Supplementary material
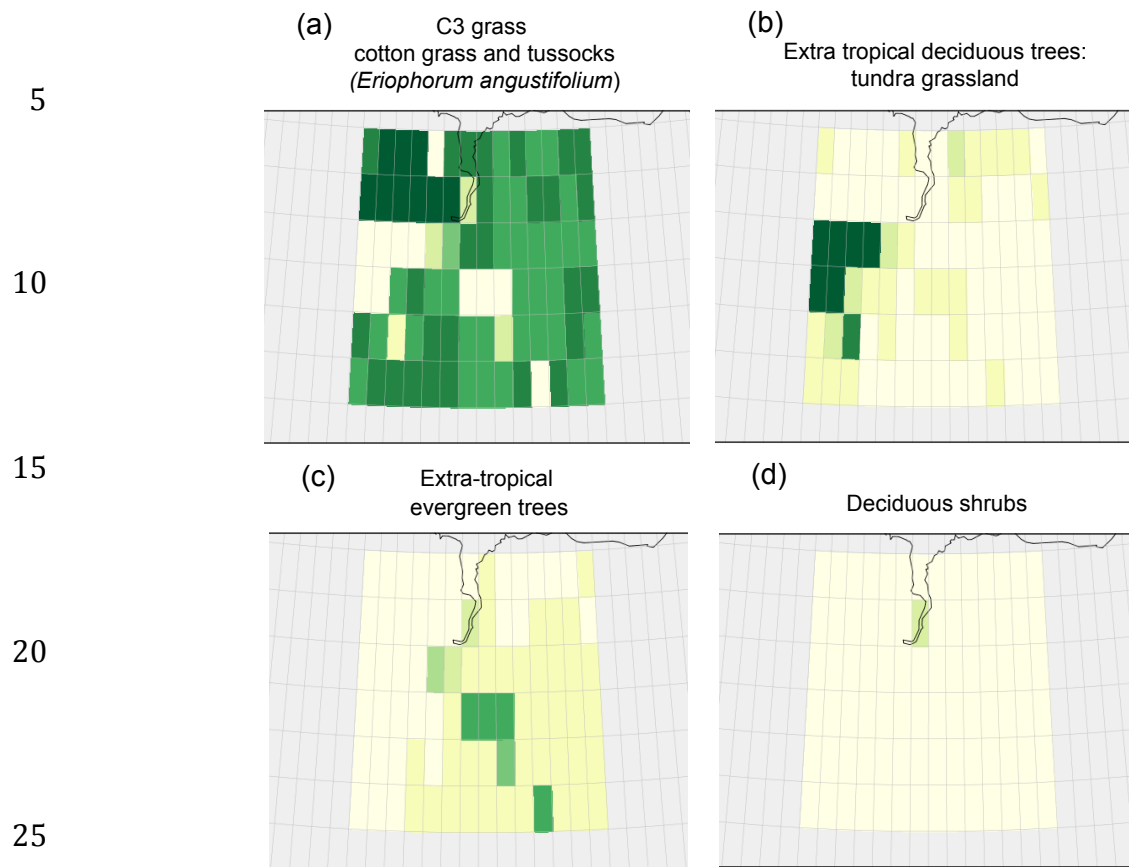
Figure S1 – Spatial distribution of the four land cover types present in the model domain: a) C3 grasses with 66 % coverage in the wetter areas in the northwest, b) Deciduous trees with 19 % coverage and characteristic of the drier tundra grassland located in the central west region of the domain, c) Evergreen trees with 14 % coverage mostly present in the central and southeast parts of the domain in the driest regions, and d) Deciduous shrubs with 1 % coverage only present in one grid cell located in the north central part of the model domain near Chersky.
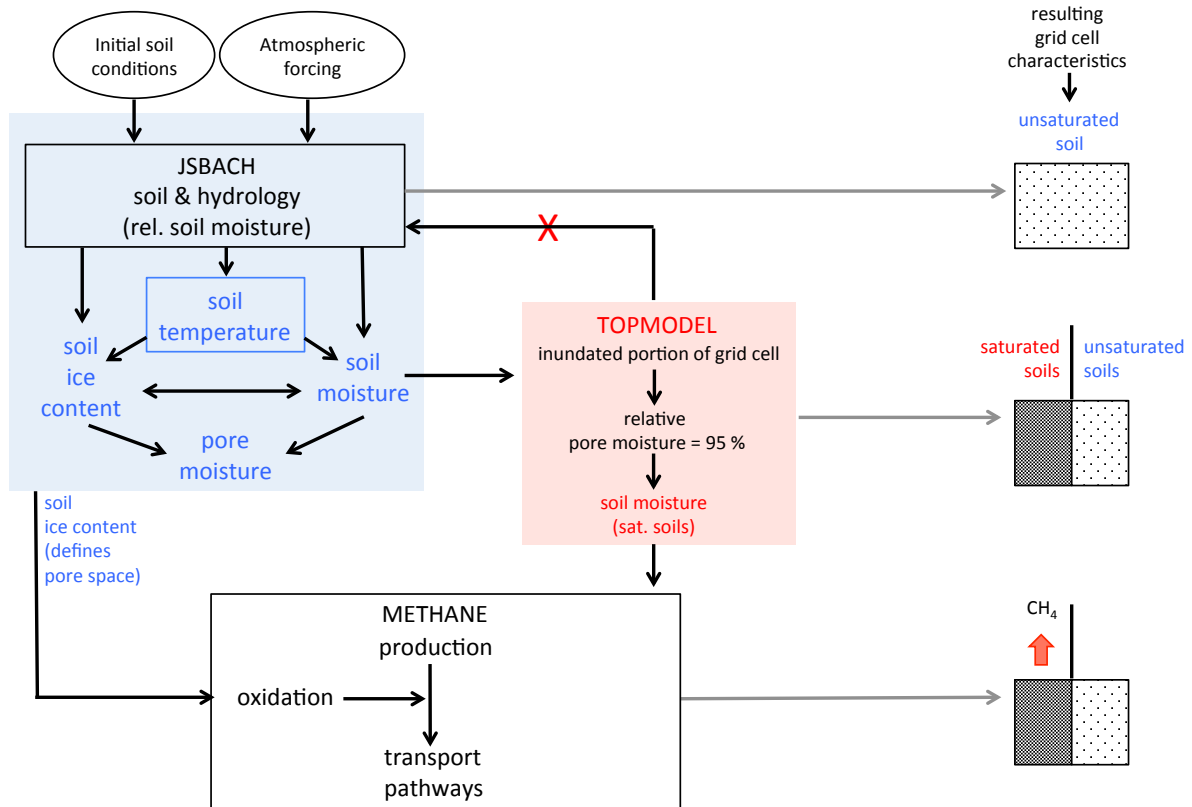
Figure S2 – Schematic representation of the connections between the hydrology and soil schemes, and TOPMODEL approach, in the JSBACH-methane model. The blue text represents those variables that are not influenced by the TOPMODEL approach, which is represented within a red box. The production, oxidation, and transport of methane take place only in the water-saturated portion of the grid cell.

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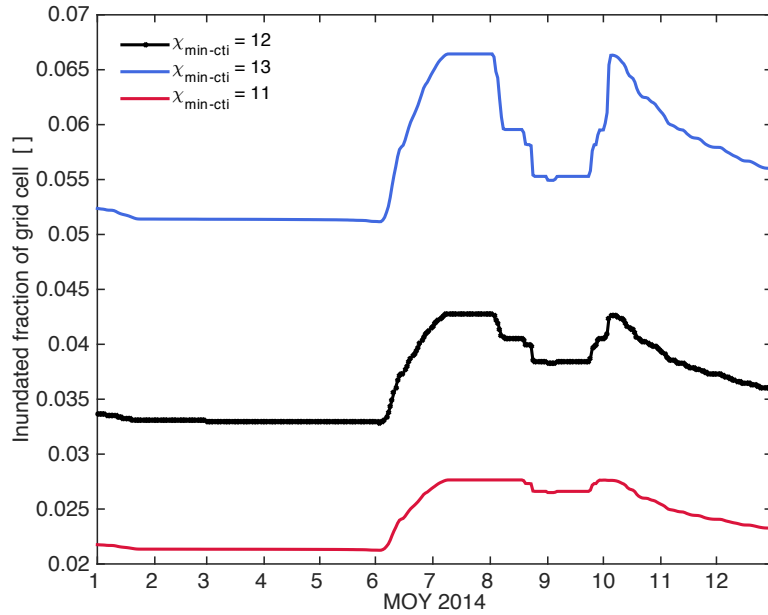
Figure S3 – Comparison of the temporal change of the daily mean inundated areas in the model domain during 2014, due to the definition of three different values of χ_{min_cti} during sensitivity tests.
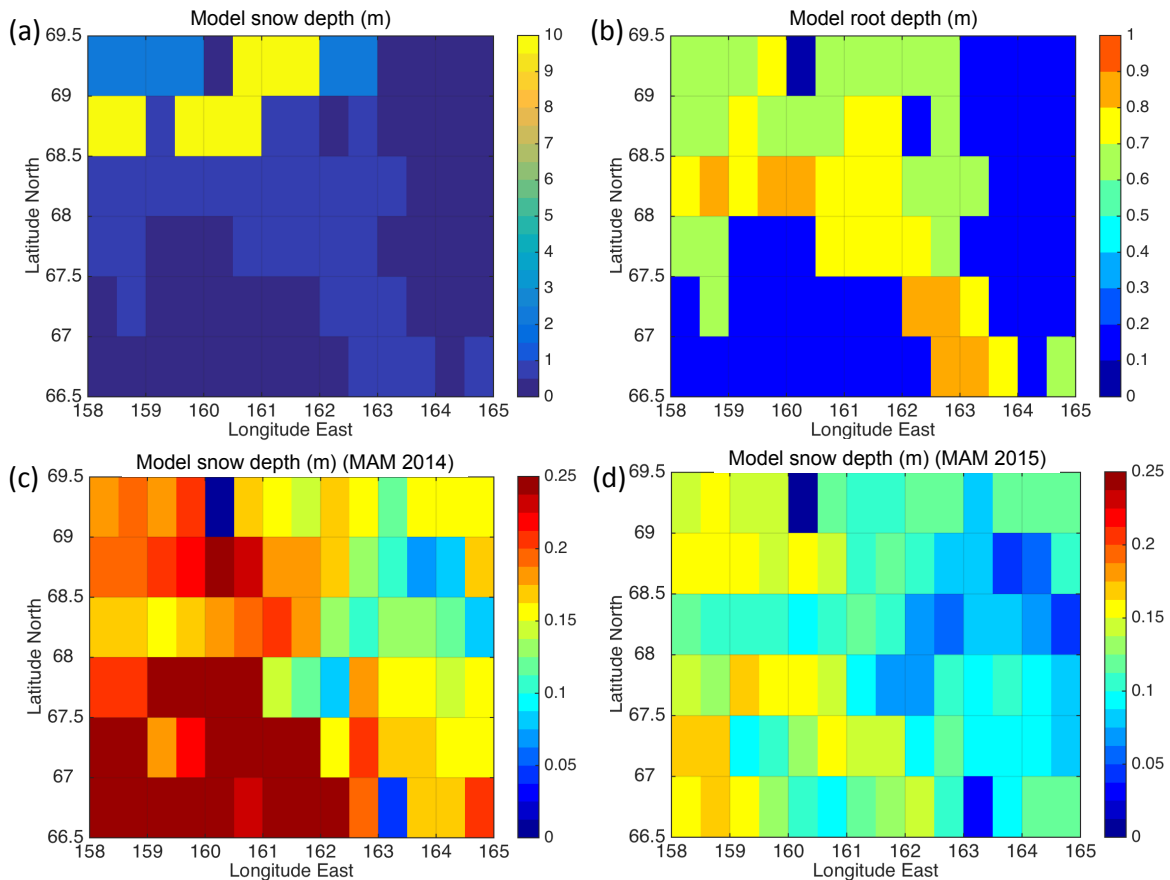
Figure S4 – Spatial distribution of soil input parameters and calculated mean spring snow depth: a) soil depth, b) maximum root depth, c) spring snow depth in 2014 and d) spring snow depth in 2015.
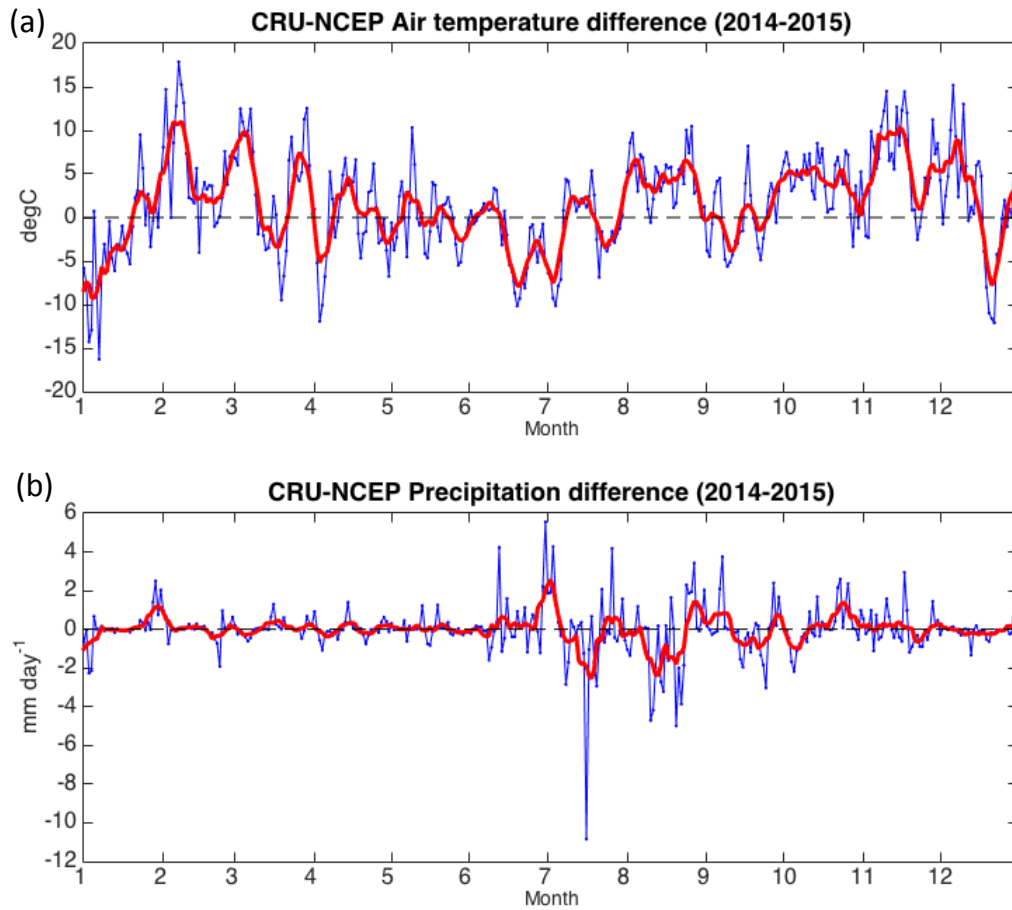
Figure S5 – Difference between 2014 and 2015 of the mean values of the CRU-NCEP data a) precipitation and b) air temperature in the model domain. The blue line shows daily values and the red line is the three-day running mean.

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