

## ***Interactive comment on “Combined assimilation of streamflow and snow water equivalent for mid-term ensemble streamflow forecasts in snow-dominated regions” by J. M. Bergeron et al.***

**K. He (Referee)**

Kevin.He@water.ca.gov

Received and published: 7 July 2016

The authors present a set of synthetic experiments in assessing the potential added value of assimilating streamflow, SWE, SCA (via EnKF) into the CEQUEAU model in short- to medium-range streamflow forecasting at the Nechako watershed located in BC, Canada. Results indicate that streamflow DA and SWE DA lead to improvements in short-term forecast and medium-term forecast (during snow melt period), respectively. Assimilation of streamflow and SWE simultaneously yields even better results at both scales. However, assimilating SCA does not show any benefit. Overall, the methodology and results are sound and meaningful, yet not innovative. The paper is very well written and organized. I think it will be of interest to the readership of HESS.

C1

My major comment is that, from the perspective of water resources management, the bias of the mean (or median) ESP forecast is typically an important factor considered in water-related decision making (e.g., water supply allocation, reservoir release/hydro-power generation schedule, among others). In light of this, when assessing EPS forecast skill, the bias is normally analyzed. In the case of this study, the score MSSS is applied in the sensitivity analysis part (Figures 4, 6 and 7) but not the forecast part (Figures 8-12). The relevant results should be added (either in tabular or graphic form) and discussed.

My minor comments include 1) the authors need to be clear about how often the forecasts are issued (every day, once a week, or once per month in the study period from 8/15/1990 to 8/14/2000). If it is once a month, the authors need to discuss the sample size issue (10 years) when discussing the skill scores; 2) Line 7 of Page 2, “Franz” should be “Franz et al.”; 3) Lines 26-27 of Page 3, august should be August; delete “to”; 4) Line 8 of Page 4, (Fig. 2), Army Corps of Engineers; 5) Lines 14-23 of Page 6, other than use (1), (2), . . . , it would be less confusing when using (#1), (#2), . . . , or (Step 1), (Step 2), etc. ; 6) Line 5 of Page 7, delete “to”; 7) Line 6 of Page 8, modify “than”; 8) Lines 20-22 of Page 8, rework on the sentence; 9) Line 12 of Page 10, change MSS to MSSS; 10) Line 20 of Page 10, in order to.

---

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-166, 2016.

C2