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Assessing and monitoring soil erosion and land degradation in Malta

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The United Nations Convention to Combat Desertification (UNCCD) identifies the Mediterranean as one of the most seriously affected by land degradation and desertification (LDD) regions in the World. LDD is a complex process related with a multitude of biogeographical and socioeconomic parameters and is often assessed using proxies or indicators. One of the most important indicators of LDD is soil erosion. Here, we assess the evolution of soil erosion and LDD in the Mediterranean islands of Malta between 1986 and 2002. Soil erosion is estimated using the Revised Soil Loss Equation (RUSLE). For the assessment of LDD, we employ a modification of the Environmentally Sensitive Area Index (ESAI) methodology with Landsat imagery and ancillary GIS datasets. We incorporate 4 vegetation-related indicators, 3 climate-related, 5 soil-related and 3 socio-economic ones in the final assessment of the evolution of LDD. Results show that there has been an increase in soil erosion rates and in the sensitivity to LDD in the areas of San Pawl il-Bahar and Il-Mizieb most likely due to the transition from agricultural use to Mediterranean shrubs. Also, almost the entire country is flagged as belonging to the 'Fragile' and 'Critical' ESAI classes. It is clear that soil erosion and LDD mitigation measures are necessary, especially in the most critical (i.e. 'C3') areas which occupy ~10% of Malta.