if they restricted themselves to discussing how their work expands on the earlier historical ecology work by adding in a flow and water demand dimension. If they wish to discuss management implications, then they must move away from 82 year averages, and address the variability which is the hallmark of California climate. When the valley was entirely inundated as it was in 1862, or even when just the floodplains were activated, as still regularly happens, provides a very different set off expectations about the demands of vegetation in dry years. In our fourth year of substantial drought, I think it is clear to all that water demand and use is an issue that is poorly reflected in long term averages like the authors use. To address the issues they raise in their conclusions demands an exploration of how the variability around that mean has changed. The authors do little in that regard, but offer many critiques of present water management strategies. Thus, their results do not justify their conclusions.

In both their introduction and conclusions they claim that outflow as the only thing that has been addressed in environmental protection. They overlook the $2 Billion work Sac Regional Saitaiton District has been required to undertake; work which Stockton earlier undertook becase their sewage is inseparable from their drinking water intake. Similarly, the drinking water requirement at the intake for Contra Costa Water District has long been the most frequent control of outflow.

The authors also overlook the 8000 acres of habitat restoration in the Biological Opinion for Delta Smelt, and the 60000 acres proposed in the Bay Delta Conservation Plan. These are legal requirements that directly address the ecological needs of the species they cite and are major investments independent of flow. Their statements to the contrary are incorrect

Finally, they present a 'natural' vs present-day comparison, but everything about regulations that are on the books relate to much more recent baselines; the anti-degradation of the Clean Water Act take 1972 as the baseline against which protection is to be assessed. By that time all the physical changes in the delta had already occurred. Similarly the The ESA protective targets all aim for conditions/abundances of the 1960s/1970s. Those baselines all suggest that what is required is a comparison of how outflows have changed in the last 50 years. No one involved in regulation or restoration is targeting the forest primeval. It is noticeable that they cite nothing, except an advisory report required to only address how much water is needed to protect fisheries, in support of their claim that only outflow is regulated. That is because their claim is false.

So I advise revision of the report to align the introduction and the conclusions with the interesting work they have done on the past. They should not obscure the value of their work by inappropriately using their broad brush view of historical ecology to attack the state's attempts to protect all beneficial uses in the modern landscape.

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