



Supplement of

Ammonia emission estimates using CrIS satellite observations over Europe

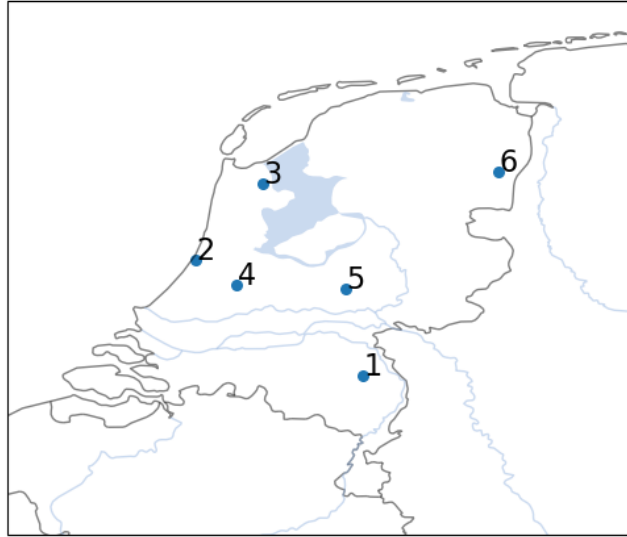
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1 **SUPPLEMENTARY INFORMATION**

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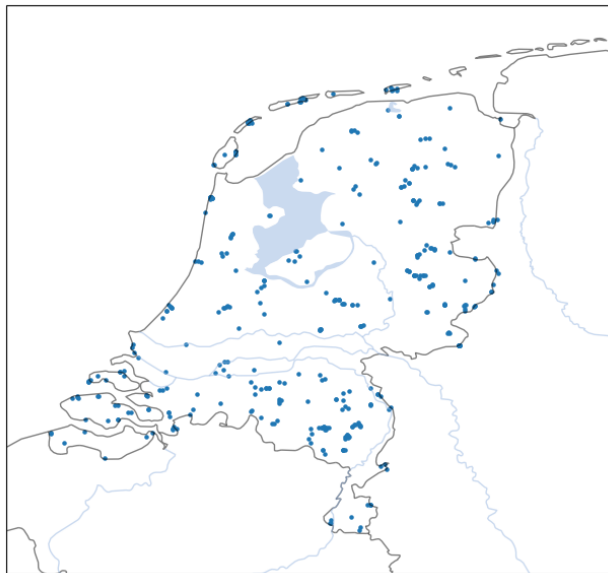


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4 *Figure S1. NH₃ measurement locations of the LML network. 1. Vredepeel-Vredeweg. 2. De Zilk-Vogelaarsdreef. 3.*
5 *Wieringerwerf-Medemblikerweg. 4. Zegveld-Oude Meije. 5. Wekerom-Riemterdijk. 6. Valthermond-Noorderdiep*

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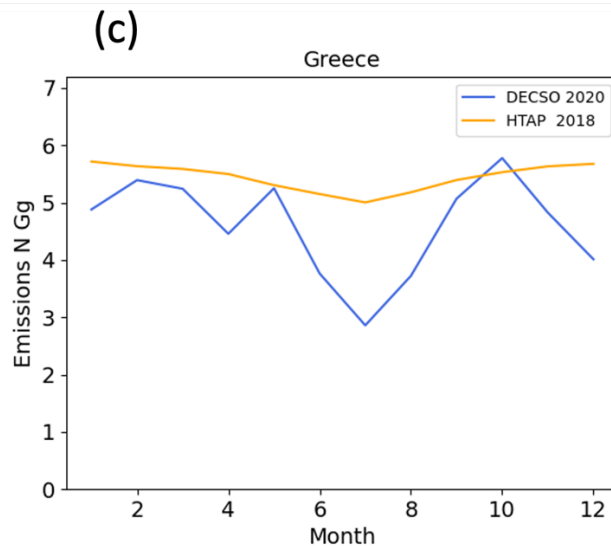
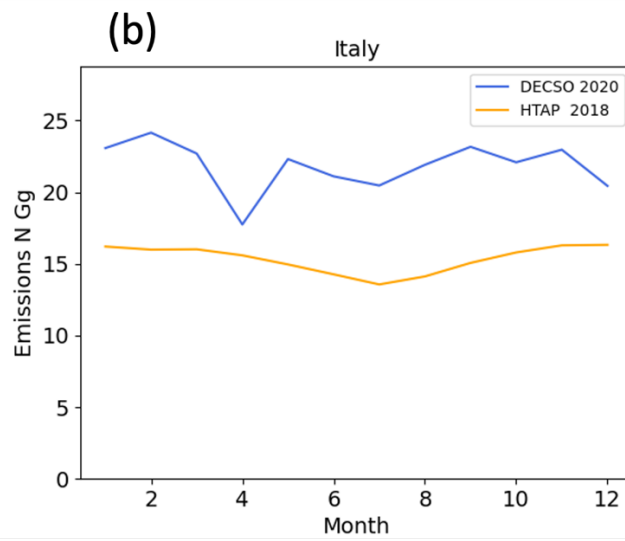
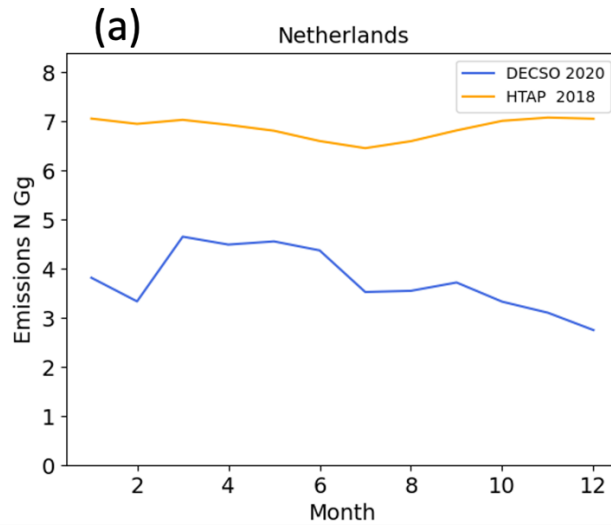
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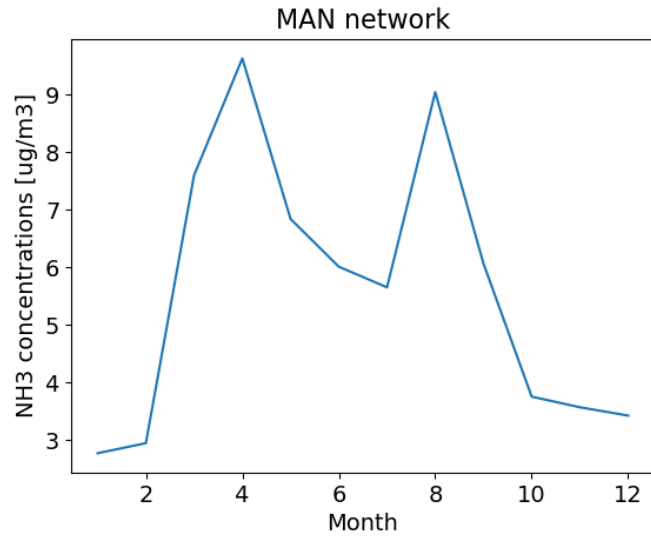
Figure S2. NH₃ measurement locations of the MAN network



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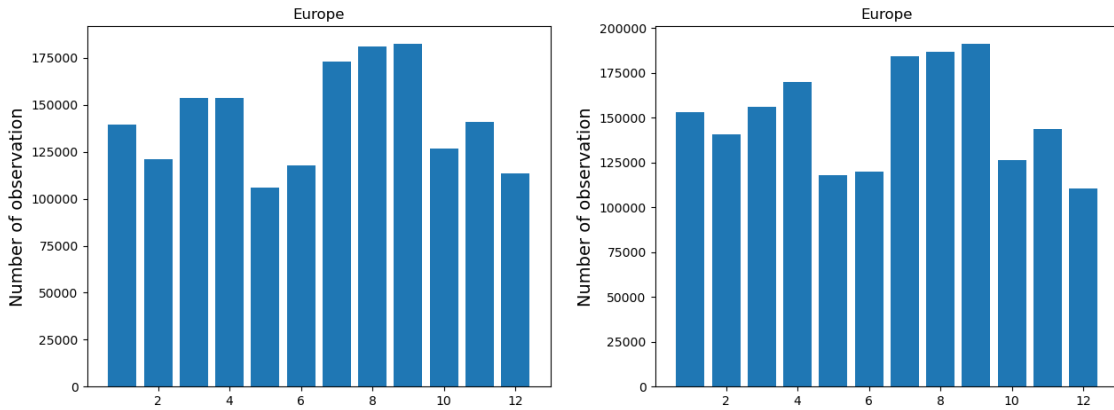
Figure S3 Monthly NOx emissions of HTAP and DECSO in the Netherlands (a), Italy (b) and Greece (c).

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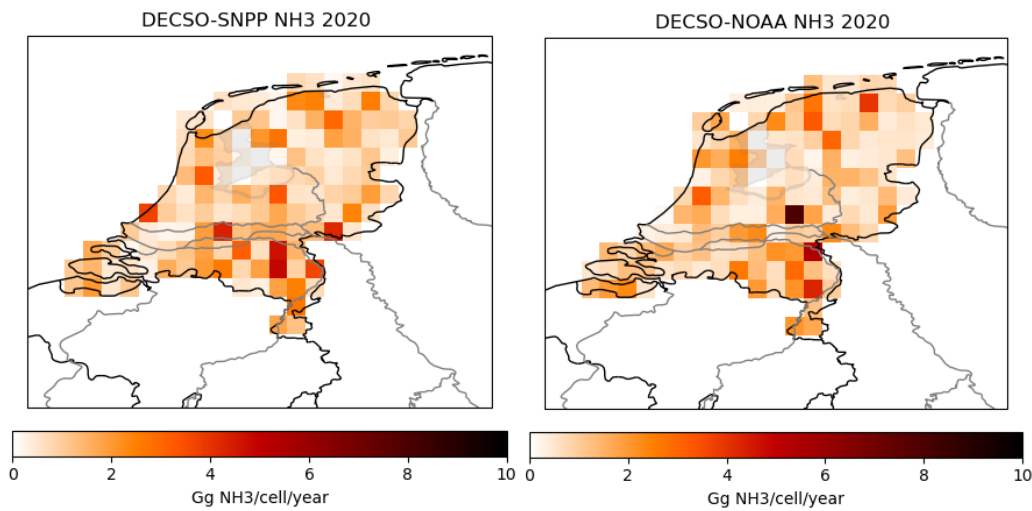
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14 Figure S4. Averaged monthly NH₃ surface concentration measured by the MAN network in 2020.

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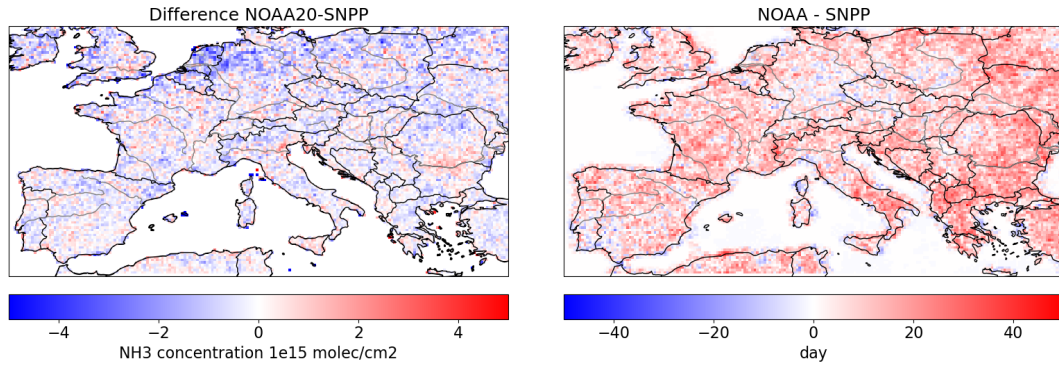
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17 Figure S5. The amount of observations from CrIS on SNPP (left) and NOAA20 (right) used for deriving emissions per
18 month in 2020.

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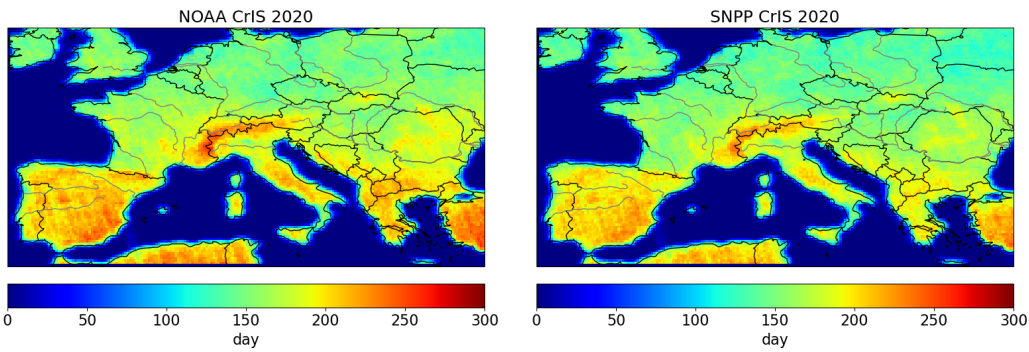
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22 Figure S6. The NH₃ emissions derived from CrIS on SNPP (left) and NOAA20 (right) over The Netherlands.

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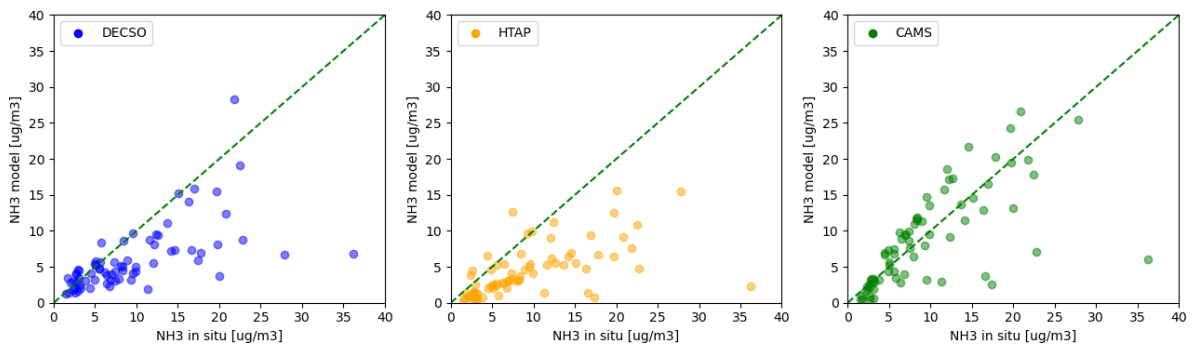
25 *Figure S7. The difference of yearly averaged NH_3 column concentrations (left) measured by CrIS on NOAA20 and*
26 *SNPP. The difference of days having observations per grid cell in 2020 (Right).*



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28 *Figure S8. Number of days having observations from CrIS on NOAA20 (left) and SNPP (right) per grid cell in 2020.*

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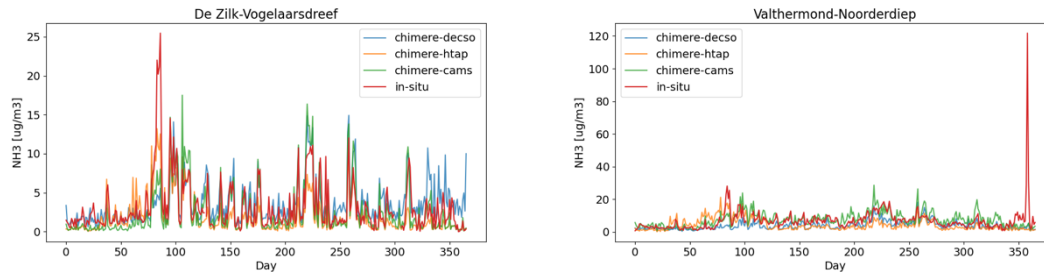


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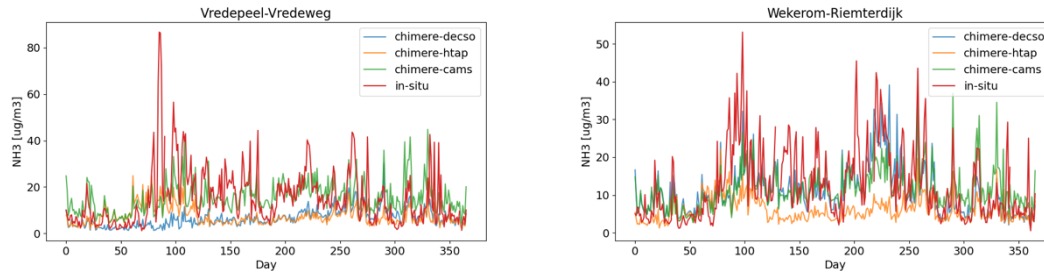
31 *Figure S9 Scatter plots of observations from the LML network with NH_3 surface concentrations from model*
32 *simulations with NH_3 emissions from DECSO (left column), HTAP (middle column) and CAMS-GLOB-ANT (right*
33 *column).*

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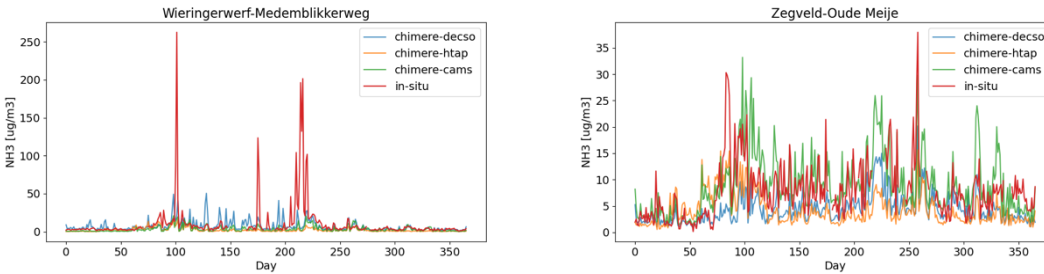
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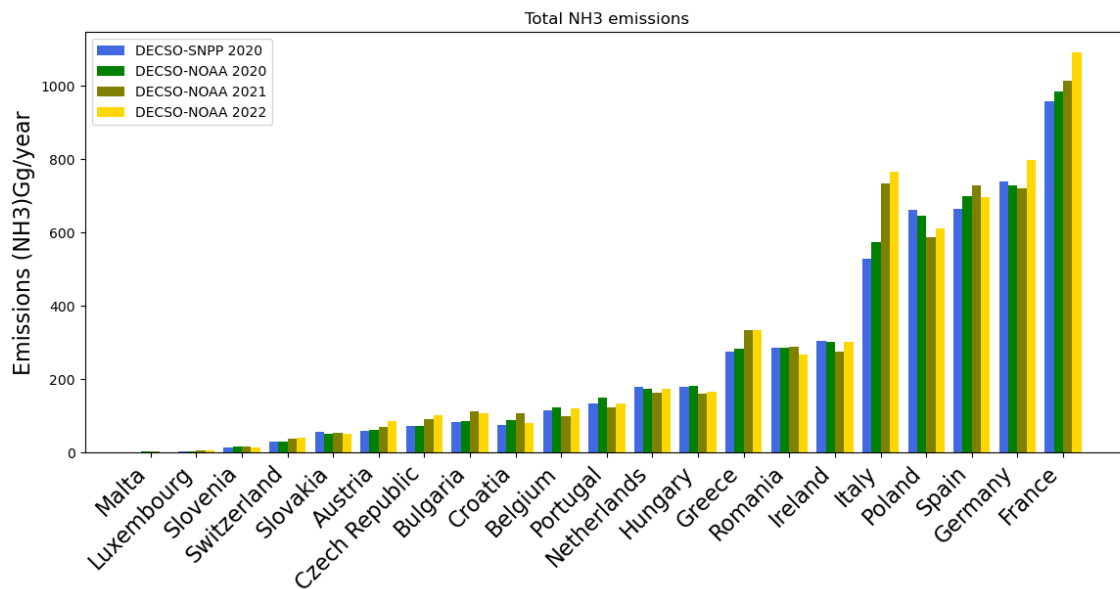


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38 Figure S10. Time series of NH_3 surface concentrations of in-situ measurement and model simulations with DECSO,
 39 HTAP, CAMS-GLOB-ANT emissions at the 6 measurement locations of the LML network. The locations with their
 40 names are referred to Figure S1.

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42 Figure S11. Country totals of NH_3 emissions (Gg/year) derived from DECSO calculations from SNPP in 2020 and
 43 NOAA-20 in 2020, 2021 and 2022.
 44
 45

46 *Table S1. The correlation coefficients and the bias of monthly mean simulated NH₃ surface concentrations using*
47 *DECSO, HTAP and CAMS-GLOB-ANT NH₃ emissions against observations of the LML network according to Figure S9.*

	Correlation coefficient	Bias (µg/m ³)	RMSE (µg/m ³)
DECSO	0.63	-3.5	6.4
HTAP v3	0.58	-5.0	7.6
CAMS-GLOB-ANT	0.68	-0.69	5.5

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