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Land degradation patterns and desertification monitoring in the Iberian Peninsula. A remotely-sensed approach.

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Land degradation is a unifying concept that covers all phenomena associated to the loss of land productivity. It has been adopted by UNCCD as the main symptom of desertification. While it is ease to understand at the conceptual level, land degradation is difficult to measure it because of its multivariable nature, which resists any straightforward attempt for a manageable integration procedure. To overcome this difficulty, a new remotely-sensed approach is has been developed in the frame of the DeSurvey project of the EU FP6 Climate Change and Ecosystems (nº 003950). It relies on well known ecosystem's properties that are associated to the degree of ecosystem maturity and are naturaly integrated by vegetation. Among those properties we selected Rainfall Use Efficiency (RUE) which is the ratio of biomass or productivity to rainfall, and the Net Energy Fraction (NEF), the ratio of sensible to net radiation fluxes between earth and atmosphere. In both cases, appropriate surrogate remotely sensed variables have been chosen from the MEDOKADS data base (built on NOAA-AHVRR 1km) for the period 1989-2000 and MODIS 1 km 2003-2005. Results were scaled across climate as to allow between-pixel spatial comparability and at-one-pixel temporal trend analysis. Degraded areas have been found in Andalucía, Eastern La Mancha, Central Ebro valley and Northern Portugal. Extensive climate dependent changes in vegetation density have been found in the South east. There extensive greening and drying out areas result from the high ecosystem's resilience. Significant greening in time has been largely observed in the North West sector, while pure decline of vegetation density in time is scarce and spotty. The application potential of the procedure in desertification

monitoring systems is discussed. The validation problem has been also considered, and the option of using the Sites of Communitarian Interest Network (SCI) as external information is presented.