



(Model) Peatlands in late Quaternary interglacials

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Peatlands have accumulated a substantial amount of carbon, roughly 600 PgC, during the Holocene. Prior to the Holocene, there is relatively little direct evidence of peatlands, though coal deposits bear witness to a long history of peat-forming ecosystems going back to the Carboniferous. We therefore need to rely on models to investigate peatlands in times prior to the Holocene.

We have developed a dynamical model of wetland extent and peat accumulation, integrated in the coupled climate carbon cycle model of intermediate complexity CLIMBER2-LPJ, in order to mechanistically model interglacial carbon cycle dynamics. This model consists of the climate model of intermediate complexity CLIMBER2 and the dynamic global vegetation model LPJ, which we have extended with modules to determine peatland extent and carbon accumulation.

The model compares reasonably well to Holocene peat data. We have used this model to investigate the dynamics of atmospheric CO₂ in the Holocene and two other late Quaternary interglacials, namely the Eemian, which is interesting due to its warmth, and Marine Isotope Stage 11 (MIS11), which is the longest interglacial during the last 500ka. We will also present model results of peatland extent and carbon accumulation for these interglacials. We will discuss model shortcomings and knowledge gaps currently preventing an application of the model to full glacial-interglacial cycles.