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Impacts of Topography and Land Cover Changes on Regional Climate Over the Eastern Mediterranean

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The influence of the topography (mountain ranges, lowlands etc) on Mediterranean climate leads to different climatic types. There are extensive south to north range of mountains (Italian and Balkan Peninsula), as well as smaller mountainous regions with east - west orientation that separate the warm southern region from the cooler north regions. In addition, the wide indentation of Mediterranean coasts (Aegean, Adriatic etc), provide additional moisture sources. During winter season, heavy precipitation assists vegetation growth of Mediterranean forests and woodlands, whereas during summer, absence of precipitation and severe heat waves result to arid and semi-arid vegetation. For that reason, it was quite interesting to track the changes that may occur in the climate of the Mediterranean region due to changes in topography and land use. The main objective of the study is the assessment of the impacts of topography and land cover changes on regional climate over the eastern Mediterranean. The examined regional climate model is RegCM4.3. Its spatial resolution is 25x25km and for the future projections the model is using the A1B SRES emission scenario. For the purposes of this study, different simulations were performed with changes in topography and land cover for the time period 1981-2000. The different simulated data were compared in order to examine the modifications that occur from the topography and land cover changes in extreme events and atmospheric circulation in the domain of study.