



Evaluating RegCM4 surface climatology over the EURO-CORDEX domain

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Regional climate model RegCM4 is forced by ERA-Interim reanalysis over the EURO-CORDEX domain for the period 1989-2008 in two experiments differing in horizontal resolution: 50 km and 12.5 km experiments. Model climatology is evaluated using following observational datasets: (1) CRU TS 3.0 near-surface air temperature T2m and total precipitation R over land; (2) E-OBS 7.0 T2m and R over land; (3) CM SAF CLARA-A1 global satellite-based net surface shortwave radiation SWR, net surface longwave radiation LWR, total cloud cover CLD and surface albedo ALB; (4) HOAPS 3.2 satellite-based sensible and latent heat flux over ocean (SHF and LHF) and (5) ESA ECV soil moisture SMR satellite-based product. Using comprehensive set of ground- and satellite-based datasets, RegCM4 systematic errors are derived and added value of 12.5 km resolution experiment is found. Additionally, using simple diagnostic model in which components of the surface energy budget are linked with the dominant governing variables, some consistent changes when increasing the horizontal resolution can be found. For example, large summer warm bias over central domain in 50-km run is substantially reduced in the 12.5-km run and is accompanied with an increase in the CLD and decrease in the SWR in the 12.5-km run in summer months.