

Satellite inspired hydrology in an uncertain future: a H SAF and HEPEX workshop



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Snow processes in bucket-type hydrological models –does increased realism lead to better simulations?

Wednesday, 27 November 2019 12:30 (30 minutes)

Bucket-type hydrological models such as the HBV model are widely popular, because of their relatively low data and computational demands. This is the case of the snow routine in the HBV model. While this approach usually results in good simulations, improvements are possible. We explored and tested different alternatives to the design of the snow routine of HBV-light such as considering a gradual transition between snowfall and rainfall, or implementing a seasonally variable degree-day factor. Furthermore, we evaluate the value of different data sources for model calibration and testing as well as the importance of different model formulation in the snow routine for simulations for changed climate conditions. We quantify the usefulness of the snow-routine modifications for simulations in alpine and other snow-covered areas. We also discuss the balance between increasing the realism and the preservation of the inherent simplicity of the HBV model. Results indicate that few model modifications result in clear model performance improvements whereas many modifications, despite seemingly increasing the model realism, did not lead to improved model performances. Furthermore, we demonstrate how different formulations of the snow routine might lead to different simulations for changed climate conditions and potentially can create artefacts, which are often overlooked.

Which session would you like to present in?

1. Impacts of hydrological uncertainty, hydrological forecasting and modelling

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