

# Steady-state and dynamic box modelling of surface ocean-lower atmosphere exchanges of ammonia/um in the Southern Ocean

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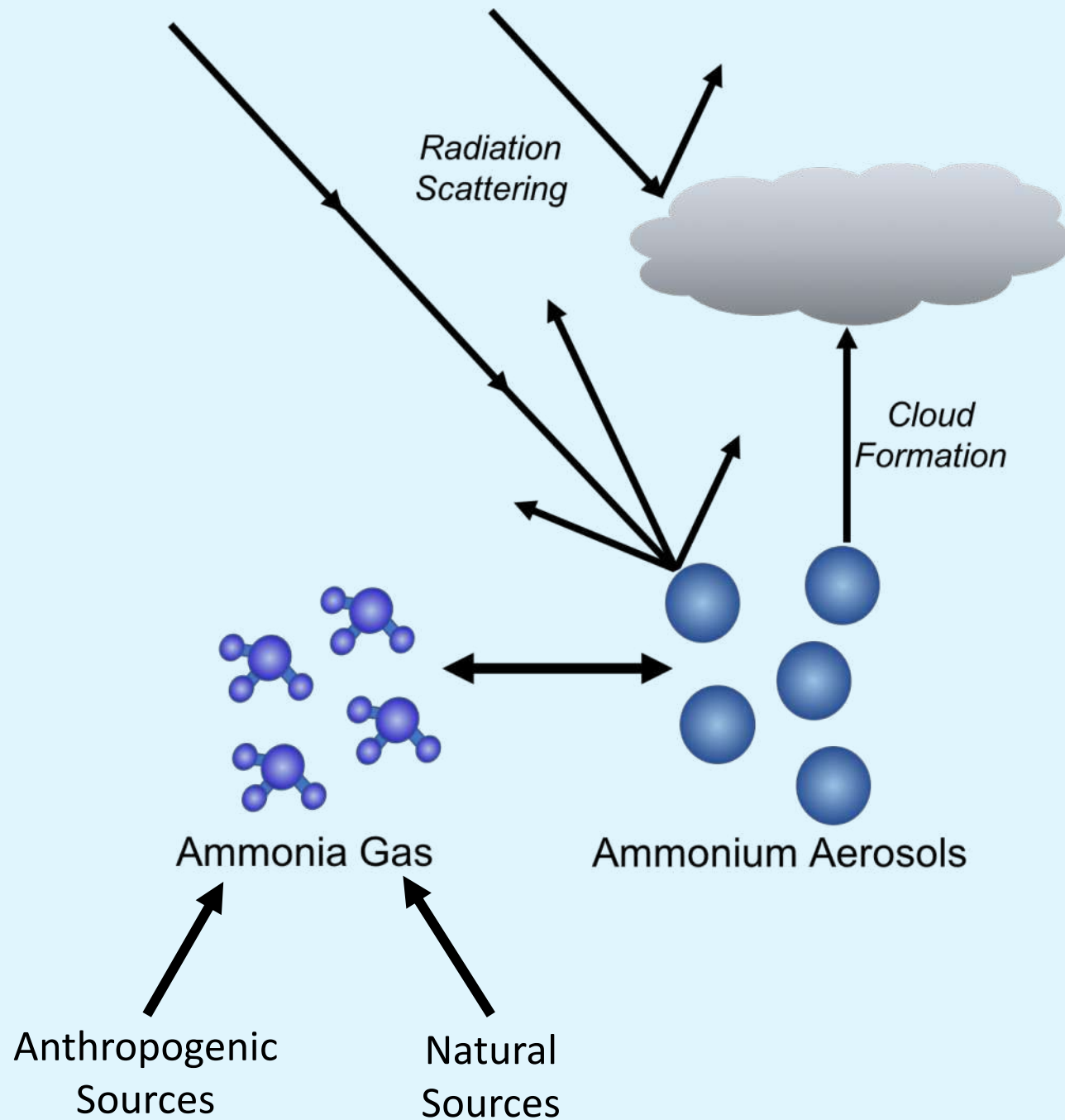


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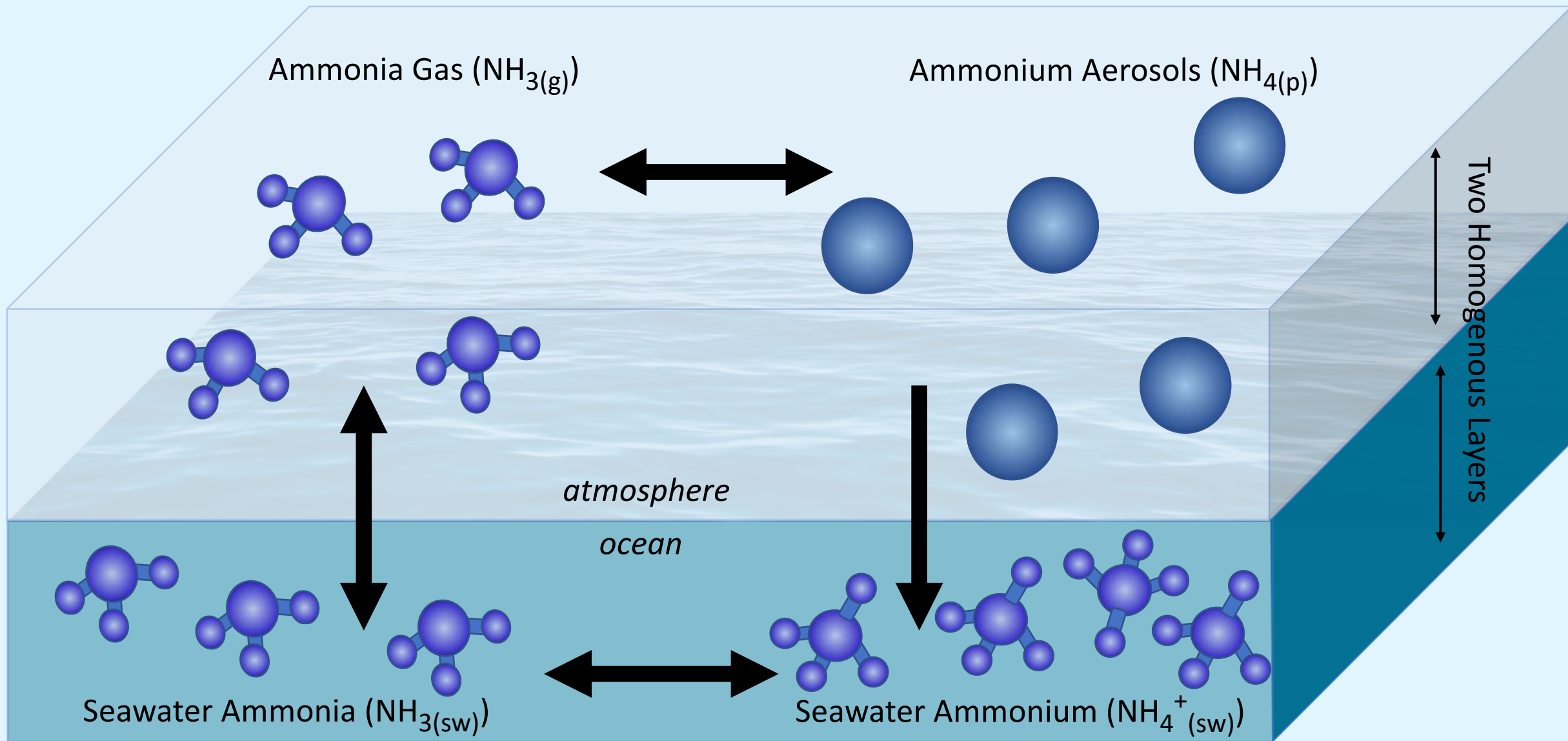


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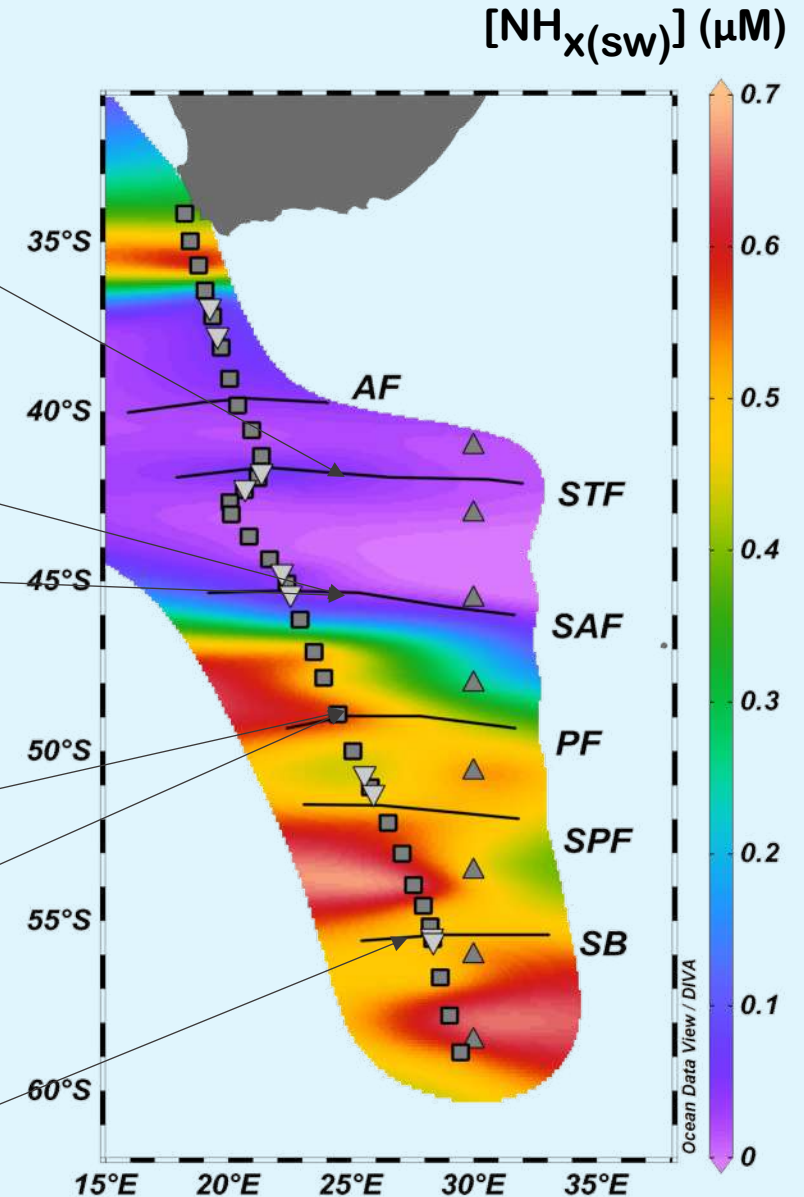
Aim

Investigate the use of stable nitrogen isotopes as a tracer of the marine ammonia source using a box model



# Steady state box model – SAZ, PFZ, AAZ

	Ammonia Gas ( $\text{NH}_3(\text{g})$ )	Ammonium Aerosols ( $\text{NH}_4(\text{p})$ )
SAZ	0.37 $\text{nmol.m}^{-3}$ $\delta^{15}\text{N} = -25.3\text{‰}$	1.86 $\text{nmol.m}^{-3}$ $\delta^{15}\text{N} = 8.0\text{‰}$
PFZ	0.93 $\text{nmol.m}^{-3}$ $\delta^{15}\text{N} = -25.4\text{‰}$	4.66 $\text{nmol.m}^{-3}$ $\delta^{15}\text{N} = 7.9\text{‰}$
AAZ	0.80 $\text{nmol.m}^{-3}$ $\delta^{15}\text{N} = -25.5\text{‰}$	4.00 $\text{nmol.m}^{-3}$ $\delta^{15}\text{N} = 7.8\text{‰}$



Winter Cruise 2017

# Additional Aim

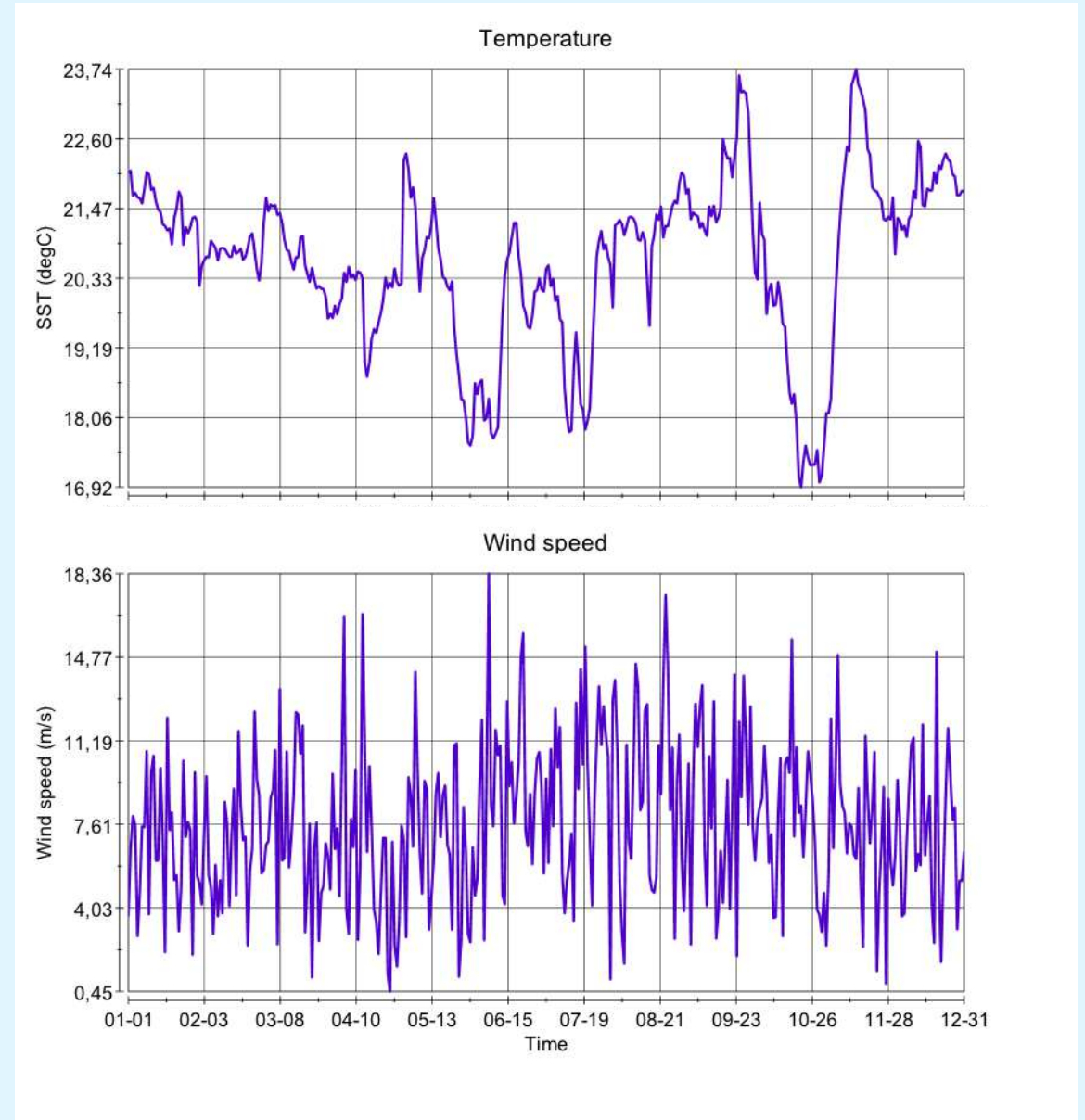
Understanding the extent of the **variation** and the **controls** on the isotopic signature of the marine ammonia source

# Biogeochemical Flux Model (BFM) – 2017 Timeseries at 15 Stn's across SO

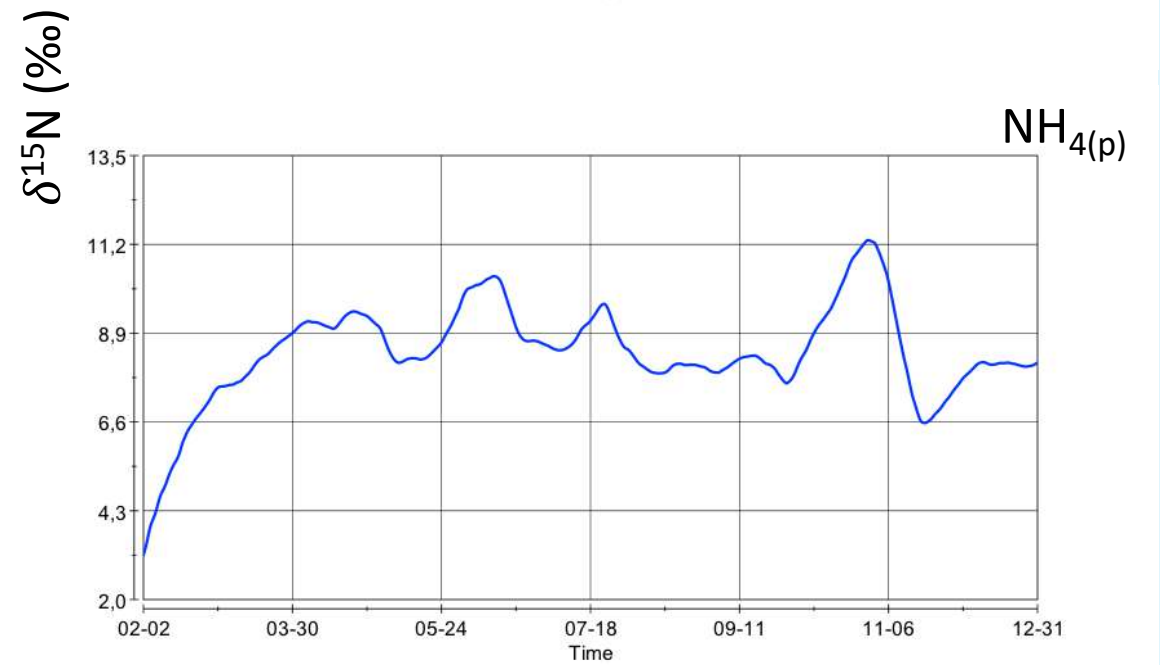
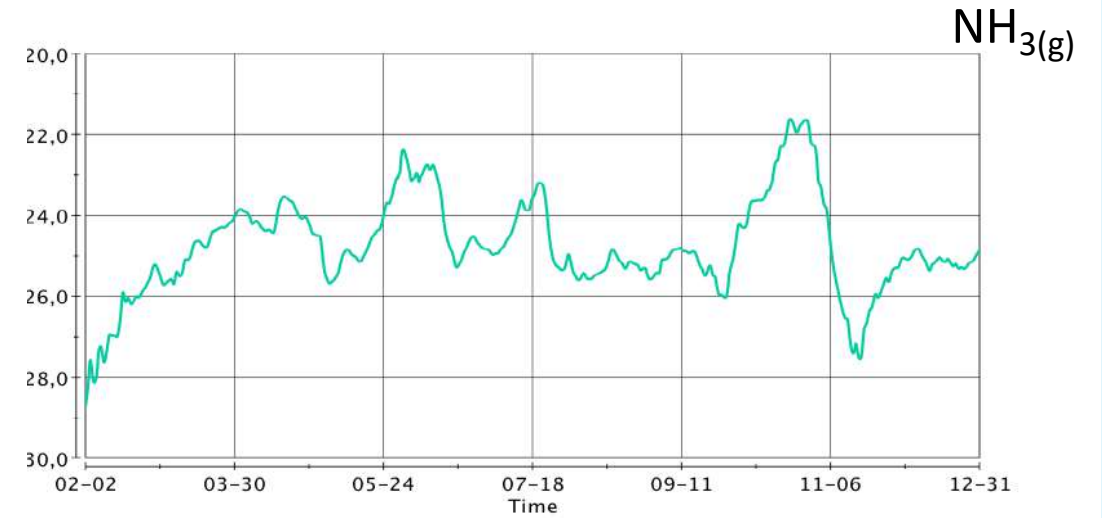
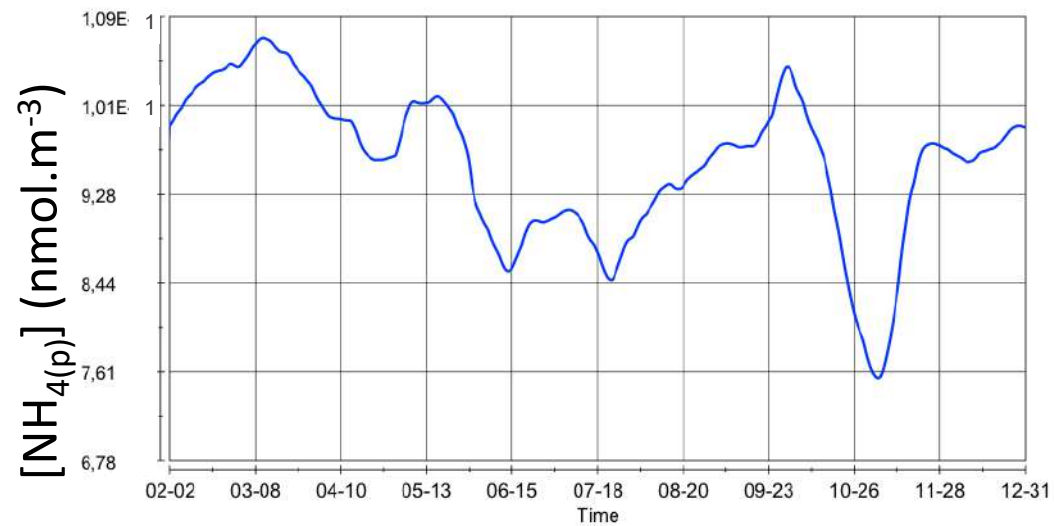
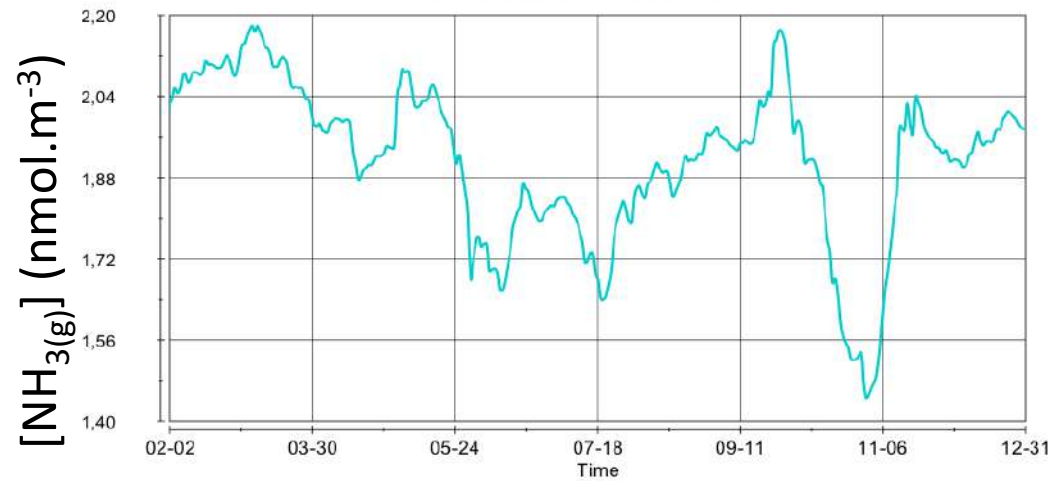


## ERA5 Reanalysis Product

- Hourly
- SST, wind speed, atmospheric BLH



# BFM – 2017 Timeseries at 38 °S 19.5 °E



A bright blue sky filled with fluffy white clouds. The clouds are scattered across the frame, with some larger, more prominent ones and many smaller, wispy ones. The overall scene is bright and cheerful.

Thank you!