



Modelling the climate impact of high-latitude vegetation in the Late Miocene

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During the Cenozoic, global climate got successively colder. The Late Miocene belongs to the late phase of the Cenozoic cooling. The climate at that time was still warmer and more humid as compared to today. Especially, high latitudes were warmer. Corresponding to the climate situation, palaeobotanical evidences support that vegetation in the high latitudes changed significantly from the Late Miocene until today. Due to the pronounced cooling in polar regions, boreal forests of the Late Miocene were replaced by tundra and even glaciers nowadays. In fact, vegetation changes from the Miocene to today are caused by the global climate cooling, but vegetation changes themselves also had an impact of the climate evolution. For quantifying this impact, we analyse how strong vegetation changes in the high latitudes contribute to the climate evolution. From Late Miocene climate modelling sensitivity experiments, we analyse the role of vegetation changes in the high latitudes. We use the Earth system model of intermediate complexity Planet Simulator. Boundary conditions generally represent the Tortonian (Late Miocene, 11 to 7 Ma). For our sensitivity experiment, we introduce the modern vegetation in the high latitudes. As compared to the Tortonian reference run, the high-latitude experiment demonstrates cooler conditions and precipitation decreases. In addition, preliminary results point to the fact, that vegetation changes in the high northern latitudes also strongly affect climate in the southern high latitudes.