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Tracking water level changes of the Amazon basin with space-borne remote sensing and integration with large scale hydrodynamic modelling

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We now have unprecedented spatial and temporal coverage of the Amazon basin in terms of remotely sensed water levels and topography. The main aim of this project is to use current space-borne water level data sets to explore their accuracy and ability to support large scale numerical modelling in view of future satellite missions for hydrology. For this purpose a first objective of the project consists of comparing the accuracy of available space-borne remote sensing observations of water level measurements and derivation of associated uncertainties. As a second objective these data will be integrated with numerical modelling via data assimilation techniques (e.g. Ensemble Kalman filtering) with the aim to improve hydrodynamic model simulations at very large scales. Water stage and extent simulations may then be compared to point gauge data and remotely sensed imagery of floodplain inundation. Assessing how enhanced flow simulation and a better representation of water level dynamics from space can help advance hydrologic understanding forms the bigger research question the project addresses.