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CONTROL ID: 845405

TITLE: SWOT data use in a large-scale hydrological model on the Amazon Basin: Preliminary results

PRESENTATION TYPE: Assigned by Committee

SECTION: Union (U)

SESSION: U06. Hydrology from Space

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ABSTRACT BODY: The Amazon Basin is a major hydrological system in the world. Its average discharge is 206,000 m³/s corresponding to 16% of the fresh water in the oceans. Hydrologic monitoring is necessary for constraining hydrodynamic models of floods, of carbon evasion through wetlands, for water management and to understand the hydro-climatic variability. This work is particularly difficult in the Amazon Basin due to its size (6x10⁶ km²), the tide effects that preclude direct measurement of the discharge at the river mouth and to difficult accessibility to this region. In the last years several studies have shown the relevance of using satellite nadir altimetry for hydrologic monitoring and modelling. In this study, we are simulating measurements from the Surface Water and Ocean Topography (SWOT) satellite mission to improve our understanding of hydrological processes and for monitoring. SWOT is a swath-based interferometric altimeter designed to acquire elevations of ocean and terrestrial water surfaces at unprecedented spatial and temporal resolutions. The SWOT mission will allow measurements of storage changes in lakes, reservoirs, and wetlands as well as estimates of discharge in rivers. The aim of the present work is to develop tools for the assimilation of SWOT data into hydrologic models, and for evaluating the contribution of SWOT to improving the hydrological modelling in the Amazon Basin. We are using the "Modelo Hidrológico de Grandes Bacias" - MGB-IPH developed in the Hydraulic Research Institute, Brazil. The MGB-IPH is a large-scale, distributed and process based hydrological model, which was recently improved by using better river hydraulics and floodplain representation with a full 1D hydrodynamic model with a simple floodplain storage model and GIS based parameters. Some of the tools developed aim at extracting information from SWOT data to the MGB-IPH grid, such as water level, total flooded area and discharge estimates. Simulated SWOT data were generated using model water surface elevations. Preliminary results for the simulation of SWOT data on the Amazon Basin and the comparisons between MGB water level, discharge and total flooded area and the SWOT based estimates are analysed and discussed.

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