

Coupling of a climate-hydrological model: Initial studies on characteristics and parameterization

Morten Andreas Dahl Larsen, Karsten Høgh Jensen, Jens Christian Refsgaard, Jens Hesselbjerg Christensen, Michael Butts, Martin Drews

The study is a part of the Danish HYACINTS project (<http://hyacints.dk/index.shtml>). A central part of the project is a fully coupled climate-hydrological model using the HIRHAM regional climate model (Danish Meteorological Institute) and the MIKE SHE hydrological model (DHI / Geological Survey of Denmark and Greenland) also incorporating the SW ET land-surface model. The objective of the coupled setup is to provide improved hydrological predictions.

Presented are outcomes of the initial studies prior to the coupling performed to support in determining the optimal HIRHAM characteristics and to parameterize MIKE SHE.

Systematic variations in domain size, location and resolution were applied to the HIRHAM model for seasonal outputs of precipitation and temperature in a 2.5 year period over Northern Europe. This study showed that between larger domain sizes compared to higher resolutions, the former is the principal element in producing accurate simulations. Further, substantial seasonal variations were seen in the accuracy of HIRHAM outputs and temperature generally showed better results compared to precipitation. For the MIKE SHE model, the parameter sensitivities were highly dependent on the groundwater table depth and vegetation type.