



Modelling spatial and temporal variation in the Holocene thermal maximum at a global scale

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Proxy records provide evidence for substantial spatial variations in the timing and magnitude of the Holocene thermal maximum around the World. We have performed several experiments with the LOVECLIM global atmosphere-ocean-vegetation model to analyze these variations and their dependence on various forcings. In these experiments, we consider the influence of variations in orbital parameters and atmospheric greenhouse gases and the early-Holocene deglaciation of the Laurentide Icesheet (LIS). Considering the LIS deglaciation, we quantified separately the impacts of the background melt-water fluxes and the changes in topography and surface albedo. We present modelled global maps showing the spatial variation in timing (in thousand years BP) of the Holocene thermal maximum and the magnitude of the climatic anomaly. In addition, also the seasonal dependence of the climatic signal is analysed that is mainly related to the nature of the orbital forcing. The model results are compared with proxy-based reconstructions of Holocene temperatures.