



Is Europe at risk of desertification due to climate change?

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Desertification is a slow process that transforms dry or semi-arid areas into arid areas, resulting in the disappearance of water bodies and vegetation. Other than human activities, recent climate change and more frequent natural disasters forced an increasing global loss of fertile areas due to desertification. A few hot semi-deserts are present in Southern Europe, where a shift from temperate to dry climate is taking place, and this phenomenon is progressively extending to mid-Latitudes. This study combines three climate classifications (FAO-UNEP Aridity Index, Köppen-Geiger climate zones, and Holdridge Life Zones) to investigate which areas in Europe are potentially subjected to desertification risk over the 21st century. As input data, we used the high-resolution (0.11°) bias-adjusted EURO-CORDEX precipitation and temperature data and calculated several indicators. We selected eleven simulations and two climate scenarios, the moderate RCP4.5 and the more extreme RCP8.5. We present maps of climate shifts in near (2041-2070) and far future (2071-2100) compared to recent past (1981-2010) for each indicator and for a combined one. Large parts of Spain, Southern Italy, South-Eastern Europe, and the Danube Delta are prone to face different levels of desertification risk: generally low in the near future under RCP4.5, medium in the near future under RCP4.5 and in the far future under RCP8.5, high in the far future under RCP8.5. In the worst-case scenario, at the end of 21st century approximately 11% of European territories will be at risk of desertification.