Responses to Referee #1

[Note: All original comments by the referee are reproduced in their entirety below in regular black text. Our responses to these comments are shown immediately after the comment in blue text.]

This paper presents a procedure that takes parameter uncertainty information into account when assimilating snow water equivalent observations in snow/rainfall-runoff hydrologic model simulations. The authors concluded that the integrated approach (as called by the authors) is superior in producing streamflow simulations, when compared to single deterministic simulation using default parameters, simulation that uses calibrated parameters, ensemble simulations from EnsKF. I probably agree that the approach seems to be useful. If I want to find a flaw in the paper, it is related to the exact details how ISURF and EnsKF are linked together as an integrated system. Maybe a flowchart would give a clear picture of the coupling. Overall I think the paper can be accepted after addressing my point above.

We would like to thank the referee for reviewing our manuscript and providing considerate comments. The ICEA is a step-wise framework with the first component ISURF providing uncertainty information on sensitive model parameters to be formulated into the second component EnKF. The linkage between ISURF and EnKF is ISURF-derived parameter uncertainty. The ISURF and its application have been presented in our previous study (He, 2010; He et al., 2011b, which we referred the readers to for details). We have added the following flowchart to illustrate how the ISURF-derived parameter uncertainty (linkage) is embedded into the EnKF to the manuscript:

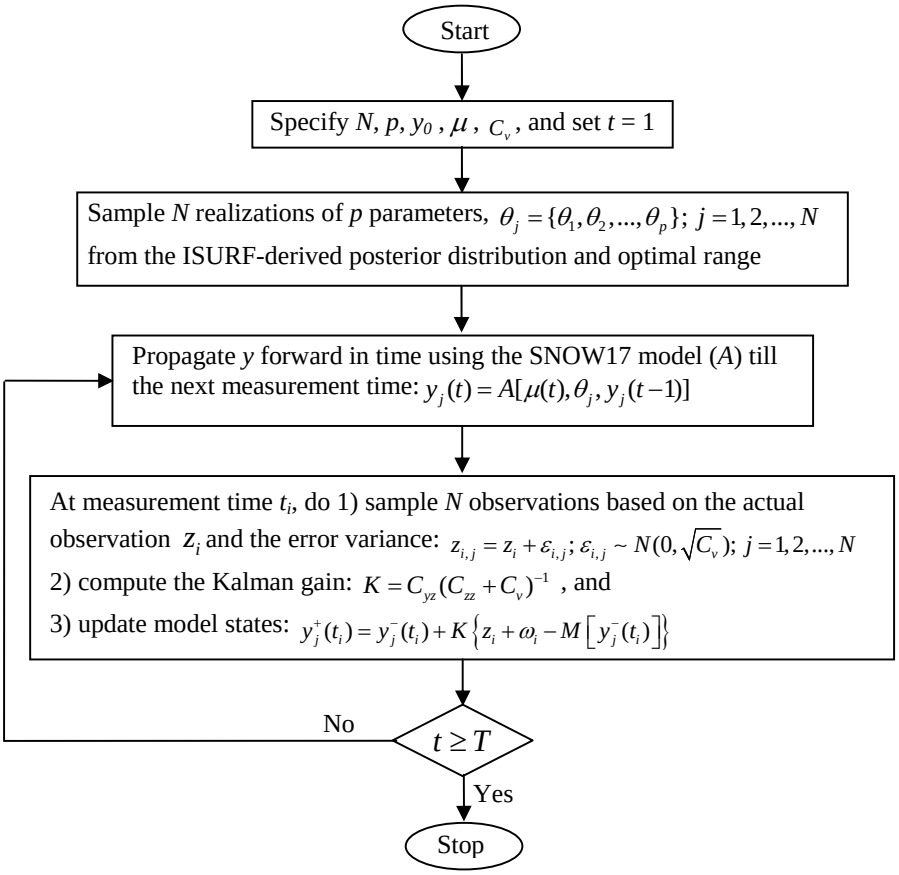

Fig. 2. Flowchart of the EnKF applied in ICEA to recursively update SNOW17 model states with the uncertainty of sensitive model parameters considered. N and p indicate the ensemble size and the number of sensitive parameters, respectively; y_0 and μ represent model initial condition and forcing, respectively; z_i and M designate the observation and measurement operator, respectively; C_v , C_{yz}, and C_{zz} denote the variance of observation error, the covariance between model states and observations, and the variance of observations, respectively.