Characterization of Main Spatial Patterns of Biophysical Factors of Desertification.

Horta, A. (1), Durão R.M. (1), Pereira M.J. (1), Soares A. (1)

(1) CERENA, Instituto Superior Té

ahorta@ist.utl.pt; rmdurao@ist.utl.pt; maria.pereira@ist.utl.pt; ncmrp@alfa.ist.utl.pt

Extreme climate events act as a main driving force for desertification. Soil degradation, vegetation and land use can be directly associated with extreme events of precipitation in areas of high susceptibility to the desertification. This paper will focus in the assessment of the spatial local relationship between extreme precipitation events and the relevant biophysical factors of desertification - soil quality, vegetation indexes and land use classes. Hence, to ascertain the spatial patterns of main relationships between soil and vegetation in the context of desertification, artificial neural networks (ANN) models will be applied with spatial dispersion maps of different variables: soil quality variables, which comprise certain properties related with land degradation (total organic carbon and pH), obtained with geostatistical simulation methods; vegetation indexes (NDVI) derived from remote sensing data; and land use cartography resulting from classification of remote sensing data.

The resulting mapping of the areas with critical values of the relationship between climatic events and desertification can be used as a fundamental tool for the planning and control of local impacts of climate in the desertification dynamic. This methodology was applied to an area in the South-East of Portugal, the left margin of the Guadiana river, classified with an high susceptibility index to the desertification phenomenon.

Keywords: Extreme Climate Events, Desertification, ANN models, Geostatistics.