Hydrol. Earth Syst. Sci. Discuss.,
doi:10.5194/hess-2016-691-AC1, 2017

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Value of seasonal streamflow forecasts in emergency response reservoir management" *by* Sean W. D. Turner et al.

Sean W. D. Turner et al.

stefano_galelli@sutd.edu.sg

Received and published: 20 April 2017

General Comments:

R: Thank you for the opportunity to review this manuscript. I found this article of significant interest in that the water municipality for which I am employed is currently investigating the use of ensemble flow forecasts to help inform the operations of the reservoirs under our management. I appreciated that this article considered both short range (continually adjusted) and long range (emergency response) reservoir operations. I feel the subject matter covered in this article is very relevant to current reservoir management challenges, because reservoir operations are becoming increasing constrained by increasing demand, release constraints due to habitat and environmental concerns, and changes in hydrology due to climate change. Incorporating seasonal

flow forecasts into a decision support system could provide useful information for operators to help meet these challenges. I found this article very well written and most concepts very well explained with a few minor exceptions as covered below.

A: *We thank the reviewer for the positive comments and practical suggestions for improvement.*

Specific Comments:

R: Section 2.3.2, Page 6, Equation 3: It is unclear if Equations 4 and 5 are the cost functions to be used in the rolling horizon objective function (Equation 3).

A: *Yes, Equation 4 and 5 define the penalty cost used in the rolling horizon objective function (Equation 3). We will clarify this in the revised version of the manuscript.*

R: Figure 8: I could not make sense of the results provided in this figure. The scenarios with higher releases have higher storage levels. If both scenarios have the same inflows then this does not make sense. Is it possible the symbology does not match for the storage and release hydrographs?

A: *It is indeed the case that the scenario with the higher releases has higher storage levels. This occurs because the capacity of this reservoir is larger. In our study, reservoirs with higher release requirements are designed with higher storage capacity to maintain a consistent reliability (see Section 2.2.1 and Table 2).*

Technical Corrections:

R: Appendix 1, Page 12, Line 25: Drift equation is not numbered. This should be Equation 8. Coefficient of variation is not defined. This should be defined or a reference provided.

A: *Thanks for picking up this error. We will add the equation number and the definition of coefficient of variation (i.e., ratio of the standard deviation to the mean of the annualized inflow).*

R: Figure 6: Panels a, c, e, and g should be labeled Panels a-d. Panels b, d, f, and h should be labeled Panels e-h. It would be useful to define “critical decision periods” in the figure caption.

R: Figure 7: This figure should be labeled Figure 8, because it is referenced in the report after the current Figure 8.

R: Figure 8: This figure should be labeled Figure 7. Figure caption should include that the results presented are for the “Serpentine” reservoir.

A: *We will implement all suggested improvements to figures.*

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-691, 2017.