

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



Contribution ID: 28

Type: **Oral presentation**

Assimilation of flood maps derived from satellite SAR data into a flood forecasting model

Wednesday, 27 November 2019 15:50 (20 minutes)

The objective of this study is to evaluate the potential of assimilating flood extent information derived from satellite Earth observation into a flood forecasting chain for reducing predictive uncertainty. A recent promising study introduces a DA framework based on probabilistic flood maps derived from SAR images considering uncertain rainfall. In our study, we carry out an identical twin experiment using synthetically generated observations to further evaluate and develop this DA framework. Synthetic probabilistic flood maps are assimilated, using a particle filter, into a flood forecasting chain composed of a rainfall-runoff and a shallow water model. The 'truth' is generated based on a forward run of the forecasting chain using ERA-interim data as meteorological forcings. Synthetic probabilistic flood maps are derived from the 'truth' flood extent maps via generating synthetic satellite images. For the DA experiment, an ensemble of particles is generated by perturbing the rainfall data and propagating these perturbations through the forecasting system. The DA allows updating the particle posterior distribution each time a synthetic satellite image is generated. Results show that discharge and water elevation predictions are significantly improved as a result of the assimilation.

Which session would you like to present in?

1. Remote sensing, hydrological modelling and data assimilation

Primary authors: DI MAURO, Concetta (Luxembourg Institute of Science and Technology); Dr HOSTACHE, Renaud (Luxembourg Institute of Science and Technology); Dr MATGEN, Patrick (LIST); Prof. NICHOLS, Nancy (University of Reading); Prof. VAN LEEUWEN, Peter Jan (University of Reading); Prof. GUENTER, Bloeschl (Technical University of Vienna)

Presenter: DI MAURO, Concetta (Luxembourg Institute of Science and Technology)

Session Classification: Session 4: Impacts of hydrological uncertainty, hydrological forecasting and modelling

Track Classification: H SAF and HEPEX joint workshop on "Satellite inspired hydrology for an uncertain future"