



## **Changing temperature response turned boreal forest from carbon sink into carbon source**

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19 years of flux measurements reveal that a boreal forest in northern Sweden has turned from a carbon sink into a carbon source. A consistent annual uptake of about 4 tonnes CO<sub>2</sub> per hectare turned into annual emissions of the same magnitude within a few years. While biomass increment and gross CO<sub>2</sub> uptake remained unchanged, gross respiration has increased, mainly during the autumn periods. This increasingly reduced the annual number of days with net CO<sub>2</sub> uptake. No significant trend towards higher temperatures could be observed during the measurement period. However, the temperature responses of ecosystem respiration have changed with time, leading to higher respiration rates in the temperature range between 0 °C and 5 °C, which is the most common range during spring and autumn. Consequently, respiration fluxes under those temperature conditions have increased, both in spring and – even more – in autumn. Thus the change of the carbon balance is not directly caused by climate warming, as stated in other studies, but by changes in ecosystem functioning. The reasons for the rapid change in temperature response are still unknown and may be sought in changes of litterfall and dead wood distribution, changes in fungi- and microbial communities, or hydrological changes.