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Evaporation and evapotranspiration estimates under present and future climate conditions over Thessaly plain, Greece

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Evaporation and evapotranspiration driving the water cycle are of great significance in a changing climate, especially on coastal environments within the Mediterranean. Taking into consideration the synergistic effects of decreasing precipitation and increasing air temperature due to global warming, the evaporation and evapotranspiration processes influence mostly the irrigation and water resources, resulting in environmental and social impacts.

The present study investigates the effects of climate change on evaporation and evapotranspiration losses of the plain of Thessaly, Greece, a region which is characterized among the main sectors of agricultural production in Greece. These losses are estimated and the modified FAO 56 Penman-Monteith formula is utilized, based on daily meteorological data (temperature, humidity, wind speed, global solar radiation), from meteorological stations of Hellenic National Meteorological Service within the plain of Thessaly. Further, the projected changes of evaporation and evapotranspiration 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, based on the simulation results, derived from a number of Regional Climate Models (RCMs), within the ENSEMBLE European Project. The projection of the future climate has been done under SRES A1B.

The findings of the performed analysis would contribute to the sustainable use of water resources for enhancing the regional socio-economic development aiming to mitigate the consequences of climate change.

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