



Drought variability over Thessaly plain, Greece. Present and future changes

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The diachronic variability of precipitation is of major scientific concern, because it is linked to water availability or deficiency on regional scale. The latter, resulted from a prolonged period of abnormally low precipitation or permanent absence of precipitation, is associated with dryness, having on one hand, a substantial impact on agricultural production and thus the society itself, and on the other hand, the redistribution of flora and fauna. In some cases, dryness drive climate refugees, and this is a great challenge - threat - that must be faced – mitigated - by stake holders in international organizations and fora.

The Aridity Index (AI) measures the degree of dryness of the climate at a given region, and according to the United Nations Environmental Programme (UNEP) it is defined as the ratio of precipitation to the potential evapotranspiration. In this study, we investigate the climate change impacts on AI over Thessaly plain, Greece. Thessaly, the largest plain and granary of Greece, includes a total area of 14,036 km², which represents almost 11% of the Greek territory. Regarding the geomorphology, the ground is 50% mountainous-hilly and 50% flat, irrigated by Peneus, the third largest river in the country, which flows through the axis east-west.

The assessment of AI was conducted utilizing daily evapotranspiration losses, based on the modified FAO-56 Penman-Monteith formula, and daily precipitation totals from a number of Regional Climate Models (RCMs), within the ENSEMBLE European Project. Further, the projected changes of AI between the period 1961-1990 (reference period) and the periods 2021-2050 (near future) and 2071-2100 (far future) along with the inter-model standard deviations are presented, under SRES A1B. The findings of the analysis revealed significant spatiotemporal changes of AI over Thessaly plain, focusing on their societal aspects.

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