Geophysical Research Abstracts
Vol. 13, EGU2011-12879, 2011
EGU General Assembly 2011

Analysis of land degradation sensitivity hot-spots through space and time: Italy as a case study

Sofia Bajocco (1), Antonella De Angelis (1), Alberto Sabbi (2), Luigi Perini (1), and Luca Salvati (3)

(1) Council for Research in Agriculture – Research Unit of Climatology and Meteorology applied to Agriculture (CRA-CMA), Rome, Italy (sofia.bajocco@entecra.it), (2) Italian National Institute of Statistics (ISTAT), Genova, Italy, (3) Council for Research in Agriculture – Research Centre for the Soil-Plant System (CRA-RPS), Rome,Italy

The international definition of the United Nations Convention to Combat Desertification (see http://www.unccd.int/convention/text/convention.php) describes 'land degradation' as a 'reduction or loss of the biological and economic productivity' resulting from land uses (mismanagement), or a combination of processes, such as soil erosion, deterioration of soil properties, and long-term loss of natural vegetation. Land degradation (LD) is hence an interactive process involving multiple factors, among which climate and land use play a significant role. Particularly in the Mediterranean regions, the biophysical and socio-economic aspects represent the main factors impacting on land vulnerability, and their interaction may become extremely complex through space and time, resulting in typical LD patterns. Here, LD is considered as a process occurring not only in semi-natural areas, but also in agricultural and peri-urban areas. For instance, other than soil erosion, the major drivers of LD in the Mediterranean basin are soil sealing, soil compaction due to agricultural intensification, soil salinization, and soil contamination due to industrial activities. In order to identify and quantify the local distribution of vulnerable areas, understanding the spatio-temporal trends (rather than the present status) of LD represents a key issue both from the ecological and policy point of view. Based on these considerations, the working hypothesis of this paper is that, through time, the LD sensitivity level of a given territorial surface (e.g. a cell) can influence, and in turn be influenced by, the status of the neighbouring areas, both positively and negatively. In this sense, a focus cell of a certain LD sensitivity degree can be seen as able to mitigate ("healing" effect) or worsen ("infecting" effect) its surrounding over time; in turn, the focus cell can be subjected to the "healing" or "infecting" effect of the neighbouring areas (vulnerable cell), or can maintain its LD status despite the influence of its surrounding (resilient cell). Such cells of interest can be considered as hot-spots of LD sensitivity on which any ecological study or political intervention should be focused. The aim of this work is thus: (i) to set up a methodological approach for identifying the spatial distribution of the LD sensitivity hot-spots; (ii) to analyse the LD sensitivity dynamics of the identified hot-spots and their surroundings through time and at national scale; (iii) to interpret the results in a framework of agro-forestry management and preservation of high naturality zones. This kind of studies repeated regularly through time may have strong practical effectiveness. In fact they would allow, on one hand, to monitor the evolution of the LD processes even under changing climate and environmental scenarios and, on the other hand, to derive the causes behind the observed dynamics overlaying basic environmental and socio-economic information.