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Ammonia-biosphere interaction from IASI and ERA5

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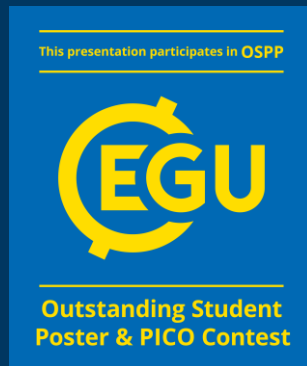
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EGU2020-8495

Ammonia-Biosphere from IASi and ERA5

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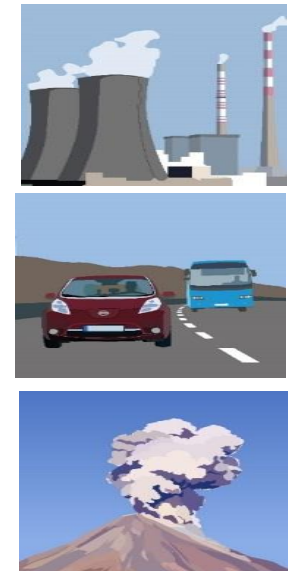
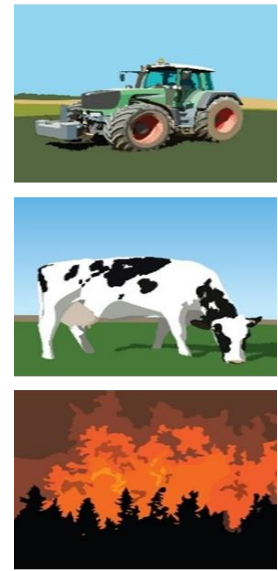
www.latmos.ipsl.fr

How does ammonia affect the environment?

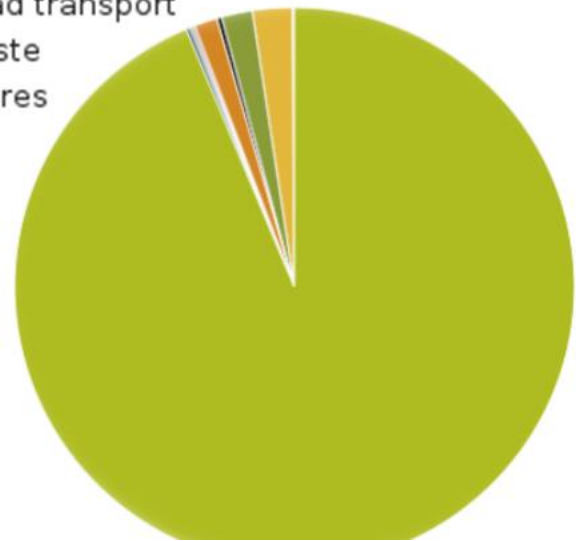
Sources

MAIN SOURCES

OTHER SOURCES



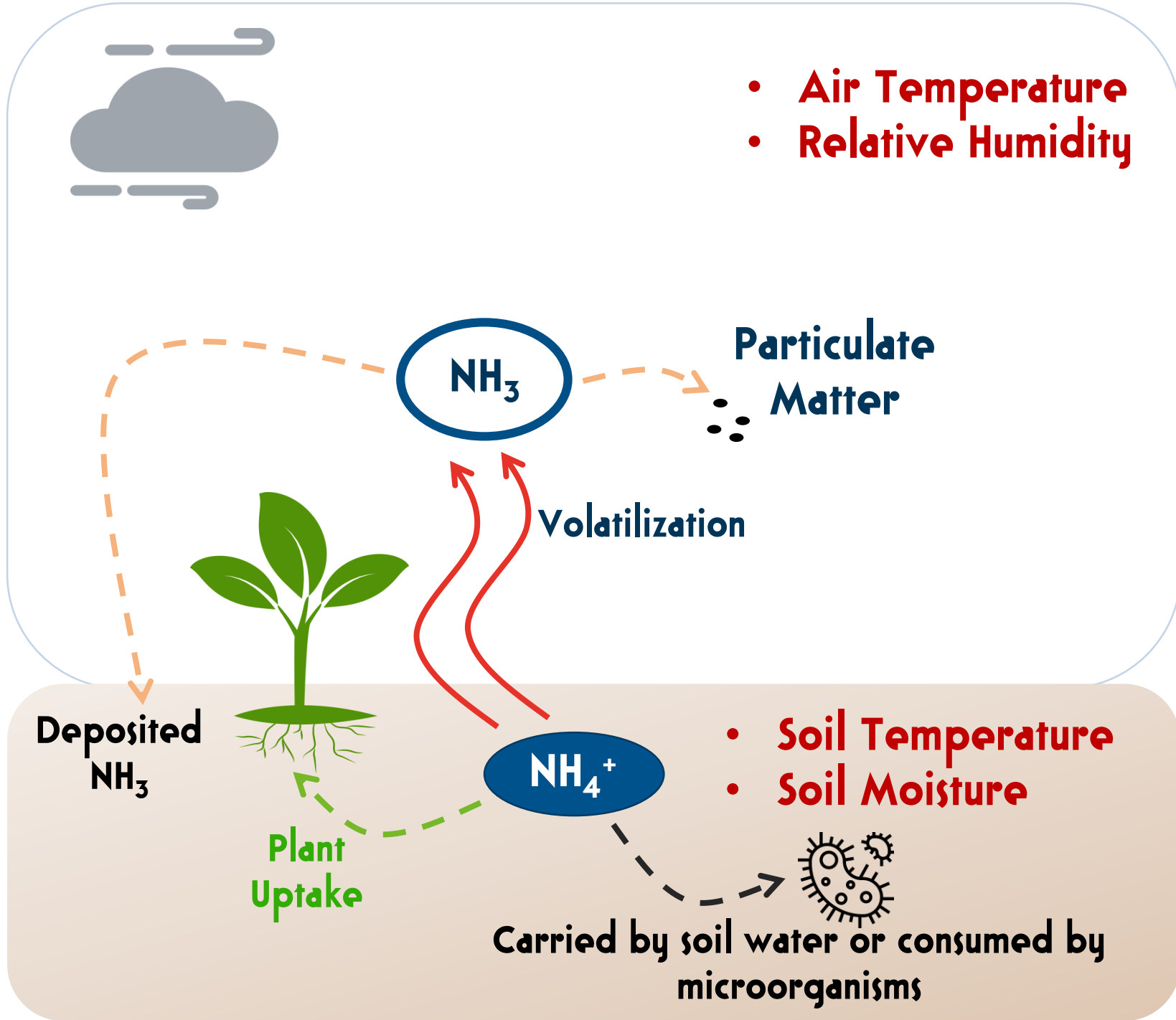
- Agriculture
- Commercial, institutional and households
- Energy production and distribution
- Energy use in industry
- Industrial processes
- Other
- Road transport
- Waste
- Autres



United Nations, Department of Economic and Social Affairs

Atmosphere

Land

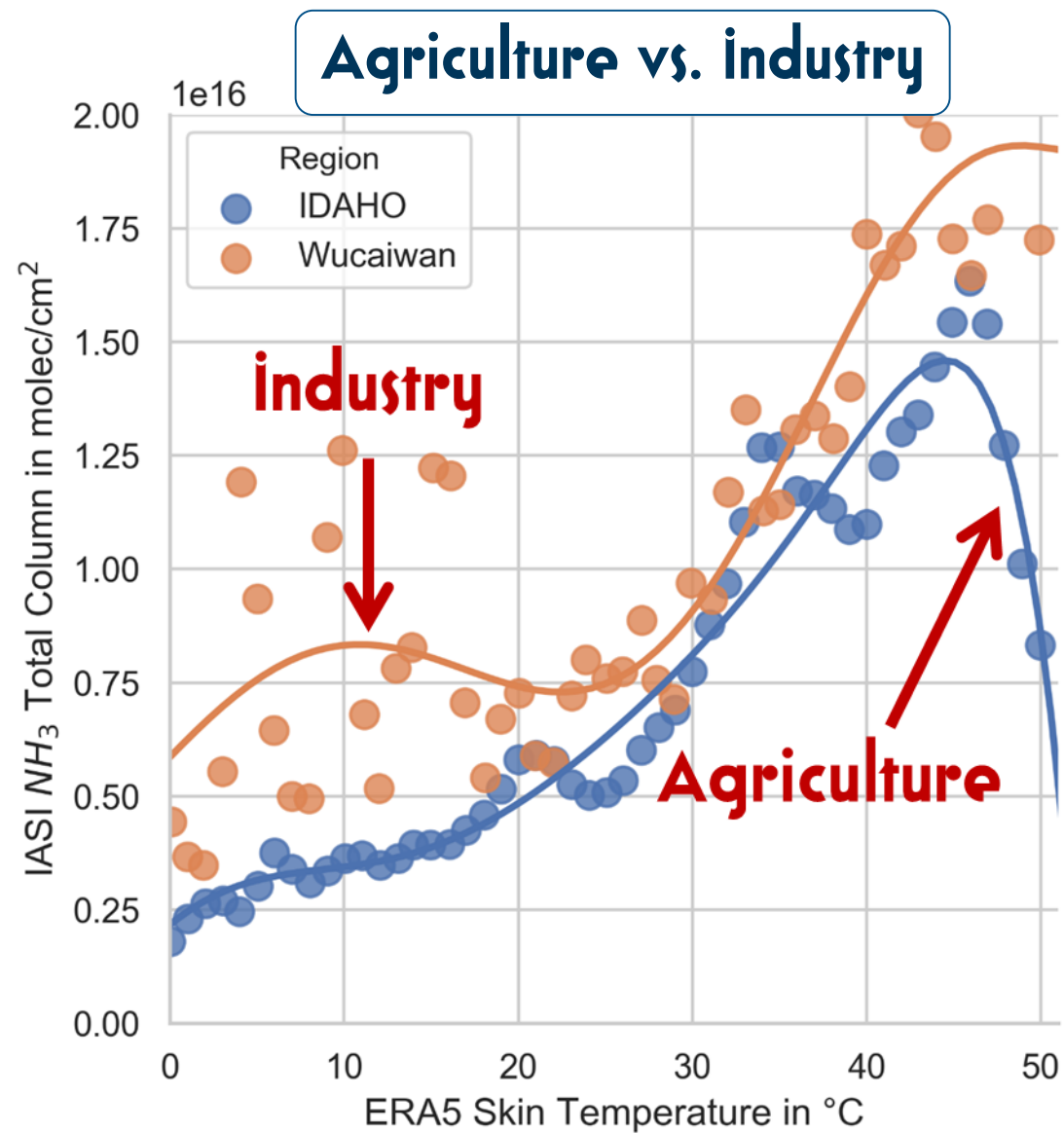


How will climate change affect the abundance of atmospheric ammonia?

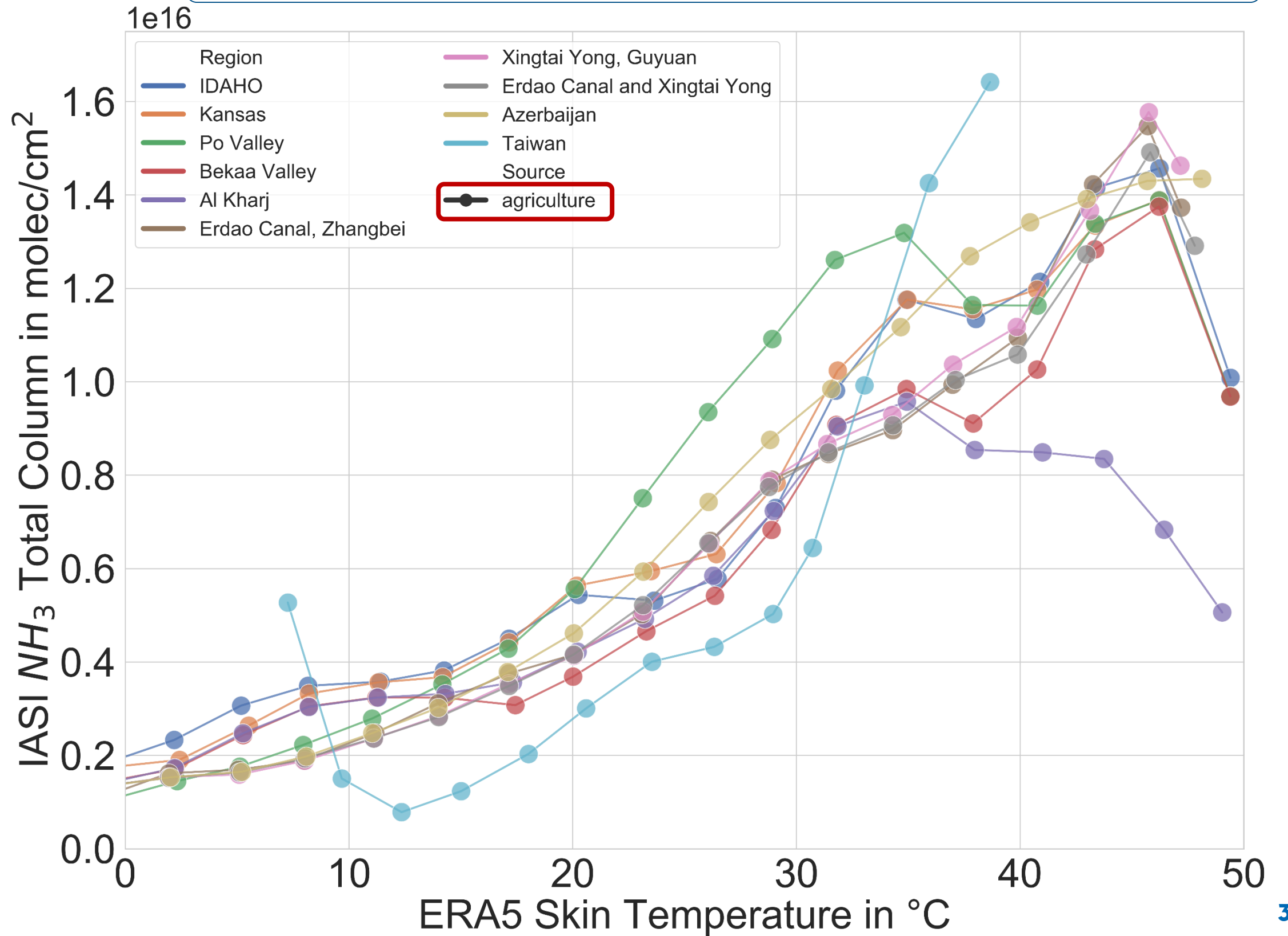
Data used are from IASI (NH_3) and ERA5.

Ammonia/Land

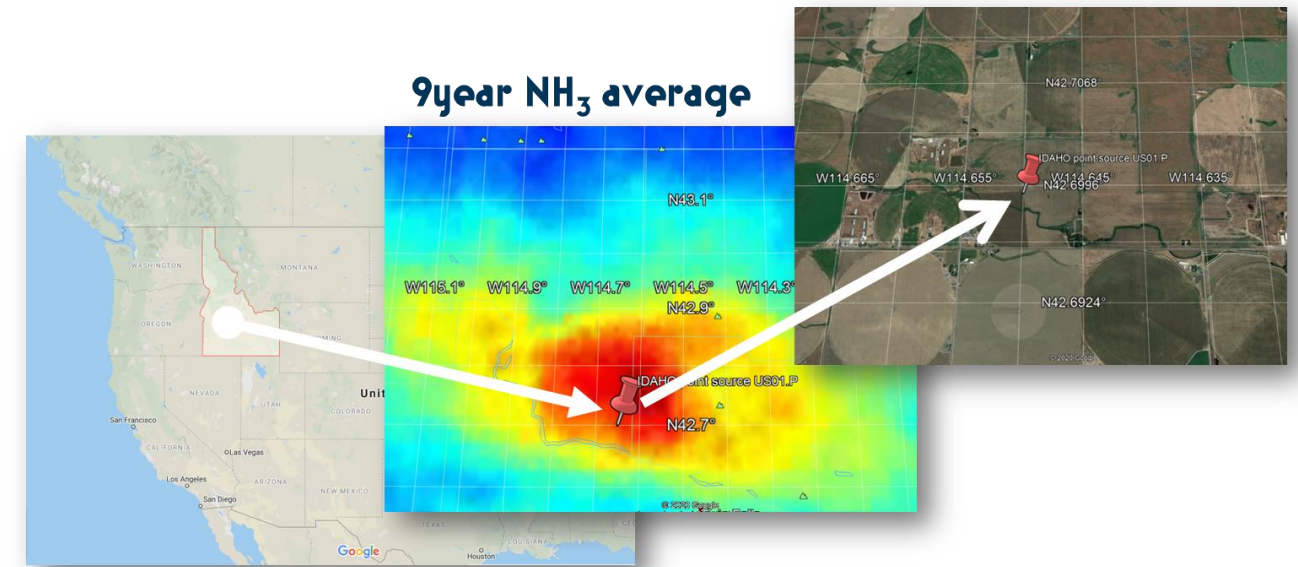
in All the agricultural regions, NH_3 concentration increased proportionally with Skin Temperature in an exponential manner.



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



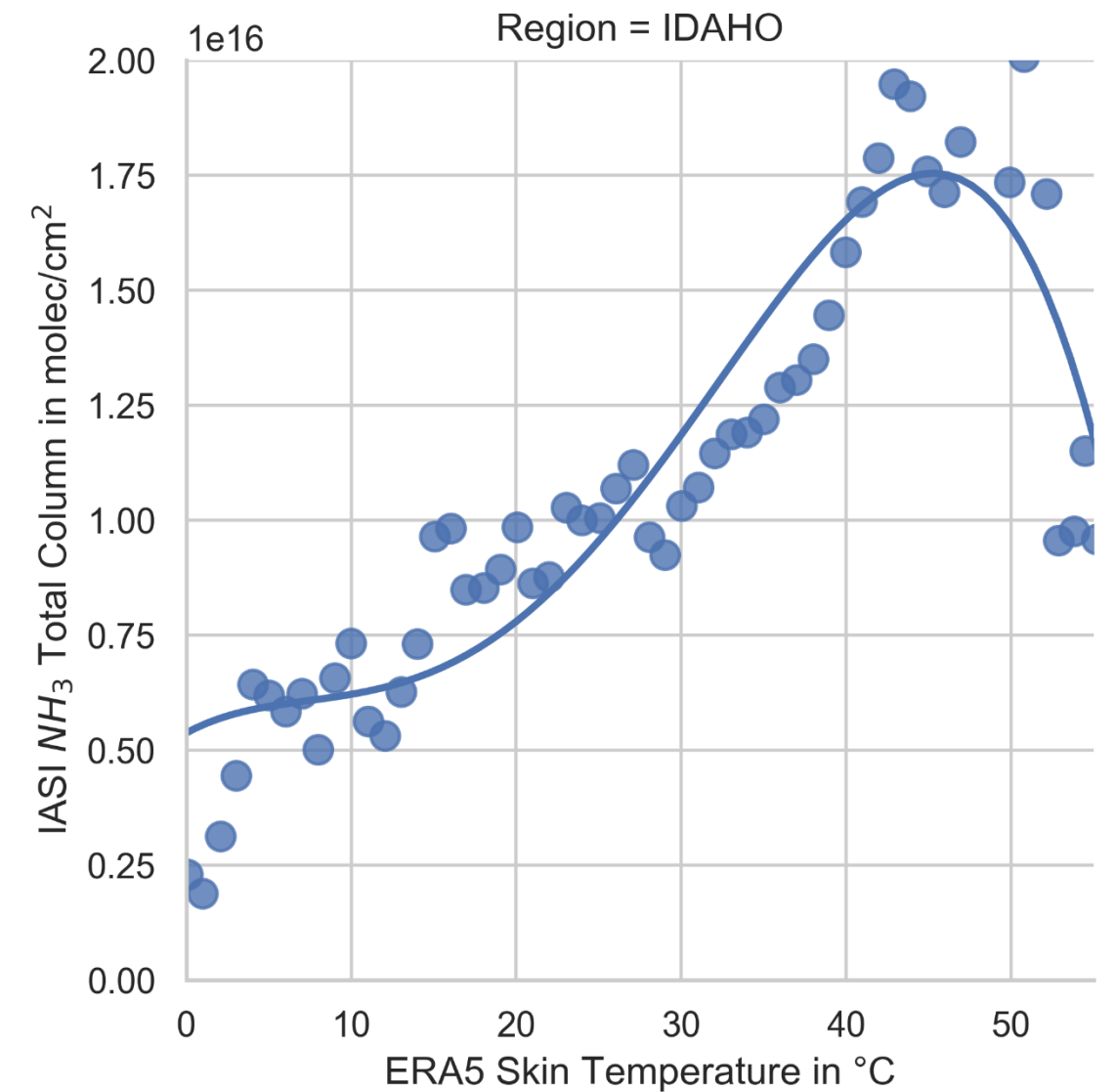
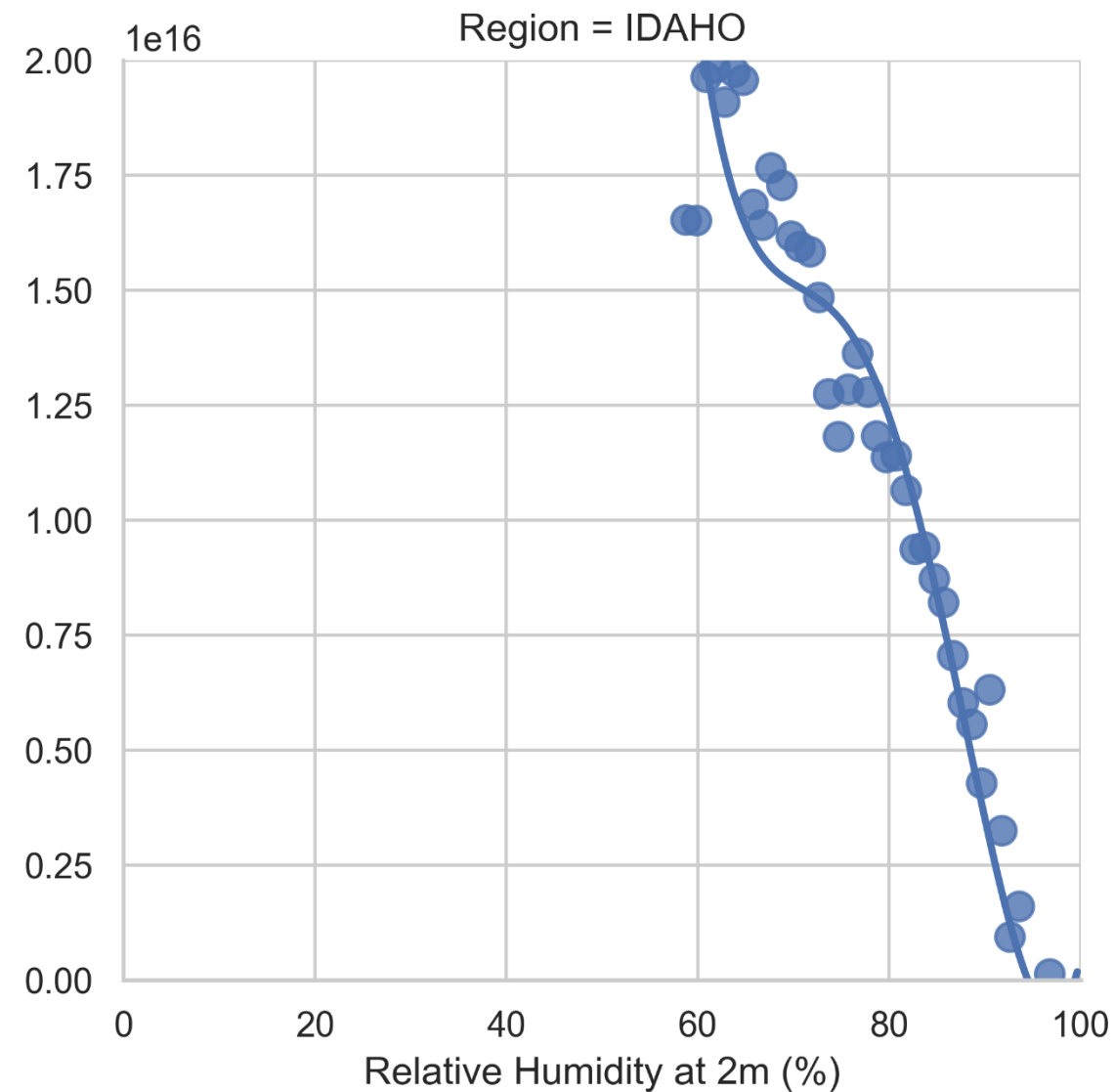
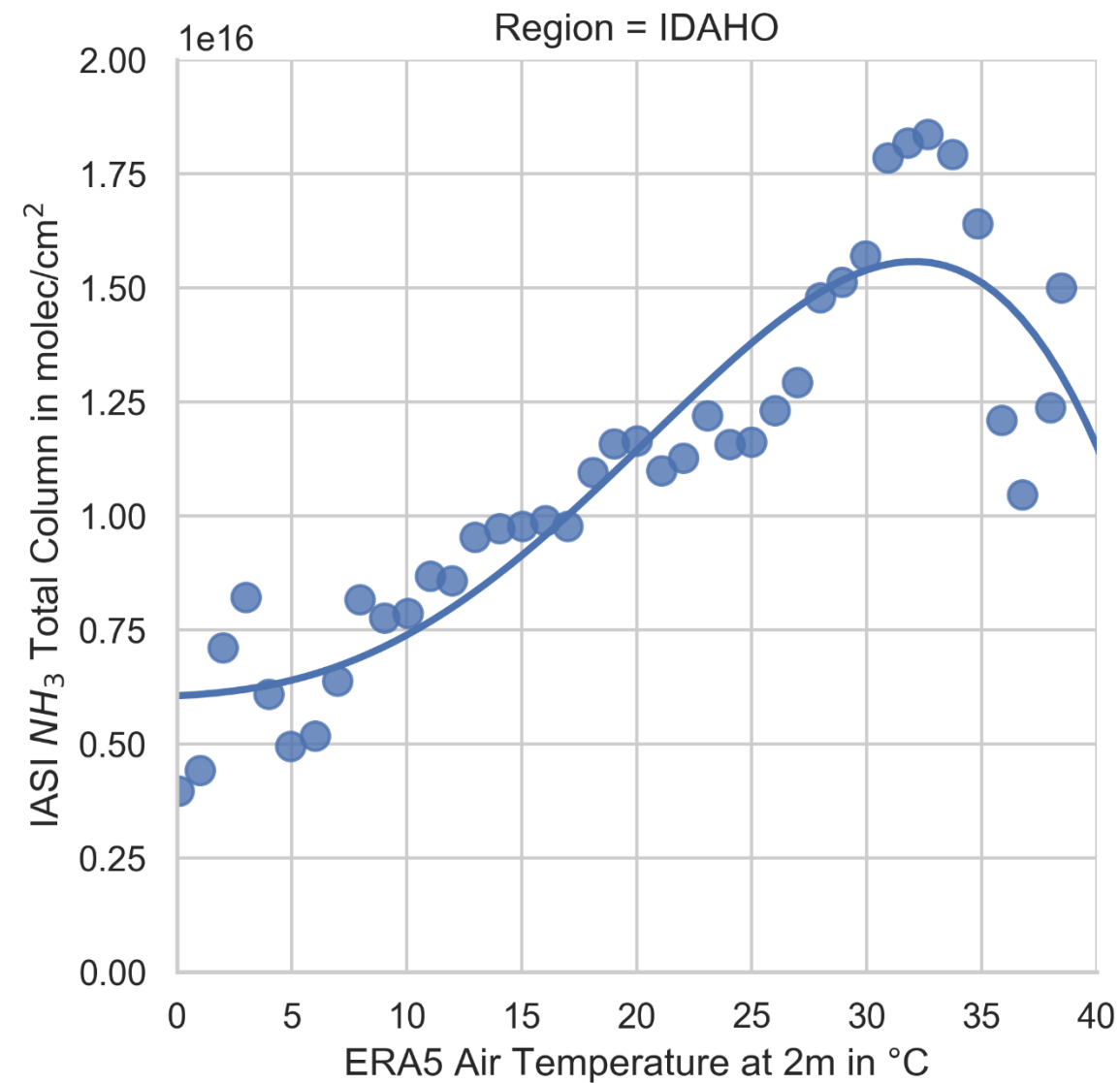
Ammonia/Land/Atmosphere



Air Temperature at 2m

Relative Humidity at 2m

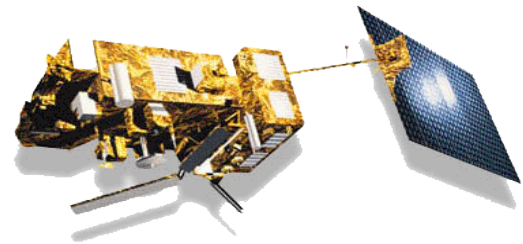
Skin Temperature



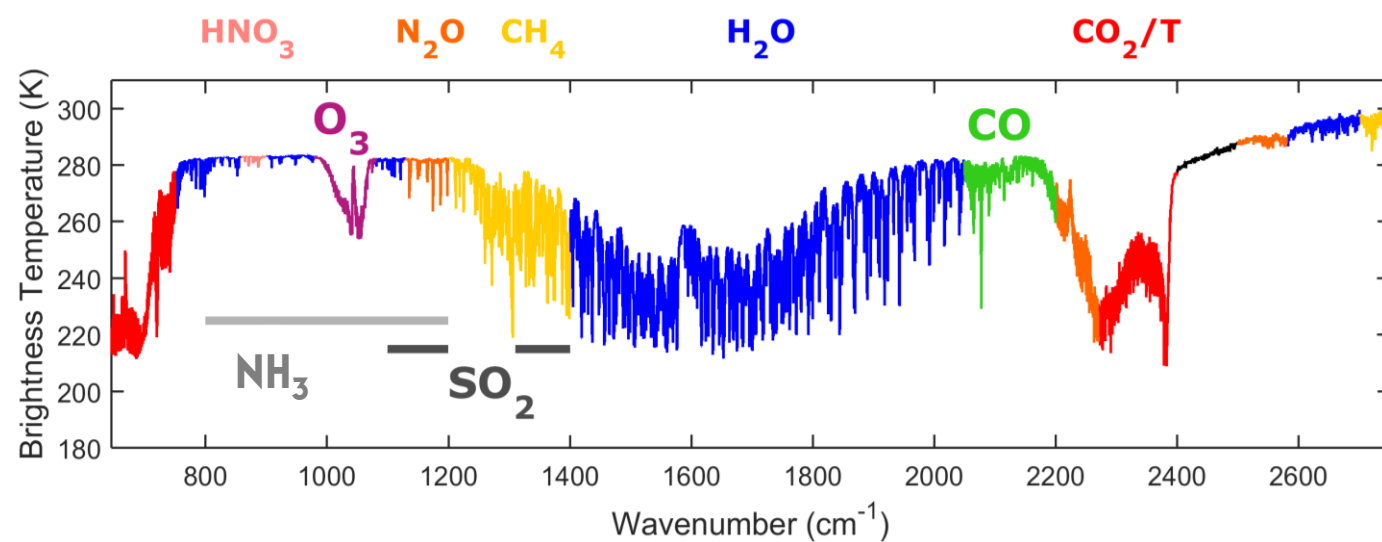


Back-up Slides

iASI on the Metop Satellites

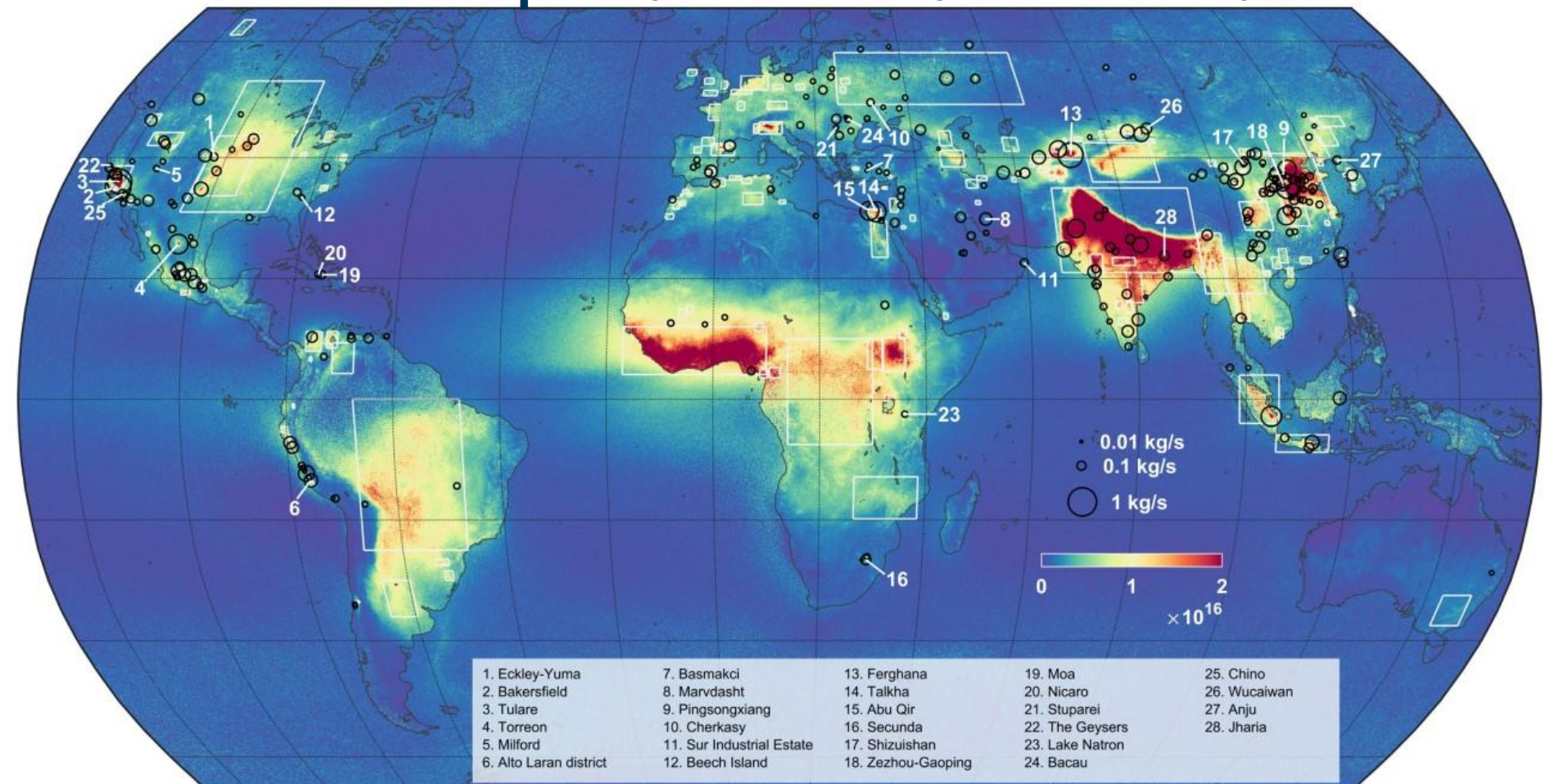


iASI brightness temperature spectrum



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

NH₃ Hotspots (iASI NH₃ 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.

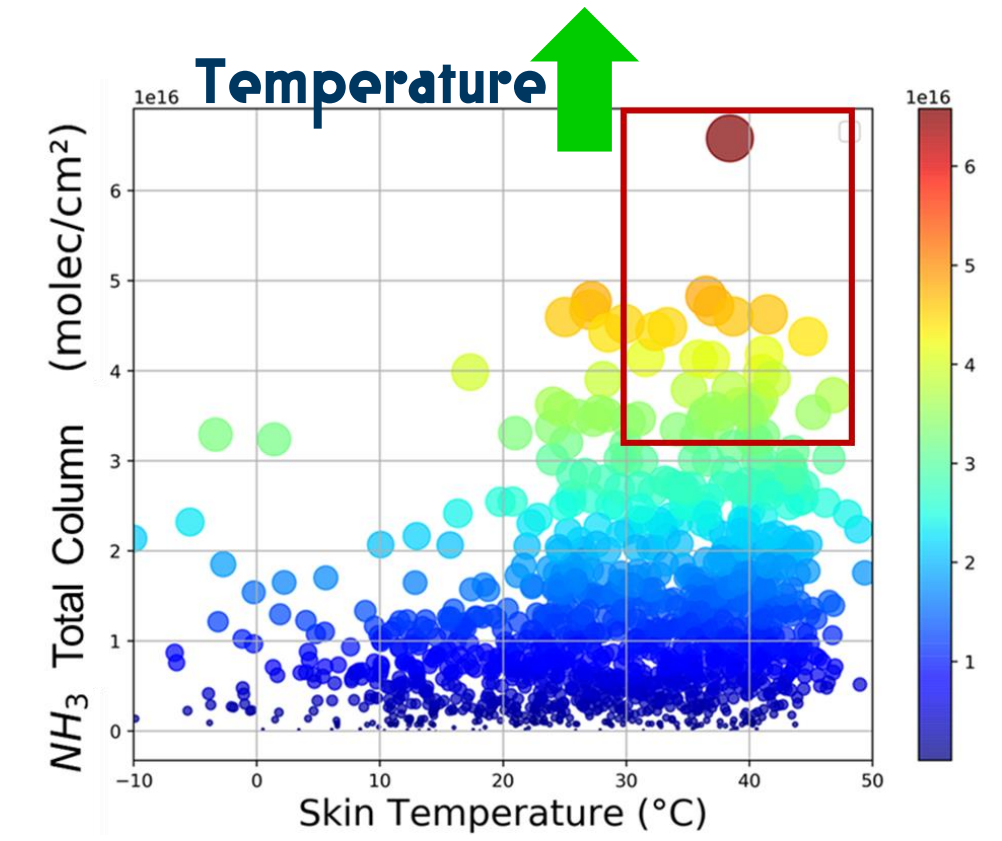
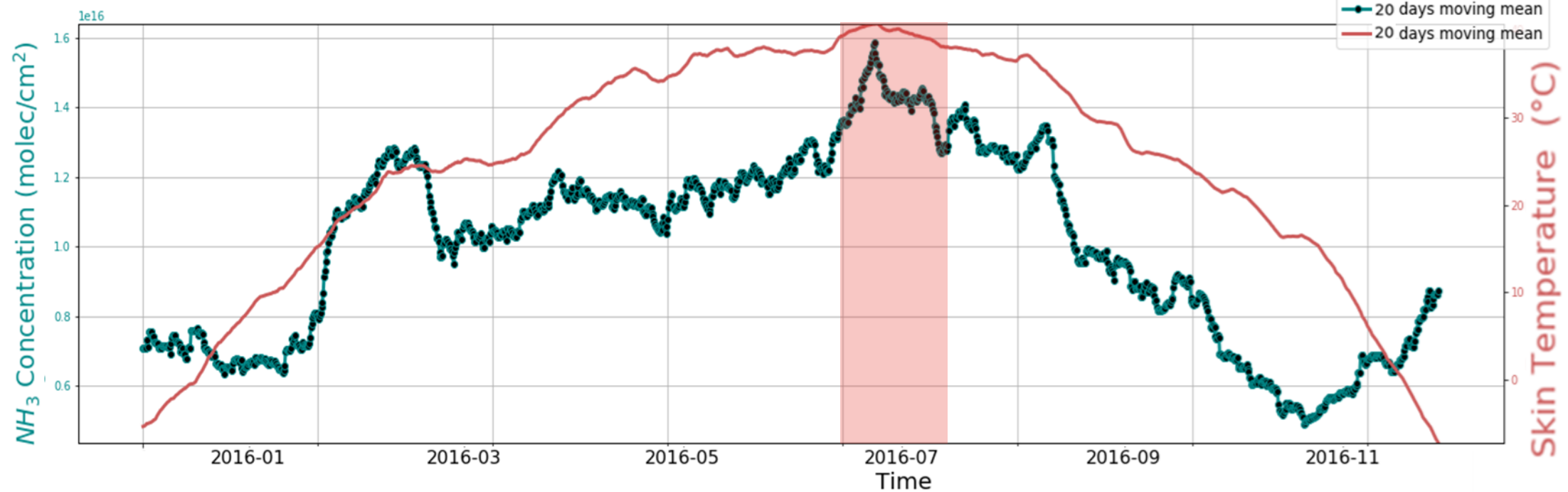


Ammonia/Land

NH₃ 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)

