Ongoing work on PT mire parameterization

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Task aim:

- to incorporate a mire parameterization into the TERRA land surface scheme

- to investigate the influence of mire parameterization on the components of the heat and water balance simulated by TERRA and compare them with available observations

Results of the preliminary tests with the mire parameterization in the COSMO model

Modifications: mire evapotranspiration as a function of PET for a climatic average position of the mire water table depth
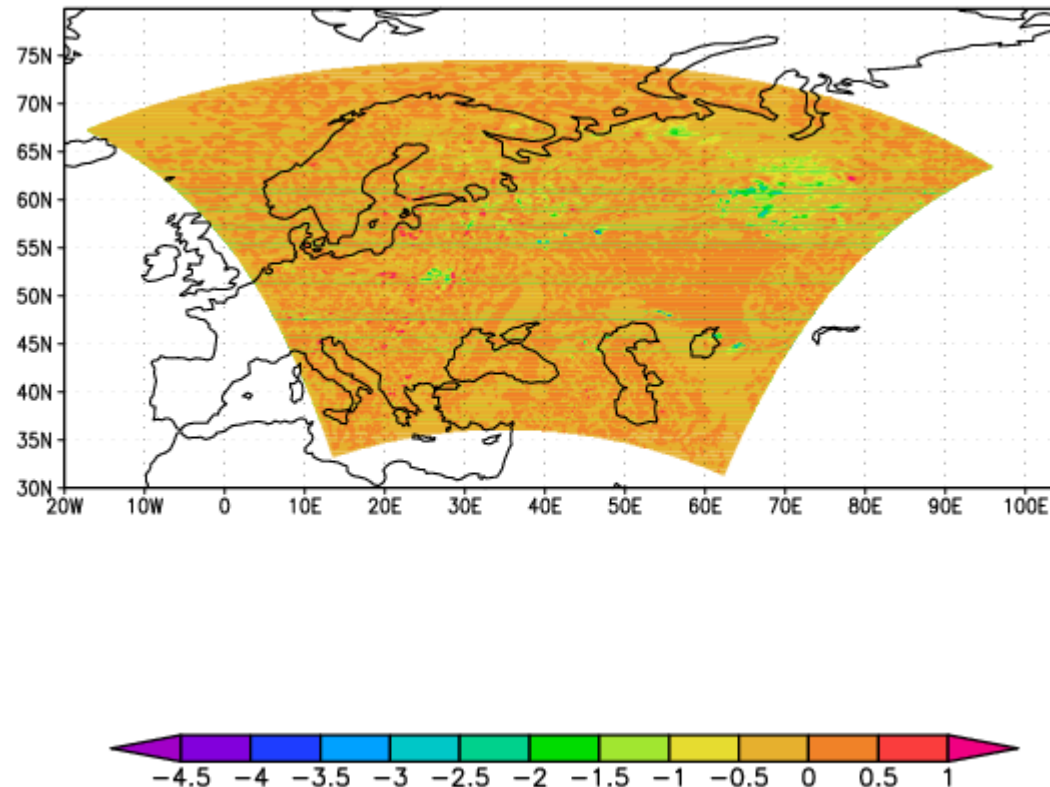
2m temperature difference between the modified (with the mire parameterization) and the standard COSMO model. 36h forecast, starting at 00 UTC, 10 August 2011, COSMO-RU domain

|Finished sub-tasks:

1. Compilation of a database of the mire distribution based on satellite vegetation classification (GEM, Bartalev) and national peat surveys (Vompersky *et al.*)

   Consistency check with TERRA soiltype 8
(peat) extracted from EXTPAR (FAO soil maps)

Finished sub-tasks:

2. Prescription of peat thermal properties in
TERRA with dependencies of thermal
conductivity on soil water (ice) content using
the organic soil thermal conductivity
database

Peat thermal conductivity

Johansen equation from TERRA used. Peat-specific parameters from Lawrence and Slater(2007), reverse problem solved to obtain Kersten number as a function of water content
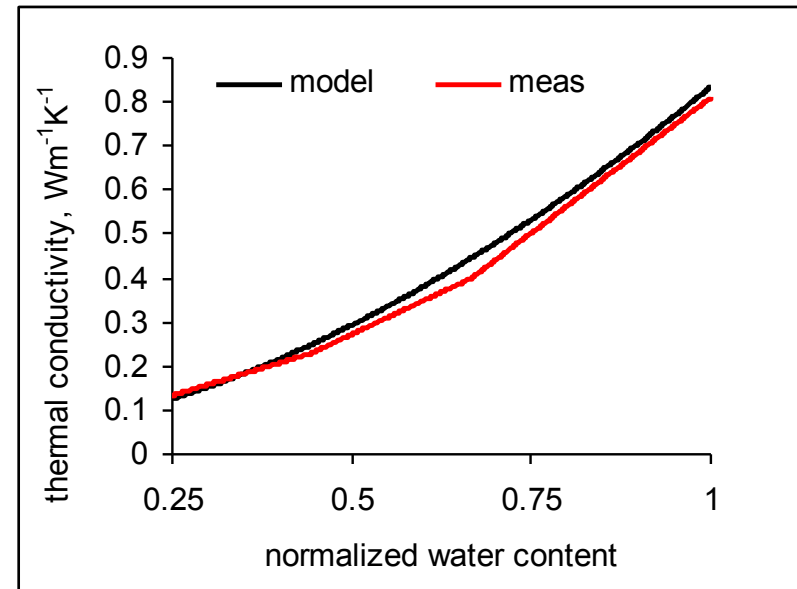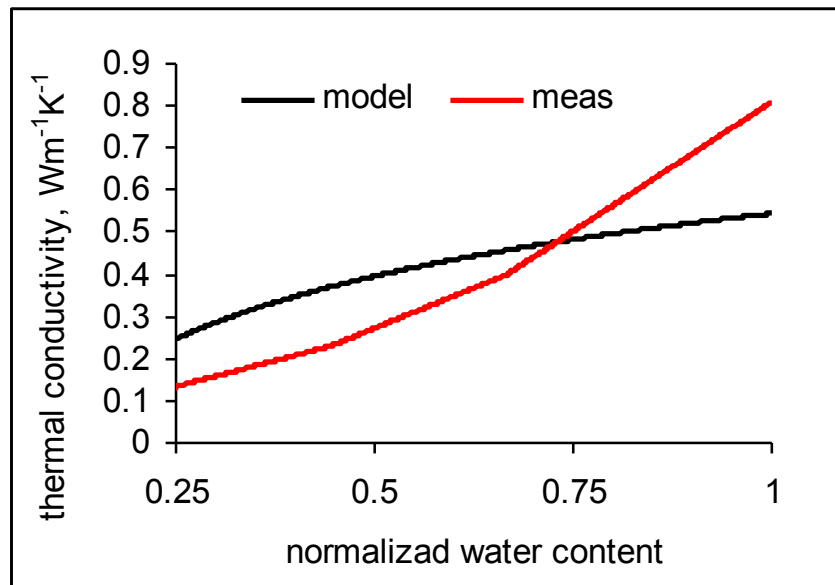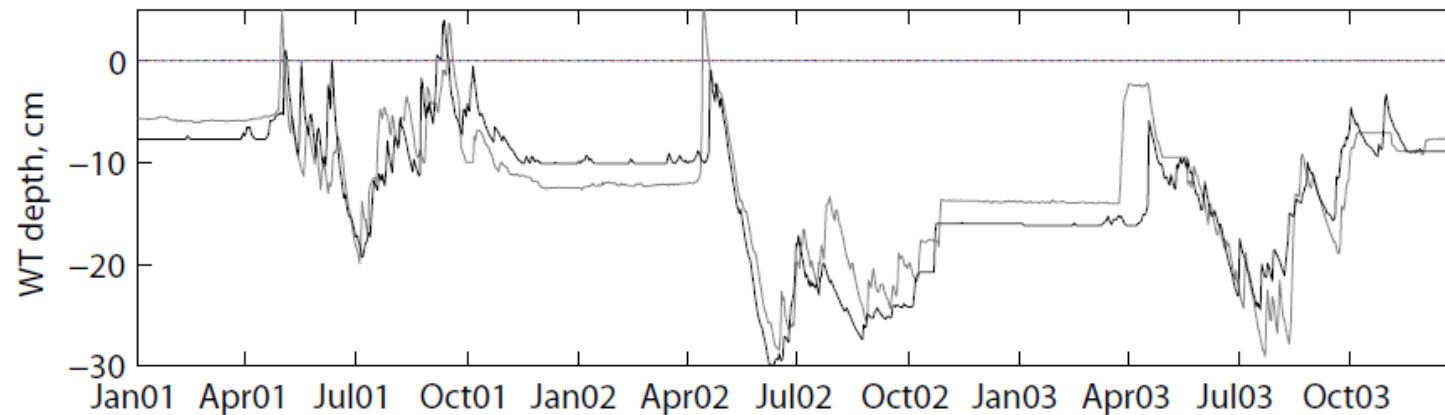

Peat thermal conductivity as a function of normalized water content:
 a) as in original TERRA parameterization,
 b) according to new parameterization and observed.

Finished sub-tasks:

3. MMWH model programmed as subroutine
ready to use in TERRA and documented.

Ongoing work

TERRA standard soil water transfer code based on Richards equation with an exchange with groundwater at the lower boundary applied and tested for the mire sites.

Integration of the mire parameterization in a fully coupled COSMO model for the COSMO-RU domain

Rice paddies. Climate simulations. Difference in rice yield trend (2020-2030) - (2006-2016), kg/ha between the standard experiment and experiment with local T modification
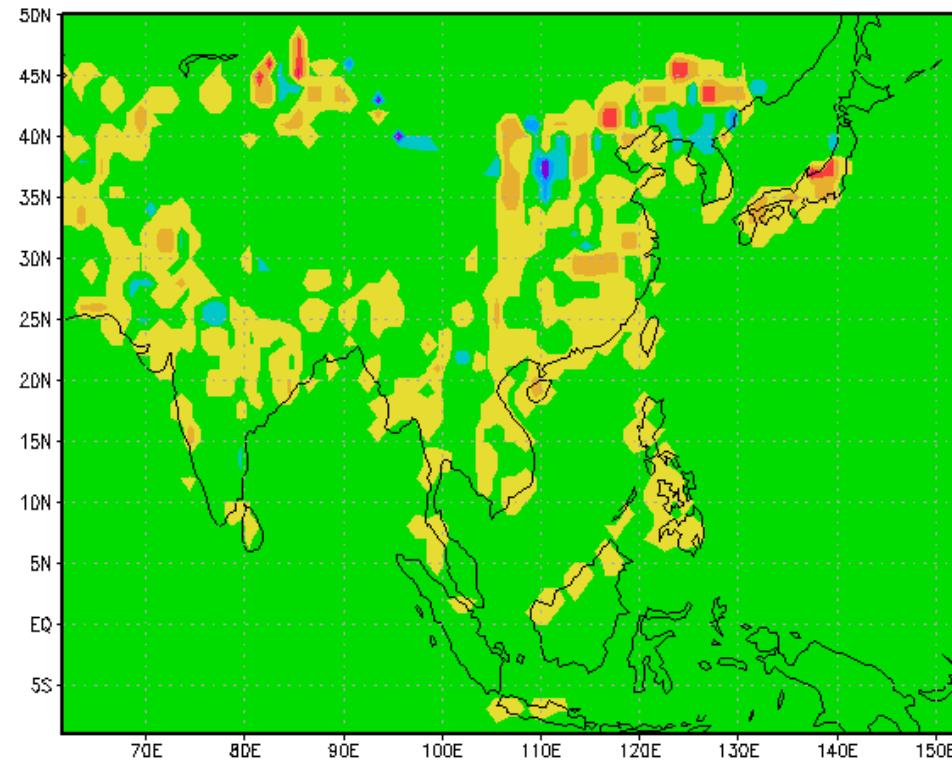
Positive numbers-less yield loss or bigger yield gain