



FEMME- post-Fire Emergency Management tool.

Diana Vieira (1), Dalila Serpa (1), João Rocha (1), João Nunes (1,2), and Jacob Keizer (1)

(1) Aveiro, CESAM, Environment and Planning, Aveiro, Portugal (dianac.s.vieira@ua.pt), (2) Centre for Ecology, Evolution and Environmental Changes, Faculty of Sciences, University of Lisbon, Lisbon, Portugal

Wildfires can have important impacts on hydrological and soil erosion processes in forest catchments, due to the destruction of vegetation cover and changes to soil properties. The involved processes however, are non-linear and not fully understood. This has severely limited the understanding on the impacts of wildfires, and, as a consequence, current runoff-erosion models are poorly adapted to recently burned forest conditions. Furthermore, while post-fire forestry operations and, to a lesser extent, post-fire soil conservation measures are commonly applied, their hydrological and erosion impacts continue poorly known, hampering decision-making by land owners and managers.

Past post-wildfire research in Portugal has involved simple adaptations of plot-scale runoff-erosion models to post-fire conditions. This follow-up study focusses on model adaptation to selected post-fire soil conservation measures. To this end, full stock is taken of various datasets collected by several (past and ongoing research projects). The selected model is the Morgan-Morgan-Finney model (MMF, Morgan, 2001), which already proved its suitability for post-fire conditions in Portugal (Vieira et al, 2010, 2014) as well as NW-Spain (Fernández et al., 2010).

The present results concerned runoff and erosion different burn severities and various post-fire mitigation treatments (mulch, hydromulch, needle cast, barriers), focussing on the plot and field scale. The results for both the first and the second year following the wildfire revealed good model efficiency, not only for burned and untreated conditions but also for burned and treated conditions. These results thus reinforced earlier findings that MMF is a suitable model for the envisaged post-fire soil erosion assessment tool, coined "FEMME".

The data used for post-fire soil erosion calibration with the MMF already allows the delineation of the post-fire management FEMME tool. Nevertheless, further model assessment will address additional post-fire forestry operations (e.g. plowing) as well as upscaling to the catchment scale with the MMF model and compare it with the SWAT model.