Global offline lake simulations: Evaluation and Impacts on ERA-INTERIM

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The lake model FLAKE was incorporated into the ECMWF land surface scheme HTESSEL. Results from global offline simulations are presented in order to (i) evaluate the model's performance in different climates and (ii) assess the impact of lakes representation in the surface energy balance. The model was forced by ERA-INTERIM (1989-1998) near surface meteorology and surface fluxes for all the lake grid-points in the reanalysis. Modelled surface fluxes are analysed and compared against the reanalysis for several time scales - ranging from the diurnal cycle to annual means. SST climatology derived from TERRA-MODIS satellite is compared with modelled lake surface temperatures. The sensitivity of the present analysis to lake depth is addressed. General issues related to the incorporation of lake models in GCMs for weather forecast and earth system modelling are discussed.