Assessment of the vegetation cover in a burned area 22-years ago using remote sensing techniques and GIS analysis (Sierra de las Nieves, South of Spain).

Juan F. Martínez-Murillo (1), Ricardo Remond (2), and José D. Ruiz-Sinoga (1)

(1) University of Málaga, Geography, Málaga, Spain (jfmmurillo@uma.es), (2) Facultad de Geografía, Universidad de La Habana, Cuba.

The study aim was to characterize the vegetation cover in a burned area 22-years ago considering the previous situation to wildfire in 1991 and the current one in 2013. The objectives were to: (i) compare the current and previous vegetation cover to widlfire; (ii) evaluate whether the current vegetation has recovered the previous cover to wildfire; and (iii) determine the spatial variability of vegetation recovery after 22-years since the wildfire.

The study area is located in Sierra de las Nieves, South of Spain. It corresponds to an area affected by a wildfire in August 8th, 1991. The burned area was equal to 8156 ha. The burn severity was spatially very high. The main geographic features of the burned area are: mountainous topography (altitudes ranging from 250 m to 1500 m; slope gradient >25Remote sensing techniques and GIS analysis has been applied to achieve the objectives. Landsat 5 and Landsat 8 images were used: July 13th, 1991 and July 1st, 2013, for the previous wildfire situation and 22-years after, respectively. The 1990 CORINE land cover was also considered to map 1991 land uses prior the wildfire. Likewise, the Andalucía Regional Government wildfire historic records were used to select the burned area and its geographical limit. 1991 and 2013 land cover map were obtained by means of object-oriented classifications. Also, NDVI and PVI1 vegetation indexes were calculated and mapped for both years. Finally, some images transformations and kernel density images were applied to determine the most recovered areas and to map the spatial concentration of bare soil and pine cover areas in 1991 and 2013, respectively.

According to the results, the combination of remote sensing and GIS analysis let map the most recovered areas affected by the wildfire in 1991. The vegetation indexes indicated that the vegetation cover in 2013 was still lower than that mapped just before the 1991 widlfire in most of the burned area after 22-years. This result was also confirmed by other techniques applied. Finally, the kernel density surface let identify and locate the most recovered areas of pine cover as well as those areas that still remain totally or partially uncovered (bare soil.