Ammonia-Biosphere from IASI and ERA5

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EGU2020-8495

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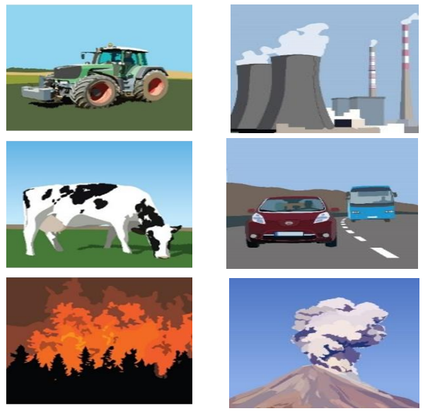
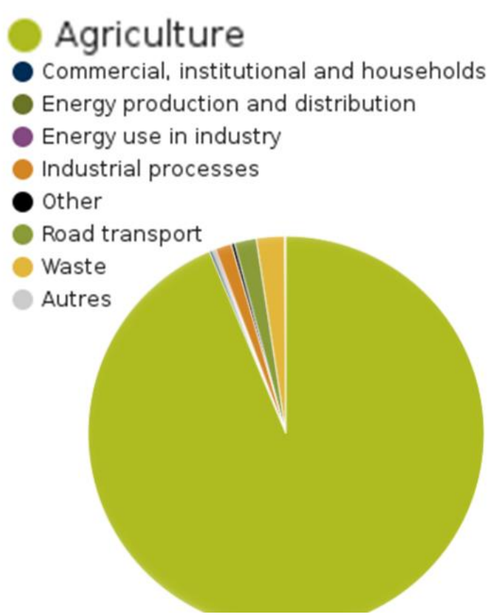
How does ammonia affect the environment?

Sources

MAIN SOURCES

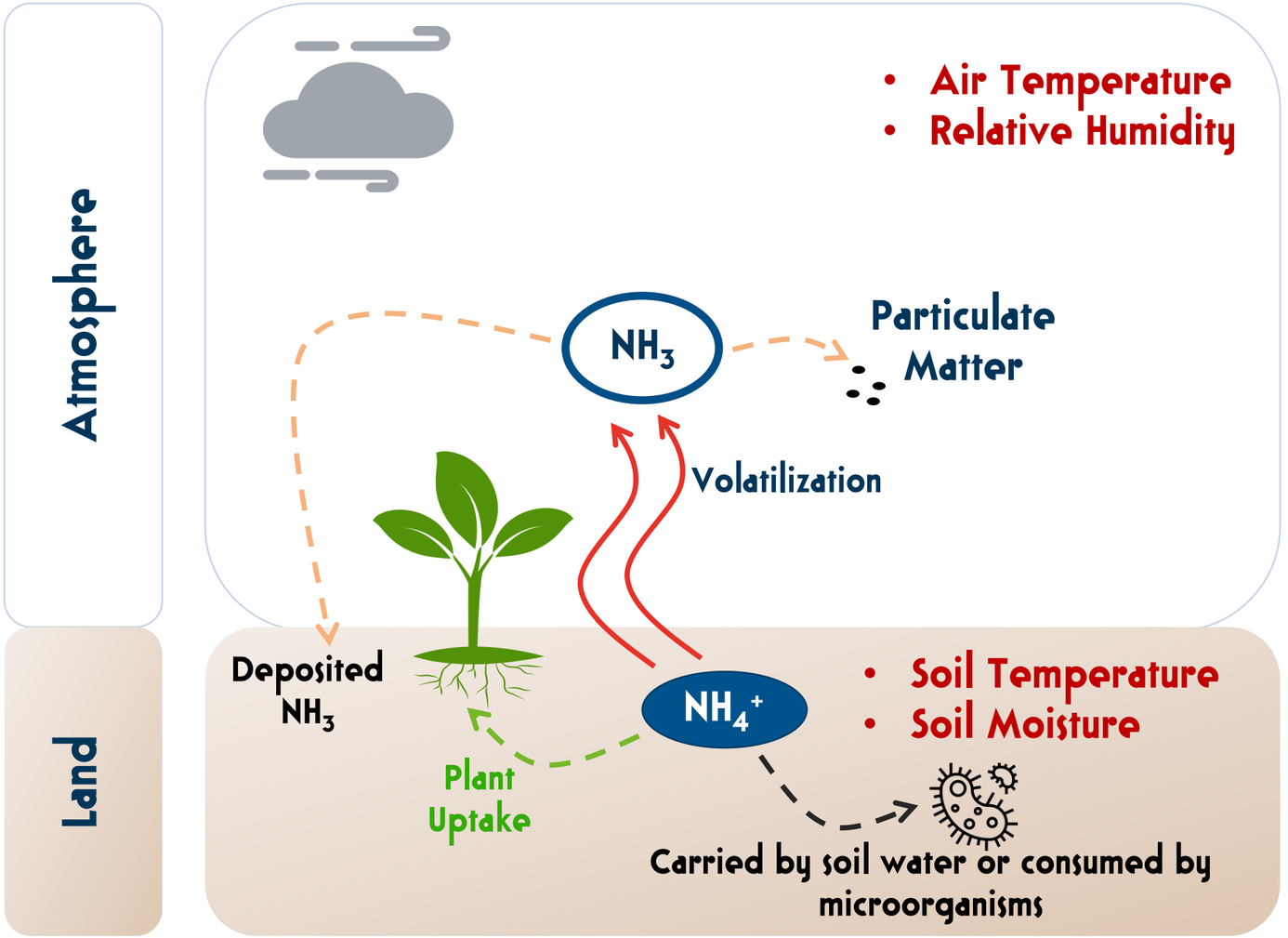
OTHER SOURCES





United Nations, Department of Economic and Social Affairs

How will climate change affect the abundance of atmospheric ammonia?

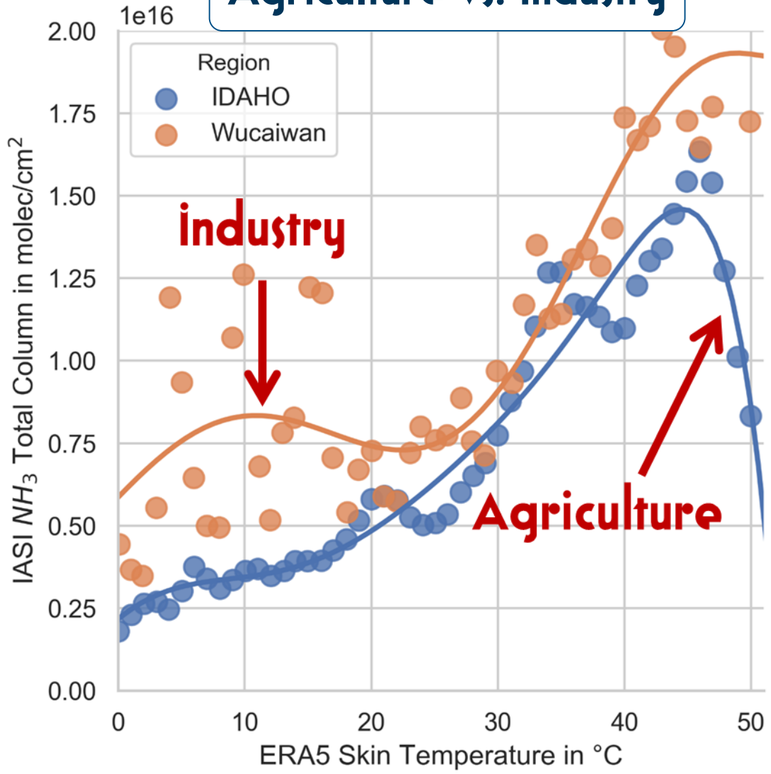


Data used are from IASI (NH_3) and ERA5.

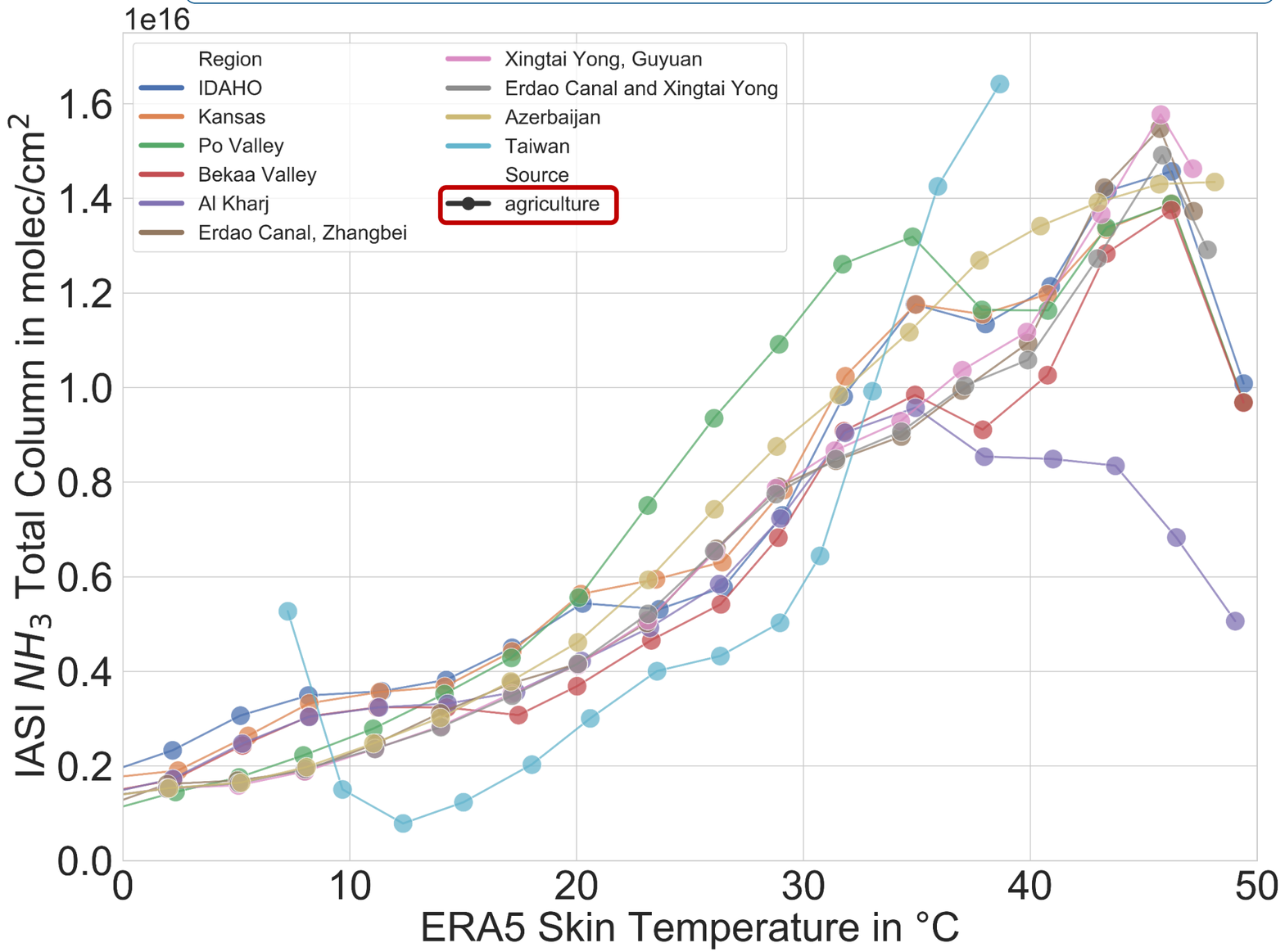
Ammonia/Land

in All the agricultural regions, NH_3 concentration increased proportionally with Skin Temperature in an exponential manner.

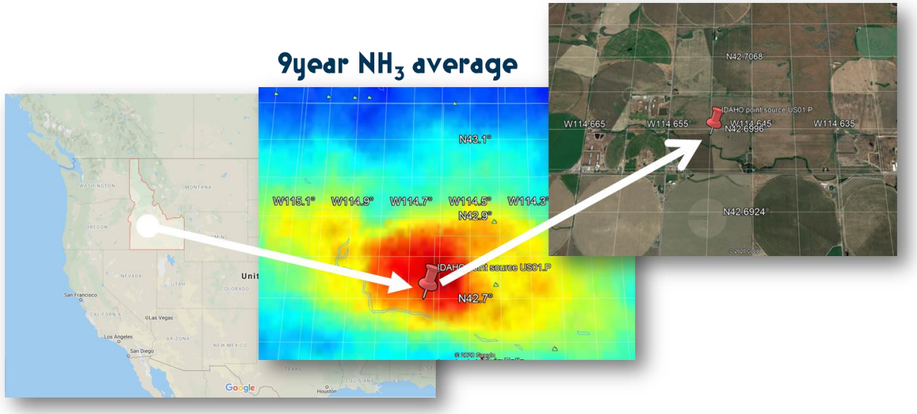
Agriculture vs. Industry



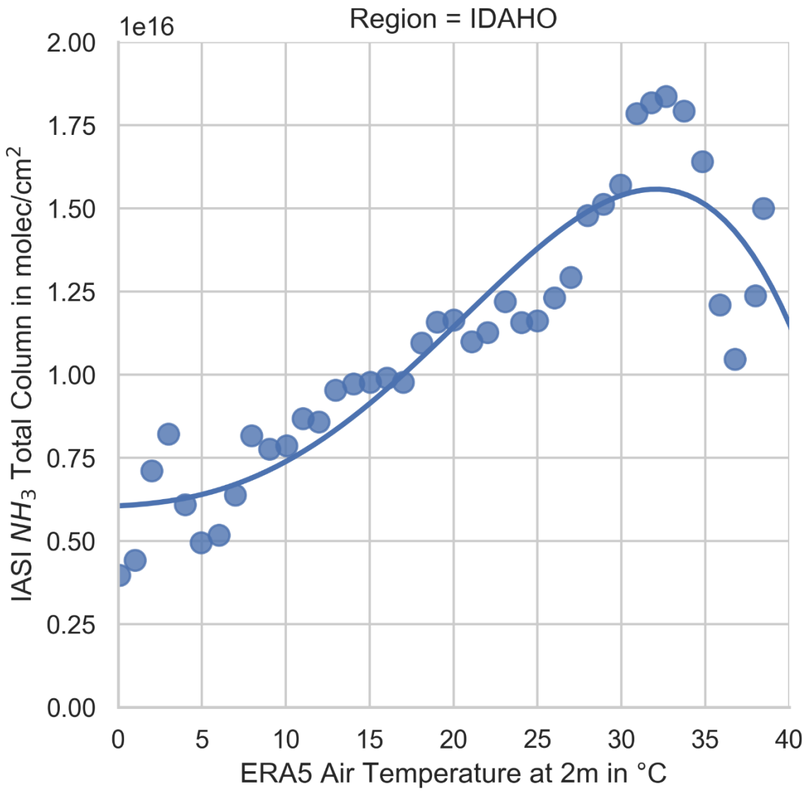
2008 to 2016 IASI NH_3 averaged per 3°C skin temperature bins



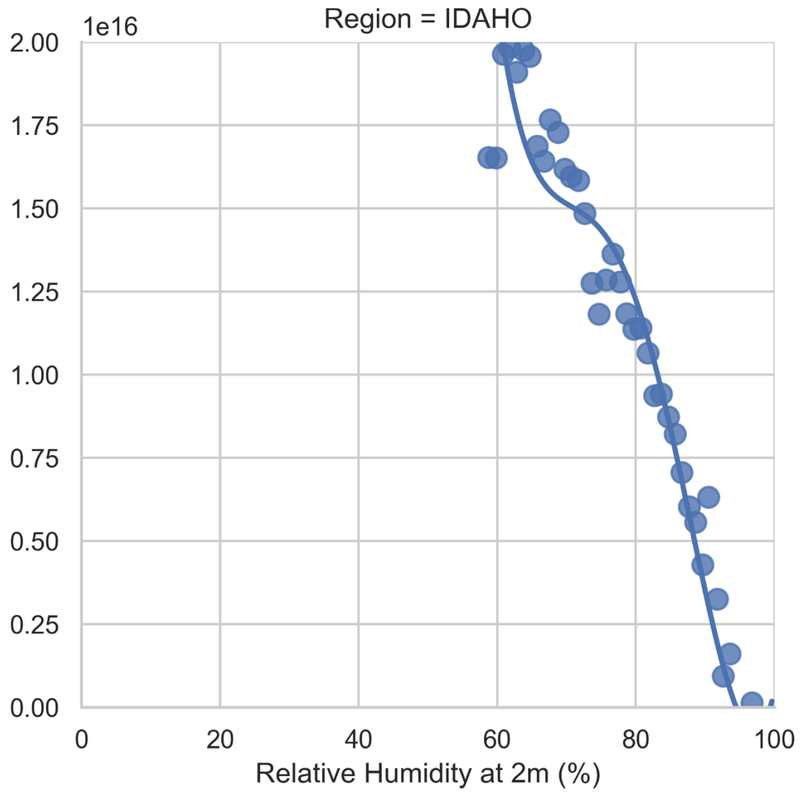
Ammonia/Land/Atmosphere



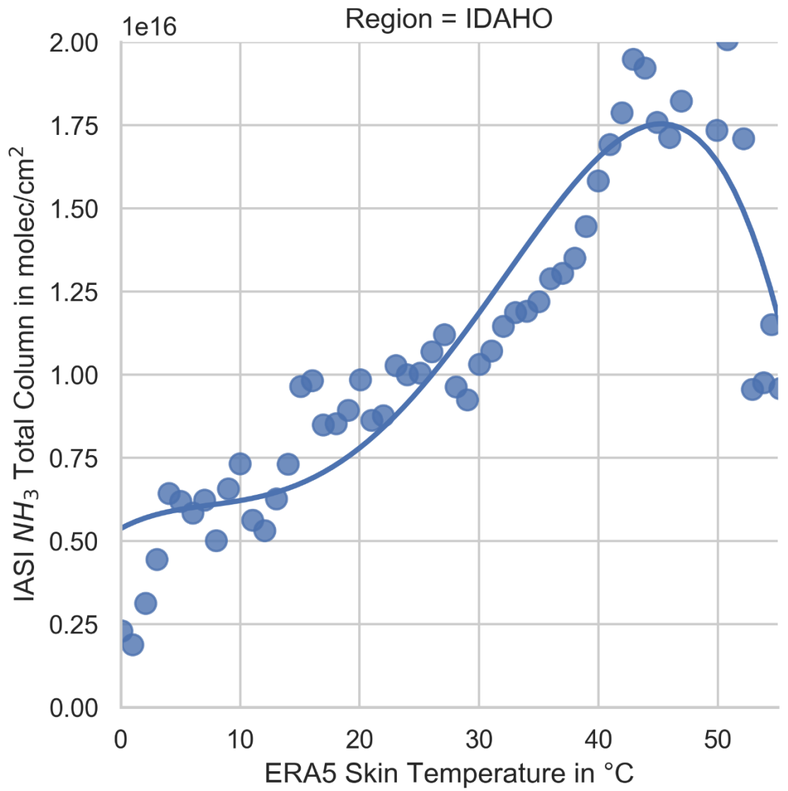
Air Temperature at 2m



Relative Humidity at 2m

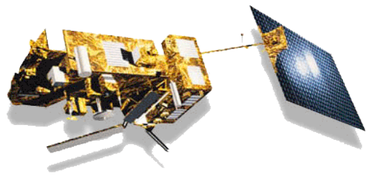


Skin Temperature



Back-up Slides

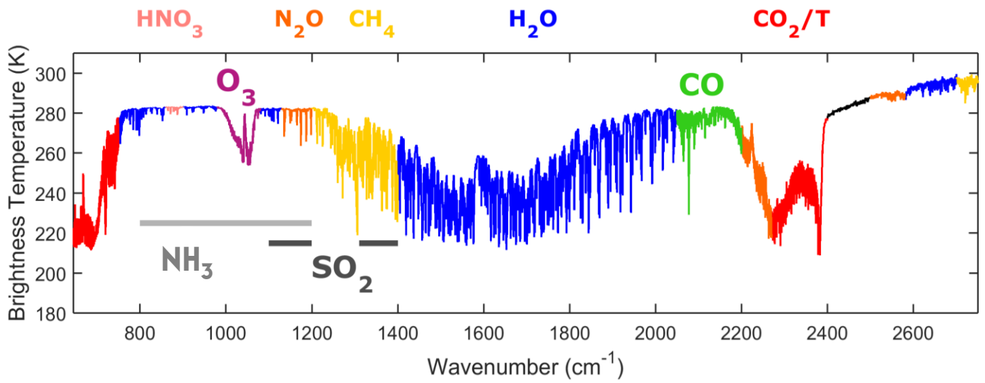
IASI on the Metop Satellites





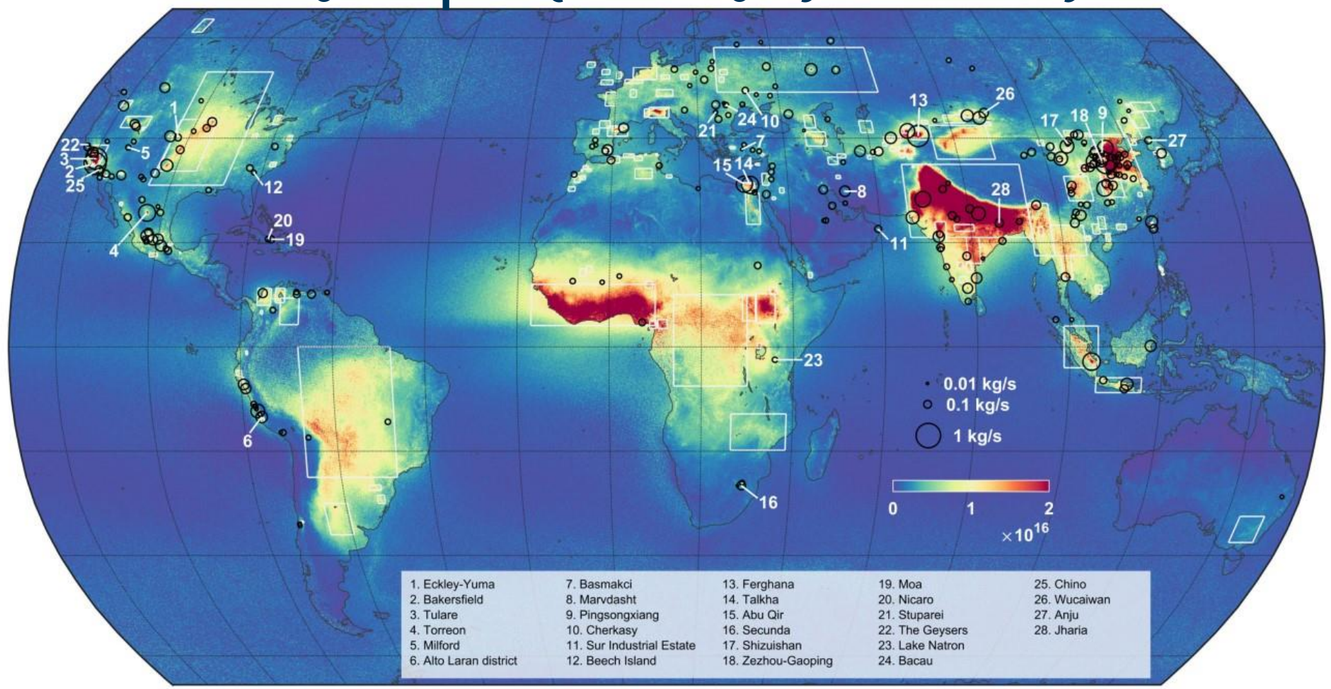


IASI brightness temperature spectrum



- First detection of ammonia from IASI in 2009
- More than 200 hotspots identified

NH_3 Hotspots (IASI NH_3 9year Mean *)



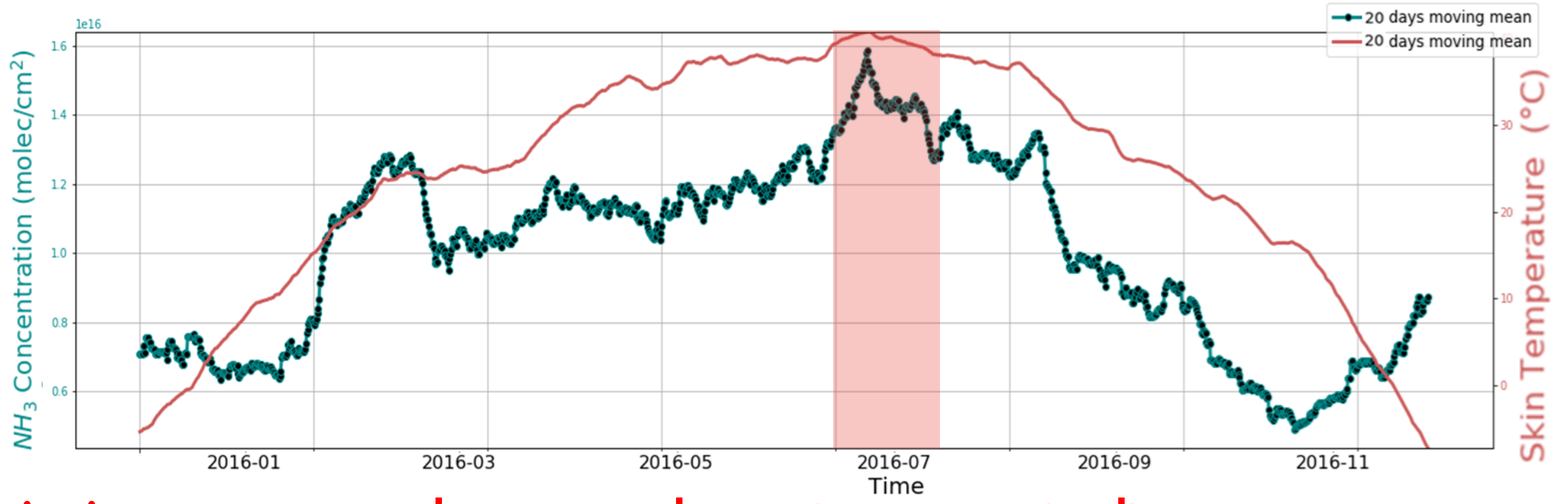
*Van Damme M., Clarisse, L., Whitburn, S., Hadji-Lazaro, J., Hurtmans, D., Clerbaux, C., Coheur, P.-F. Nature, December 5, 2018. DOI: 10.1038/s41586-018-0747-1.

Ammonia/Land

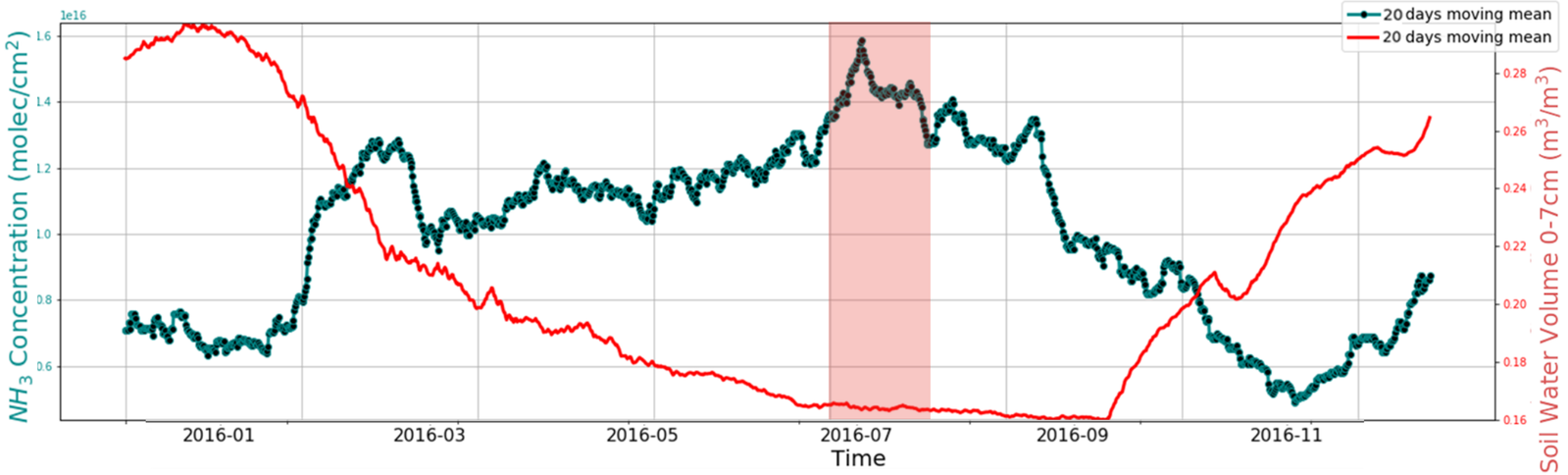
NH_3 volatilization is enhanced by high temperature and low soil moisture.

IASI NH3 vs. ERA5 Skin Temperature

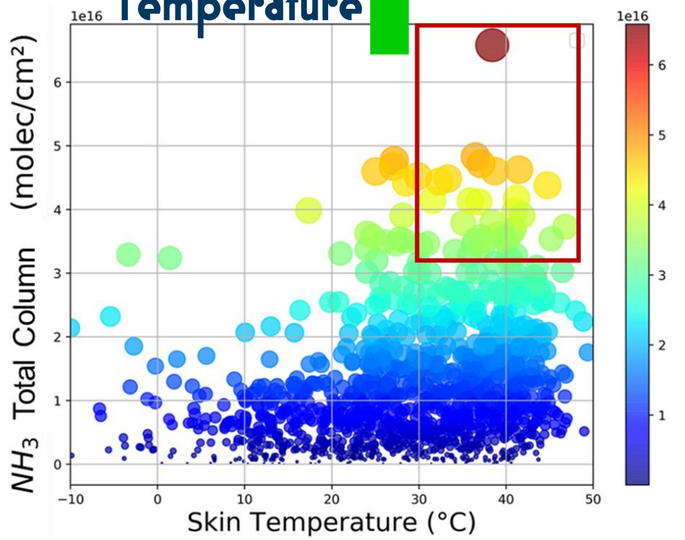
IDAHO [42-43°N , 114-115° W], 2016



IASI NH3 vs. ERA5 Soil Moisture - layer 1 (0 to 7cm of soil)



Temperature



Soil moisture