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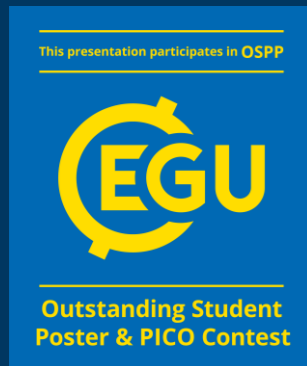
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Laplace



EGU2020-8495

# Ammonia-Biosphere from IASi and ERA5

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université PARIS-SACLAY



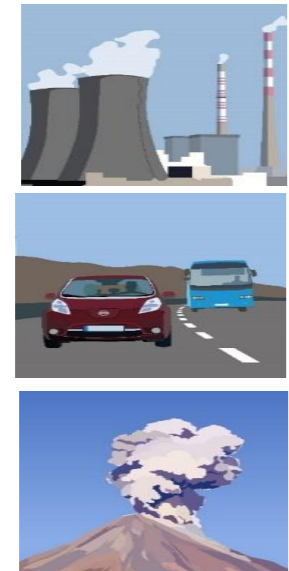
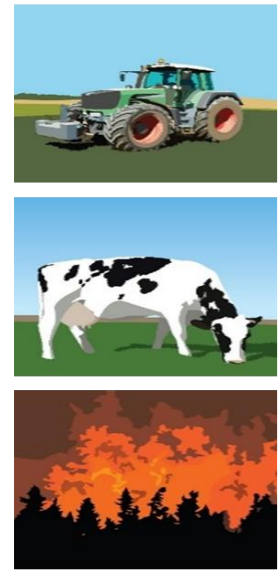
[www.latmos.ipsl.fr](http://www.latmos.ipsl.fr)

# How does ammonia affect the environment?

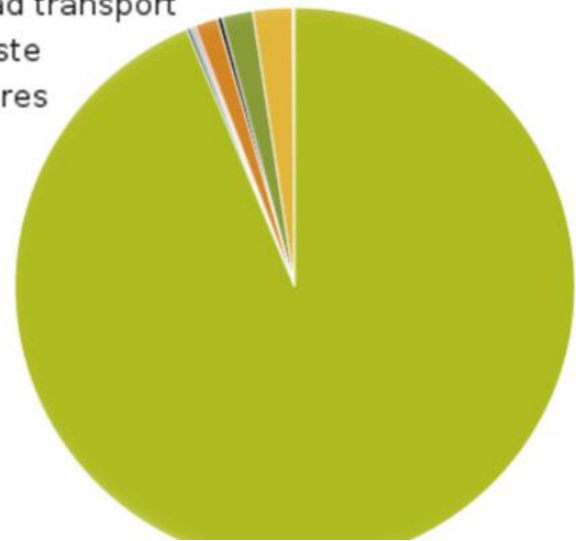
## Sources

**MAIN SOURCES**

**OTHER SOURCES**



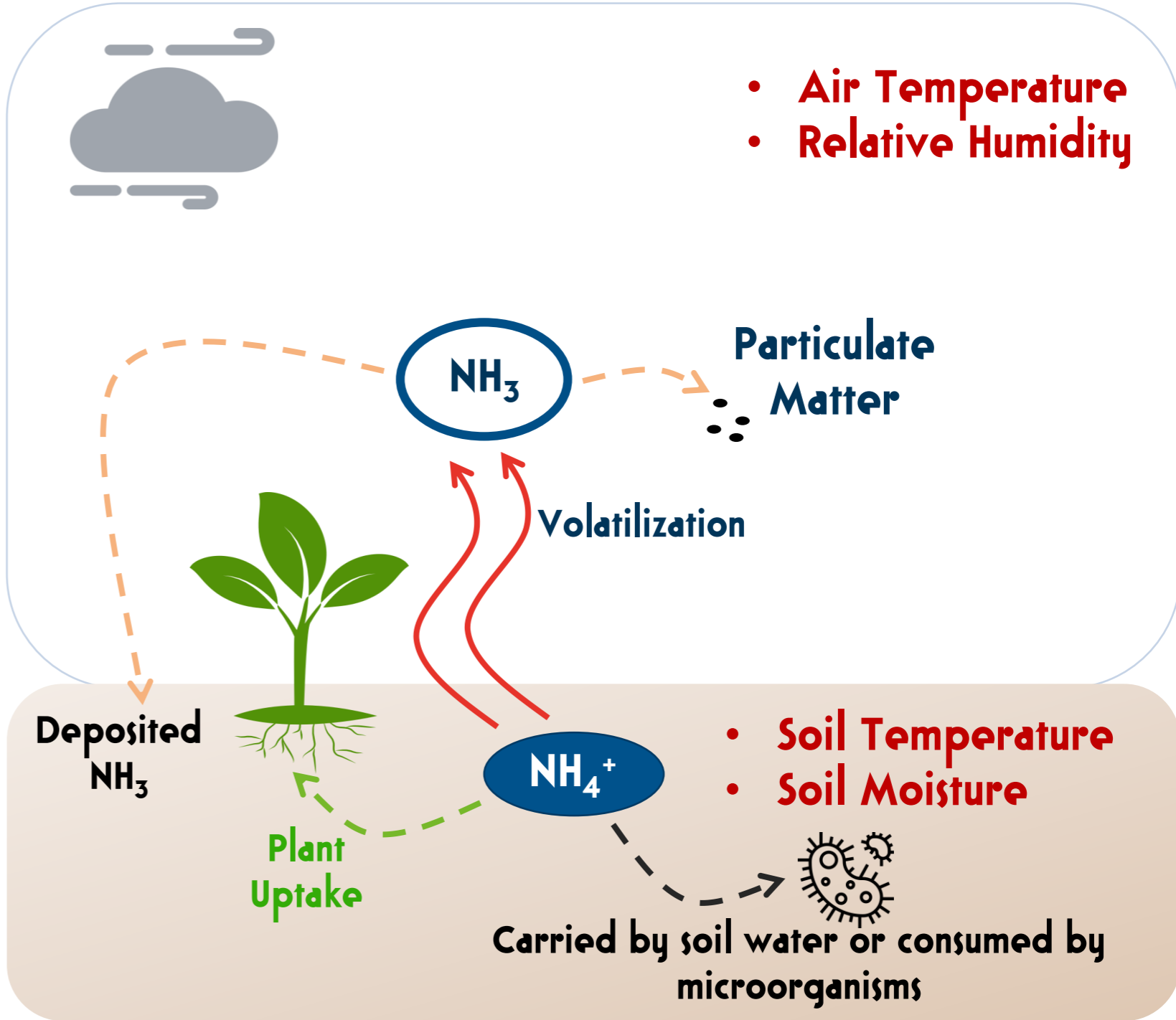
- Agriculture
- Commercial, institutional and households
- Energy production and distribution
- Energy use in industry
- Industrial processes
- Other
- Road transport
- Waste
- Autres



United Nations, Department of Economic and Social Affairs

Atmosphere

Land

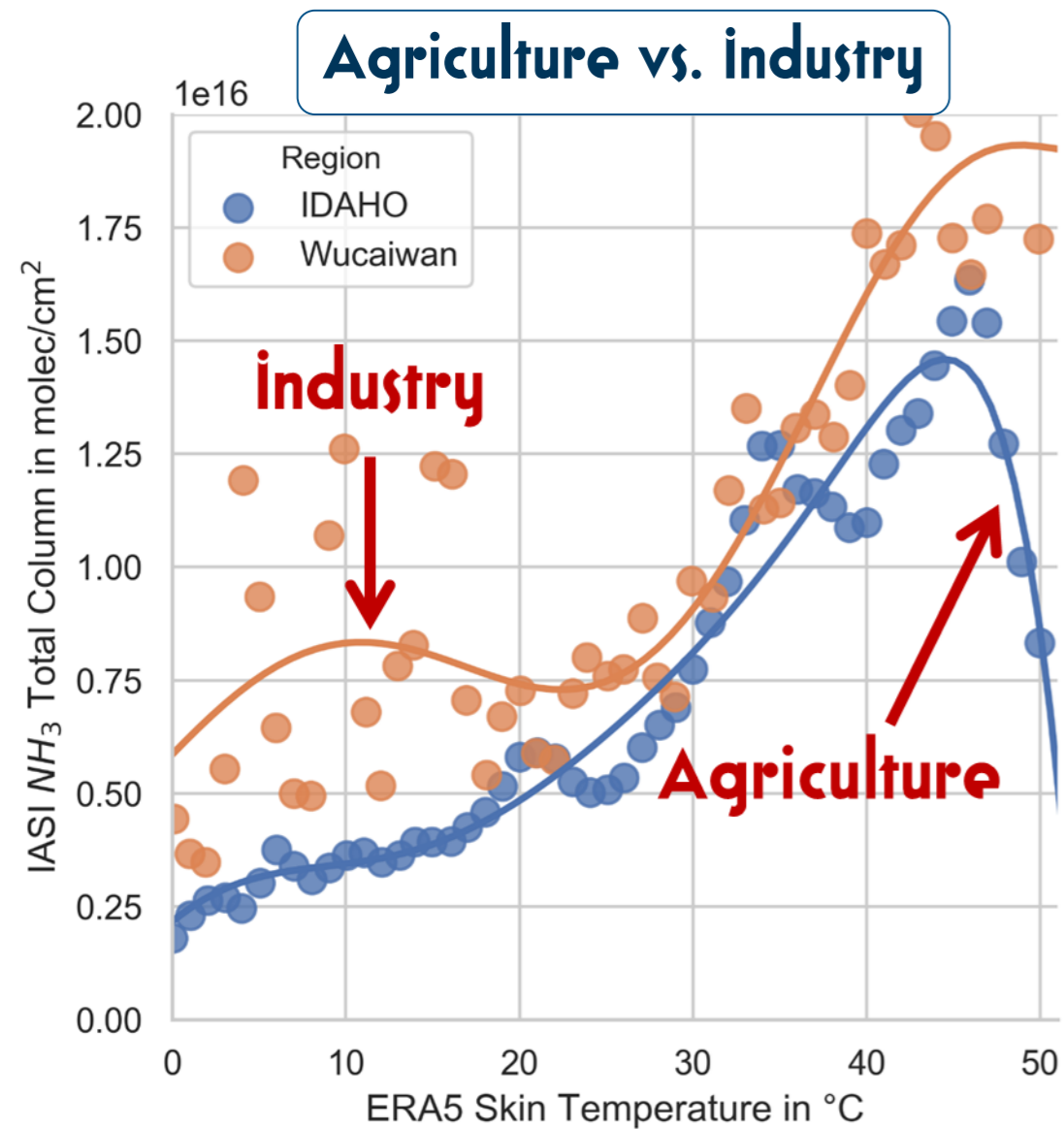


How will climate change affect the abundance of atmospheric ammonia?

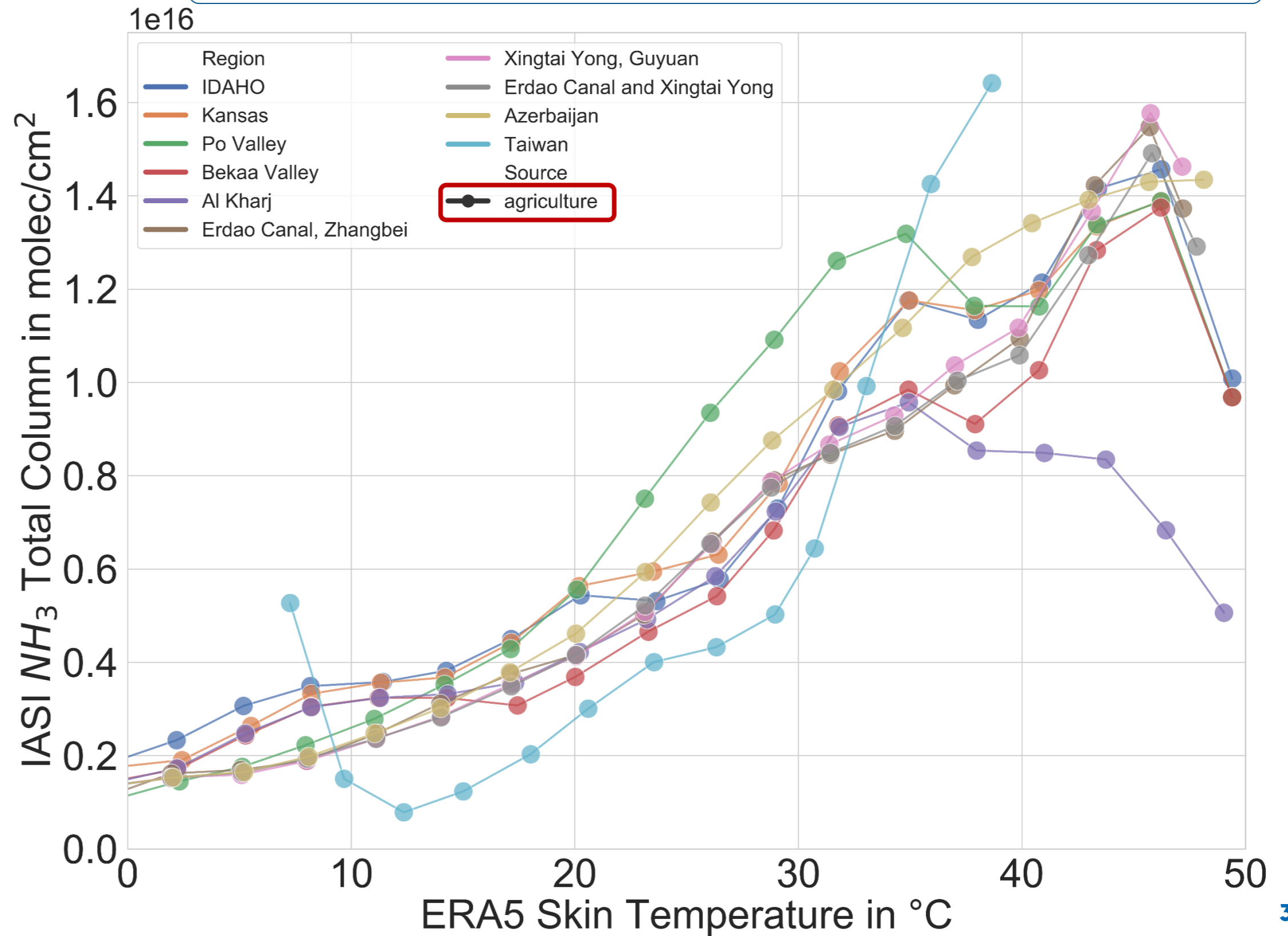
Data used are from IASI ( $NH_3$ ) and ERA5.

# Ammonia/Land

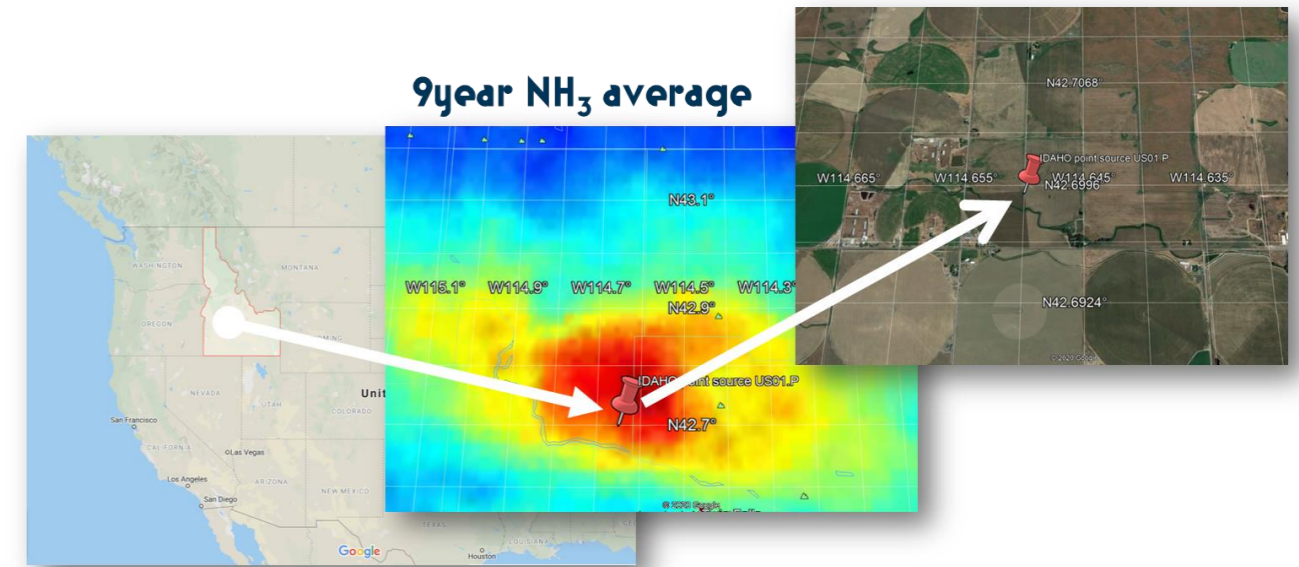
in All the agricultural regions,  $\text{NH}_3$  concentration increased proportionally with Skin Temperature in an exponential manner.



2008 to 2016 iASI  $\text{NH}_3$  averaged per 3°C skin temperature bins



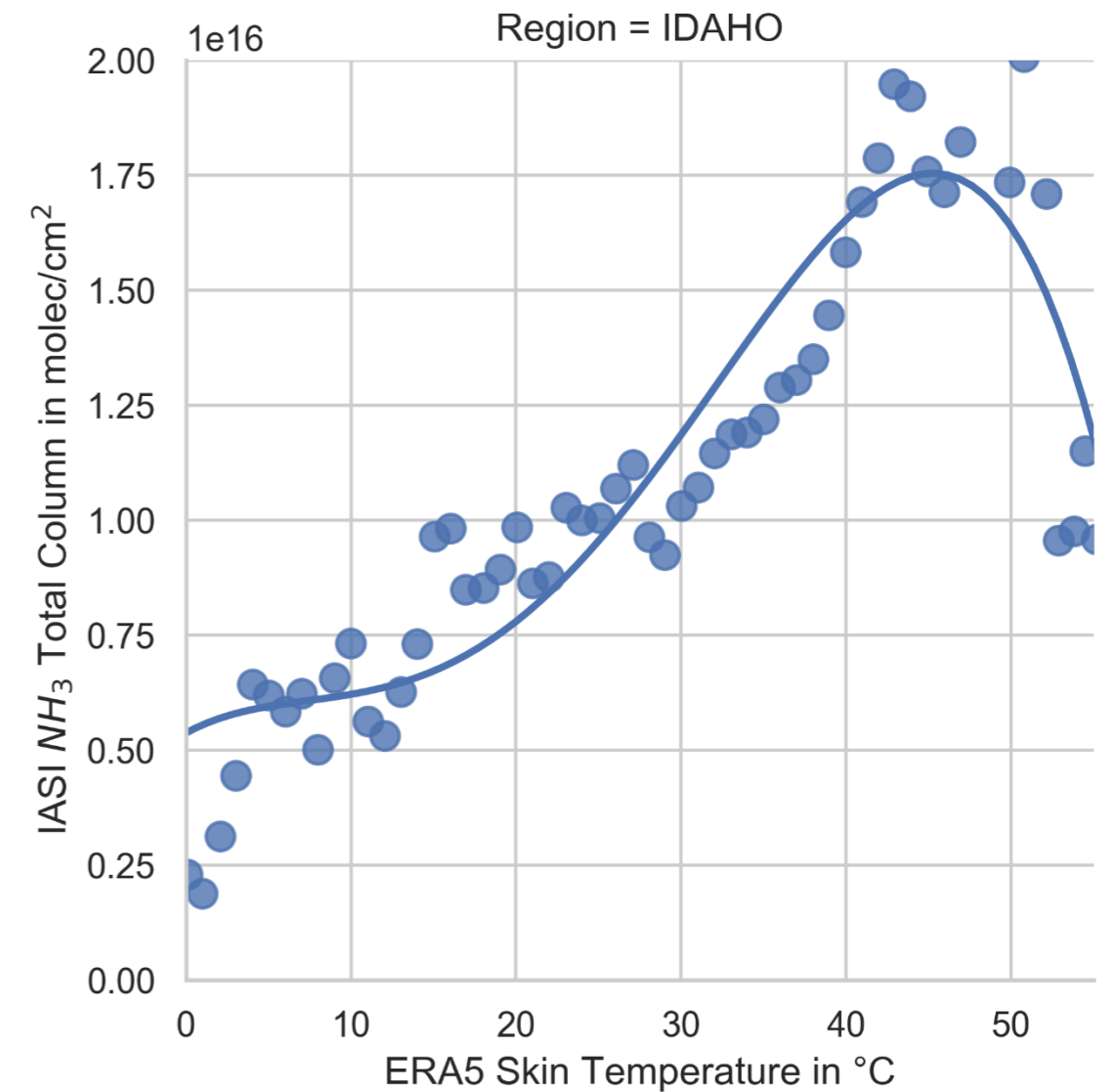
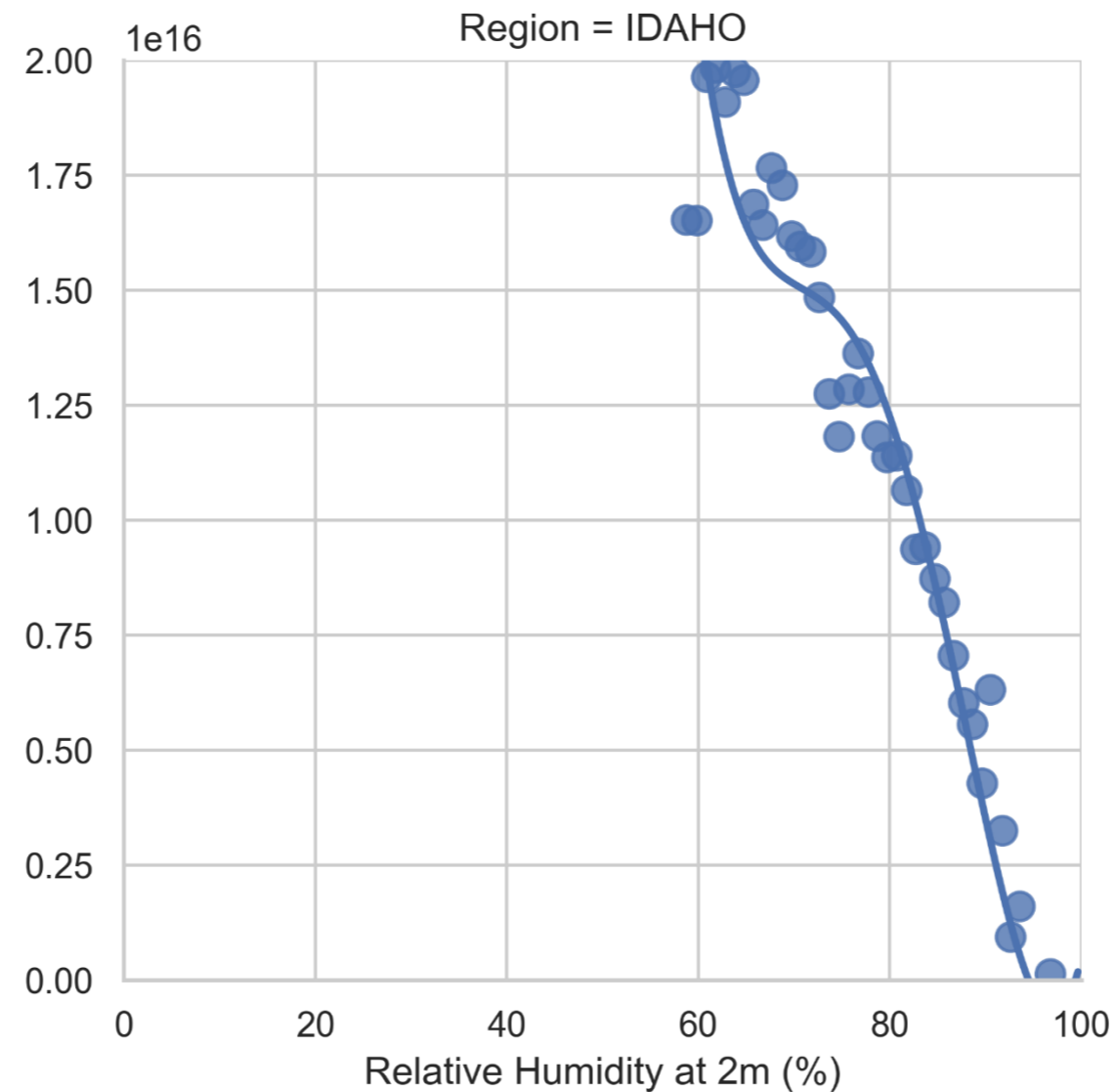
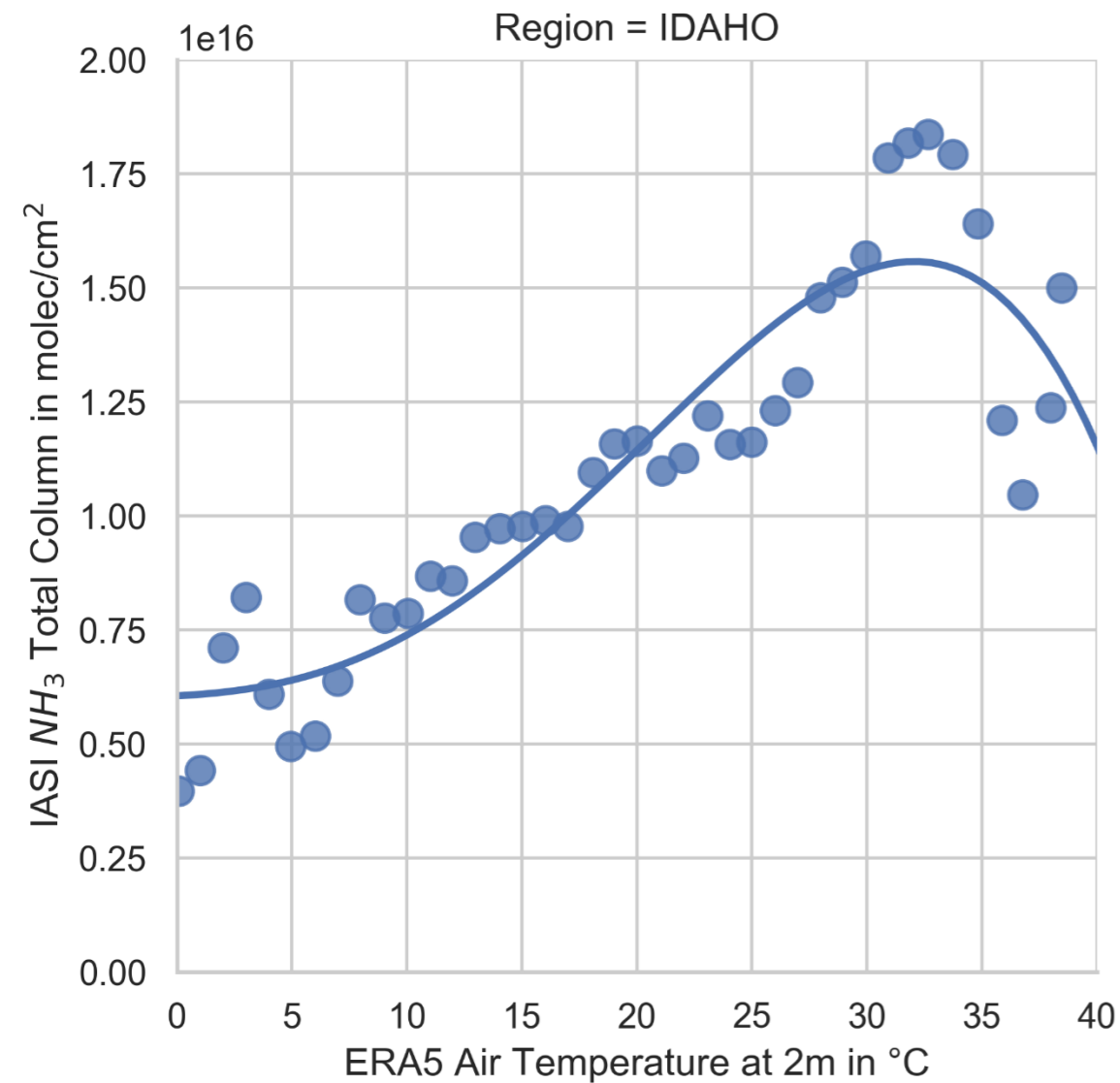
# Ammonia/Land/Atmosphere



## Air Temperature at 2m

## Relative Humidity at 2m

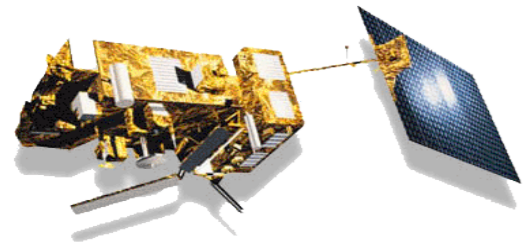
## Skin Temperature



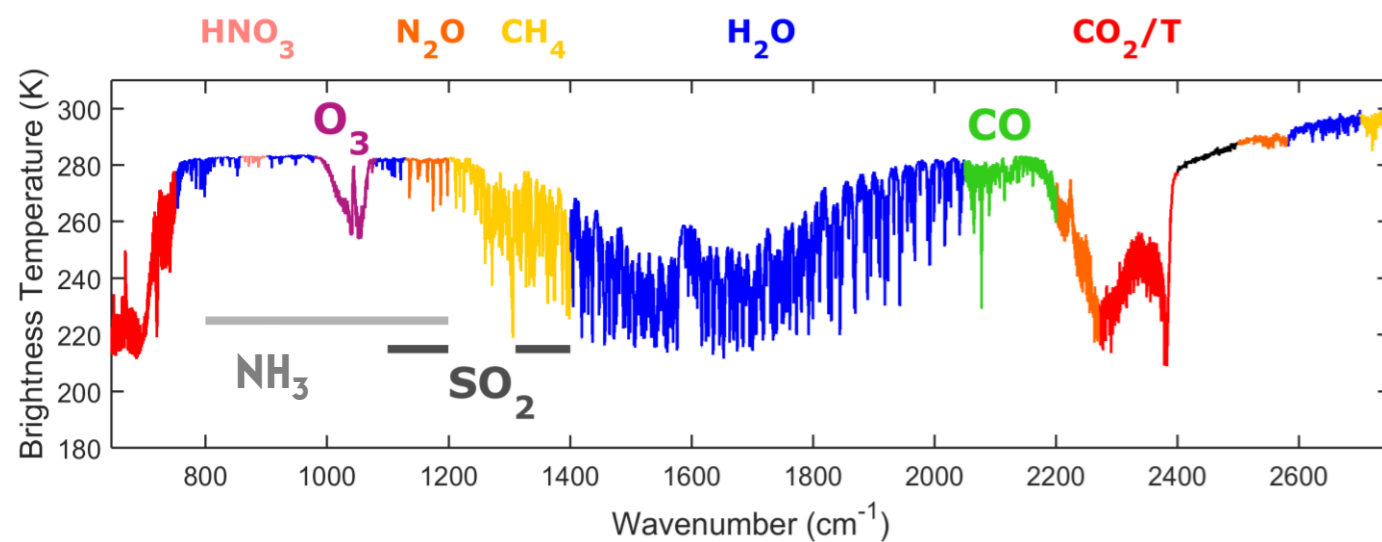


# Back-up Slides

# iASI on the Metop Satellites

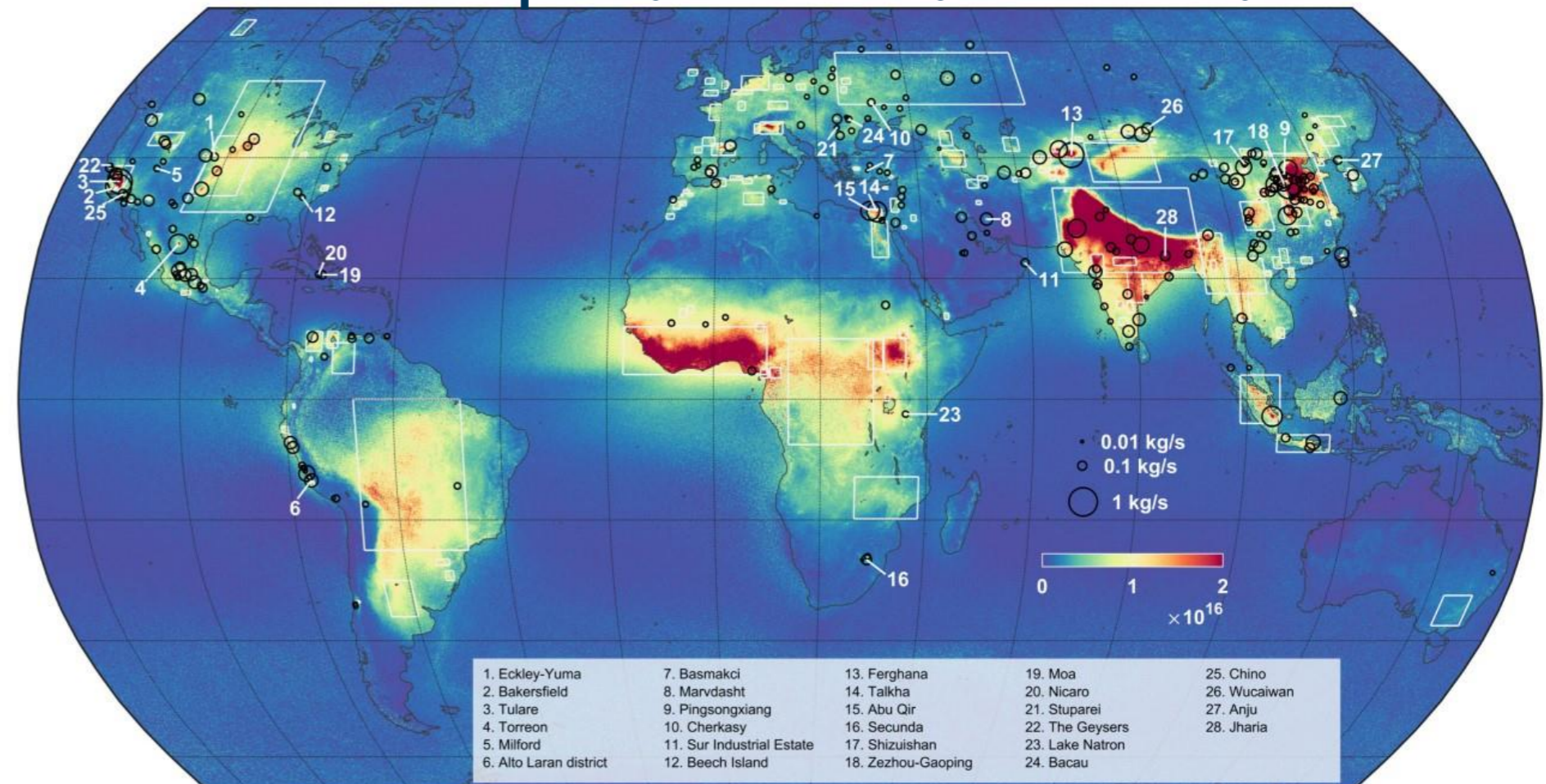


## iASI brightness temperature spectrum



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

## NH<sub>3</sub> Hotspots (iASI NH<sub>3</sub> 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.

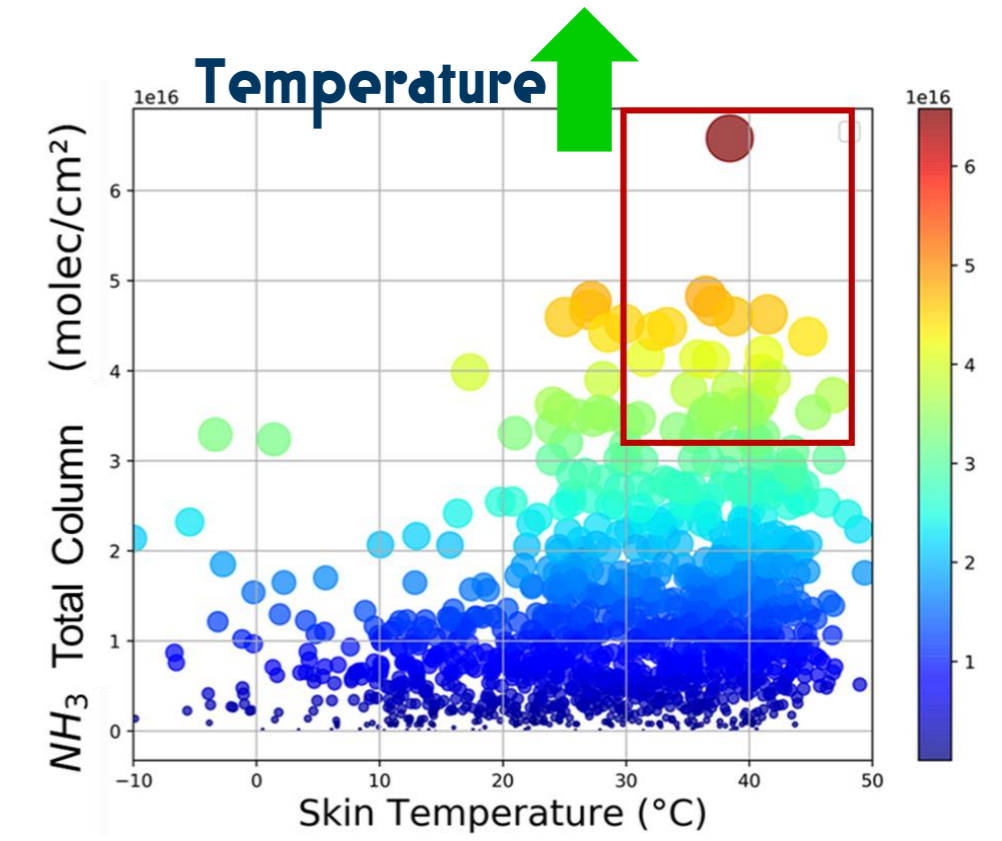
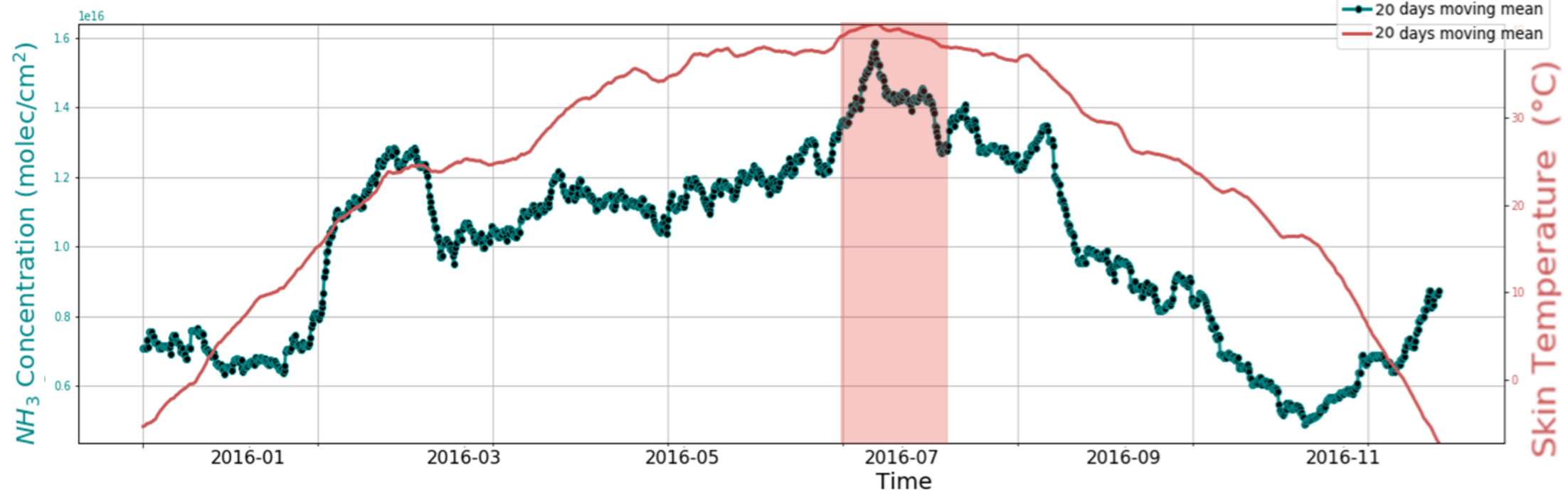


# Ammonia/Land

**NH<sub>3</sub> volatilization is enhanced by high temperature and low soil moisture.**

**iASI NH<sub>3</sub> vs. ERA5 Skin Temperature**

**IDAHO [42-43°N , 114-115° W], 2016**



**iASI NH<sub>3</sub> vs. ERA5 Soil Moisture - layer 1 (0 to 7cm of soil)**

