Adjustment of a spaceborne DEM based on SRTM vegetation removal and hydrological conditioning

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Abstract. Precise Digital Elevation Models (DEMs), such as the Shuttle Radar Topography Mission (SRTM), are required for accurate modeling hydrodynamics. The accuracy of the STRM is however hindered by various errors and a vegetation signal contained within Digital Elevation Model (DEMs), which reduce the flow connectivity. Not removing the vegetation signal causes DEMs to be overlapped preventing on correct simulation of overbank inundation. Previous effort to remove this vegetation signal have either not accounted for its spatial variability or relied on upon single assumed error values. As a possible solution solution, a systematic approach to removing the vegetation signal which accounts for spatial variability using recently published estimates of global height is proposed. We ameliorated this approach by interpolating our first results with extensive filed trip and a drainage network to obtain conditioned adjusted DEMs. This procedure improved the Root Mean square Error (RMSE) accuracy between the conditioned DEM and various ground data, such as filed trip data, and altimetry's data issued from the ICESAT/GLA and CRYOSAT/SARin sensors. Basic map of flood extent during low water and high water have been compared to a derived product of JERS (Japanese Earth Resources Satellite) observations. Drainage Network is also certificated using LANDSAT images.

Palavras-chave: DEM adjustment, flow connectivity, SRTM, ICESAT, CRYOSAT, floodplains, Landsat remote sensing