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# Simulated intense convective precipitation over the Black Sea coasts: sensitivity to temporal modifications of SST

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Anatolia, a peninsula in the eastern Mediterranean, has quite complex terrain and together with its surrounding seas, Mediterranean, Black and Aegean Seas, it shows quite extraordinary contrasting features in topography and land-sea distribution. Fluctuations in the sea surface temperatures (SSTs) over the surrounding seas may have significant role on intensification of the precipitation over the region. Long-term variations in seasonal SST anomalies of the surrounding seas of the peninsula indicate a striking warming period beginning from the early 1990's and the warming period is projected to continue in the future according to regional climate change projections. In parallel with the general agreement that intensity and frequency of extreme events will become more common due to enhanced greenhouse forcing and associated with atmospheric warming (IPCC AR4), a number of extreme precipitation and regional flooding events have been observed along the coasts of the peninsula, especially along the Black Sea coasts in recent years. The heavy rainfall episode over megacity Istanbul, located in the southwest Black Sea, and its surroundings on September 8-9, 2009 resulted in over 30 casualties and several million dollars damage. The first analysis indicates that a positive SST anomaly over the Black Sea enhanced the large-scale atmospheric circulation by providing substantial amounts of heat and moisture from the sea surface. This extreme event has been simulated by the high-resolution regional climate model, ICTP-RegCM4 with a spatial resolution of 15 km driven by ERA-Interim data. The Emanuel Scheme has been applied with different temporal SST input field on the monthly, weekly and daily time scales. The model performance has been evaluated by comparing upper level circulations, moisture, and temperature with ECMWF Reanalysis. The rainfall prediction was validated by comparing rainfall from the Tropical Rainfall Measuring Mission (TRMM) products and the meteorological stations. Results indicate that simulation forced with the daily SST with diurnal cycle mostly captures the heavy rainfall over the southwest Black Sea coasts and the spatial pattern of the rainfall is consistent with the observations. In this on-going study, additional simulations will be done for another episode took place in eastern Black Sea coasts, which is prone to frequent landslide occurrence due to steep topography and high amount of precipitation. The modeling studies may help to understand better those physical processes and may contribute the management of extreme events within the context of adaptation to climate change.