

Supporting Information for ”Clouds and radiation processes in regional climate models evaluated using observations over the ice-free Arctic Ocean”

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Introduction

The surface condition in the CAFS coupled model is explained here. The skin surface temperature is nearly 0 °C in the observations and most models, while the CAFS-bsl and CAFS-ini have significant cold bias until September 18, 2014 (Fig. S1a). Sea-ice concentration, which was 60%–80% until September 15, decreased rapidly thereafter when the surface winds exceeded 10 m s⁻¹, producing an almost ice-free condition after September 19 (Fig. S1b). The temporal change in sea-ice concentration would cause a change in the skin surface temperature. Therefore, this situation, as a function of the own air–ice–sea coupled system of the CAFS, should be taken into account when interpreting the results for model comparison. The net surface heat loss was overestimated in both CAFS runs by the cold bias; however, the other models also have different issues as described in the main text.

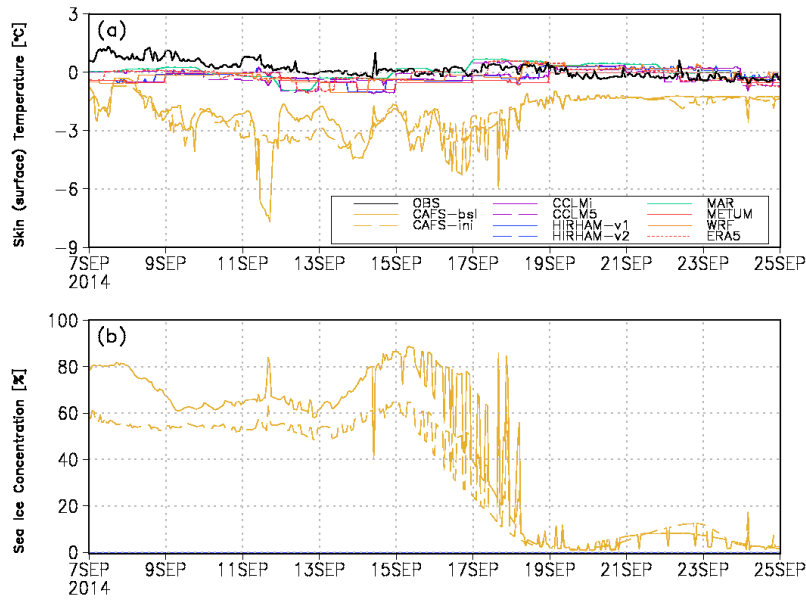


Figure S1. Time series of (a) skin surface temperature for each model, and (b) sea ice concentration in the CAFS. The skin temperatures in the CAFS are the fractional skin temperatures, which consider both ice and open water parts based on the ice concentration. The sea ice concentration in the other models is 0%.