

Interactive comment on “Socio-hydrology and the science-policy interface: a case study of the Saskatchewan River Basin” by P. Gober and H. S. Wheeler

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General comments

The authors describe the Saskatchewan River Basin in the context of historic and future (potential) water problems in the basin. The objective of the paper is (in my interpretation) to (1) convey the breadth and depth of the water challenges in this basin and (2) suggest how these challenges can be mitigated by socio-hydrology. The paper does not present significant new scientific or policy developments, and instead its merit is in synthesizing a number of findings from other works and reformulating the problem so

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that it can be more adequately addressed. The authors divide the challenges into three major categories: environmental change, population growth, and governance model. I commend the authors' work in creating a useful and informative synthesis of research to illustrate the challenges facing the Saskatchewan River Basin (SRB). This synthesis is successful in meeting the first objective that I mention above, but the paper can (and should) go further in describing the role of socio-hydrology in addressing these problems. The paper is well-written and well-organized.

Specific comments

There are no methods or results to comment on. Instead I focus on the scientific merits and contributions of this paper to scientific literature, which are conceptually present but not fully realized. There are multiple paths this paper could potentially take in making a significant contribution to the scientific community: one would be as a review of scientific and policy literature related to the SRB (along with an argument for why such a review is needed), and another as a synthesis of the same literature in a way to reformulate the problem as an argument for socio-hydrology (the study of long-term human-water interactions). The paper appears to go with the latter based on the title and the discussion in Section 3. I agree with the previous referee that the intent of the paper could be more clearly conveyed in the abstract, introduction, and in Section 3 "Socio-hydrology and the science-policy interface".

Part of my concern is that the study of socio-hydrology suffers from a lack of clear definition. Though the authors of this paper use a definition of "socio-hydrology" by Sivapalan et al (2012) it remains unclear how socio-hydrology is applied and what questions it addresses. While there is an opportunity to specifically describe how socio-hydrology can relate to the issues in this basin, instead socio-hydrology is discussed in general terms. What is missing is a clear connection between socio-environmental challenges and the role of socio-hydrology, which should be made in Section 3.

There are many human-water interactions present in the basin and there have been for

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a long time. How will a better understanding of these interactions (and which ones in particular) benefit the people and environment in the SRB? For instance, some specific questions that could be brought up (not necessarily answered) in Section 3 might be: how will governance respond to long-term drought not heretofore experienced? What are the hydrological and environmental thresholds that must be crossed before social or political changes take place? What potential social changes could take place that would affect the hydrology? Why is it important to understand the co-evolution of these systems and how can socio-hydrology attempt to do so? Bringing up these types of questions and describing precisely the role of socio-hydrology in answering them will strengthen this paper.

Technical comments

- p 6676 line 17-27 – model runs / results should have citation.
- Figures 1 and 5 were unreadable or barely legible when printed. I suggest this figure be simplified and enlarged.
- Figure 1 contains the contact information for a 3rd party organization, and I and would suggest removing the 3rd party references (with any necessary permission).
- Figures 2, 3 and 4 include multiple timeseries which are indistinguishable when printed in black and white. I suggest different brightness for each series or different types of lines (eg, dashed & solid).
- Figure 4: Figure shows GDP per capita, not growth. From this plot we can infer growth. Missing parenthesis in citation.

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