Understanding past fires to anticipate better land management in the forests of NW Portugal

Amandine Pastor (1,2), Myke Koopmans (3), Rossano Ciampalini (1), Yves Le Bissonnais (1), Jantiene Baartman (3), Stéphane Follain (1), Damien Raclot (1), and Joao Pedro Nunes (2)

(1) LISAH, Univ Montpellier, INRA, IRD, Montpellier SupAgro, Montpellier, France (amandine.pastor22@gmail.com), (2) Faculty of Sciences, University of Lisbon, CE3C/CCIAM, Office 1.4.39, Campo Grande, 1749-016 Lisbon, Portugal, (3) Soil Physics and Land Management Group, Wageningen University, Wageningen, The Netherlands

During the last decades, a large number of fires occurred in Portugal due to its large forest area exacerbated by high fire weather index and due to the plantation of fire prone species such as eucalyptus. A large number of studies show that fires lead to accelerated soil erosion and land degradation. Additionally, heavy ploughing was shown to exacerbate erosion in post fire forest areas. We studied the fire of 2011 to calibrate the erosion model LANDSOIL to evaluate the impact of fires in Maciera, part of the Caramulo region in NW Portugal. For that, land use maps from 2000 to nowadays were classified, the DEM was improved with the inclusion of terraces and about 40 extreme rainfall events were selected to feed the model. Once the model was calibrated, we simulated the impact of the 2011 fire on soil erosion and repeat the same method for 2 previous fires. Finally, we created future land use maps based on narrative scenarios that were developed from socio-economic surveys sent to local researchers. Four types of scenarios were applied: business-as-usual, land productivity, environmental protection and sustainable trade-off scenarios. The impact of different land managements and land uses was then assessed on soil erosion.