Geophysical Research Abstracts
Vol. 15, EGU2013-13288, 2013
EGU General Assembly 2013

The suitability of plastic optical fiber turbidity sensors to estimate sediment and organic matter loads in runoff from recently burnt areas

Jan Jacob Keizer (1), Lúcia Bilro (2), Martinho Martins (1), Ana Isabel Machado (1), Diana Vieira (1), Sergio Prats (1), Anne Karine Boulet (1), Filipa Sequeira (2), and Rogério Nogueira (2)

(1) CESAM, University of Aveiro, Environment&Planning, Aveiro, Portugal (jjkeizer@ua.pt), (2) IT-Aveiro, Aveiro, Portugal

It is well-documented that wildfires can markedly increase runoff generation and the associated transport of sediments. There continue to be important knowledge gaps, however, with respect to the underlying hydrological and erosion processes, in part due to the difficulties of measuring sediment concentrations with high-temporal resolution. Commercial turbidity sensors exist for over two decades now but their deployment has by and large been limited to point-wise observations, i.e. at a single, fixed position in the channel at the outlet of a selected catchment. Due to their low-costs and suitability for multiplexing, plastic fiber optics (POF) turbidity sensors are envisaged to greatly facilitate continuous sediment concentration monitoring from plot-to-slope-to-catchment scale as well as across channel profiles. Furthermore, a prototype POF turbidity sensor revealed elevated potential for the identification of the particles in suspension, which is of particular interest for detecting high loads of charred organic matter in runoff produced during the early stages of the fire-induced window-of-disturbance. This potential is now being tested exhaustively, using two sets of runoff samples that were collected in recently burnt study areas in the framework of the EROSFIRE-II and FIRECNUTS projects. The results of these tests will be presented and the implications discussed for the commercial POF sensor that is being developed by the TRANSFIBRA project.