



Readme for the data published with:

Estimation of Carbon Fluxes in Urban Vegetation Using Machine Learning Emulators of the Land Surface Model JSBACH

by Veera Vasenkari ¹, Leif Backman ¹, Juha Leskinen ¹, Leena Järvi ^{2,3}, Hannakaisa Lindqvist ⁴, Mari Pihatie ^{2,5}, and Liisa Kulmala ¹

¹ Finnish Meteorological Institute, Helsinki, Finland

² Institute for Atmospheric and Earth System Research (INAR), University of Helsinki, Helsinki, Finland

³ Helsinki Institute of Sustainability Science (HELSUS), University of Helsinki, Helsinki, Finland

⁴ Finnish Meteorological Institute, Sodankylä, Finland

⁵ Department of Agricultural Sciences, Faculty of Agriculture and Forestry, University of Helsinki, Helsinki, Finland

Files:

Vasenkari_etal_2026_daily_emulator_NEE_GPP.csv

Contains **daily emulator predictions** for GPP and NEE for the test years **2016–2024** for all plant functional types (agricultural grass, deciduous, coniferous, lawn, cereal). Units are **g C m⁻² d⁻¹**.

Vasenkari_etal_2026_monthly_emulator_NEE_GPP.csv

Contains **monthly emulator predictions** for GPP and NEE for the test years **2016–2024**, for all plant functional types (agricultural grass, deciduous, coniferous, lawn, cereal). Units are the daily flux values (**g C m⁻² d⁻¹**) averaged over each month.

Vasenkari_etal_2026_JSBACH_NEE_GPP.csv

Contains **daily fluxes from JSBACH** for GPP and NEE for **1991–2024**, for all plant functional types. Units are **g C m⁻² d⁻¹**. The emulators were trained on **1991–2015** and evaluated on **2016–2024**. The monthly emulators were trained on calculated monthly averages.