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Representing socio-economic factors in INFERNO using the Human Development Index

Joao Teixeira^{1,2}, Chantelle Burton¹, Douglas I. Kelley³, Gerd Folberth¹, Fiona M. O'Connor¹, Richard Betts^{1,2}, and Apostolos Voulgarakis^{4,5}

¹Met Office, Fitzroy Road, EX1 3PB, Exeter, UK

²College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, UK

³Centre for Ecology and Hydrology, Wallingford, OX10 8BB, UK

⁴Leverhulme Centre for Wildfires, Environment and Society, Department of Physics, Imperial College London, London, UK

⁵School of Environmental Engineering, Technical University of Crete, Chania, Greece

INFERNO human fire ignitions and fire suppression functions excluded the representation of socio-economic factors (aside population density) that can affect anthropogenic behaviour regarding fire ignitions. To address this, we implement a socio-economic factor in the fire ignition and suppression parametrisation in INFERNO based on an Human Development Index (HDI) term. The HDI is calculated based on three indicators designed to capture the income, health, and education dimensions of human development. Therefore, we assume this leads to a representation where if there is more effort in improving human development, there is also investment on higher fire suppression by the population. Including this representation of socio-economic factors in INFERNO we were able to reduce large positive biases that were found for the regions of Temperate North America, Central America, Europe and Southern Hemisphere South America without significant impact to other regions, improving the model performance at a regional level and better representing processes that drive fire behaviour in the Earth System.