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Sensitivity of a regional Climate model for the mediterranean area to ocean-atmosphere coupling.

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An ocean-atmosphere limited area coupled model for climate studies, the PROTHEUS system, has been recently implemented. The Protheus system consists of the RegCM+BATS (atmospheric+landuse model), the MITgcm (ocean model), coupled via OASIS3, plus a very high resolution model for the Strait of Gibraltar. We present results from the control simulations performed by employing ERA40 reanalysis as lateral boundary condition for the atmospheric model. We focus our analysis on the main differences between the stand-alone configurations of the single model components and the fully coupled system. To gain further insight on the atmospheric model sensitivity to ocean-atmosphere coupling in this region we also compare the coupled (stand-alone) control simulation with a corresponding idealized simulation in which the stomatal-resistance of the land-use model is artificially incremented to reduce evapotransiration over land. In the analysis, special attention is devoted to the model's hydrological cycle.