Supplementary Material

Total OH reactivity changes over the Amazon rainforest during an El Niño event

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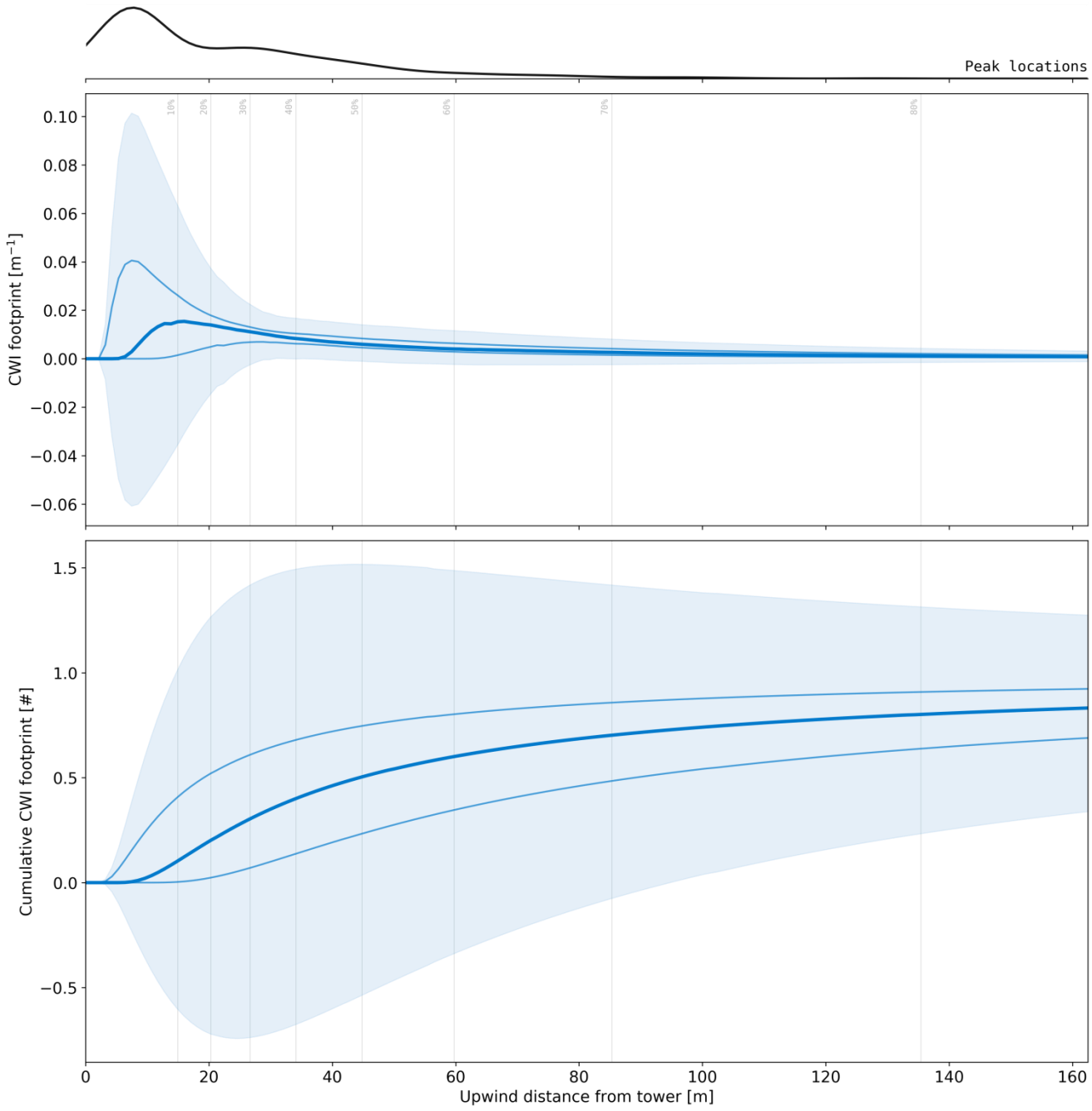
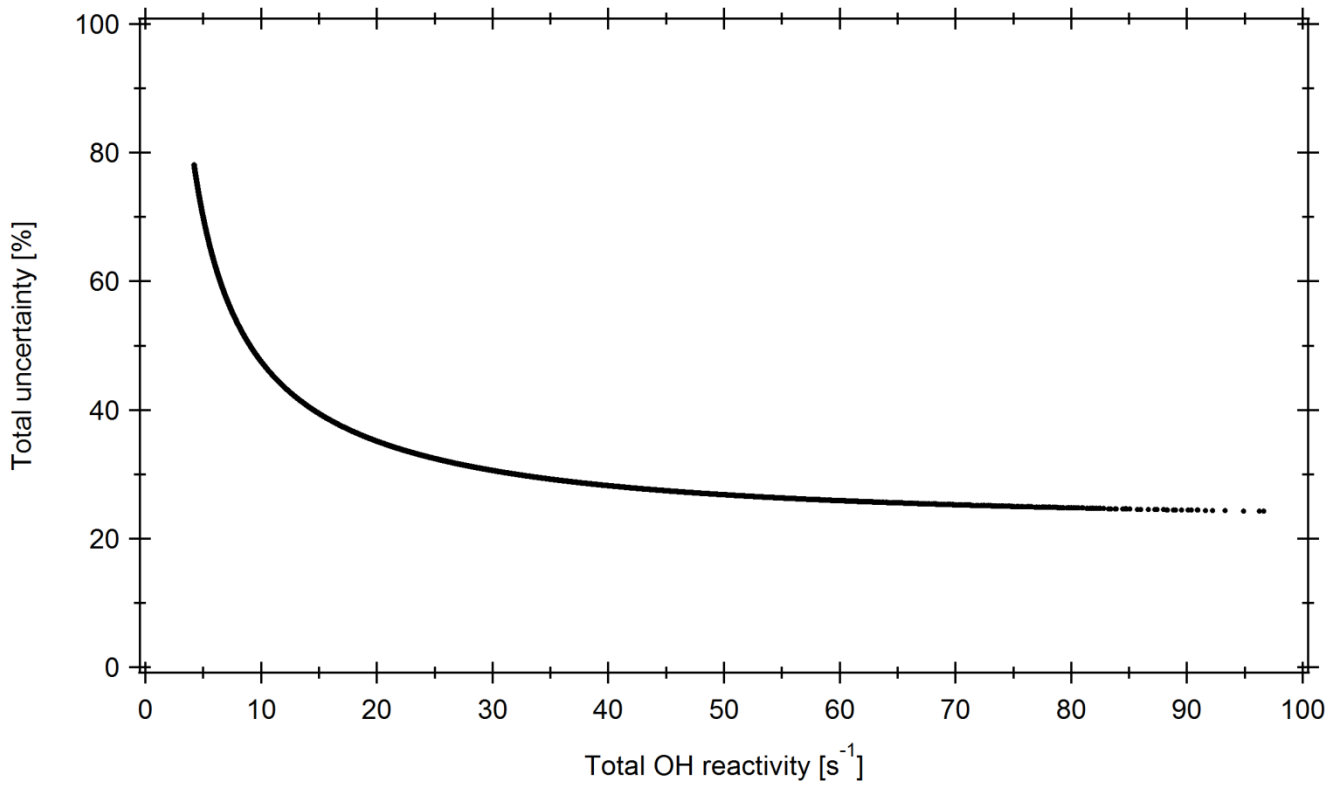
Supplementary Figure 1. Main wind direction and surroundings of the ATTO site. Picture: NASA (https://worldwind.earth).

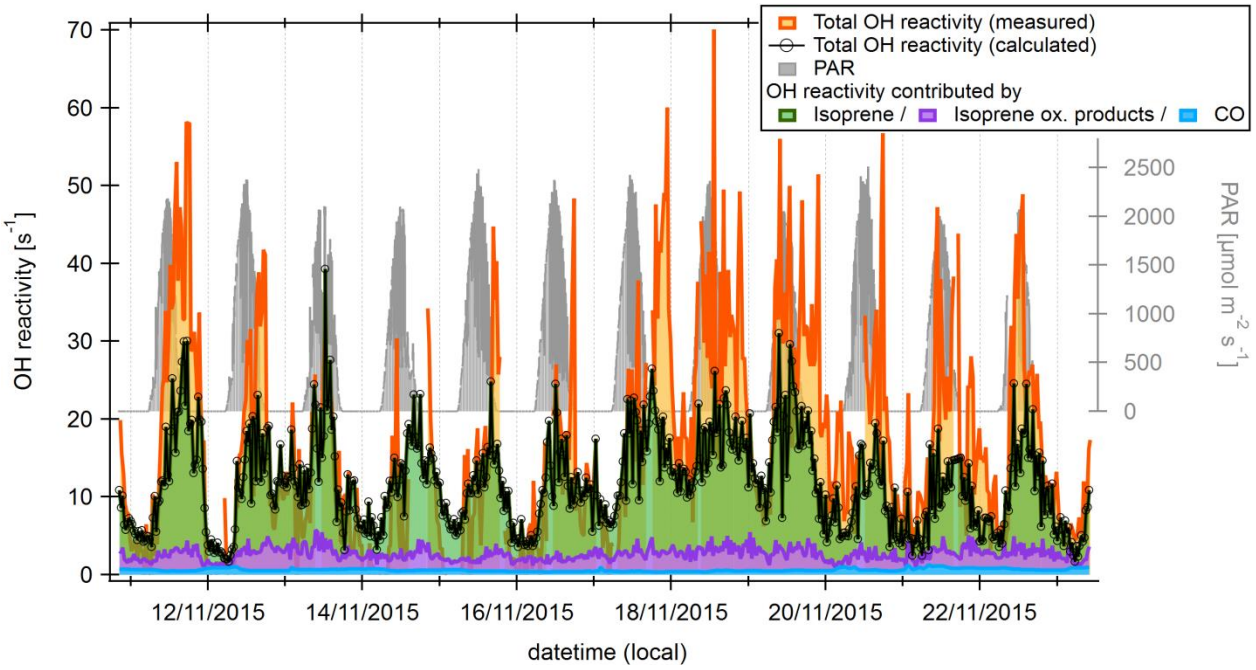
Supplementary Figure 2. Footprint with up to 80% origin of the fluxes measured at a displacement height of 0.9 h = 31.5 m at the walk-up tower. Satellite image: NASA (https://worldwind.earth).



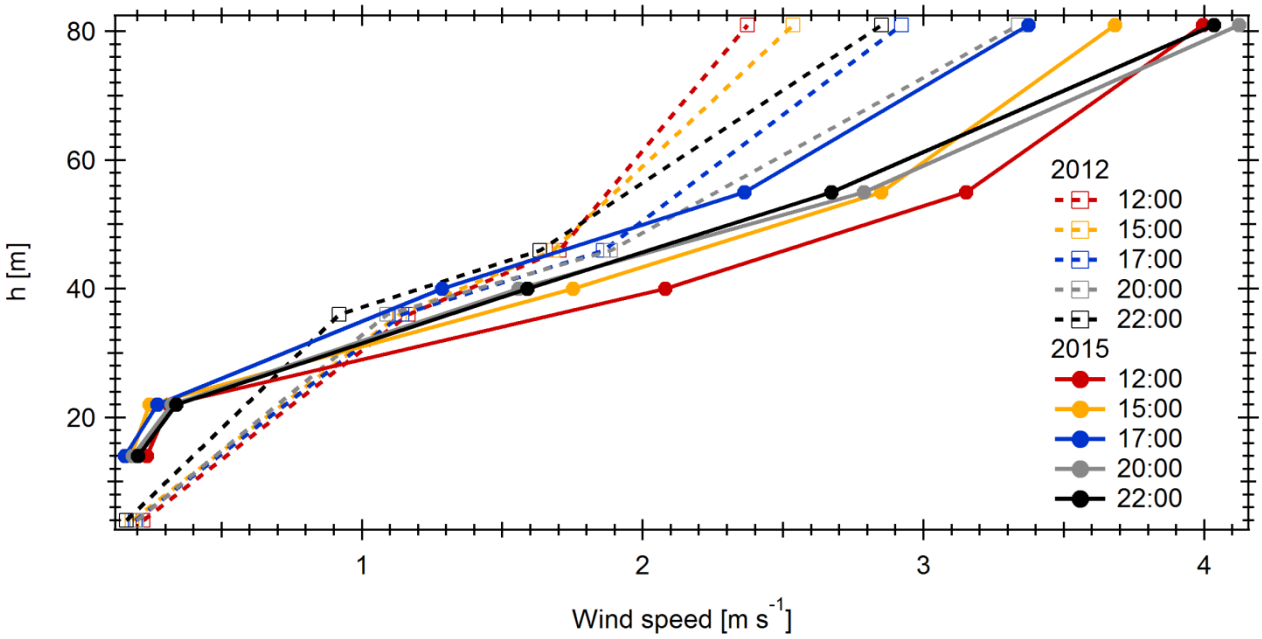
Supplementary Figure 3. Distance of the origin of fluxes measured at a displacement height of 0.9 h = 31.5 m. The light-blue lines depict the 25th to 75th percentiles and the shaded areas all data.



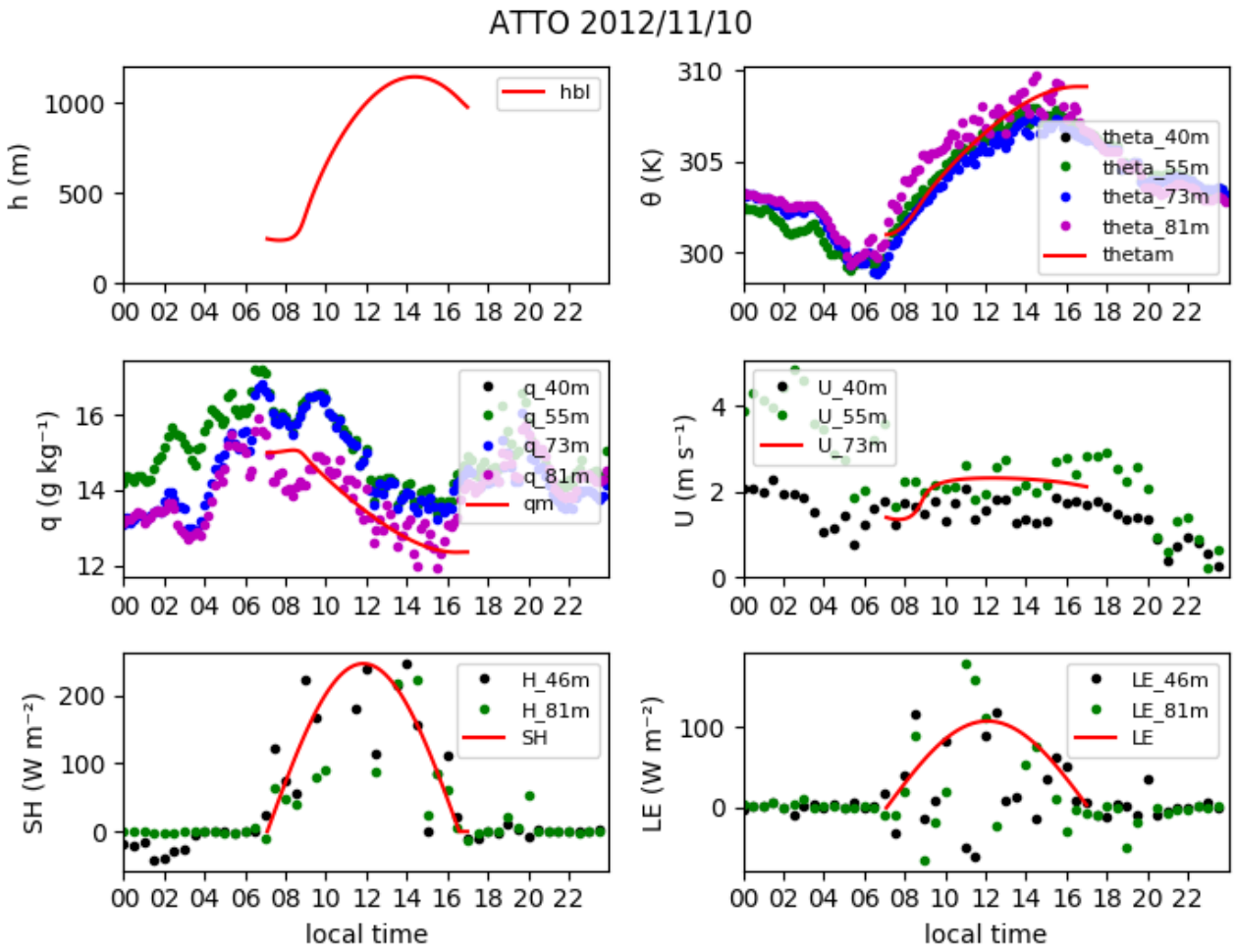
Supplementary Figure 4. Total uncertainty of the total OH reactivity measurement, dependent of the amount of OH reactivity.



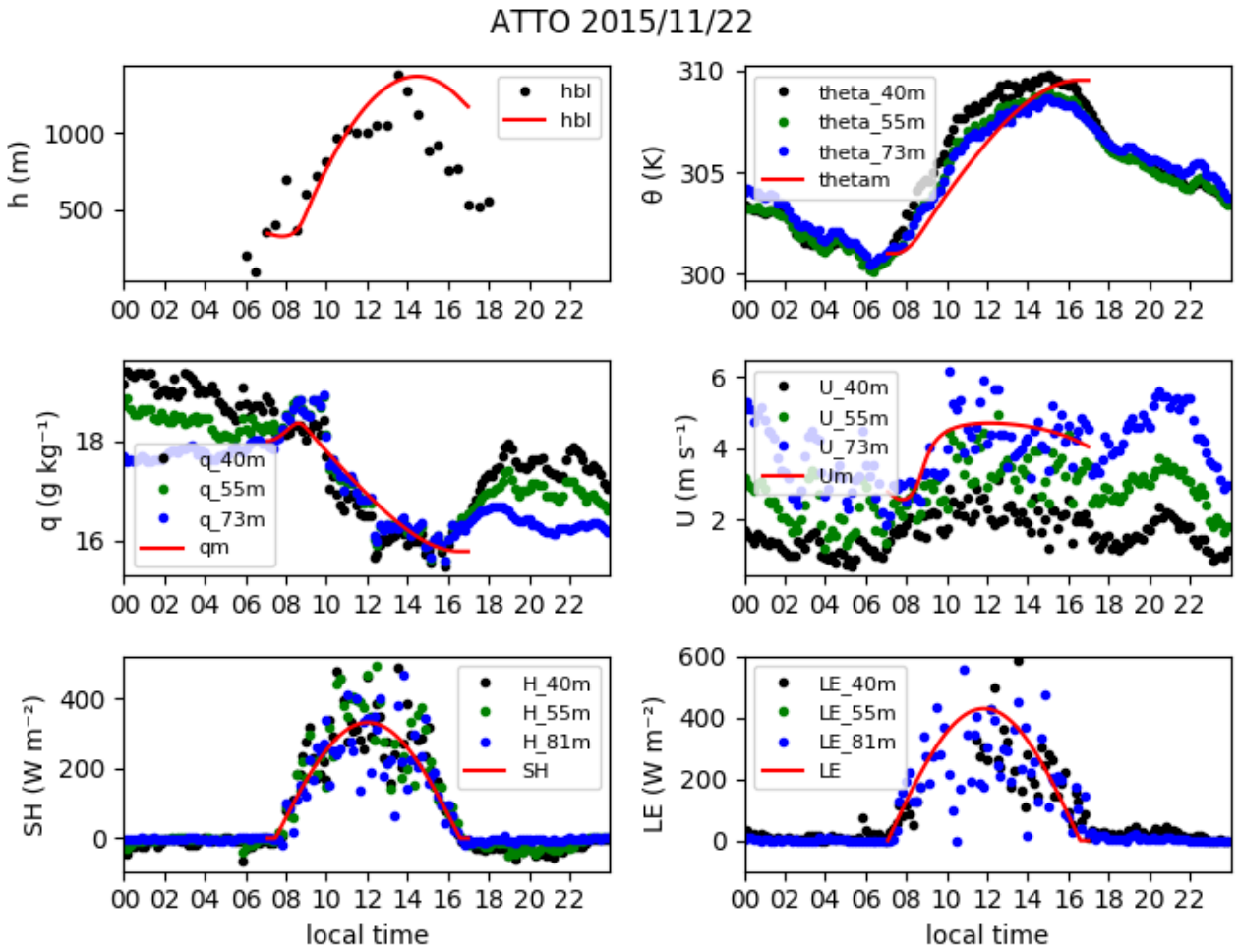
Supplementary Figure 5. Time series of OH reactivity measured in November 2015, and reactivity contributions calculated from measured isoprene, isoprene oxidation products (m/z 71) and carbon monoxide (30 min averages, respectively). Not depicted: contributions of ozone (max. 0.06 s^{-1}), methane (max. 0.28 s^{-1}), NO (max. 0.2 s^{-1}) and NO_2 (max. 0.38 s^{-1}). Gaps in reactivity data are due to calibrations. Photosynthetic active radiation (PAR) is displayed on the right axis.



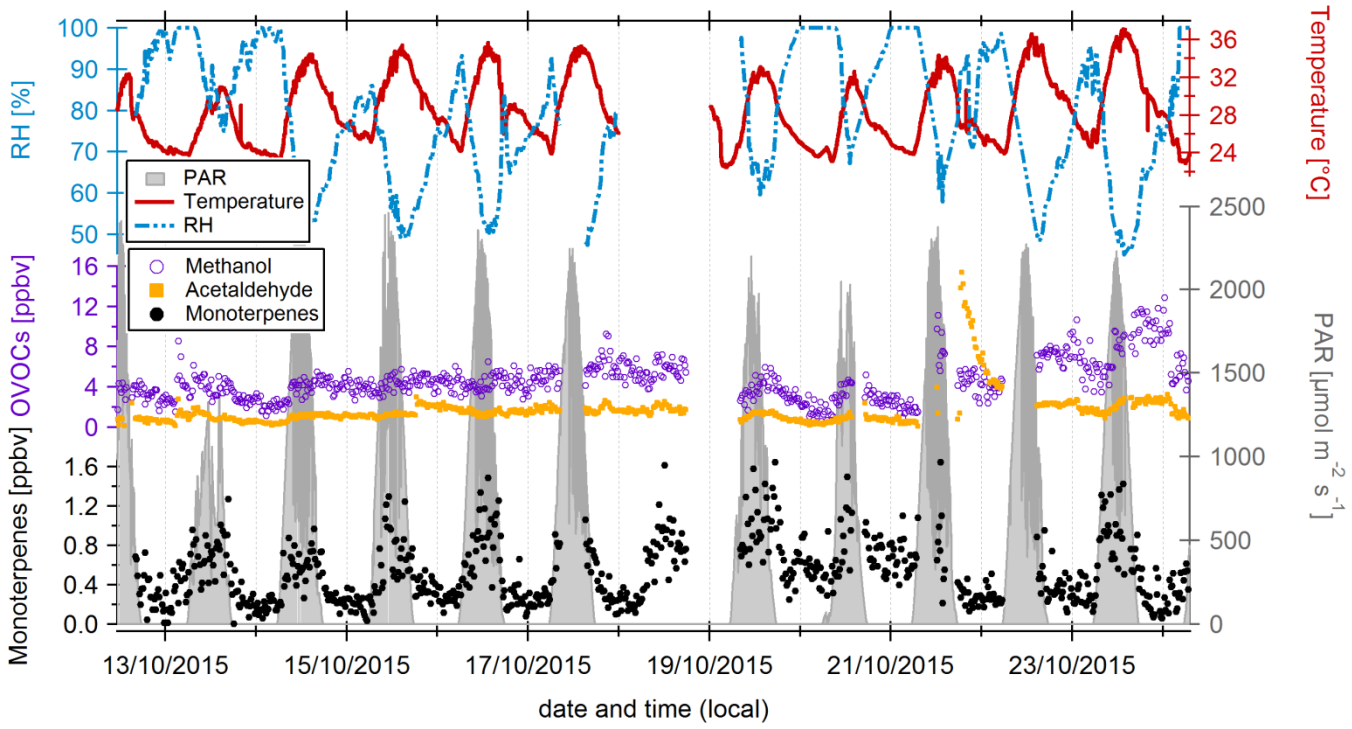
Supplementary Figure 6. Wind speed measured at different heights above ground level in November 2012 (dashed lines) and November 2015 (solid lines). Diel average values are shown for 12:00, 15:00 17:00, 20:00 and 22:00 local time.



Supplementary Figure 7. Boundary layer case study for November 10, 2012. Red lines represent model results, points are measured data at various heights, as indicated. The panels show boundary layer height (h), potential temperature (θ), specific humidity (q), wind speed (U), sensible heat flux (SH) and latent heat flux (LE), respectively.



Supplementary Figure 8. Boundary layer case study for November 22, 2015. Red lines represent model results, points are measured data. The panels show boundary layer height (h), potential temperature (θ), specific humidity (q), wind speed (U), sensible heat flux (SH) and latent heat flux (LE), respectively.



Supplementary Figure 9. Time series of VOC mixing ratios, photosynthetic active radiation, ambient relative humidity and temperature measured in October 2015 at 41 m above ground level.

Supplementary Table 1. Contributions of individually measured compounds to total OH reactivity. Reaction coefficients (*k*) of single compounds with the OH radical, campaign averages for November 2015 measured at 38 m (CO, methane, ozone, NO, NO_2) or 41 m (isoprene, MVK/ MACR/ ISOPOOH) and standard deviations thereof.

Compound	k_{X+OH} [cm^3 $molecule^{-1}$ s^{-1}]	Average OH reactivity [s^{-1}]	Standard deviation [s^{-1}]
Isoprene	1.0×10^{-10}	9.12	5.15
MVK+MACR+ISOPOOH	5.62×10^{-11}	2.04	0.77
CO	1.44×10^{-13}	0.48	0.14
Ozone	7.3×10^{-14}	0.03	0.01
Methane	6.4×10^{-15}	0.28	0.00
NO	3.3×10^{-11}	0.01	0.02
NO_2	1.1×10^{-11}	0.03	0.04