

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



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Type: **Oral presentation**

On the impacts of location, timing, and frequency of inundation extent assimilation on flood forecast skill

Thursday, 28 November 2019 10:00 (20 minutes)

Recent studies have demonstrated the potential of assimilating probabilistic inundation maps derived from Synthetic Aperture Radar (SAR) imagery for improved flood forecasts. However, high resolution SAR acquisition can only provide partial coverage of large catchments. Consequently, information on the impacts of location, timing, and frequency of inundation extent assimilation on flood forecast skill can provide guidance for acquisition planning. To investigate this issue, twin experiments were set up at 90m grid resolution using the two dimensional hydraulic model LISFLOOD-FP for the 2011 flood event in the Clarence Catchment, Australia. The truth run was setup using the observed inflow hydrograph, calibrated parameters, and LiDAR topography, while the open loop considered errors in all these datasets. Error characteristics of COSMO-SkyMed SAR images available for the event, were estimated and used to generate synthetic images, subsequently converted to probabilistic flood extents for assimilation. Synthetic observations were assimilated into three catchment sub-regions, delineated by flow distances based on reach flow behaviour, using a new Particle Filter-based algorithm. Preliminary results indicate that the forecast performance is highly sensitive to the spatiotemporal characteristics of the observation and that flood extent assimilation can even lead to forecast degradation.

Which session would you like to present in?

1. Novel hydrological data sources and assimilation techniques

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