



*Supplement of*

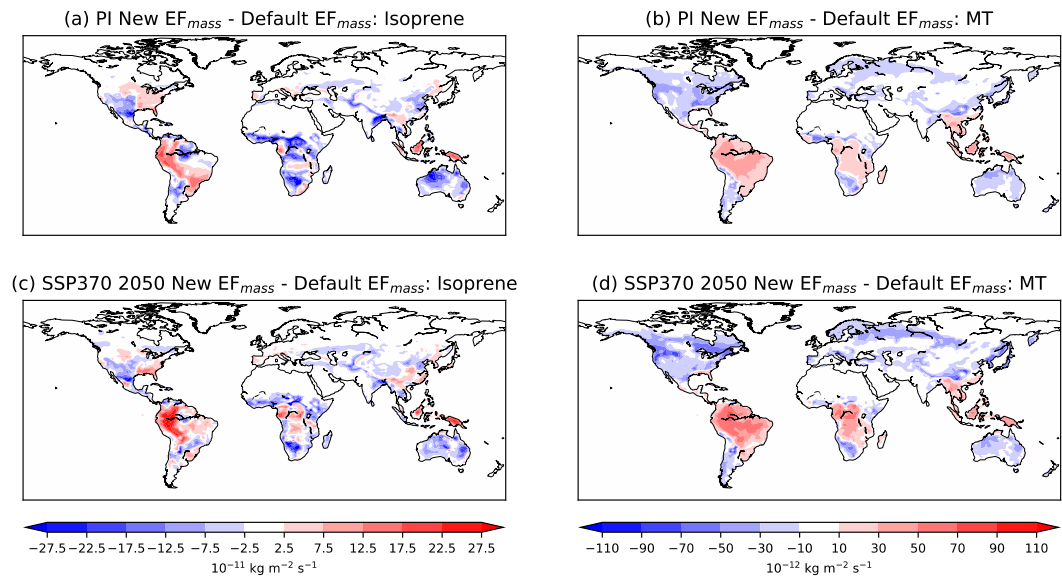
**Updated isoprene and terpene emission factors for the Interactive BVOC (iBVOC) emission scheme in the United Kingdom Earth System Model (UKESM1.0)**

**James Weber et al.**

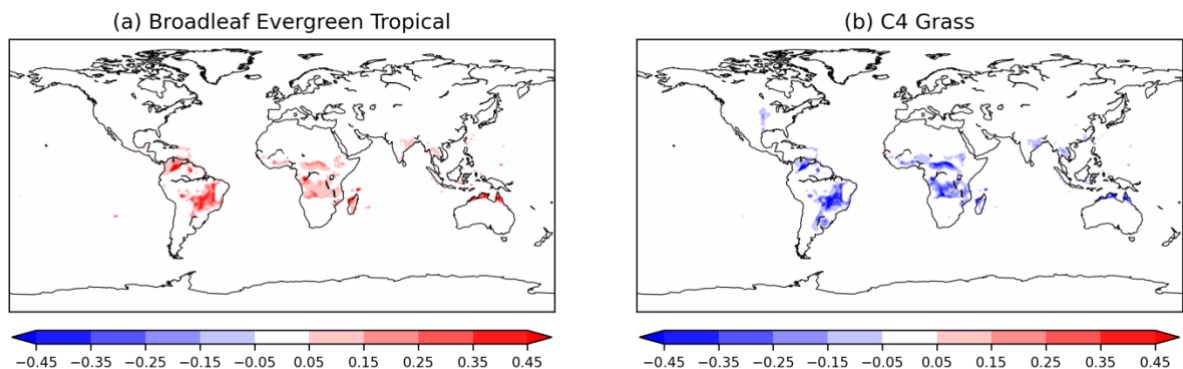
*Correspondence to:* James Weber ([j.weber@sheffield.ac.uk](mailto:j.weber@sheffield.ac.uk))

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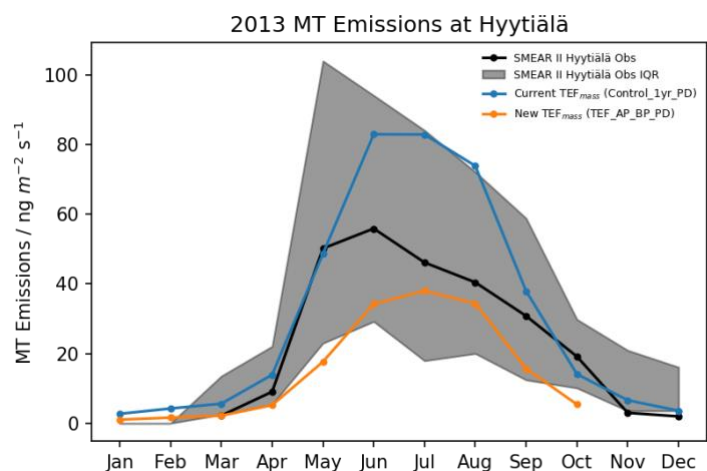
# Supplementary Information: Updated Isoprene and Terpene Emission Factors for the Interactive BVOC Emission Scheme (iBVOC) in the United Kingdom Earth System Model (UKESM)



**Fig S1.** Change in (a, c) isoprene and (b, d) monoterpene emissions following the change in  $EF_{mass}$  values for the PI and SSP3-7.0 2050 scenarios.



15 **Fig S2.** Change in PFT fractional coverage from 2010 to 2050 in the Maxforest scenario for (a) Broadleaf Evergreen Tropical trees and (b) C4 grass.



20 **Fig S3.** Measured monoterpene emissions at the SMEAR II station in Hyytiälä and simulated monoterpene emissions using the current  $TEF_{mass}$  (Control\_1yr\_PD) and updated  $TEF_{mass}$  (TEF\_AP\_BP\_PD) values from the grid cell containing the SMEAR II station. It is important to note that while the measurement station at Hyytiälä is in a completely forested area, the corresponding grid cell in UKESM is only 54% trees (27% each needleleaf evergreen and needleleaf deciduous) with the remainder predominantly C3 grass, C3 crops and water (lakes), which have negligible or zero  $TEF_{mass}$  so we would expect UKESM1 to simulate lower terpene emissions than the fully forested region measurement site.

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Table S1. ORCHIDEE specific leaf area (SLA) values. Taken from  
<https://forge.ipsl.jussieu.fr/orchidee/wiki/Documentation/OrchideeParameters>,

PFT	SLA / m <sup>2</sup> gC <sup>-1</sup>
Needleleaf Evergreen Temperate Tree	0.00926
Needleleaf Evergreen Boreal Tree	0.02
Needleleaf Deciduous Boreal Tree	0.019
Broadleaf Evergreen Tropical Tree	0.0153
Broadleaf Evergreen Temperate Tree	0.02
Broadleaf Deciduous Tropical Tree	0.026
Broadleaf Deciduous Temperate Tree	0.026
Broadleaf Deciduous Boreal Tree	0.026
Arctic C3 Grass	0.026
Cool C3 Grass	0.026
Warm C4 Grass	0.026
Crops	0.026