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Spatial variability in Holocene wildfire responses to environmental change in the northern extratropics

David Kesner^{1,2}, Sandy Harrison^{1,2}, Tatiana Blyakharchuk³, Mary Edwards⁴, Michelle Garneau⁵, Gabriel Magnan⁵, and Colin Prentice^{2,6}

¹University of Reading, Reading, United Kingdom of Great Britain – England, Scotland, Wales (d.kesner@pgr.reading.ac.uk)

²Leverhulme Centre for Wildfires, Environment and Society, United Kingdom

³Institute of monitoring of climatic and ecological systems of Siberian branch of Russian academy of sciences (IMCES SB RAS)

⁴Geography and Environmental Science, University of Southampton, United Kingdom

⁵GEOTOP Research Center, Université du Québec à Montréal

⁶Department of Life Sciences, Imperial College London, United Kingdom

Fire is an important environmental and ecological process in northern high latitude environments. It is unclear how fire will respond to modern environmental change in this region and its implications for ecosystem processes and human societies. For insight into the long-term evolution of fire regimes, we reconstruct changes in biomass burning in the northern extratropics (>45°N) from the early Holocene (9000 years ago) to the present using the Reading Palaeofire Database, currently the most comprehensive repository of northern extratropical palaeo charcoal records. We examine the different geographic patterns in fire regimes across the northern extratropics from the sub-continental to circum-northern extratropical scale, by quantitatively comparing biomass burning with insolation, CO₂, human population records land cover changes. This study provides novel insight into the fire regimes that have characterized the northern extratropics over the Holocene and the differential importance of environmental controls in shaping these burning histories.