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Carbon balances of Northern Peatlands

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In this presentation I will address three main issues: 1) The relative importance of the component carbon (C) fluxes for the annual mire Net Ecosystem Carbon Balance (NECB); 2) The importance of gross primary production (GPP) versus ecosystem respiration (Reco) for the annual Net Ecosystem Exchange (NEE) and finally 3) whether NEE of different mire types respond in the same or different ways to controlling factors. The annual mire NECB is made up principally by the biosphere-atmosphere exchange of CO_2 (NEE) and CH_4 and the runoff C-export. One important research issue is to further understand what controls the relative contribution from the component fluxes to annual mire NECB. A second important major research issue is to reveal the relative importance of gross photosynthesis (GPP) and ecosystem respiration (Reco) respectively for the annual mire NEE. The general understanding is that the low rate of decomposition constitutes a major control on peat accumulation. There is though growing evidences from estimates of contemporary annual as well as growing season NEE and peat core based estimates of long-term C accumulation that GPP is at least as important for the annual NEE. Finally, I will address the question whether all mires respond in the same way to controlling factors or if different mire types i.e. bogs and fens respond differently. Recent empirical as well as modeling studies indicate that e.g. changes in water table level causes contradictory response in mire NEE.