Supplement of Earth Syst. Sci. Data, 14, 743–761, 2022
https://doi.org/10.5194/essd-14-743-2022-supplement

Supplement of

Reactive nitrogen fluxes over peatland and forest ecosystems using micrometeorological measurement techniques

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Table S1: Overview of literature presenting eddy-covariance measurements of reactive nitrogen compounds. Some additional flux campaigns are listed in the publication of Walker et al. (2020).

Paper	**Compound**	**Main aim of study**	**Dataset length**	**Flux uncertainty / detection limit**	**Vegetation type**
Ammann et al. (2012)	ΣN_r	Suitability of converter for EC measurements	Few weeks are shown for cross-validation with other techniques	~5 ng N m^{-2} s^{-1} (upper flux detection limit)	Managed grassland
Brümmer et al. (2013)	ΣN_r	Temporal dynamics, controlling factors, and seasonal N budget	11 months	~6.6 ng N m^{-2} s^{-1} (upper flux detection limit)	Cropland (winter wheat)
Eugster and Hesterberg (1996)	NO_2	Deriving transfer resistances	Four different periods with a total of 68 days	Not explicitly given	Rural litter meadow
Famulari et al. (2004)	NH_3	Suitability of TDLAS system for EC; cross-validation with AGM	2 months	Not explicitly given, only standard deviation of fluxes for entire campaign	Managed grassland
Farmer and Cohen (2008)	HNO_3, ΣAN, ΣPN and NO_2	In-canopy chemical analysis	12 months	Not explicitly given	Ponderosa pine plantation
Farmer et al. (2006)	HNO_3, ΣAN, ΣPN and NO_2	Suitability of TD-LIF system for EC	12 months; shorter periods are shown from different seasons	<1 ng N m^{-2} s^{-1}; <20% relative errors at low wind speed (<1 m s^{-1})	Ponderosa pine plantation
Farmer et al. (2011)	Aerosols (NH_4, SO_4, NO_3)	Suitability of HR-AMS system for EC	15 days	~0.4 to 6.4 ng m^{-2} s^{-1} depending on substance and mode; typical single flux measurement was below DL for NH_4 fragments	Ponderosa pine plantation
Ferrara et al. (2012)	NH_3	Comparison of high-frequency correction methodologies using QC-TILDAS	13 days	~75 ng N m^{-2} s^{-1} (flux detection limit)	Cropland (sorghum)
Ferrara et al. (2016)	NH_3	Temporal dynamics of NH_3 volatilization after slurry application using QC-TILDAS	~14 days	Only MAE (4700 ng NH_3 m^{-2} s^{-1}) and RMSE (12000 ng NH_3 m^{-2} s^{-1}) given	Maize stubbles and Italian ryegrass

Ferrara et al. (2021)	NH_3	Evaluation of measurement errors using QCL spectrometer	21 days	13.6 and 20.7 ng m^{-2} s^{-1} at 95 and 99% CI, respectively	Cropland (faba bean)
Horii et al. (2004)	NO, NO_2, O_3	Impacts of temporal dynamics on tropospheric chemistry and parameterizations	7 months, but no time series shown	Not explicitly given	Mixed deciduous forest
Horii et al. (2006)	NO_x, NO_y	Concentration and flux budgets of N_r, inferring HNO_3, validation of deposition velocities	5 months, but only time series of ~2 weeks are shown	Not explicitly given	Mixed deciduous forest
Marx et al. (2012)	ΣN_r	Suitability of converter for capturing all N_r species at high frequency	1-week validation, 11 months field campaign	Not explicitly given as aim was on concentrations and fast response	Managed grassland and cropland (winter wheat)
Min et al. (2014)	NO, NO_2	Comparison of gradient and direct flux measurements; within-canopy chemistry of NO_x	6 weeks, no time series shown	<8% for NO flux; <6% for NO_2 flux; 0.08 ppt m s^{-1} (NO); 0.14 ppt m s^{-1} (NO_2)	Ponderosa pine plantation
Moravek et al. (2019)	NH_3	Quantify impact of adsorption on time response of the system	5 months	Median flux detection limit of 2.15 ng m^{-2} s^{-1}	Corn crop field
Munger et al. (1996)	NO_y, O_3	Response of NO_y deposition to environmental conditions	5 years	Only given for concentrations (~50 ppt at the mixed forest site and <10 ppt at the spruce woodland)	Mixed deciduous forest and spruce woodland
Rummel et al. (2002)	NO	Flux pattern within the canopy	3 months	0.07 ng N m^{-2} s^{-1}	Amazonian rain forest
Sintermann et al. (2011)	NH_3	Suitability of a CIMS (chemical ionization mass spectrometry) instrument for EC measurements	Few days	5 ng N m^{-2} s^{-1}	Crop stubble field and cut grassland
Sun et al. (2015)	NH_3	Suitability of the open-path NH_3 sensor for EC measurements and comparison to other commercial sensors	2 weeks	1.3 +/- 0.5 ng m^{-2} s^{-1}	Cattle feedlot

Wang et al. (2021)	NH_3	Suitability of the open-path NH_3 sensor for EC measurements	1 week	7.1 ug N m^{-2} h^{-1}	Subtropical rice paddy
Whitehead et al. (2008)	NH_3	Suitability and inter-comparison of different analyzers	2 campaigns, only few days are presented	Not explicitly given	Managed grassland

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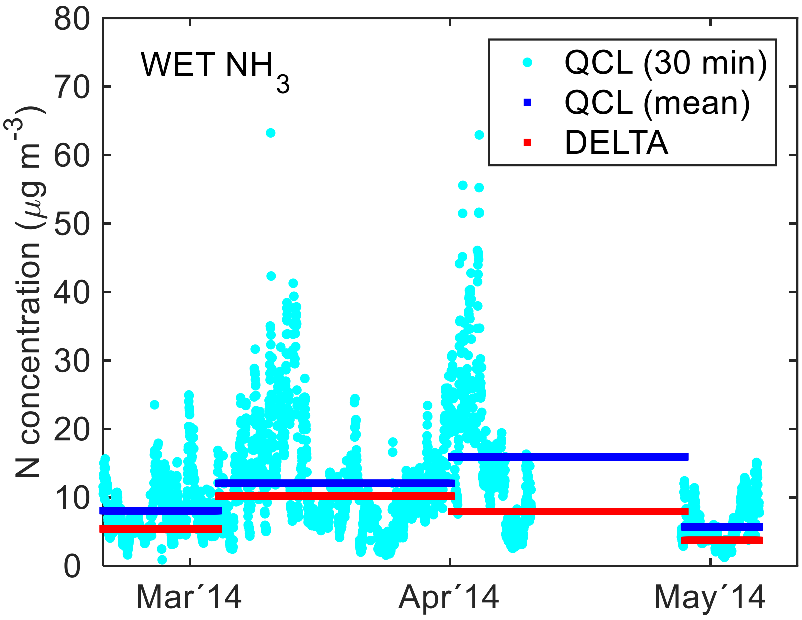

Fig. S1: Concentration time series of NH_3 at the peatland (WET) site. Horizontal red lines correspond to the exposition time of the DELTA denuders. For better comparability, averages of the QCL are shown in blue for the same periods.

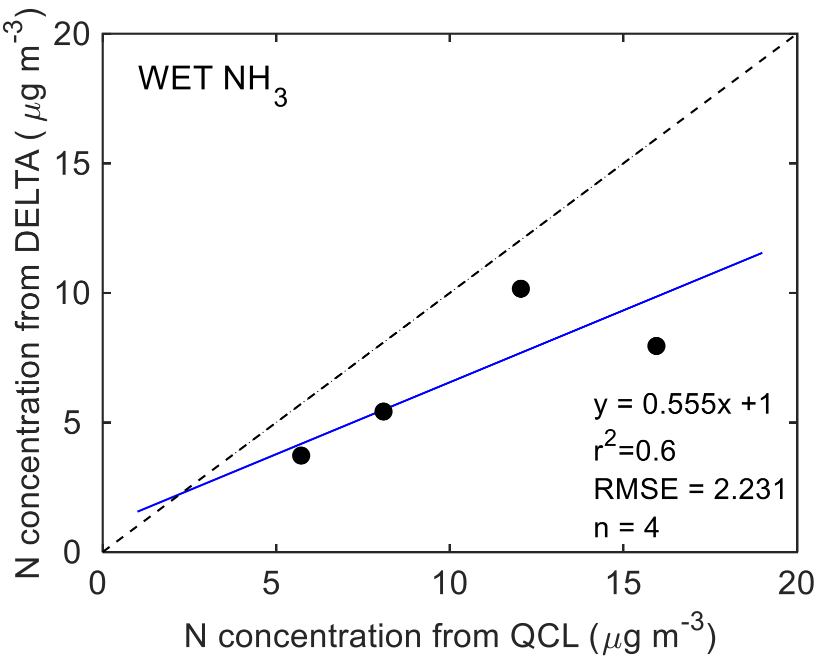

Fig. S2: Scatter plot of NH_3 concentration from QCL and DELTA denuders corresponding to identical periods at the peatland (WET) site.

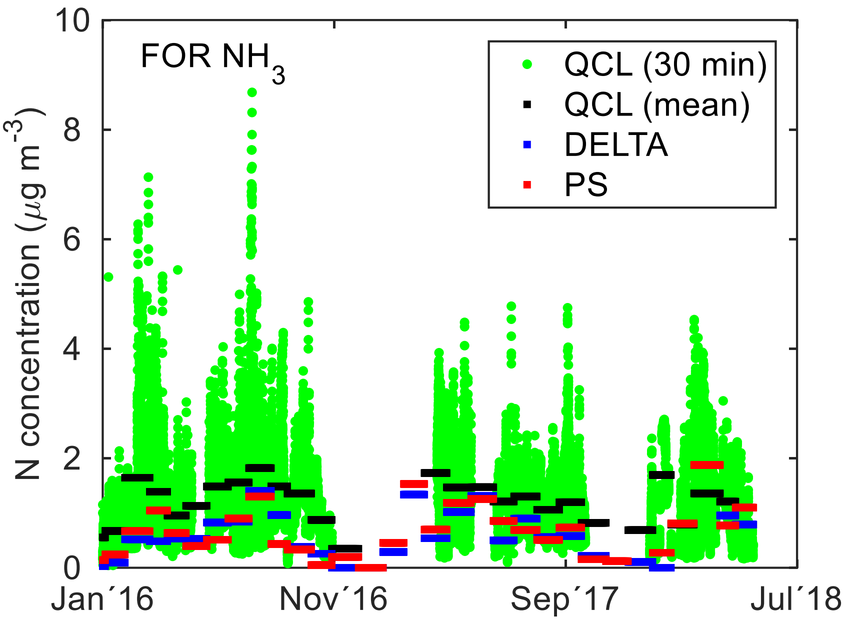

Fig. S3: Concentration time series of NH_3 at the forest (FOR) site. Horizontal blue and red lines correspond to the exposition time of the DELTA denuders and passive samplers (PS), respectively. For better comparability, averages of the QCL are shown in black for the same periods.

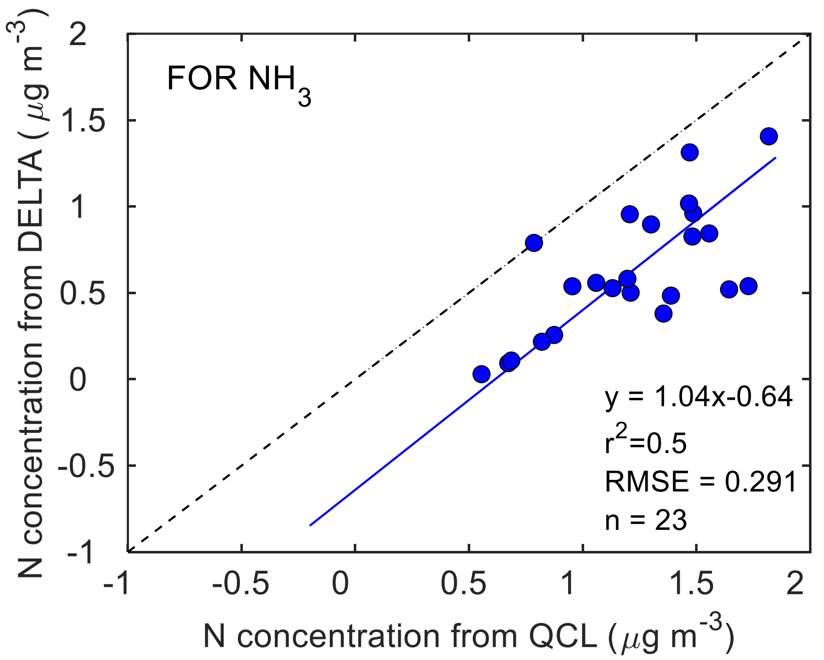

Fig. S4: Scatter plot of NH_3 concentration from QCL and DELTA denuders corresponding to identical periods at the forest (FOR) site.

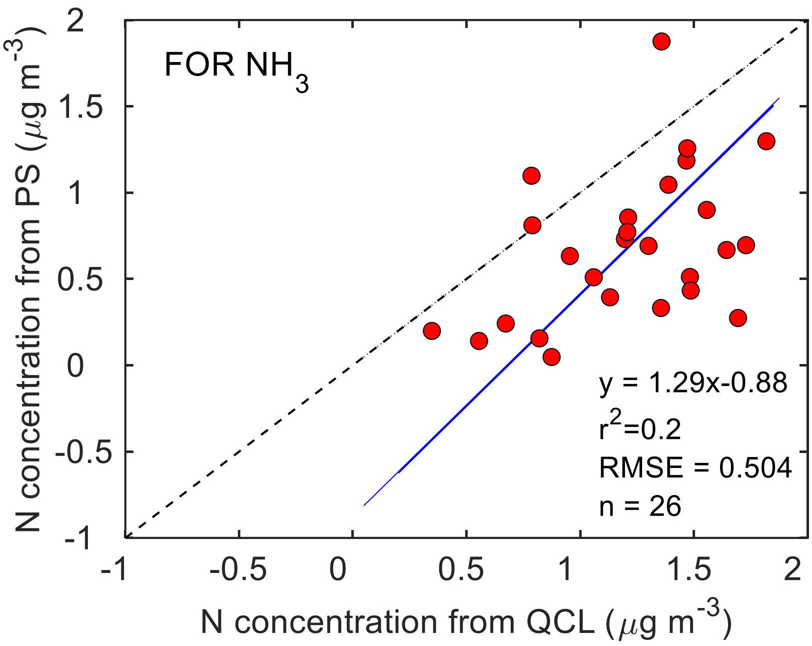

Fig. S5: Scatter plot of NH_3 concentration from QCL and passive samplers (PS) corresponding to the same periods at the forest (FOR) site.

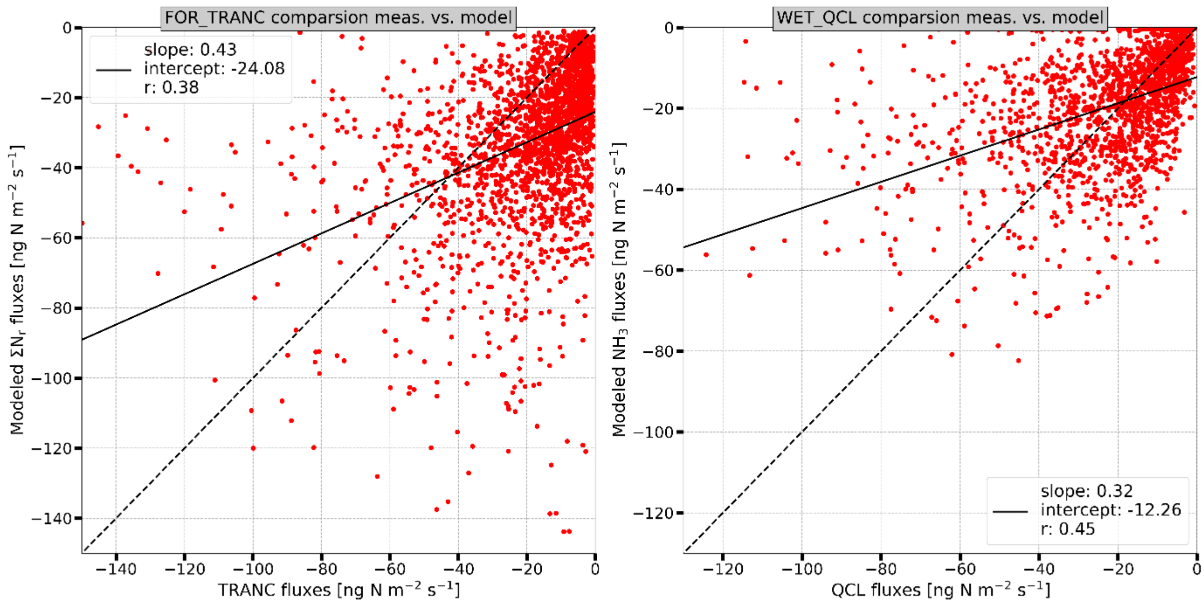

Fig. S6: Measured vs. modeled deposition data in half-hourly time resolution at the forest (FOR, left panel) and peatland site (WET, right panel). FOR data comprise the period mid-July to end of September 2016. For the WET site the entire campaign from February to May 2014 is shown.

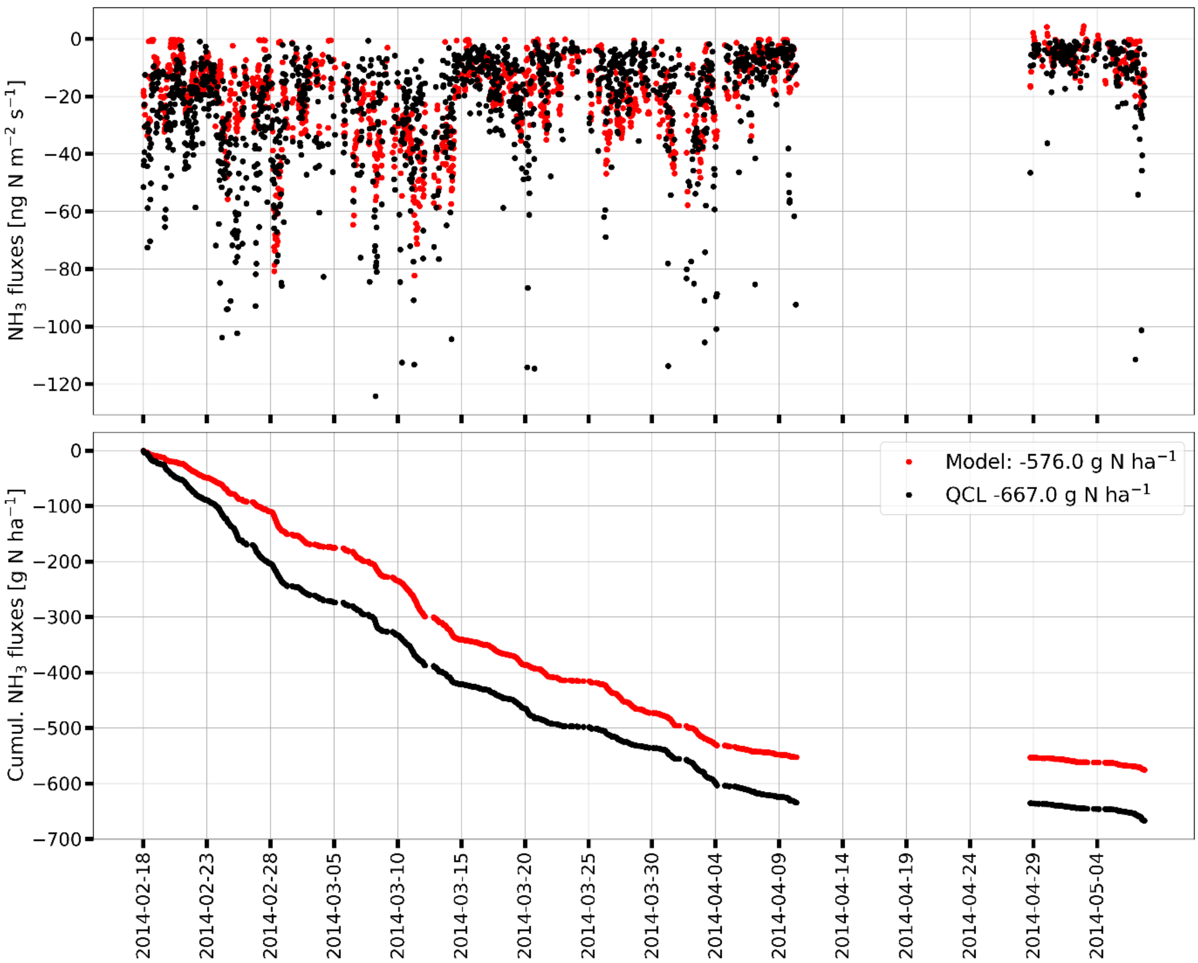

Fig. S7: Time series (upper panel) and cumulative curves (lower panel) of measured vs. modeled deposition data in half-hourly time resolution at the peatland site (WET) from February to May 2014.

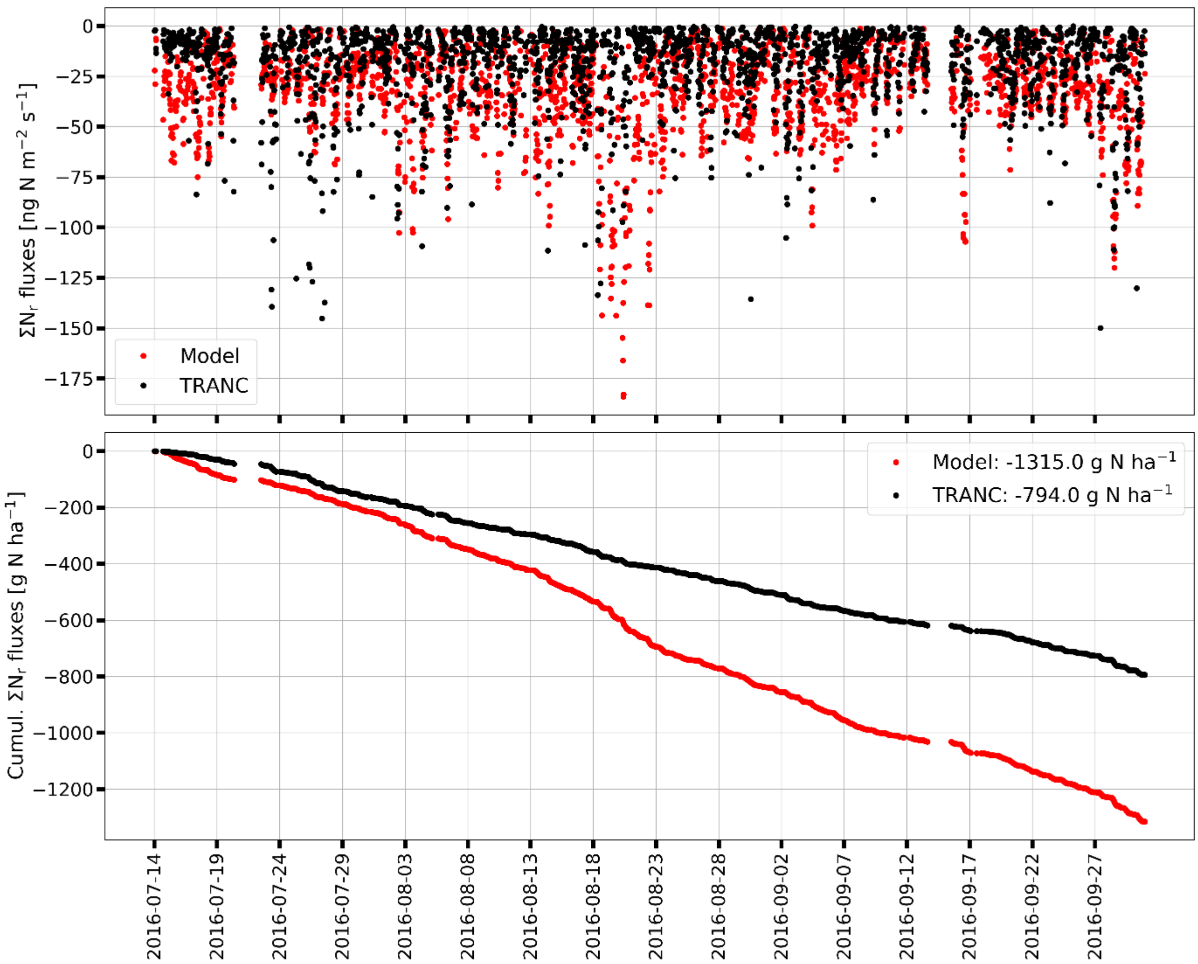

Fig. S8: Time series (upper panel) and cumulative curves (lower panel) of measured vs. modeled deposition data in half-hourly time resolution at the forest site (FOR) from mid-July to September 2016.