Geophysical Research Abstracts
Vol. 16, EGU2014-12351, 2014
EGU General Assembly 2014

Defining Extreme Climate Indices Using High Resolution Regional Climate Simulation

Fulden Batıbeniz and Barış Önol

Istanbul Technical University, Aeronautics and Astronautics Faculty, Meteorological Engineering, Istanbul, Turkey (onolba@itu.edu.tr, +90 0212 2852926)

In this study, high resolution regional climate simulation (horizontal grid spacing 10-km) has been analyzed to determine extreme weather events which have been observed more frequent and severe in recent decades. The climate indices related to extreme weather events and their possible trends have been evaluated and calculated using the daily rainfall and temperature simulations for the period of 1961-2008. ICTP-RegCM3 has been used to produce double-nested simulations (from 50-km to 10-km) and NCEP/NCAR Reanalysis have been applied for the lateral forcing. The climate indices defined by World Meteorological Organization (WMO) and World Climate Research Programme (WCRP) have been selected for estimation of extreme climatic events over Turkey and the surrounding region. All the extreme indices analyzed in the study are chosen from climate indices which affects human life directly or indirectly. Extreme hot days (TX35), summer Days (SU), warm Nights (TN90p), very wet days (R95p), excessive heavy rainy days (RR20), consecutive dry days (CDD) have been calculated as major climate indices and additional indices will be evaluated. The comparisons for each indices between the high resolution simulation and observations have been examined to detect deficiencies of the model. More than 180 meteorological stations over Turkey have been applied for station versus corresponding grid-point comparison. Q-Q plot analysis demonstrates that the simulation and observations are highly consistent for both extreme daily rainfall and extreme daily temperature and most of the stations are statistically significant. In addition, the results have been also analyzed to investigate inter-annual and decadal variability and to define frequency and intensity change in extreme events due to human-induced climate change. Regional climate simulation at 10 km spatial resolution eliminates most of the difficulties arise from the spatial scale in terms of extreme weather events.