



## **Climate Extremes Index Analysis Based on High Resolution Regional Climate Simulation**

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The Climate Extremes Index (CEI) has been calculated by using multivariate and multidimensional indicators for United States and originally developed by Karl et al. (1996) to represent impact of climate change more evident. In this study, we have repeated the same study for the Eastern Mediterranean region by using the regional climate model (ICTP/RegCM3) outputs to define for all CEI indicators. The CEI is driven by five indicators, which are maximum and minimum monthly mean temperature, extreme 1-day precipitation, precipitation/non-precipitation days, and the Palmer Drought Severity Index (PDSI) based on the annual or seasonal periods. Extremes for each indicator are calculated in terms of occurrences of above/below based on the 90th/10th percentile value over the whole period. The high resolution model simulation (horizontal grid spacing: 10-km) driven by NCEP-Reanalysis for the period of 1961-2008 has been analyzed to produce CEI. The annual mean of CEI represents that Turkey and its surroundings area are experienced extreme events in the range of 30-70%. The mean CEI increases gradually from north to south over the model domain which is related to temperature and precipitation distribution. The trend analysis of CEI reveals decadal positive increase up to 1.2% over Turkey. In addition, the decadal anomalies of CEI (reference period 1961-1990) have been investigated to interpret decadal tendency. CEI demonstrates decreasing signal until the end of 1979 (1-3%) and it starts to increase from 1980s. The extreme events enhance for the periods of 1990-1999 and 2000-2008. In terms of this last period, CEI indicates positive signal in range of 1-6%. Especially, northern Balkans, northwestern part of Turkey, eastern Mediterranean region and some part of the Central Anatolia region have experienced highest increasing signal in range of 3-6%. The changes of the extremes over these regions are also considered as hotspot due to their dense population.