



Soil organic layer: Importance Implications for Arctic climate

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Although it is well known that the land-surface and its coupling with the atmosphere play an important role for the climate, the land-surface representation in Arctic regional climate models is poor. A surface layer of organic material is a dominant feature of the Arctic soil, and plays a dominant significant role in soil temperature and hydrological regime because of its distinct thermal and hydraulic properties. In a sensitivity study, a surface organic layer has been incorporated in the land-surface scheme of the Arctic regional climate model HIRHAM, and its relevance for Arctic climate simulations is discussed. It is shown that this addition modifies not only the soil thermal and hydrological regimes, but also strongly dynamically feeds back to the atmosphere as changes of ground heat flux imply those of turbulent heat fluxes which has consequences for the regional climate. In this context, potentially of most importance is the reduction of mean sea level pressure (SLP) over the Barents- and Kara Seas during winter which would correct the well-known positive SLP bias over those regions in global climate models.