



## Role of vegetation on fire behaviour in Fennoscandia forests during the Holocene

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The relationship between Holocene changes in Fennoscandia biomass burning (reconstructed by means of sedimentary charcoal records from lake and peat bogs) and main forest composition (based on pollen reconstructions from the same sites) divided into three different fire sensitivity classes is explored based on the hypothesis that fire-prone species are more abundant during periods characterized by higher fire disturbance, while fire-intolerant species dominate when biomass burning is low.

The overall patterns found across Fennoscandia suggest that there was low but increasing fire activity during the early Holocene, while a low and decreasing trend characterized the middle Holocene. During the late Holocene biomass burning increased, with a peak around 500 cal yr BP. This maximum is then followed by a downturn during the last centuries.

Generally, fire-prone species are strongly positively correlated with multi-millennial variability of biomass burning in Fennoscandia forests. A positive - but much weaker - relationship also exists between fire-tolerant species and long-term fire trends. On the contrary, a quite strong negative correlation is detected between biomass burning and fire-intolerant species.

The results presented in this large-scale analysis demonstrate that biomass burning was highly linked to fuel type (according to different fire sensitivity classes) during the Holocene, underlying the fact that all past fire-climate studies must consider key functional interactions between fuel type and long-term changes in fire regime.