

**Representation of the diurnal cycle of near-surface parameters in CESM and EC-Earth**Gunilla Svensson<sup>†</sup>;<sup>†</sup> Stockholm University, SwedenLeading author: [gunilla@misu.su.se](mailto:gunilla@misu.su.se)

As climate models are developing and becoming more complex, there is an increased need for evaluation of their performance in more detail. In this project, we are studying the general behavior of the near-surface variables and the boundary-layer evolution in CESM ([www.cesm.ncar.edu](http://www.cesm.ncar.edu)) and EC-Earth ([eearth.knmi.nl](http://eearth.knmi.nl)). The two versions of the atmospheric model in CESM (CAM4 and CAM5) have very different boundary-layer parameterizations, one scheme is of first order and the other is a TKE-based boundary layer scheme. EC-Earth contain a different first-order scheme. The two models also differ in their land models which are important for the boundary conditions for the PBL. The performance of the schemes are examined and hourly model results are compared with surface based observations of mean and turbulence parameters at about twenty land based locations all over the world. The comparison covers different types of land use and climate zones. The focus is on amplitude of the diurnal cycles of the near-surface parameters such as low-level wind and temperatures as well as turbulent fluxes of heat and momentum. The depth of the boundary layer and overall vertical structure is also evaluated.