

NO_x at Cape Verde

ACTRIS NO_x QA workshop 2025

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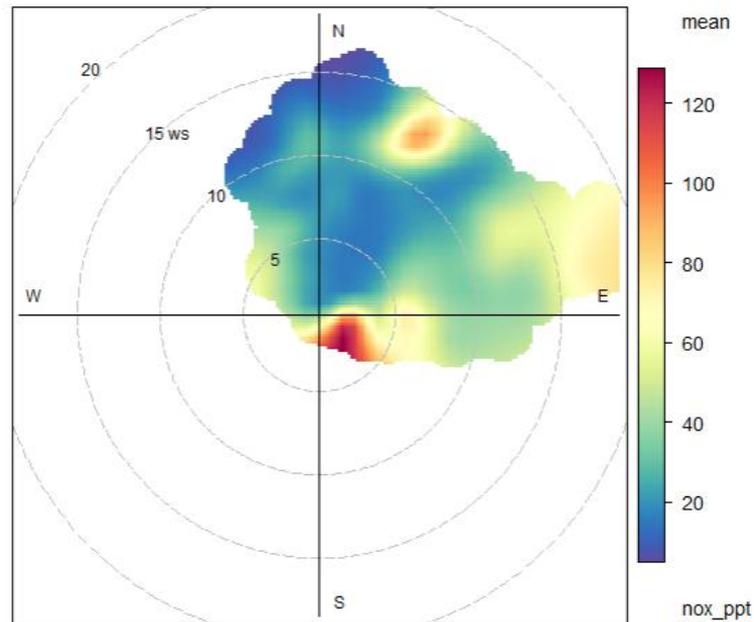
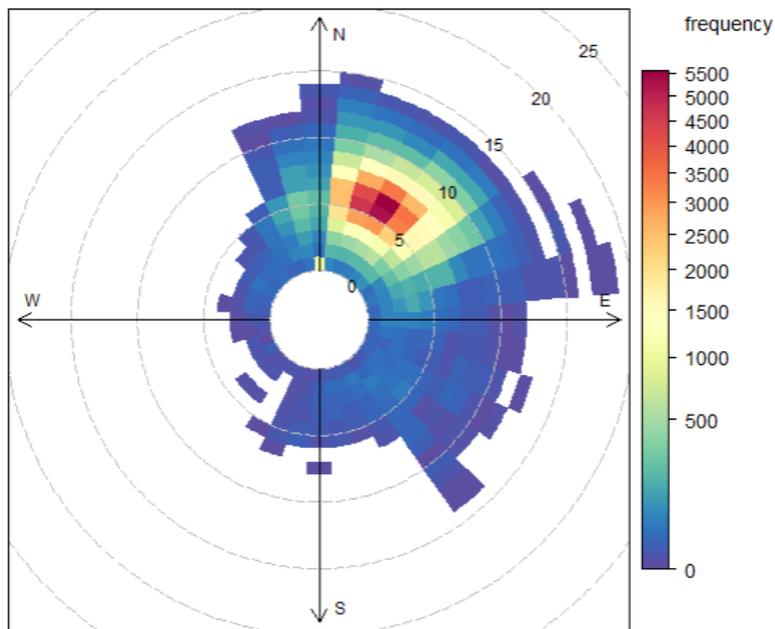
University of York & National Centre for Atmospheric Science (NCAS)



Cape Verde location



Wind direction and wind speed



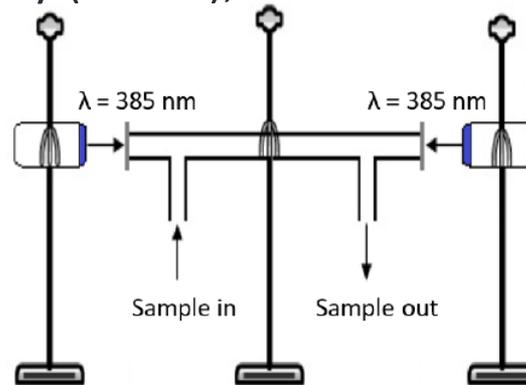
NO_x Instrument

- NO_x measured via a custom, dual channel NO chemiluminescence instrument
 - Channel 1: NO, NO_x and background
 - NO₂ photolytically dissociated at 385 and 395 nm
 - Nafion dryer on sample
 - Channel 2: currently not operational



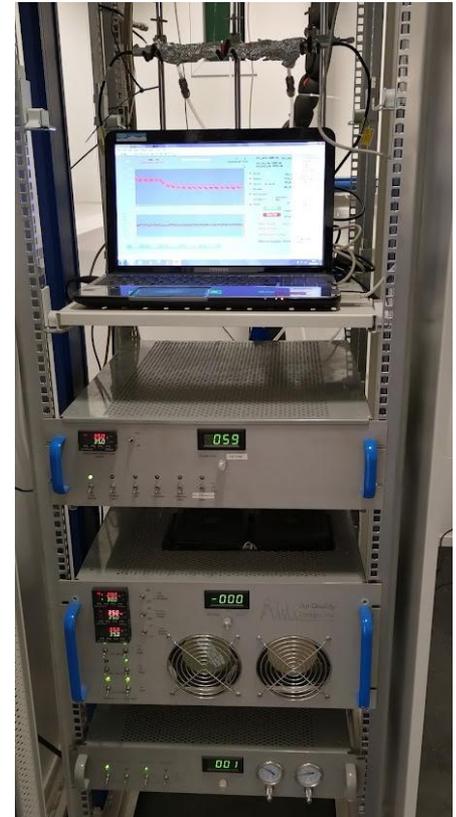
NO_x Instrument

- Two NO₂ converters used
 - Blue light converter (BLC 2), high conversion efficiency (~ 92%) but thermal interferences due to BLC heating up
 - Diodes and quartz tube system (photolysis cell – PLC), lower conversion efficiency (~ 54%), but minimal interferences



NO_x Measurement cycle

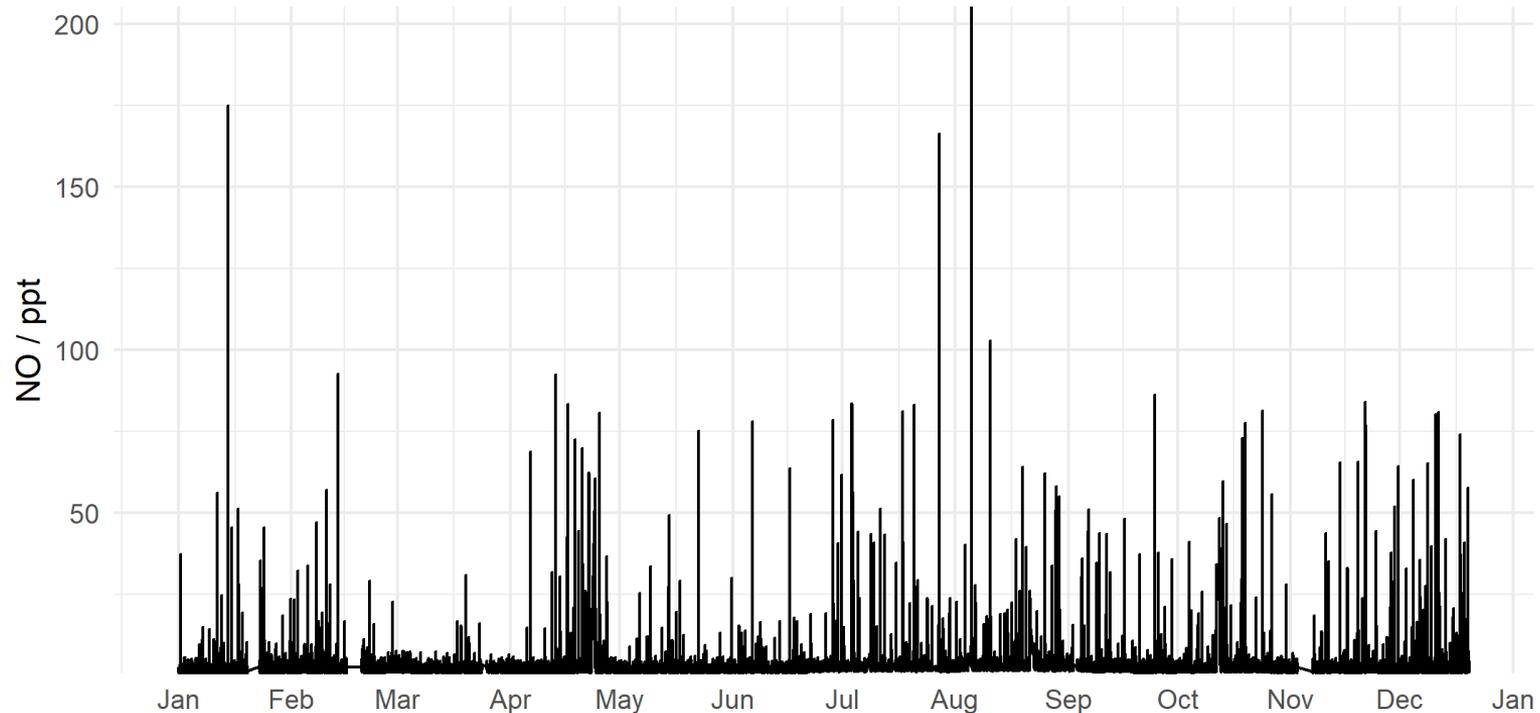
- 5-minute measurement cycle
 - 2 minutes of NO measurement
 - 2 minutes of NO_x, 1 minute using BLC, 1 minute using PLC
 - 1 minute of background
- NO_x measured continuously at CVAO since 2006
 - Most recent BLC installed in 2015
 - PLC installed in 2017, diodes replaced in April 2022
- Limits of detection
 - NO ~ 1.2 ppt / hour
 - NO₂ ~ 2.2 ppt / hour



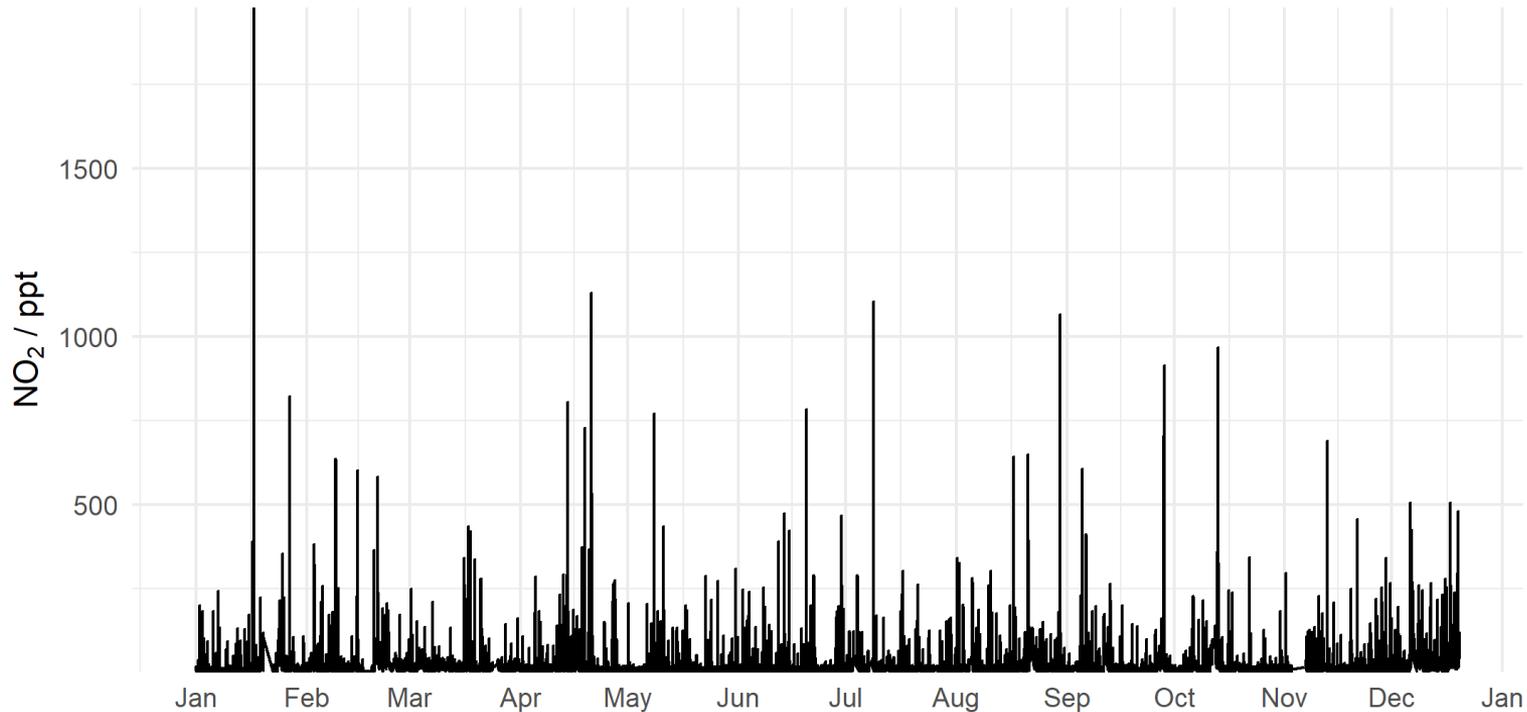
NO_x Calibration

- Calibration every 61 hours
 - 3 NO sensitivity cycles
 - 2 NO₂ conversion efficiency cycles
- After calibration 30 minutes of zero air measurement
 - PAG air used
 - For NO nighttime measurement used to calculate the offset

NO Timeseries - uncorrected, 5 min



NO₂ Timeseries - uncorrected, 5 min





Thank you!

