**Expected Effects of Regional Climate Change on the Soil Moisture Regimes in Central Europe and Central US**

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**Motivation**

1. Soils are an important control on water fluxes in the landscape and in many parts of the world act as the most important water reservoir mitigating the effects of rainfall variability.
2. Soil moisture and temperature regimes are inherently more stable and quantifiable than their atmospheric counterparts and are essential for determining the environmental conditions of any region.
3. They can also be used to demonstrate the impacts of climate change on a given region as they integrate not only the change of climate variables but also existing soil condition status and plant cover.

**Aims**

1. To test performance of the SoiClim model over the range of climatic conditions in the Central Europe and Central US.
2. To determine the soil moisture and temperature regime under the present climate conditions.
3. To estimate change of both regimes over 21st century.

**Study Area**

The study regions are located in the centre of Europe with mixed influence of oceanic and continental climate and in the High Plains where continentality is more pronounced. In the Central Europe relatively high density of stations was available for the study whilst in the High Plains region the number of stations available was somewhat lower. Both regions include ustic and udic hydric regimes according to USDA.

**Methods and Data**

1. Daily weather data from 125 stations in the Czech Republic and 59 from the High Plains region were available for the study.
2. The input data were fed into the SoiClim model (Fig. 2).
3. Based on the series of daily observed data set of 99 year-long synthetic series for present and future climate conditions were generated. The soil profile is described in terms of the maximum water holding capacity of the root zone (MWHC) was available for the whole territory in case of the Central Europe and for individual sites in the High Plains.

**Results**

**Evaluation of SoilCIIm**

![Evaluation of SoilCIIm](image)

**Conclusions**

- Model SoiClim realistically reproduces soil moisture, temperature and ETa values in both Central Europe and High Plains region and should be thus able to estimate correctly the soil moisture regime.
- Significant shifts of soil climate ought to be expected under the climate change through out the Central Europe. The establishment of presently missing Wet Tempustic regime and severe reduction of Peduralic areas in the upper parts of river basins is very likely by 2050.
- Drier hydric regimes should be expected also in the High Plain region accompanied by likely eastward shift of Pedalfer/Pedocalc line resulting in higher drought probability than during 20th century.