



Midsummer and autumn depressions in net carbon fluxes and light-use efficiency across the circumpolar boreal forest

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How the carbon (C) balance of northern terrestrial ecosystems responds to climate change is a crucial question given the large environmental changes that are expected to occur in this region. Thus, it is important to examine how and to what extent seasonal events might create positive C cycle feedbacks to the atmosphere. Recent studies at specific flux sites have shown a midsummer depression in net C exchange and light use efficiency due to decreases in ecosystem photosynthesis and increases in ecosystem respiration. However, we do not yet know how general this phenomenon is across the circumpolar boreal forest and how the timing and extent of midsummer depressions vary among regions. Furthermore, warmer autumn temperatures have been found to decrease net C exchange and modeling studies have suggested that ecosystem respiration is stimulated more than ecosystem photosynthesis under such conditions. The degree of commonality in the response of a circumpolar range of boreal sites to environmental factors in the autumn has yet to be examined. The La Thuile global flux dataset allows us an unprecedented opportunity to examine these issues. In this talk, we will present our progress to date.