The "Land Unit and Soil Capability Map of Sardinia" at a 1:50,000 scale, a new tool for land use planning in Sardinia (Italy) - The pilot area of Pula-Capoterra (southwestern Sardinia)

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The Regional Landscape Plan (RLP) of Sardinia (Italy), approved in 2006, establishes the directions for any land use planning in Sardinia and requires that pre-existing plans have to be changed to comply with these directives. In the RLP, the soil is specifically considered one of the main landscape components and in the RLP guidelines a soil survey of the whole communal territory is required. Moreover, Land Unit and Land Capability maps are explicitly required, and the adoption of a single regional reference legend for these maps is strongly recommended. The Planning Department of the Regional Administration of Sardinia (RAS) has recently realized the need for specific knowledge and tools to support land use planning according to the RLP rules. Consequently, a new project for the creation of a "Land Unit and Soil Capability Map of Sardinia", at a scale of 1:50,000, was recently initiated in four pilot areas. Two Universities (Cagliari and Sassari) and two regional Agencies (AGRIS and LAORE) are involved in the project, each of them being responsible for one pilot area. In this work we present the map of the pilot area Pula-Capoterra (southwestern Sardinia, 46,040 ha).

A GIS approach was used. We used the soil-landscape paradigm for the prediction of soil classes and their spatial distribution based on landscape features. The work was divided into two main phases. In the first phase, the available digital data on topography, geology and land cover were processed and classified according to their influence on weathering processes and soil properties. Digital thematic maps of soil-forming factors (landform, parent material, land cover) were produced to build the first draft of the Land Unit Map. The dataset was developed in a GIS environment, exploiting its potential to produce derived maps by intersections, reclassifications and summarizing themes using GIS functions. The existing soil data (areal and point data) were collected, reviewed, validated and standardized according to international and national guidelines. The data of 155 soil observations considered to be usable, 69 of which correspond to soil profiles with routine analytical data set, were input into a specific database created for the project. During the second phase, the first draft of the Land Unit Map was implemented with the existing soil data and verified in the field. During the field work, 603 new soil observations were carried out, 61 of which correspond to soil profiles with routine analyses. Considering that in the area 8,755 ha do not have soil cover (urban areas, industrial areas, and rock outcrops), the final survey density is equal to 1 soil observation per 50 ha. Finally, the Land Unit and Soil Capability Map was produced by classifying the land units using a reference matching table of land capability classes created for this project. The legend of this map is divided into three main sections: Land Unit, Soil and Soil Capability. Each section is divided into several parts containing detailed information.