Fire as a driver of ecosystem dynamics in Central and Eastern Europe throughout the Lateglacial and Holocene

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Fire drives significant changes in ecosystem structure, diversity and function, and affects species evolution and biomass dynamics. To understand the ecology of terrestrial ecosystems it is crucial to understand the role of fire in the earth system. Through fire, humans have also greatly impacted on global land cover and climate for millennia and significantly altered wildfire dynamics (frequency and severity). Fire activity has increased over recent decades in many parts of the world and it is anticipated to intensify in a future warmer and drier climate and abundant biomass accumulation.

Sedimentary microscopic charcoal (particles smaller than 150 microns) has been used to describe multi-decadal to millennial scale biomass burning at regional scales, whereas macroscopic charcoal (particles larger than 150 microns) analysis is increasingly used to investigate past biomass burning at a local scale. Typically, previous studies of fire activity have focused on single microscopic charcoal records with a poorly defined source area. With the creation of the Global Charcoal Database (GCD thereafter) and the continually increasing number of charcoal records (mainly micro-charcoal), several regional, continental, and global syntheses of trends in biomass burning and associated drivers of change have become possible. These studies have highlighted that the distribution of charcoal records is relatively sparse and that filling the gaps is urgently needed to better understand the spatial complexity of patterns and processes responsible for trends in fire regime (Marlon et al., 2015). Central Eastern Europe is among the regions sparsely covered in terms of charcoal records.

We seek to contribute to the closing of this gap by collecting and unifying published medium to high-resolution micro and macro-charcoal records from CE Europe spanning the Lateglacial throughout the Holocene, thereby providing the palaeo-community with a comprehensive synthesis. These charcoal records will be evaluated in combination with other proxy-based and modelled data sets of past climate, vegetation, land cover and land use, and will facilitate a critical examination of various hypotheses regarding patterns, drivers and consequences of biomass burning over multiple spatial and temporal scales.

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References

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