

Land degradation and desertification assessment in the European Union

Land degradation is a major environmental challenge affecting ecosystems, agricultural productivity, biodiversity, climate regulation and the provision of ecosystem services across the European Union (EU). In response to the recommendations of the European Court of Auditors (Special Report 33/2018), the Joint Research Centre (JRC) developed a **harmonised methodology to characterise land degradation and desertification at the European** scale by building upon the United Nations Convention to Combat Desertification (UNCCD) Sustainable Development Goal (SDG) Indicator 15.3.1 framework. This dataset provides the datasets that were used for the methodological framework specifically designed for European environmental conditions. It supports monitoring under the UNCCD land degradation indicator while ensuring consistency with emerging European policies, including the Soil Monitoring and Resilience Directive and the activities of the EU Soil Observatory (EUSO).

Dataset description

The dataset allows for the spatial assessment of land degradation and desertification across continental Europe. The methodology integrates information on land cover dynamics, land productivity and soil degradation using a One-Out-All-Out (1OAO) decision framework. Areas identified as degraded are subsequently combined with climatic aridity information (Aridity Index) to delineate current desertification and areas at future risk of desertification. On the desertification assessment side, it introduced an explicit climatic definition of desertification based on the Aridity Index and identifying areas vulnerable to future desertification using climate projections.

Spatial coverage and resolution

Geographical coverage

- Continental European Union

Projection

- ETRS89 / LAEA Europe (EPSG:3035)

Spatial resolution

- 100 m raster

All input datasets are harmonised to a common spatial resolution and projection before integration within the assessment workflow.

Geopackage dataset

Layer	Description
SO1-1	Land degradation due to land cover change
SO1-2	Land degradation due to land productivity dynamics
SO1-3	Soil degradation (EUSO dashboard version1, 2025, without Biodiversity risk layer)
SO1-4	Proportion of land degradation obtained through the One-Out-All-Out methodology
Desertification	Degraded land located within drylands (AI < 0.65)

Layer	Description
Future desertification risk	Areas projected to become climatically vulnerable under future Aridity Index scenarios

Related publications

Schillaci, C., Broothaerts, N., Yunta Mezquita, F., Panagos, P., Jones, A. (2026). *A methodology to characterise land degradation and desertification in the European Union – A response to the European Court of Auditors Special Report 33/2018*. Publications Office of the European Union.

Schillaci, C., Broothaerts, N., Yunta, F., Panagos, P., Scarpa, S., Jones, A. (2026). *Towards a better characterisation of land degradation and desertification in the European Union – An assessment*. Publications Office of the European Union.

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Keywords

Land degradation; Desertification; SDG 15.3.1; Land Degradation Neutrality; UNCCD; EUSO; Soil health; CORINE Land Cover; Land productivity; NDVI; Soil degradation; Aridity Index; Climate change; Copernicus; European Union.