

Nitrate at Coriolis

Where we were after BGC WORKSHOP 7 in San Diego

- No RTQC on NITRATE at Coriolis

- No DM in DOXY

 - => difficult to use Neural network methods based on DOXY

 - => only RT Adjustment based on WOA13 at depth

Where we are now :

- Work on RTQC documentation

- Implement RTQC documentation at Coriolis

- ~100 floats were DM in DOXY

RTQC documentation

argo data management

Argo data management

DOI: <http://dx.doi.org/10.13155/xxxx>

BGC-Argo quality control
manual for nitrate
concentration

Version 0.9

April 1st 2019

**DONE IS
BETTER
THAN
PERFECT**

PRINTED BY THE BGC-ARGO PROJECT AT THE NIOO-KNAW RESEARCH INSTITUTE

NITRATE QC is initially set to '3'

-Range Test

- IF NITRATE **not** in range $[-2, 50]$ micromole/kg THEN QC = '4' for NITRATE.

-Spike test :

TestValue = $\text{ABS}[V2 - \text{MEDIAN}(V0, V1, V2, V3, V4)]$

- In Red Sea and in Mediterranean sea:
 - IF TestValue > 1 micromole/kg THEN the test failed and V2 should be flagged with a QC = '4' for NITRATE.
- Other places:
 - IF TestValue > 5 micromole/kg THEN the test failed and V2 should be flagged with a QC = '4' for NITRATE.

-Saturation test

- IF $\text{UV_INTENSITY_NITRATE}(R) = \text{SATURATION_VALUE}$ THEN QC = '3'
 - for the SUNA V2 on CTS4 floats, $\text{SATURATION_VALUE} = 2^{16} - 1 = 65535$.

-Absorbance 240nm test

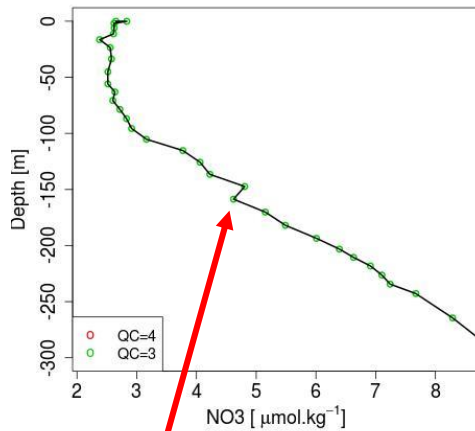
- IF $0.8 \leq \text{ABSORBANCE_SW}(i_{240\text{nm}}) < 1.1$ THEN QC = '3'
- IF $\text{ABSORBANCE_SW}(i_{240\text{nm}}) \geq 1.1$ THEN QC = '4'

-Fit Error Test :

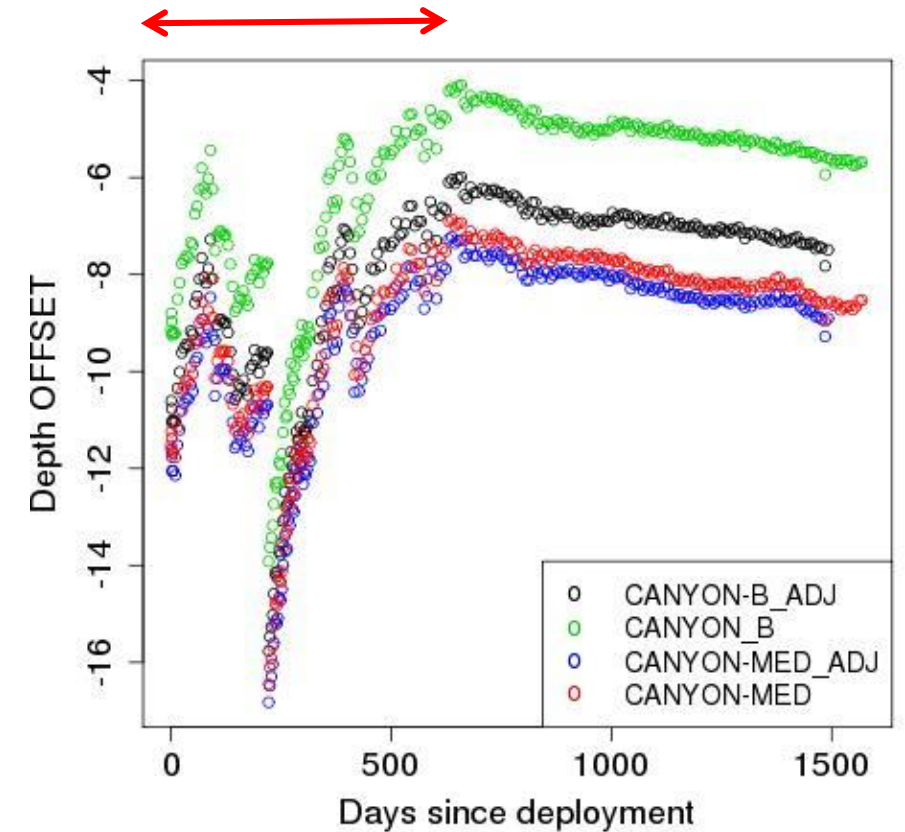
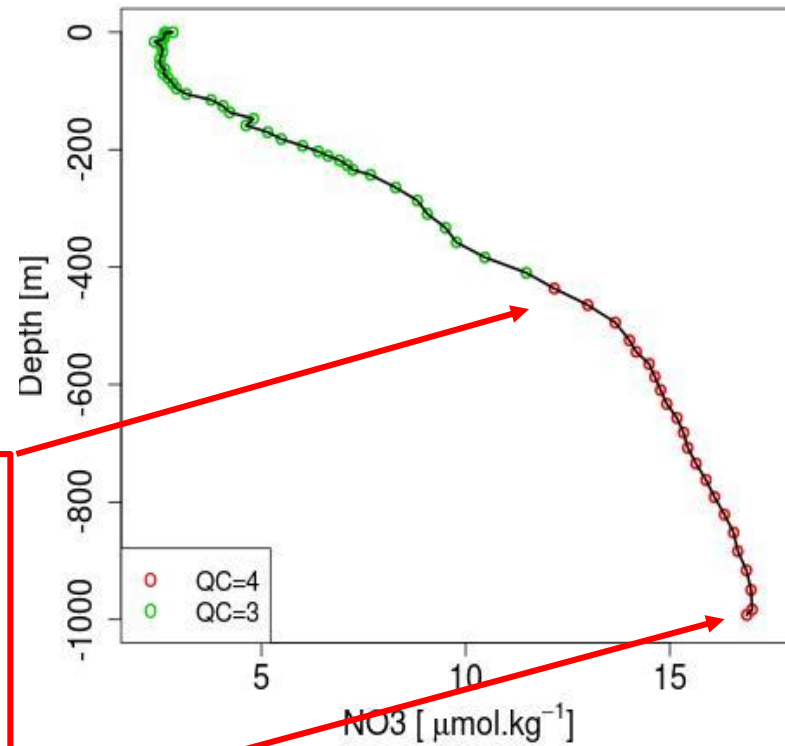
- IF $\text{FIT_ERROR_NITRATE} \geq 0.003$ THEN QC = '4'

float 6901773

During 625 days after the deployment this issue occurred, preventing from doing any adjustment at depth thanks to RTQC



Some channels of the spectrophotometer saturate and prevent the estimation of the NITRATE Concentration at depth

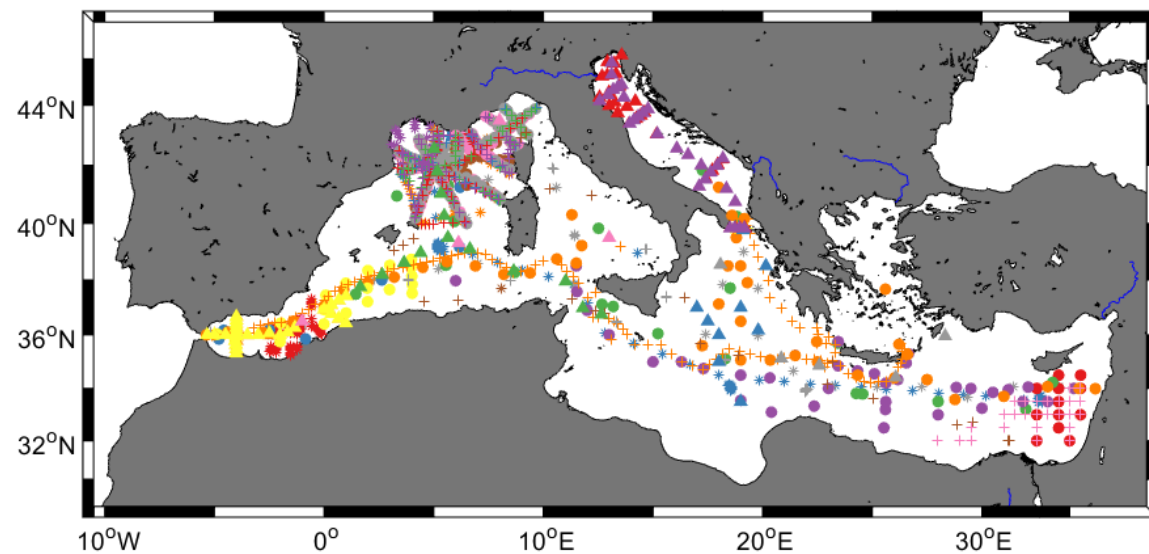


NITRATE DM principles

- There is an offset between the SUNA MEASUREMENTS and the NITRATE concentration
- This Offset may drift in time
- The best way to estimate this offset is to compare the SUNA measurements with a reference at depth

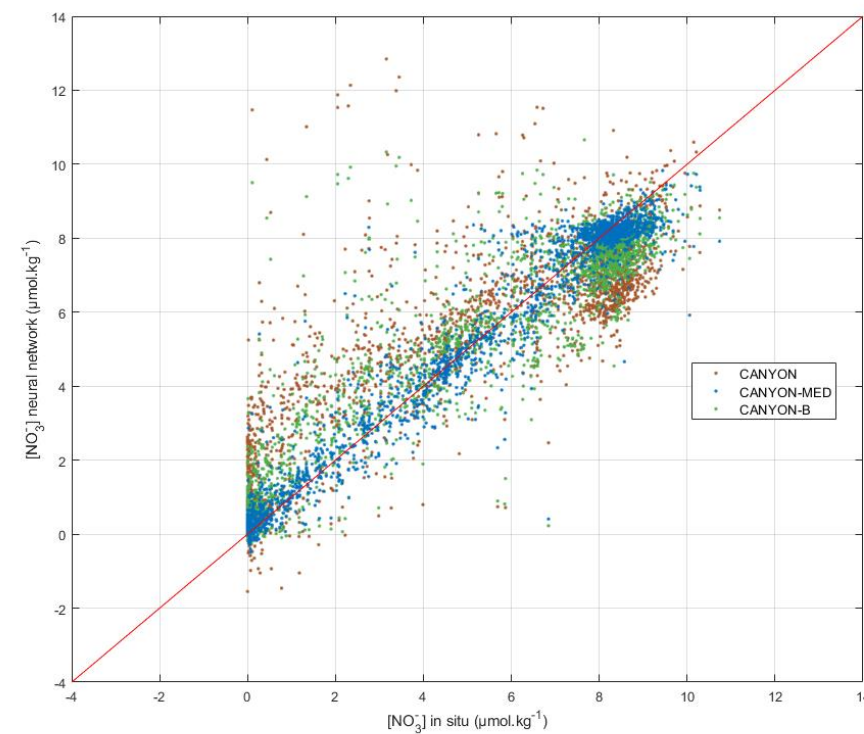
As a large part of floats equipped with NITRATE sensors are deployed in the mediterranean Sea :

- CANYON-MED a neural network method for the Mediterranean Sea
 - PRES, PSAL, TEMP, LATITUDE, LONGITUDE, DOXY

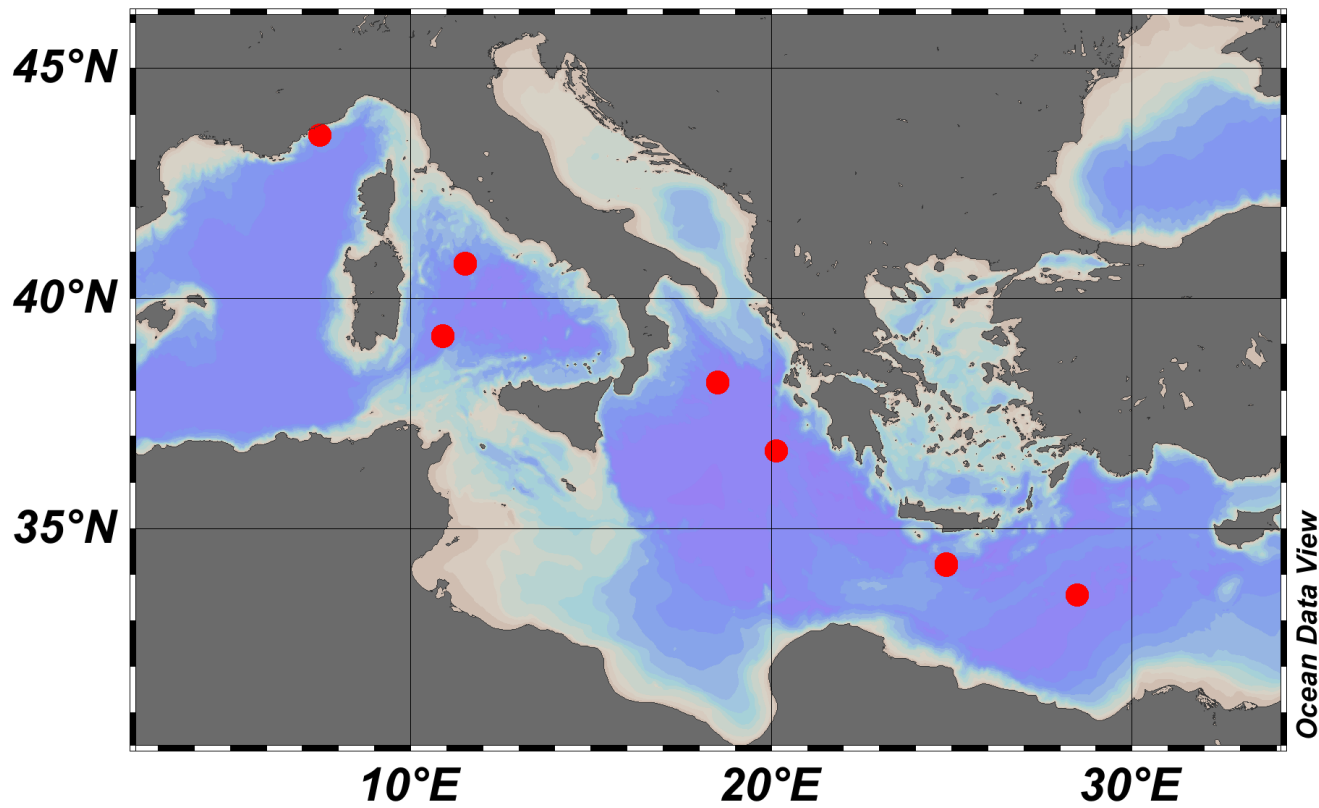


Cruises		
* ALMOFRONT	● METEOR_51_2	+ PACIFIC_CEBES
* BOUM	● METEOR_84_3	+ POEMXXIS
* CARBOGIB	● MILLERO	+ PROSOPE
* CASCADE	● MOOSE_GE_2010	▲ SESAME_IT01
* DEWEX	● MOOSE_GE_2011	▲ SESAME_IT_02
* DYFAMED	● MOOSE_GE_2012	▲ SESAME_IT_04
* GEOSECS_LEG_3	● MOOSE_GE_2013	▲ SESAME_IT_07
* GIFT	● MOOSE_GE_2014	▲ SESAME_SPI
* HOTMIX	● MOOSE_GE_2015	▲ SESAME_SPII
● MCXXIS	● MOOSE_GE_2016	▲ SOMBA
● MEDIPROD IV	● MSM72	▲ TRANSMED_LEGII
● MEDSEA_2013	● OTRANTO	▲ TRANSMED_LEGIII

CANYON-MED (Fourrier in prep.)
Regional version of CANYON



Validation

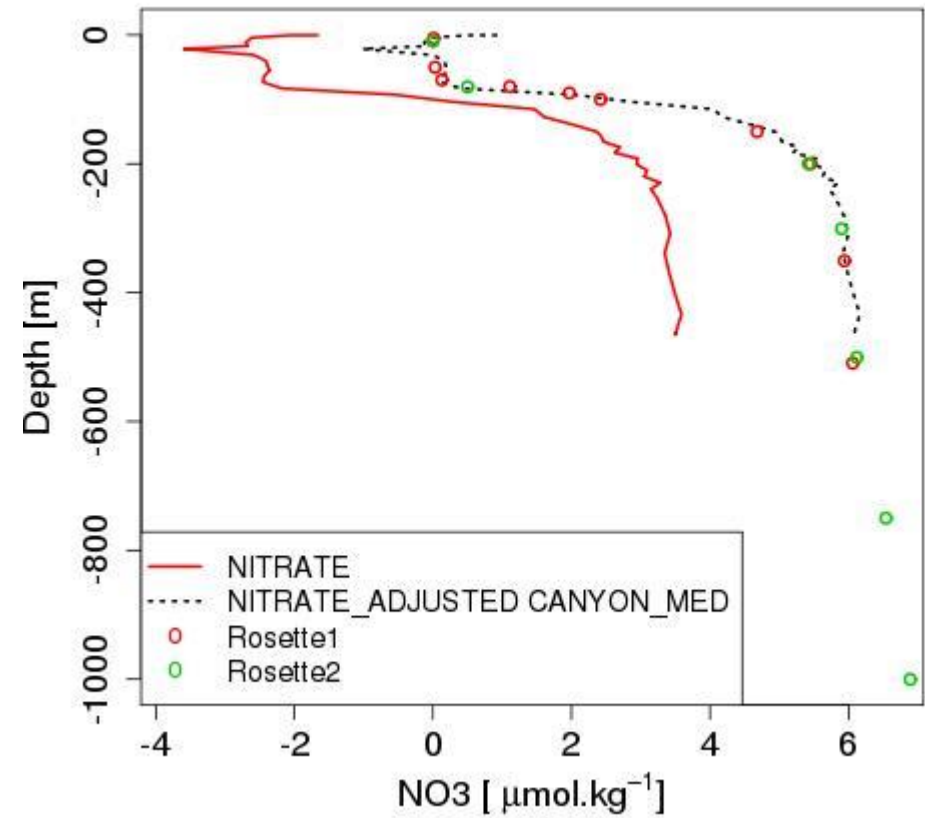
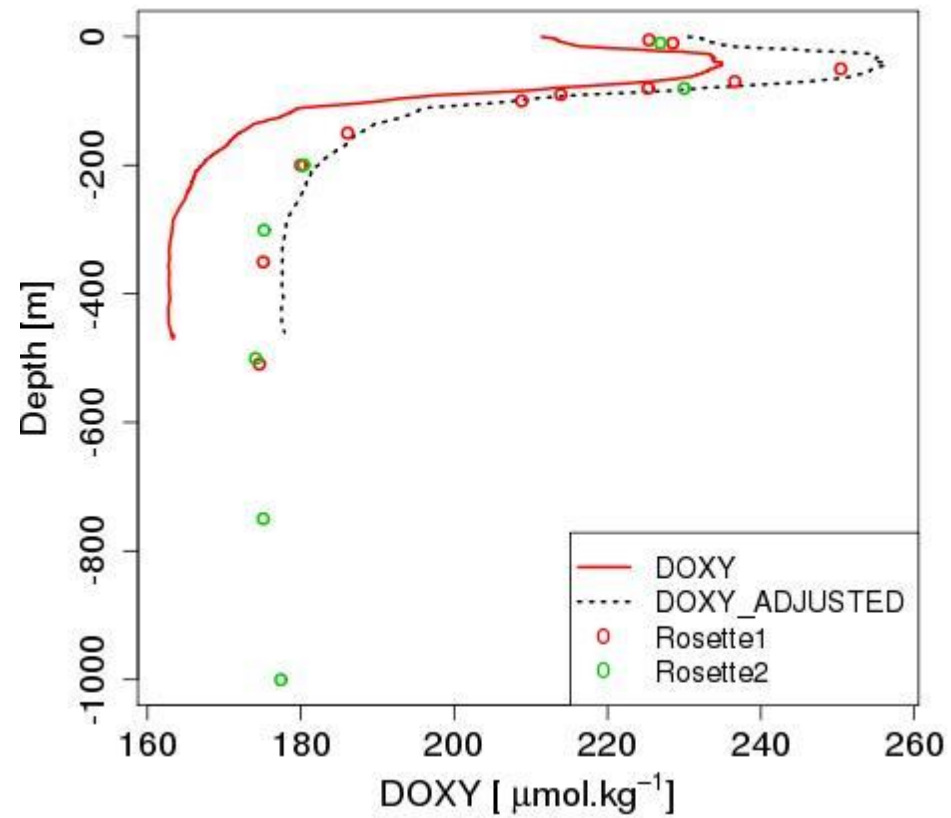


Bioargomed cruise

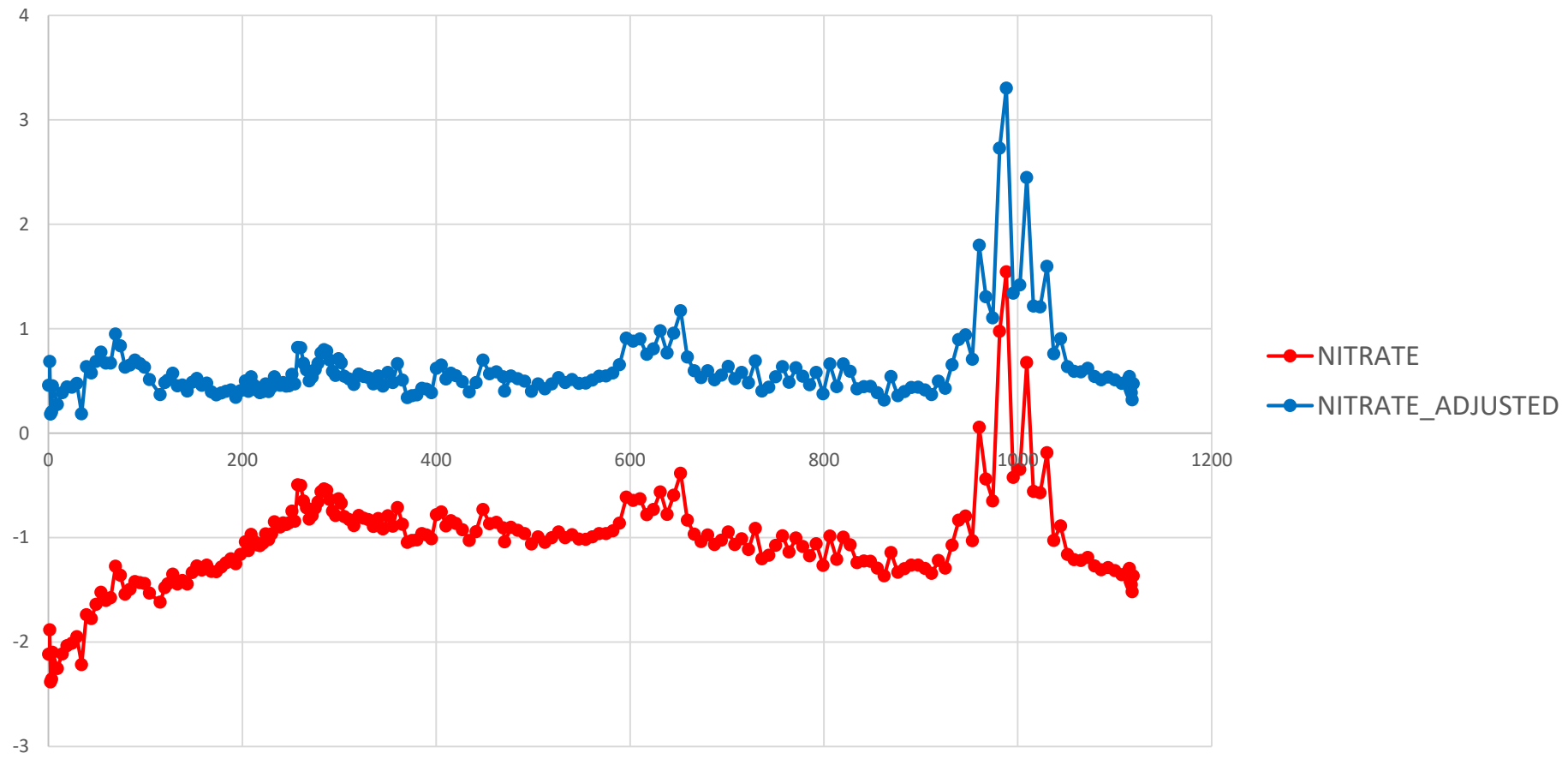
Discrete samples collected during the 14 upcasts performed during the seven stations.

- dissolved oxygen concentration measured by the Winkler method
- concentration of nitrate

<https://doi.org/10.17882/51678>



At Surface



Conclusion

- We perform a RTQC that allows to remove a lot of dubious points
 - We DM ~100 floats in DOXY which allows us to begin reliable DM for NITRATE
 - A regional version of CANYON is available for Mediterranean Sea
- => Ready To DM NITRATE