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Palaeofire: current status and future opportunities

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Sedimentary charcoal records are widely used to reconstruct regional changes in fire regimes through time in the geological past. The Reading Palaeofire Database (RPD) represents the most comprehensive compilation of sedimentary charcoal data currently available. It contains 1673 individual charcoal records from 1480 sites worldwide, with sufficient metadata to allow for the appropriate selection of sites to address specific questions. Most of the records have new age models, made by re-calibrating the radiocarbon ages using INTCAL2020 and Bayesian age-modelling software. In this talk we will show how these data are being used to document changing fire regimes during the Late Quaternary and to explore how fire regimes have responded to changes in climate, vegetation and human activities. We will demonstrate the progress that has been made to calibrate the charcoal records and make quantitative estimates of fire properties. We will also explore how these data can be used to evaluate and benchmark process-based fire-enabled models. Finally, we will highlight opportunities to use the palaeo-record together with models to explore fire regimes and their consequences for land-surface processes, biogeochemical cycles and climate.