Geophysical Research Abstracts
Vol. 18, EGU2016-10009, 2016
EGU General Assembly 2016

Evaluation of the EURO-CORDEX RCMs to accurately simulate the Etesian wind system

Stella Dafka (1), Elena Xoplaki (1), Andrea Toreti (2), Prodromos Zanis (3), Evangelos Tyrlis (4), and Jürg Luterbacher (1)

(1) Climatology, Climate Dynamics and Climate Change, Department of Geography, Justus-Liebig-University of Giessen, Germany (styliani.dafka@geogr.uni-giessen.de), (2) European Commission, Joint Research Centre, Ispra, Italy, (3) Department of Meteorology and Climatology, School of Geology, Aristotle University of Thessaloniki, Greece, (4) Energy, Environment and Water Research Center, The Cyprus Institute, Cyprus

The Etesians are among the most persistent regional scale wind systems in the lower troposphere that blow over the Aegean Sea during the extended summer season.
An evaluation of the high spatial resolution, EURO-CORDEX Regional Climate Models (RCMs) is here presented. The study documents the performance of the individual models in representing the basic spatiotemporal pattern of the Etesian wind system for the period 1989–2004. The analysis is mainly focused on evaluating the abilities of the RCMs in simulating the surface wind over the Aegean Sea and the associated large scale atmospheric circulation. Mean Sea Level Pressure (SLP), wind speed and geopotential height at 500 hPa are used. The simulated results are validated against reanalysis datasets (20CR-v2c and ERA20-C) and daily observational measurements (12:00 UTC) from the mainland Greece and Aegean Sea.
The analysis highlights the general ability of the RCMs to capture the basic features of the Etesians, but also indicates considerable deficiencies for selected metrics, regions and subperiods. Some of these deficiencies include the significant underestimation (overestimation) of the mean SLP in the northeastern part of the analysis domain in all subperiods (for May and June) when compared to 20CR-v2c (ERA20-C), the significant overestimation of the anomalous ridge over the Balkans and central Europe and the underestimation of the wind speed over the Aegean Sea.
Future work will include an assessment of the Etesians for the next decades using EURO-CORDEX projections under different RCP scenarios and estimate the future potential for wind energy production.