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Estimation of erosion and sedimentation yield in the Ucayali river basin, a Peruvian tributary of the Amazon River, using ground and satellite methods

William Santini (1), Jean-Michel Martinez (2), Jean-Loup Guyot (1), Raul Espinoza (3,4), Philippe Vauchel (2), and Waldo Lavado (5)

(1) GET-IRD, Lima, Peru, (2) GET-IRD, Toulouse, France, (3) UNALM, Lima, Peru, (4) UnB, Brasilia, Brazil, (5) SENAMHI, Lima, Peru

Since 2003, the works of HYBAM observatory (www.ore-hybam.org) has allowed to quantify with accuracy, precision and over a long period Amazon's main rivers discharges and sediments loads. In Peru, a network of 8 stations is regularly gauged and managed in association with the national meteorological and Hydrological service (SENAMHI), the UNALM (National Agrological University of La Molina) and the National Water Agency (ANA). Nevertheless, some current processes of erosion and sedimentation in the foreland basins are still little known, both in volumes and in localization. The sedimentary contributions of Andean tributaries could be there considerable, masking a very strong sedimentation in subsidence zones localized between the control points of the HYBAM's network. The development of spatial techniques such as the Altimetry and reflectance measurement allows us today to complete the ground's network: HYBAM's works have allowed establishing a relation between surface concentration and reflectance in Amazonian rivers (Martinez et al., 2009, Espinoza et al., 2012) and reconstituting water levels series (Calmant et al., 2006, 2008). If the difficulty of calibration of these techniques increases towards the upstream, their use can allow a first characterization of the tributaries contributions and sedimentation zones. At world level, erosion and sedimentation yields in the upper Ucayali are exceptional, favored by a marked seasonality in this region (Espinoza et al., 2009, Lavado, 2010, Pépin et al., 2010) and the presence of cells of extreme precipitation ("Hotspots") (Johnson et al., 1976, Espinoza et al, 2009a). The upper Ucayali drainage basin is a Piggyback where the River run with a low slope, parallel to the Andean range, deposing by gravity hundred millions a year of sands, silts and clays. In this work, we thus propose an estimation of sedimentation and erosion yield in the Ucayali river basin using ground and satellite methods.