



Soil sealing and desertification: GIS assessment of existing land cover digital cartography for the spatial quantification of the process

J.A. Pascual-Aguilar, V. Andreu and J.L. Rubio

Centro de Investigaciones sobre Desertificación-CIDE -CSIC, UV, GV-
(juan.a.pascual@uv.es/Fax: +34 96 127 09 67)

Soil sealing is one of the most threatening soil degradation processes worldwide and, particularly, in Mediterranean environments where socio-economical development has produced an intensive and extensive soil artificialization. Although attempts have been made to its quantification and evaluation as an environmental threat, its measurement is still troublesome. To overcome such difficulty different sources have been used, mainly belonging to spatial imagery and/or existing land use-cover digital cartography, with their inherent semantic (legend details) and geometric (scale dependent delimitation of the polygonal entities) restrictions.

To assess the spatial representation of the soil sealing phenomenon this work evaluates three cartographic sources at different scales: 1. The CORINE (1990) LAND COVER map (1:100.000 scale), a non published land cover map (1:50.000 scale) produced by the Regional Government (Comunidad Valenciana) with information related with the year 1991, and a detailed topographic map (1:10.000 scale) also produced with information of the year 1991.

The methodology, applied to a large area, with contrasting Mediterranean environments in the Valencia Region (Spain), has been developed using the analytical tools of vector GIS. The approach is based in the spatial analysis of the vector cartographic structures applying a set of metrics related to: (1) total sealed surfaces, (2) number and average patchiness of sealed and non-sealed covers, (3) continent position or distance to the shore line, an (4) geographical differences for soil sealing representativeness of

the three cartographic sources.

Using the 1:10000 scale map as reference, results show that the Corine Land Cover underestimates total area of soil sealing by 17.3%, while the unpublished land cover map at 1:50000 scale overestimate sealed surfaces up to 25%. Also the spatial description or patchiness is represented poorly in both the Corine Land Cover and the 1:50000 scale sources. Such disagreements could be mainly related with the legend definition and the concept of cartographic representation used in maps construction, whereas the soil sealing process, to apprehend its real dimension as soil degradation process, should need a better and accurate representation.

Acknowledgments. The authors thank the Spanish Ministry of Science and Technology (Project CGL2007-66687-C02-02).