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A Land Resource Database for the Republic of Niger to Estimate Topsoil Losses through Wind Erosion at the Regional Scale

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Abstract

Arid and semiarid regions like the Republic of Niger are most prone to soil losses by wind erosion. In the last decades, the decreasing vegetation cover in the semi-arid part of Niger Republic increased the risk of soil erosion. The decline is partly due to decreasing rainfall, but more important is the expansion of cropland. The wind erosion potential is variable, depending on soil cover, land use, soil moisture and soil surface type and has been described only qualitatively at the regional scale.

Thus, in order to assess wind erosion at the regional scale, a geographical information system on the relevant surface properties in the Republic of Niger has been generated for regional modelling, following the conceptual basis of the SOTER approach (ISRIC 1993) and the World Reference Base of Soil Resources (FAO/ISRIC 1998), including the following spatial layers:

1. Land cover and soil surface types based on analysis of remote sensing data (LANDSAT, AVHRR/NDVI) from transects covering arid to semiarid areas in Niger
2. Geological map of Niger Republic
3. Soil map of the world covering the entire Republic of Niger
4. Detailed soil maps of the intensively used Southern part of Niger Republic
5. Digital elevation model (GTOPO 30).

Through the combination of the surface data sets with climatic data, realistic modelling of the dust emission rates in space and time can be performed. Maps on the wind erosion potential for different land use scenarios in Niger Republic will be presented.

Keywords: Land resources database, land use scenarios, Niger Republic, wind erosion

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