



EMODnet Thematic Lot n° 4 - Chemistry

Black Sea

Data Collection and Metadata Compilation - nutrients data
Quality control of nutrients data

Luminita Buga - NIMRD
George Sarbu - NIMRD



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1. Introduction

1.1 Black Sea Data Set

The EMODnet dataset for the nutrients in the Black Sea region contains:

- **27694** files in ODV format received from MARIS Harvester Robot
- **1724** files in ODV format received from MHI

The following errors / problems occurred during Black Sea data aggregation:

- Errors at importing in ODV:
 - ODV format (wrong date format, missing QF column, etc)
 - Mismatches between semantic header and header
- Poor quality control:
 - High parameters values (outliers ?)
 - No quality control (QV=0)
 - Same value for all profile
- Duplicates:
 - Cruise with more than one station reported as one CDI
 - Same station(s) reported by 2 partners

1.2 Workflow

Due to the above mentioned problems, to the high number of the contributing data centers and the high variability of the parameters labeling the following workflow was adopted:

1. ROBOT and MHI data set separated into individual data sets for every **EDMO_code**
2. Individual data sets imported into individual ODV collection
3. Detected **ODV import errors** ⇒ errors corrected (in original ODV files)
4. **Duplicates check** for individual EDMO_code ODV collections
 - ⇒ duplicates solved (when possible) (in original ODV files)
 - ⇒ keep records of duplicates for further reporting to data centers
5. Re-import corrected ODV files into ODV individual collections

6. Units check / values check

⇒ detected wrong units ⇒ contact data centers

⇒ detected impossible units ↔ values ⇒ contact data centers

⇒ check for data values = 0 ⇒ contact data center to check if they are missing values or “under detection limit values

7. Export Station Data into individual EDMO_code ODV Spreadsheet files (*only nutrients and silicates variables*) and:

⇒ corrections of units and /or data values (new corrected ODV files send by data centers)

⇒ data center confirmed “0” values as missing ⇒ deleted (QV (*SDN quality flag*) =9)

⇒ QV = 3 ⇒ QV=4

⇒ QV =6 (data ≠ 0, real detection limit) ⇒ QV=1 and keep records of real detection limits

⇒ QV =6 (data =0) ⇒ QV=3

⇒ obvious bad data and/or default data ⇒ QV=4

⇒ **Units conversion in $\mu\text{mol/l}$**

After this step individual ODV Spreadsheet files for every EDMO_code containing only nutrients and silicates data (in $\mu\text{mol/l}$) and with SDN quality flags were available for importing into new Black Sea ODV collection

8. Created New_ODVCF6_Collection (***Black_Sea_collection***) with only nutrients and silicates variables and manually set for every variable QF schema = SEADATANET

10. Imported all individual EDMO_code ODV Spreadsheet files into new ***Black_Sea_collection*** (*when importing the individual EDMO_code ODV Spreadsheet files the original SEADATANET Quality flags are maintained*)

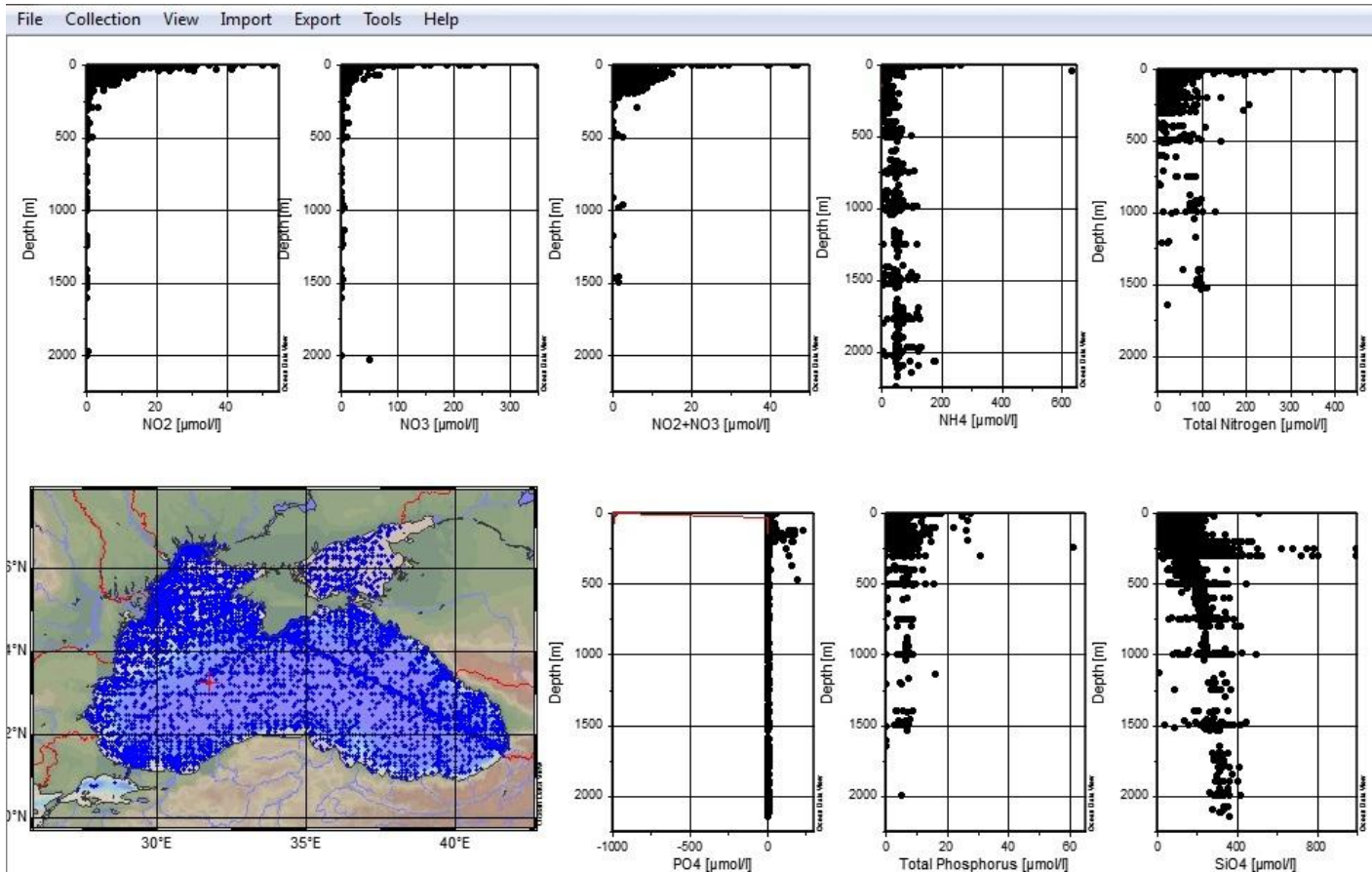
11. Duplicates check for Black_Sea_collection ⇒ duplicates found (Same station(s) reported by 2 partners) ⇒ duplicates report to be send to data centers

1.3 Black Sea aggregated data collection

The *Black_Sea_collection* contains:

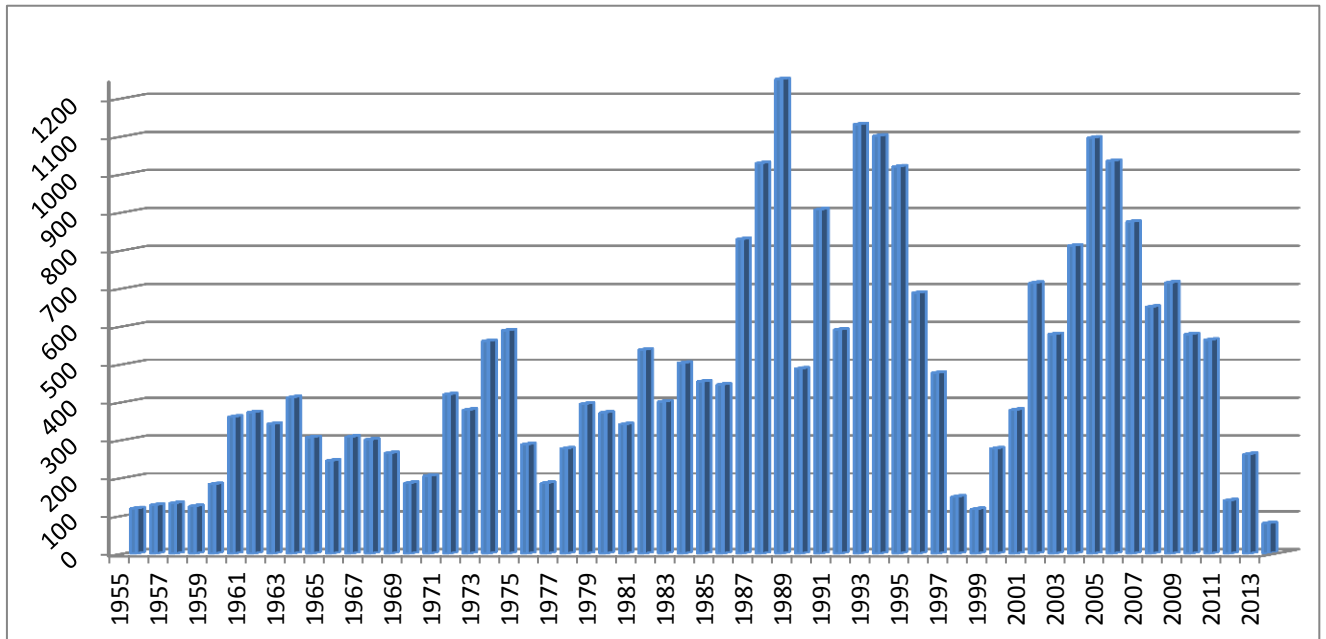
- 28695 stations - vertical profiles

Spatial coverage and plots of variables:



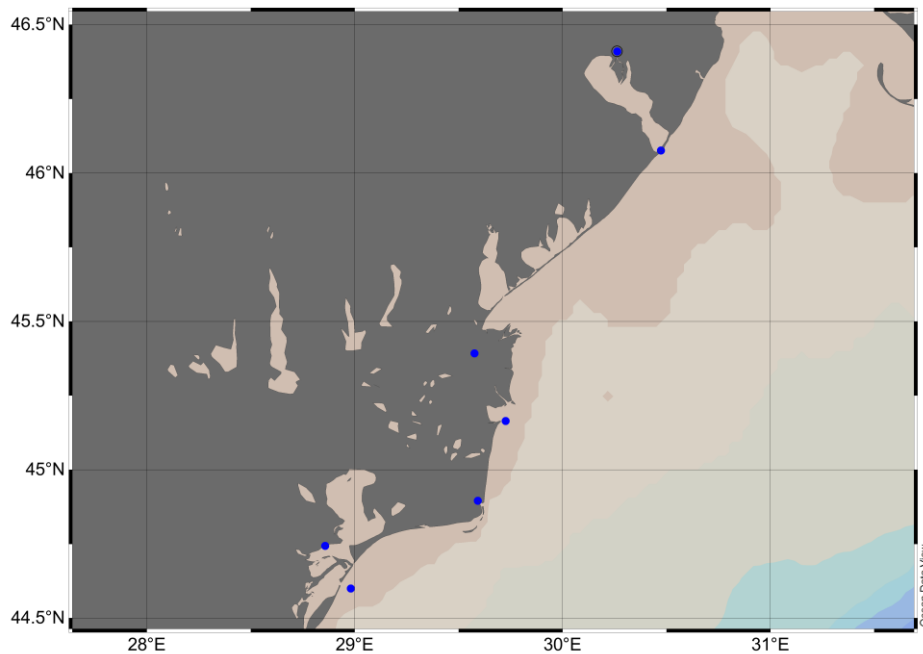
- Pressure, temperature profiles into depth profiles
- Corrections for mismatches between semantic headed – header
- Profiles availability only for nutrients (and silicates) data
- ALL units in $\mu\text{mol/l}$
- **NO** quality control on data
- **NO** (NO₂+NO₃) calculated
- **WITH "0"** for "under detection limit"

Temporal coverage: 1955 - 2013



- *7 stations - time series*

Spatial coverage



Black Sea data contributors

	Name	EDMO_ code	No CDIs	Time Coverage		Depth profiles/ Time Series
1	HCMR	269	4	2007	2007	DP
2	RIHMI-WDC	681	1793	1967	1994	DP
3	SIO-RAS	685	235	1985	2008	DP
4	YugNIRO	688	9650	1955	1996	DP
5	TSU_DNA	693	85	1999	2012	DP
5	IMS-METU	696	1897	1986	2010	DP
7	NIMRD	697	3911	1963	2012	DP
8	SOI (data on SIO-RAS server)	723	4048	2001	2010	DP
9	MHI	727	2356	1955	2011	DP
10	MB-UHMI	841	1933	2003	2010	DP
11	UkrSCES	1167	1582	1983	2000	DP
12	IO-BAS	1843	34	1990	1990	DP
13	IFR	191	50	2002	2003	DP
14	LME_BG	192	697	1987	2006	DP
15	BGODC	692	377	2000	2013	DP
16	Odessa National I.I.Mechnikov University	1169	10	1998	1998	DP
17	Taurida V.I. Vernadsky National University	2227	16	1996	1996	DP
18	Sinop University, Fisheries Faculty	733	17	1999	1999	DP
19	MB-UHMI	841	3	2003	2004	TS
20	DDBRA	2178	4	2008	2010	TS

2. Ammonium data set

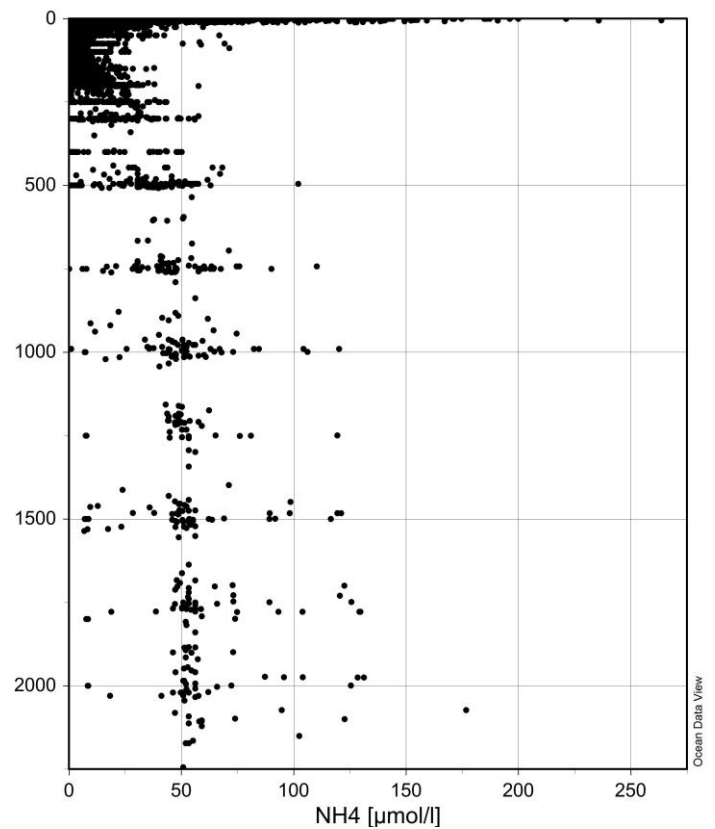
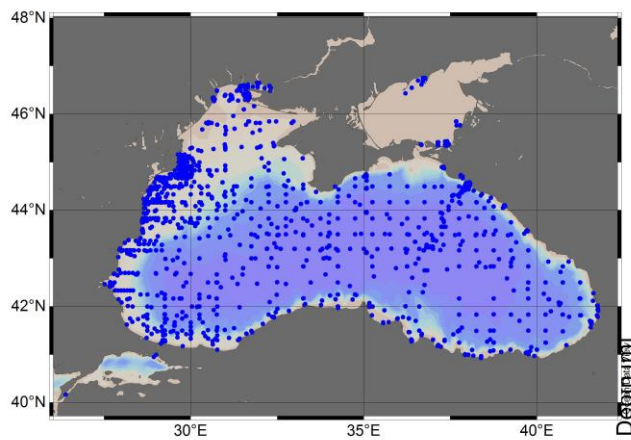
The Ammonium dataset contains the following related parameters:

Parameter label	P01 CODES	P06 units	Units conversion to $\mu\text{mol/l}$	P01 definition
AMON [mol/m^3]	Codes: AMONAAZX:MLM3	mol/m^3	Value * 1000	Concentration of ammonium {NH4} per unit volume of the water body [unknown phase] by colorimetric autoanalysis
AMON [$\sim\text{m}\sim\#\text{mol/l}$]	Codes: AMONAAZX:UPOX, AMONZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of ammonium {NH4} per unit volume of the water body [unknown phase] by colorimetric autoanalysis
				Concentration of ammonium {NH4} per unit volume of the water body [unknown phase]
N_NH4 [mg/l]	Codes: AMONMATX:UMGL	mg/l	Value * 1000/14.0067	Concentration of ammonium {NH4} per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
WC_NH4 [$\sim\text{m}\sim\#\text{mol/l}$]	Codes: AMONMATX:UPOX	$\mu\text{mol/l}$	-	Concentration of ammonium {NH4} per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
AMON [mmol/l]	Codes: AMONZZXX:MMPL	mmol/l	Value * 1000	Concentration of ammonium {NH4} per unit volume of the water body [unknown phase]
Ammonium [mmol/l]	Codes: AMONZZXX:MMPL	mmol/l	Value * 1000	Concentration of ammonium {NH4} per unit volume of the water body [unknown phase]
Ammonia [mmol/l]	Codes: AMONZZXX:MMPL	mmol/l	Value * 1000	Concentration of ammonium {NH4} per unit volume of the water body [unknown phase]
Ammonium [$\sim\text{m}\sim\#\text{g/l}$]	Codes: AMONZZXX:UGPL	$\mu\text{g/l}$	Value/14.0067	Concentration of ammonium {NH4} per unit volume of the water body [unknown phase]
AMON [mg/l]	Codes: AMONZZXX:UMGL	mg/l	Value * 1000/14.0067	Concentration of ammonium {NH4} per unit volume of the water body [unknown phase]
NH4 [$\sim\text{m}\sim\#\text{mol/l}$]	Codes: AMONZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of ammonium {NH4} per unit volume of the water body [unknown phase]

Ammonium (N-NH₄) data set contains:

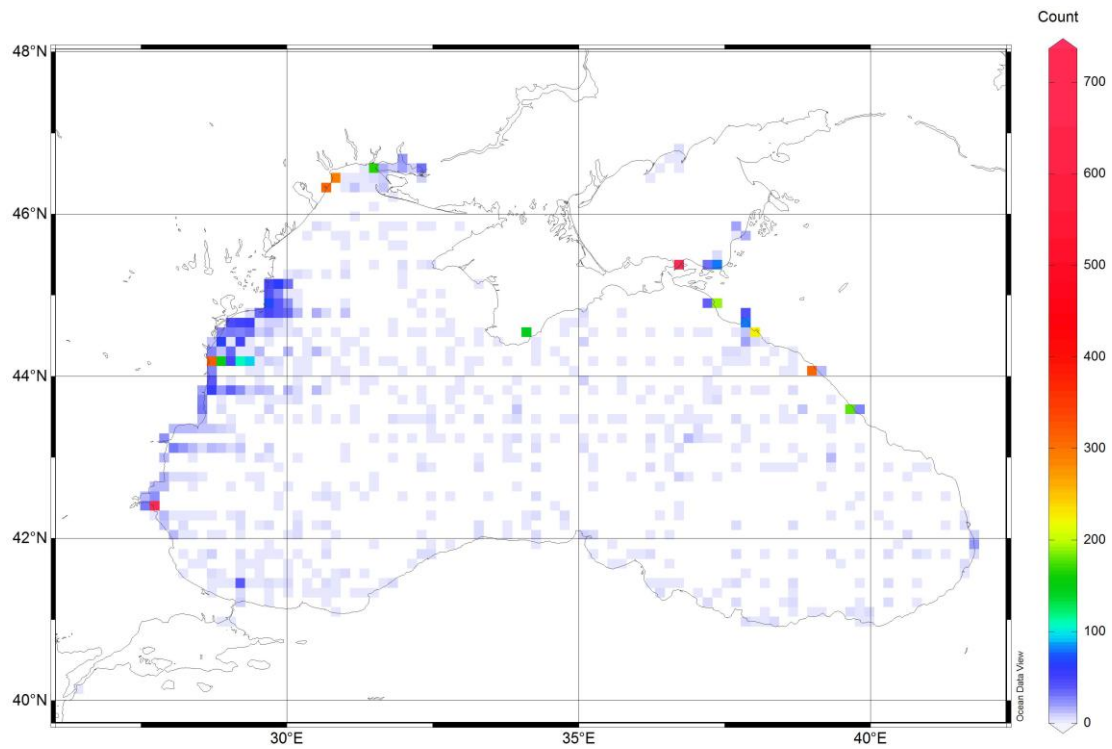
- Total depth profiles (stations): 7166
- Total measurements: 25742 from which:
 - 23193 data ≠ 0
 - 2549 data = 0

Spatial coverage and plot of Ammonium data set

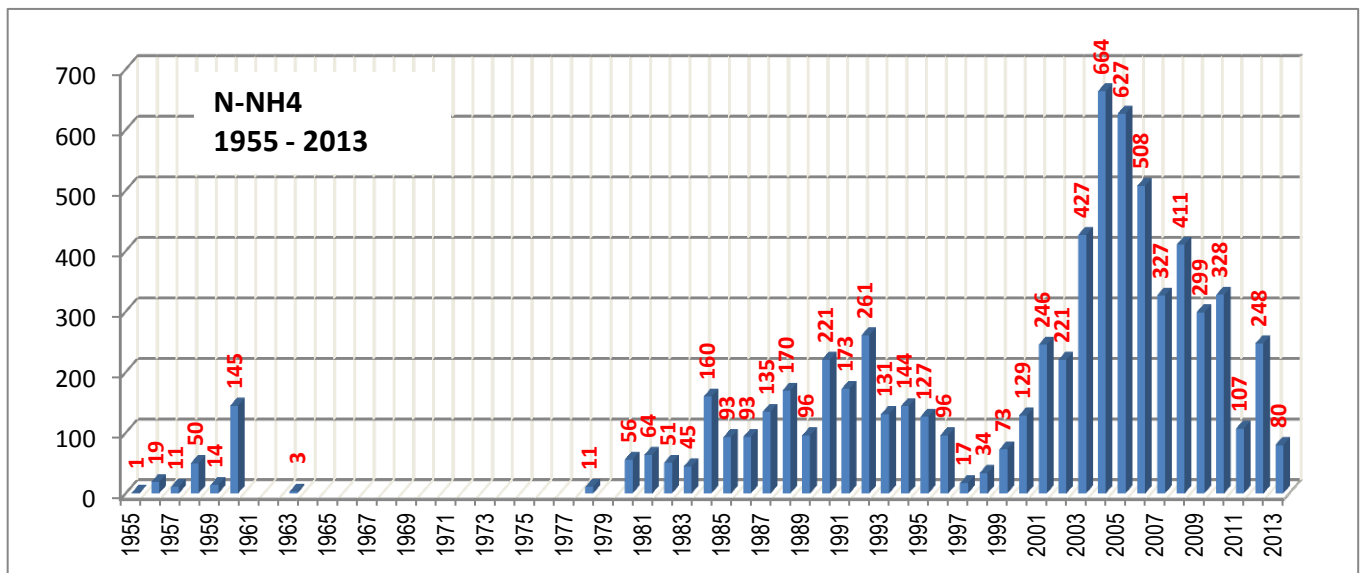


Data with QV (SEADATANET) = 0, 1, 2
Excluded data with QV=4
"0" values with QV=3

N-NH₄ Stations density distribution



N-NH₄ Temporal coverage / number of profiles per year



3. Silicates data set

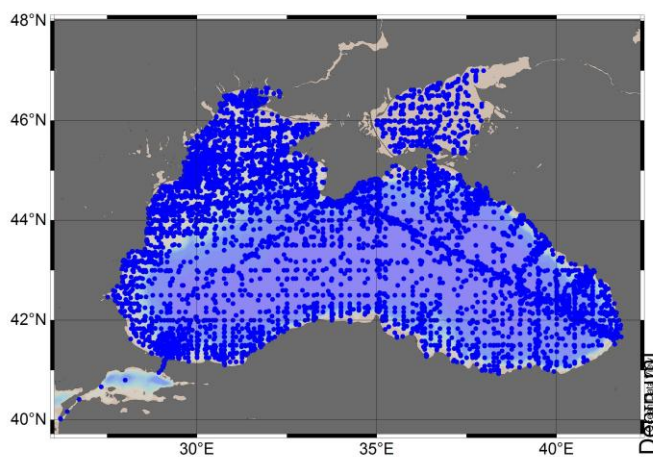
The Ammonium dataset contains the following related parameters:

Parameter label	P01 CODES	P06 units	Units conversion to $\mu\text{mol/l}$	P01 definition
Si [mg/l]	Codes: SLCAMATX:UMGL	mg/l	Value* 1000/28.08550	Concentration of silicate {SiO ₄ } per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
WC_SiO ₄ [~\$m~#mol/l]	Codes: SLCAMATX:UPOX	$\mu\text{mol/l}$	-	Concentration of silicate {SiO ₄ } per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
SLCA [~\$m~#mol/l]	Codes: SLCAMAZX:UPOX, SLCAZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of silicate {SiO ₄ } per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
				Concentration of silicate {SiO ₄ } per unit volume of the water body [unknown phase]
SLCA [mm/l]	Codes: SLCAZZXX:MMPL	mmol/l	Value * 1000	Concentration of silicate {SiO ₄ } per unit volume of the water body [unknown phase]
Silicate [mm/l]	Codes: SLCAZZXX:MMPL	mmol/l	Value * 1000	Concentration of silicate {SiO ₄ } per unit volume of the water body [unknown phase]
Silicate [~\$m~#g/l]	Codes: SLCAZZXX:UGPL	mg/l	Value /28.0855	Concentration of silicate {SiO ₄ } per unit volume of the water body [unknown phase]
SIO ₃ [~\$m~#mol/l]	Codes: SLCAZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of silicate {SiO ₄ } per unit volume of the water body [unknown phase]
SI [~\$m~#mol/l]	Codes: SLCAZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of silicate {SiO ₄ } per unit volume of the water body [unknown phase]

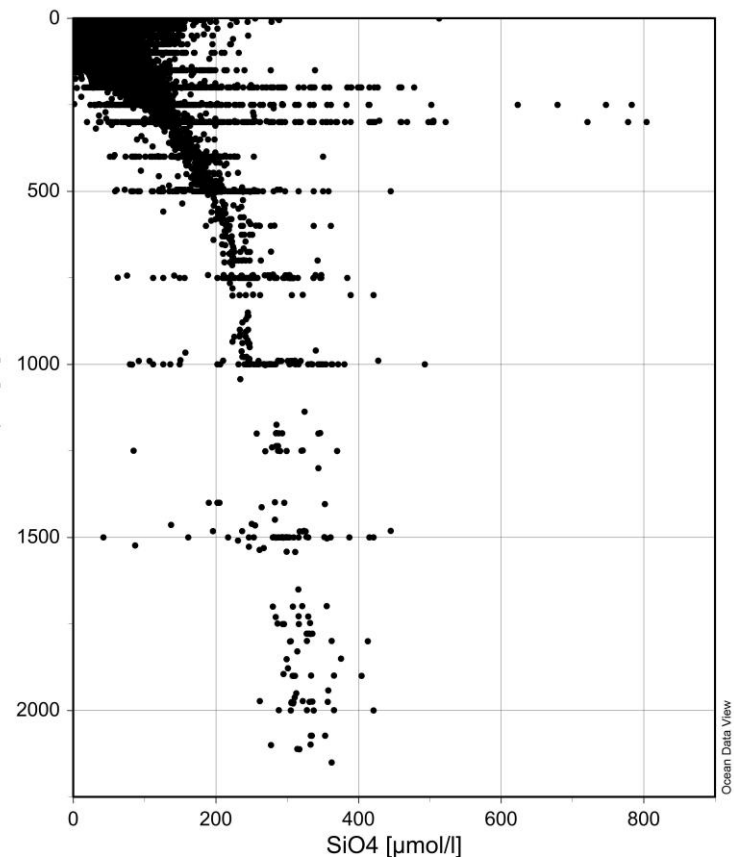
Silicates (S-SiO₄) data set contains:

- Total depth profiles (stations): **19146**
- Total measurements: **109326** from which:
 - 108026 data \neq 0
 - 1300 data = 0

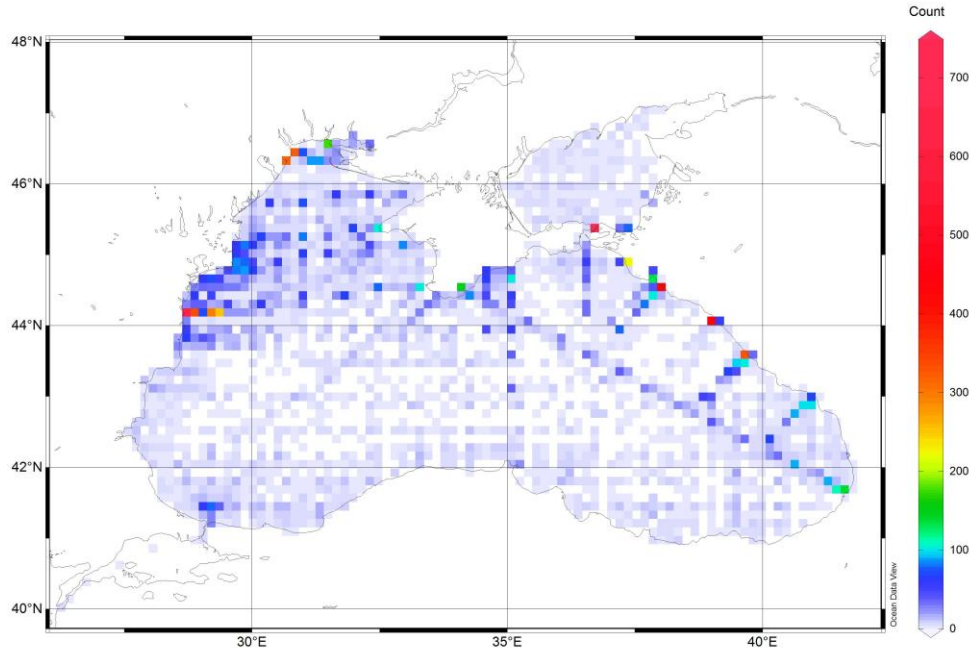
Spatial coverage and plot of Silicates data set



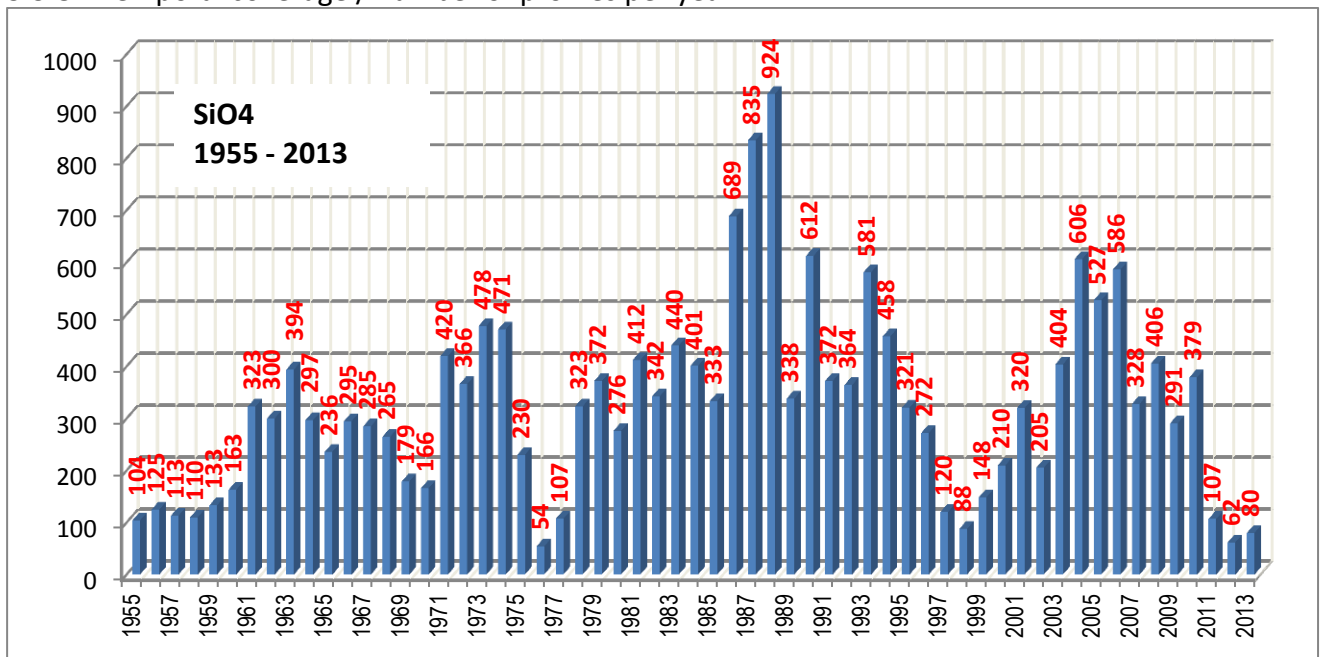
Data with QV=0, 1, 2
Excluded data with QV=4
"0" values with QV=3



S-SiO₄ Stations density distribution



S-SiO₄ Temporal coverage / number of profiles per year



4. Phosphates data set

The Ammonium dataset contains the following related parameters:

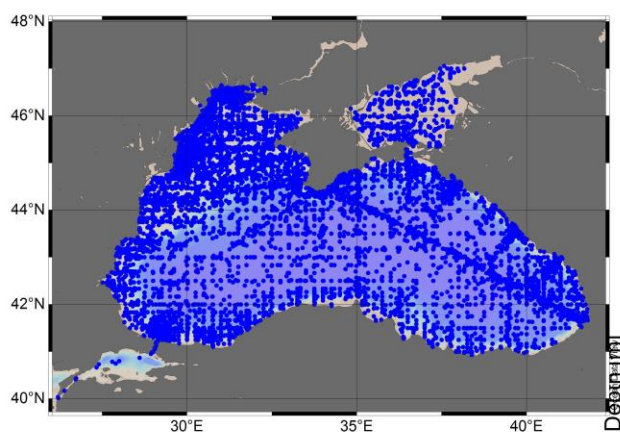
Parameter label	P01 CODES	P06 units	Units conversion to $\mu\text{mol/l}$	P01 definition
PO4 [~\$m~#mol/kg]	Codes: MDMAP906:KGUM	$\mu\text{mol/kg}$	Value * 1	Concentration of phosphate {PO4} per unit mass of the water body [unknown phase]
PHOS0 [~\$m~#mol/l]	Codes: PHOSAADZ:UPOX	$\mu\text{mol/l}$	-	Concentration of phosphate {PO4} per unit volume of the water body dissolved plus reactive particulate <unknown phase> by filtration and colorimetric autoanalysis
PHOS1 [~\$m~#mol/l]	Codes: PHOSAAZX:UPOX	$\mu\text{mol/l}$	-	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase] by colorimetric autoanalysis
PHOS2 [~\$m~#mol/l]	Codes: PHOSZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]
PHOS [~\$m~#mol/l]	Codes: PHOSAAZX:UPOX, PHOSZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase] by colorimetric autoanalysis
				Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]
P_PO4 [mg/l]	Codes: PHOSMATX:UMGL	mg/l	Value * 1000/30.97376	Concentration of phosphate {PO4} per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
WC_PO4 [~\$m~#mol/l]	Codes: PHOSMATX:UPOX	$\mu\text{mol/l}$	-	Concentration of phosphate {PO4} per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
PO4 [~\$m~#mol/l]	Codes: PHOSMAZX:UPOX, PHOSZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase] by manual colorimetric analysis
				Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]
Phosphate [~\$m~#mol/kg]	Codes: PHOSZZXX:KGUM	$\mu\text{mol/kg}$	Value * 1	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]

PHOS [mm/l]	Codes: PHOSZZXX:MMPL	mmol/l	Value * 1000	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]
Phosphate [mm/l]	Codes: PHOSZZXX:MMPL	mmol/l	Value * 1000	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]
Phosphate [~\$m~#g/l]	Codes: PHOSZZXX:UGPL	µg/l	Value/30.97376	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]
PHOS [ug/l]	Codes: PHOSZZXX:UPGL	µg/l	Value/30.97376	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]
Phosphates [~\$m~#mol/l]	Codes: PHOSZZXX:UPOX	µmol/l	-	Concentration of phosphate {PO4} per unit volume of the water body [unknown phase]

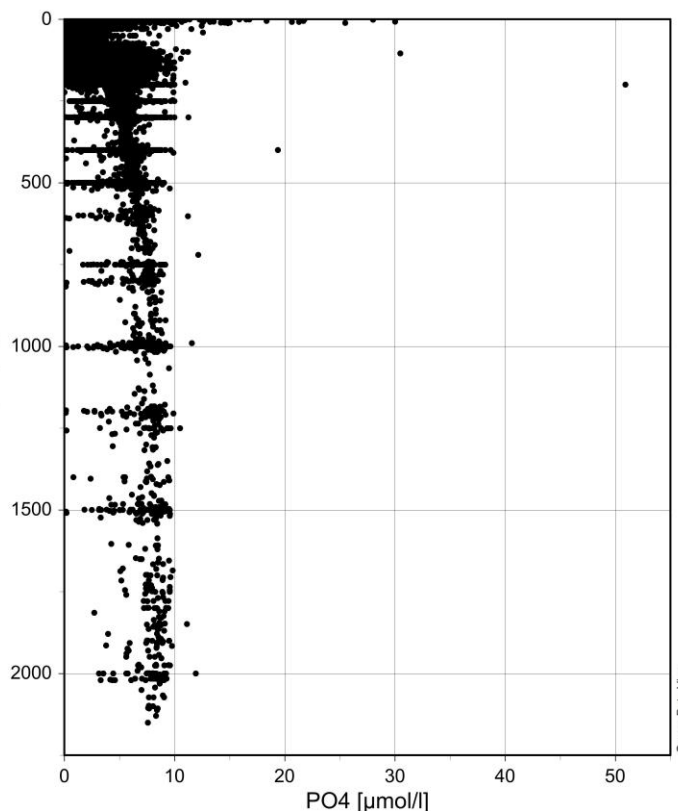
Phosphates (P-PO4) data set contains:

- Total depth profiles (stations): **23387**
- Total measurements: **135391** from which:
 - 126318 data ≠ 0
 - 9073 data = 0

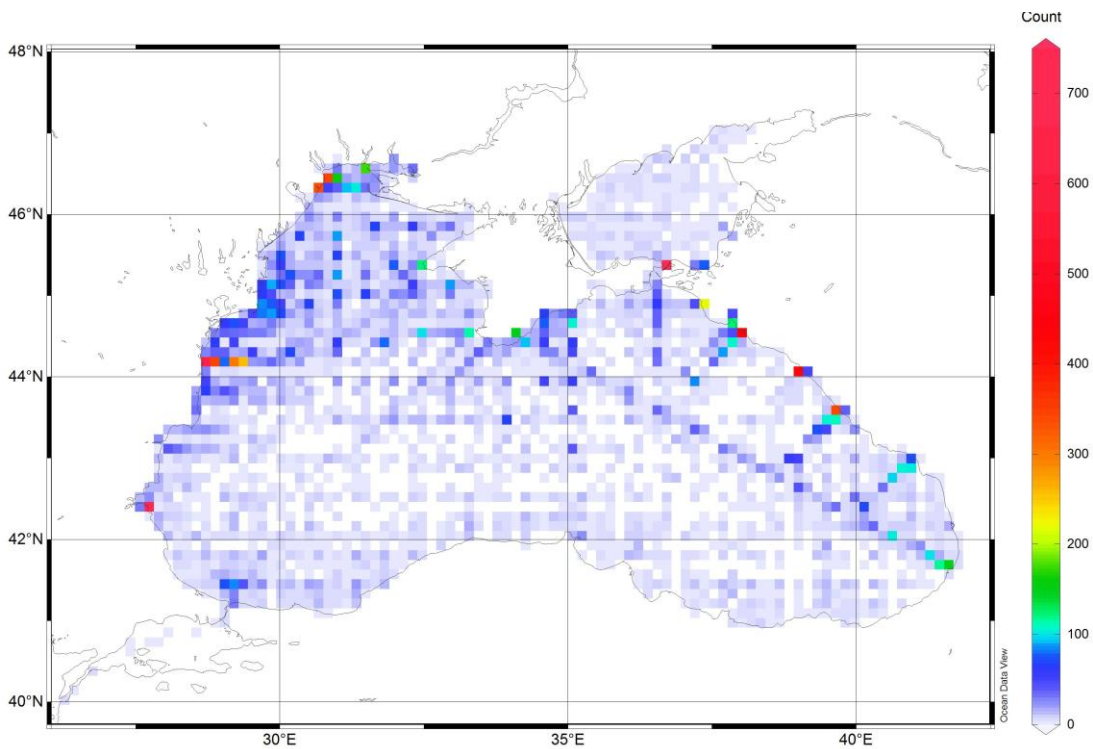
Spatial coverage and plot of Phosphates data set



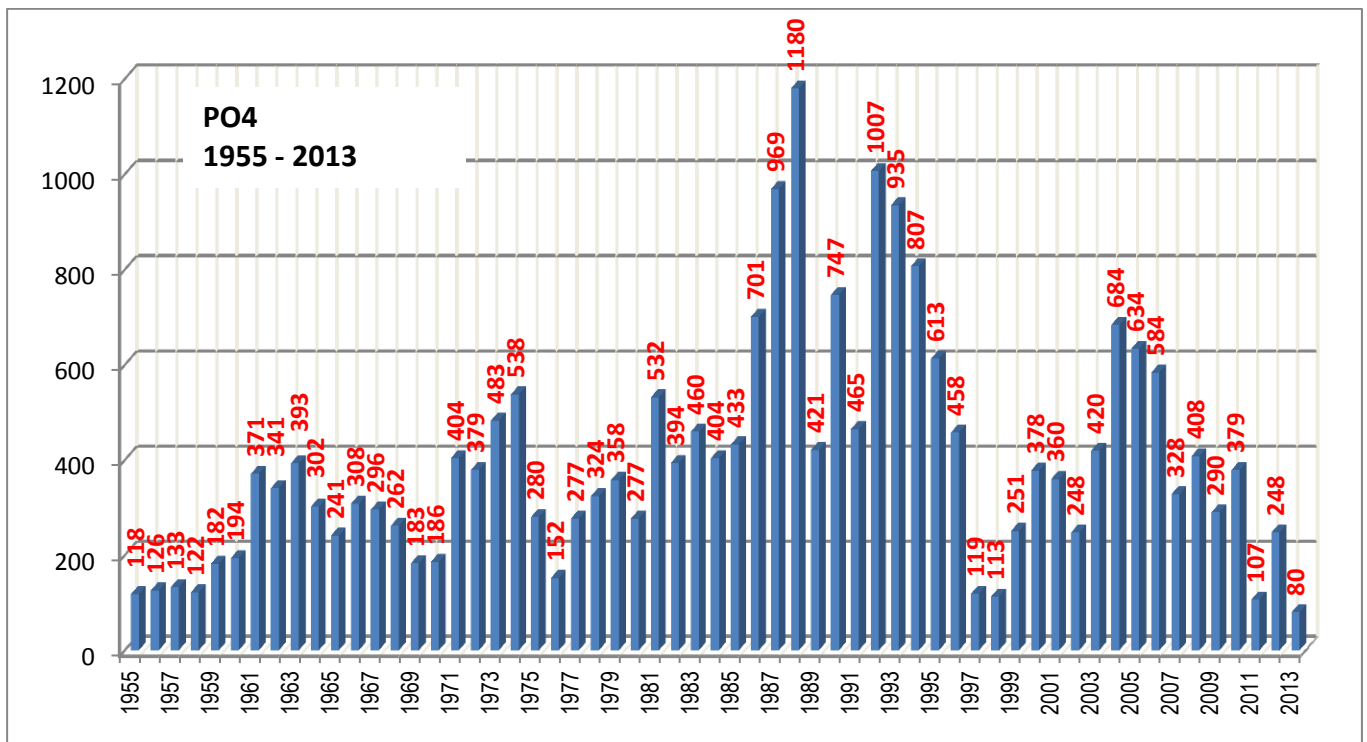
Data with QV=0, 1, 2
Excluded data with QV=4
"0" values with QV=3



P-PO4 Stations density distribution



P-PO4 Temporal coverage / number of profiles per year



5. Nitrites data set

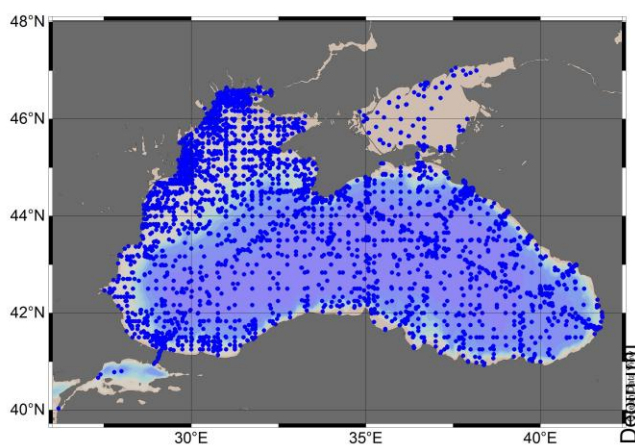
The Nitrites dataset contains the following related parameters:

Parameter label	P01 CODES	P06 units	Units conversion to $\mu\text{mol/l}$	P01 definition
N_NO2 [mg/l]	Codes: NTRIMATX:UMGL	mg/l	Value * 1000/14.0067	Concentration of nitrite {NO ₂ } per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
WC_NO2 [~\$m~#mol/l]	Codes: NTRIMATX:UPOX	$\mu\text{mol/l}$	-	Concentration of nitrite {NO ₂ } per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
Nitrite [mmol/l]	Codes: NTRIZZXX:MMPL	mmol/l	Value * 1000	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase]
Nitrites [mmol/l]	Codes: NTRIZZXX:MMPL	mmol/l	Value * 1000	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase]
NTRI [mmol/l]	Codes: NTRIZZXX:MMPL, MDMAP007:MMPL	mmol/l	Value * 1000	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase] Concentration of nitrite {NO ₂ } per unit mass of the water body [unknown phase]
Nitrite [~\$m~#g/l]	Codes: NTRIZZXX:UGPL	$\mu\text{g/l}$	Value/14.0067	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase]
NTRI [mg/l]	Codes: NTRIZZXX:UMGL	mg/l	Value * 1000/14.0067	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase]
NTRI [~\$m~#mol/l]	Codes: NTRIZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase]
NO2 [~\$m~#mol/l]	Codes: NTRIZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase]
Nitrite [~\$m~#mol/l]	Codes: NTRIZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase]
NTRI [$\mu\text{g/l}$]	Codes: NTRIZZXX:UPGL	$\mu\text{g/l}$	Value/14.0067	Concentration of nitrite {NO ₂ } per unit volume of the water body [unknown phase]

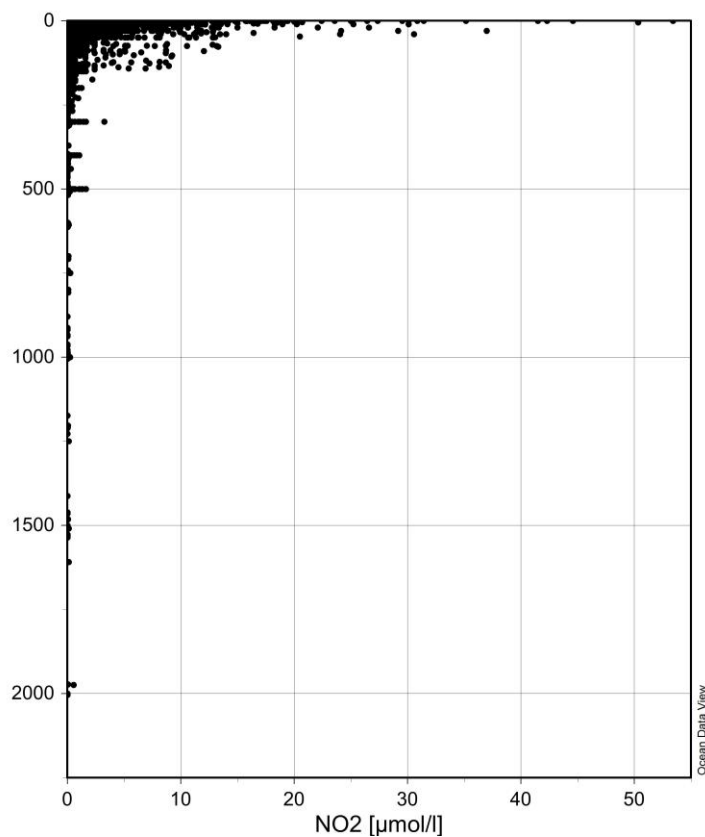
Nitrites (N-NO₂) data set contains:

- Total depth profiles (stations): **12128**
- Total measurements: **53032** from which:
 - 40134 data ≠ 0
 - 12898 data = 0

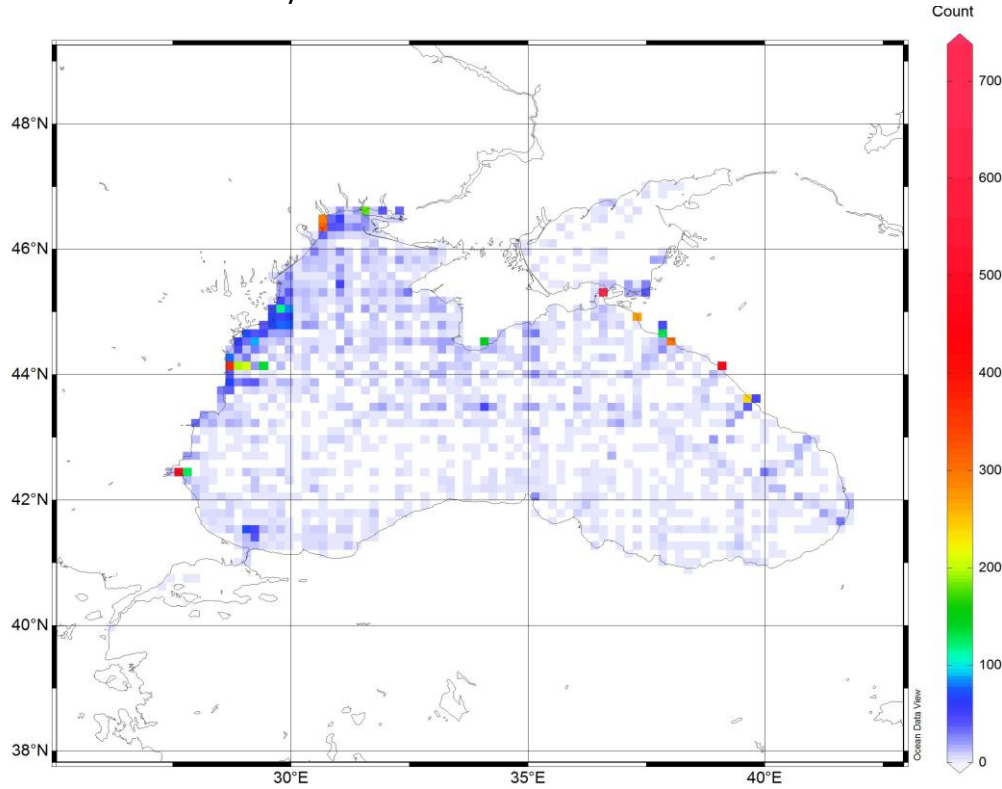
Spatial coverage and plot of Nitrites data set



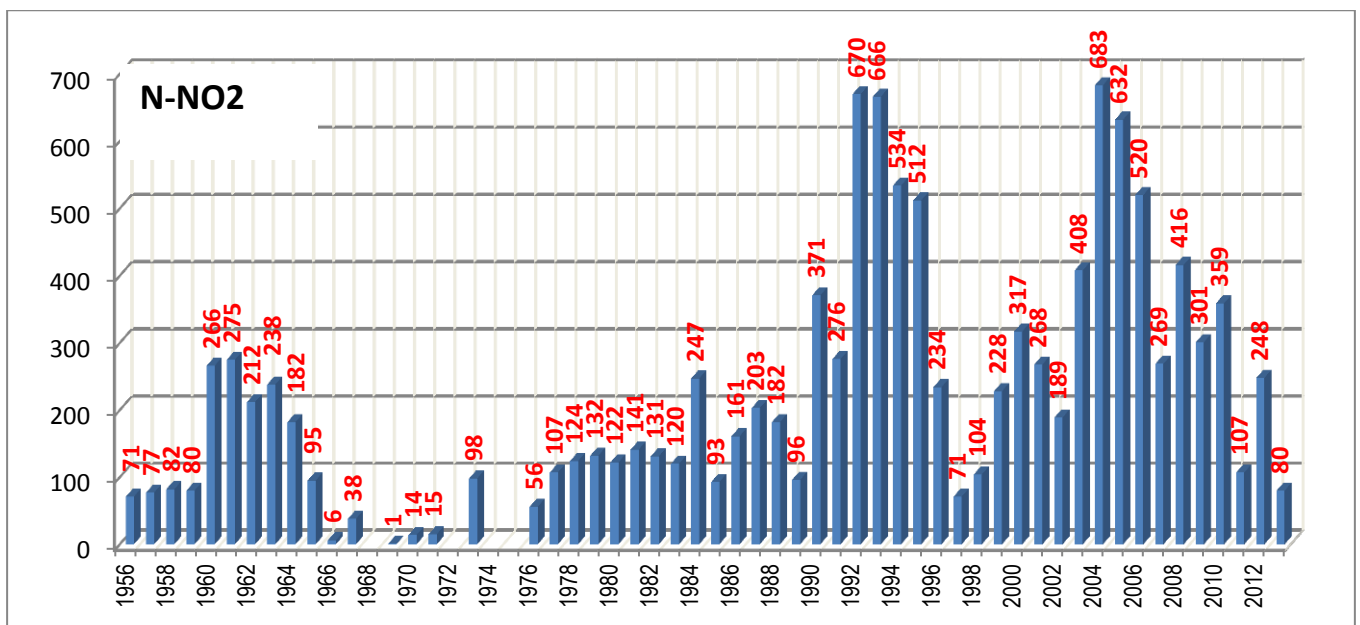
Data with QV=0, 1, 2
Excluded data with QV=4
"0" values with QV=3



N-NO₂ Stations density distribution



N-NO₂ Temporal coverage / number of profiles per year



6. Nitrates data set

The Nitrites dataset contains the following related parameters:

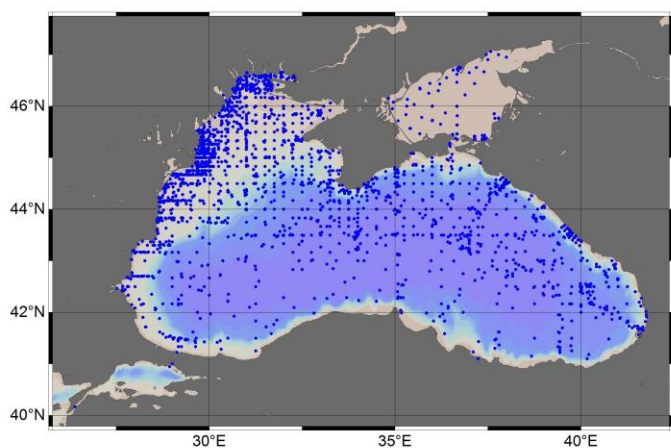
Parameter label	P01 CODES	P06 units	Units conversion to $\mu\text{mol/l}$	P01 definition
NTRA [mol/m ³]	Codes: CHEMM012:MLM3	mol/m ³	Value *1000	Concentration of nitrate {NO ₃ } (NOT nitrate+nitrite) per unit volume of the water body [dissolved plus reactive particulate phase] by colorimetric autoanalysis and correction for nitrite
N_NO3 [mg/l]	Codes: NTRAYDZ:UMGL	mg/l	Value * 1000/14.0067	Concentration of nitrate {NO ₃ } per unit volume of the water body [dissolved plus reactive particulate phase]
Nitrate [~\$m~#mol/kg]	Codes: NTRAZZXX:KGUM	$\mu\text{mol/kg}$	Value	Concentration of nitrate {NO ₃ } per unit volume of the water body [unknown phase]
Nitrate [mm/l]	Codes: NTRAZZXX:MMPL	mmol/l	Value *1000	Concentration of nitrate {NO ₃ } per unit volume of the water body [unknown phase]
Nitrates [mm/l]	Codes: NTRAZZXX:MMPL	mmol/l	Value *1000	Concentration of nitrate {NO ₃ } per unit volume of the water body [unknown phase]
NTRA [mm/l]	Codes: NTRAZZXX:MMPL, MDMAP005:MMPL	mmol/l	Value *1000	Concentration of nitrate {NO ₃ } per unit volume of the water body [unknown phase]
				Concentration of nitrate {NO ₃ } per unit mass of the water body [unknown phase]
Nitrate [~\$m~#g/l]	Codes: NTRAZZXX:UGPL	$\mu\text{g/l}$	Value /14.0067	Concentration of nitrate {NO ₃ } per unit volume of the water body [unknown phase]
NTRA [mg/l]	Codes: NTRAZZXX:UMGL	mg/l	Value * 1000/14.0067	Concentration of nitrate {NO ₃ } per unit volume of the water body [unknown phase]
NTRA [$\mu\text{g/l}$]	Codes: NTRAZZXX:UPGL	$\mu\text{g/l}$	Value /14.0067	Concentration of nitrate {NO ₃ } per unit volume of the water body [unknown phase]
NTRA [~\$m~#mol/l]	Codes: NTRAZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of nitrate {NO ₃ } per unit volume of the water body [unknown phase]

NO3 [$\mu\text{mol/l}$]	Codes: NTRAZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of nitrate {NO3} per unit volume of the water body [unknown phase]
Nitrates [$\mu\text{mol/l}$]	Codes: NTRAZZXX:UPOX	$\mu\text{mol/l}$	-	Concentration of nitrate {NO3} per unit volume of the water body [unknown phase]
WC_NO3 [$\mu\text{mol/l}$]	Codes: NTRZMATX:UPOX, NTRAMADZ:UPOX	$\mu\text{mol/l}$	-	Concentration of nitrate+nitrite {NO3+NO2} per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
				Concentration of nitrate {NO3} per unit volume of the water body [dissolved plus reactive particulate <unknown phase] by filtration and manual colorimetric analysis and correction for nitrite

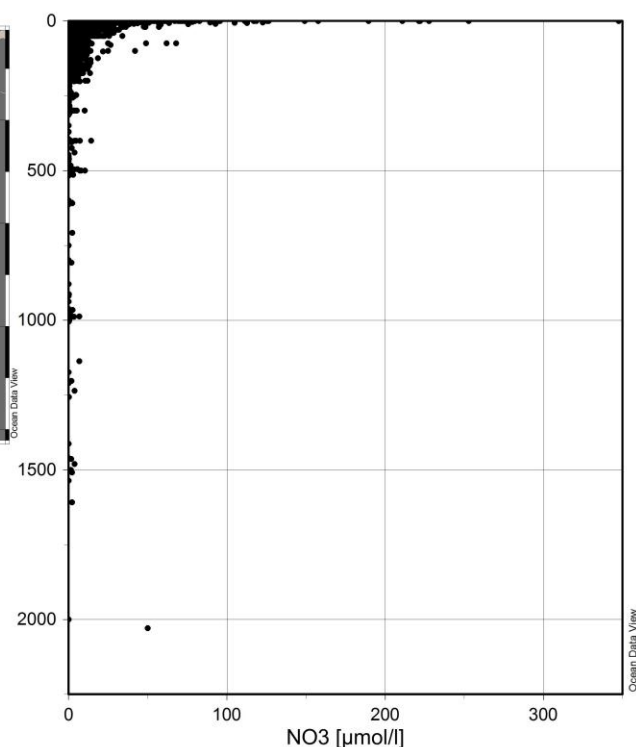
Nitrites (N-NO₂) data set contains:

- Total depth profiles (stations): **8771**
- Total measurements: **37996** from which:
 - 31775 data \neq 0
 - 6241 data = 0

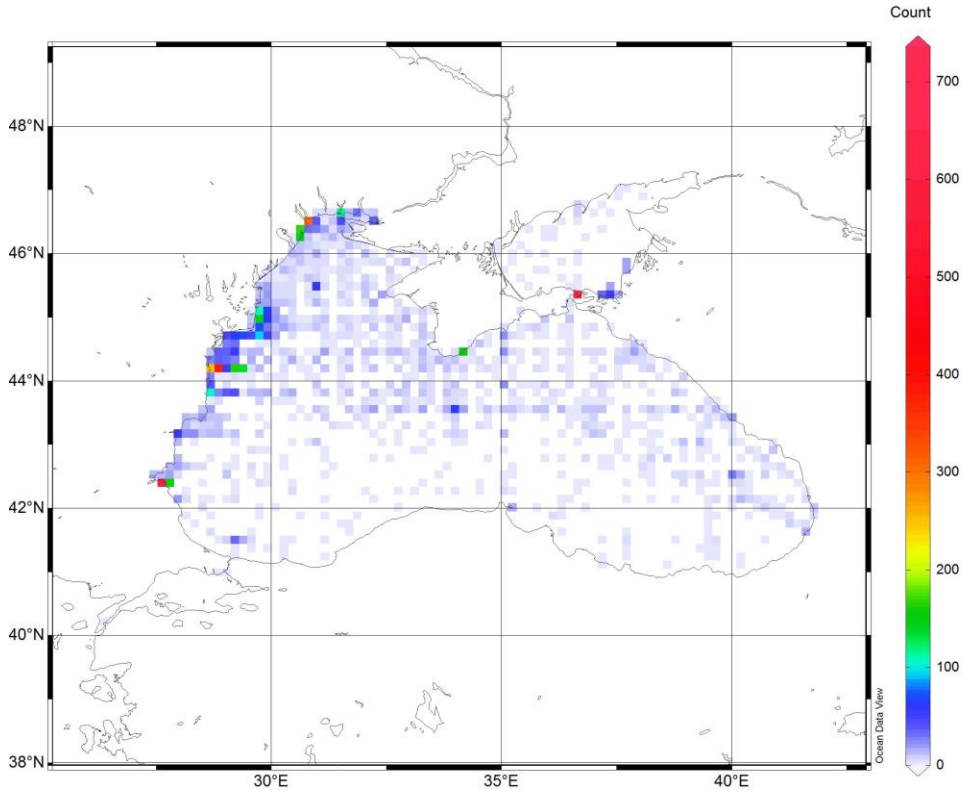
Spatial coverage and plot of Nitrites data set



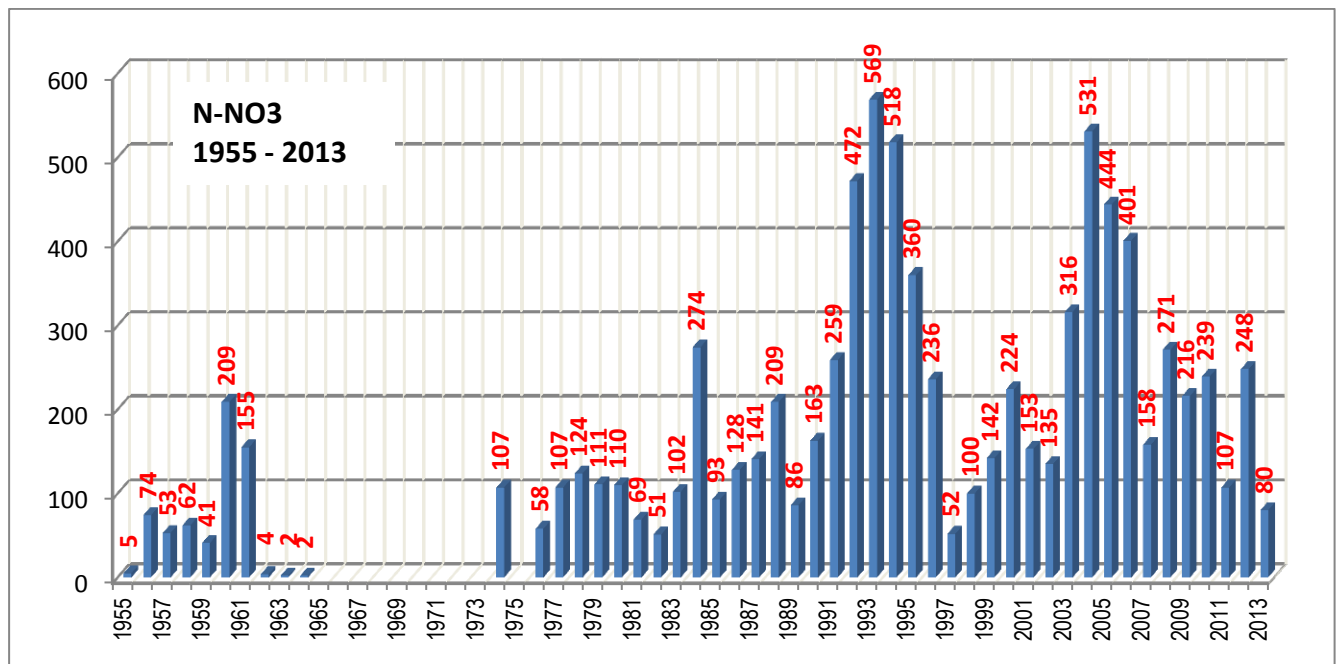
Data with QV=0, 1, 2
Excluded data with QV=4
"0" values with QV=3



N-NO3 Stations density distribution



N-NO2 Temporal coverage / number of profiles per year



7. Nitrate + Nitrite (NO_x) data set

The original EMODnet dataset for the nutrients in the Black Sea (NO₃+NO₂) data with the following related parameters:

Parameter label	P01 CODES	P06 units	Units conversion to µmol/l	P01 definition
WC_NO3 [µmol/l]	Codes: NTRZMATX:UPOX, NTRAMADZ:UPOX	µmol/l	-	Concentration of nitrate+nitrite {NO ₃ +NO ₂ } per unit volume of the water body [dissolved plus reactive particulate phase] by manual colorimetric analysis
				Concentration of nitrate {NO ₃ } per unit volume of the water body [dissolved plus reactive particulate <unknown phase] by filtration and manual colorimetric analysis and correction for nitrite
Nitrate+nitrite [mmol/l]	Codes: NTRZZZXX:MMPL	mmol/l	Value * 1000	Concentration of nitrate+nitrite {NO ₃ +NO ₂ } per unit volume of the water body [unknown phase]
Nitrogen [mmol/l]	Codes: NTRZZZXX:MMPL	mmol/l	Value *1000	Concentration of nitrate+nitrite {NO ₃ +NO ₂ } per unit volume of the water body [unknown phase]
NTRZ [µmol/l]	Codes: NTRZZZXX:UPOX	µmol/l	-	Concentration of nitrate+nitrite {NO ₃ +NO ₂ } per unit volume of the water body [unknown phase]
NO ₃ _NO ₂ [µmol/l]	Codes: NTRZZZXX:UPOX	µmol/l	-	Concentration of nitrate+nitrite {NO ₃ +NO ₂ } per unit volume of the water body [unknown phase]

Because the final product will deal with NO_x (NO₂_NO₃) the following steps were done:

1. From the ODV *Black_Sea_collection* ⇒ Export Station Data into ODV Spreadsheet files only NO₂, NO₃ and (NO₃+NO₂) (in µmol/l)
2. Calculation of NO_x (NO₂_NO₃) as following:

If [NO₃ (QV= 1 or QV=2) and NO₂ (QV=1 or QV=2 or QV=3 or QV=9)]
then calculate NO_x=NO₂+NO₃
else “null value”

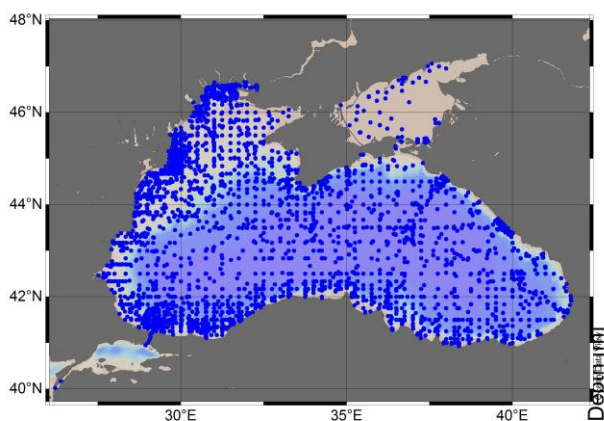
3. For calculated NO_x ≠ 'null value' ⇒ QV=1
4. For calculated NO_x = "null value" ⇒ QV=9
5. If NO₂, NO₃ and (NO₃+NO₂) were provided in the same time then comparison between (NO₃+NO₂) and calculated NO_x as following:

If [(NO₃+NO₂) >0 and (QV=1 or QV=2)] and [(NO₃+NO₂) ≠ *calculated NO_x*]
then keep (NO₃+NO₂) for final product
else keep calculated NO_x for final product

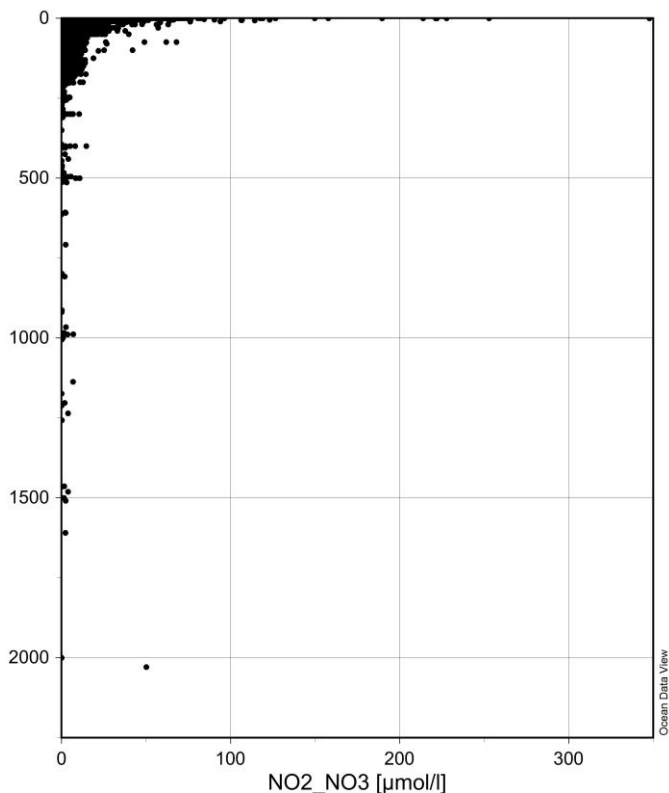
Final NO_x data set contains:

- Total depth profiles (stations): **9506**
- Total measurements: **47157** from which:
 - 47157 data ≠ 0
 - 0 data = 0

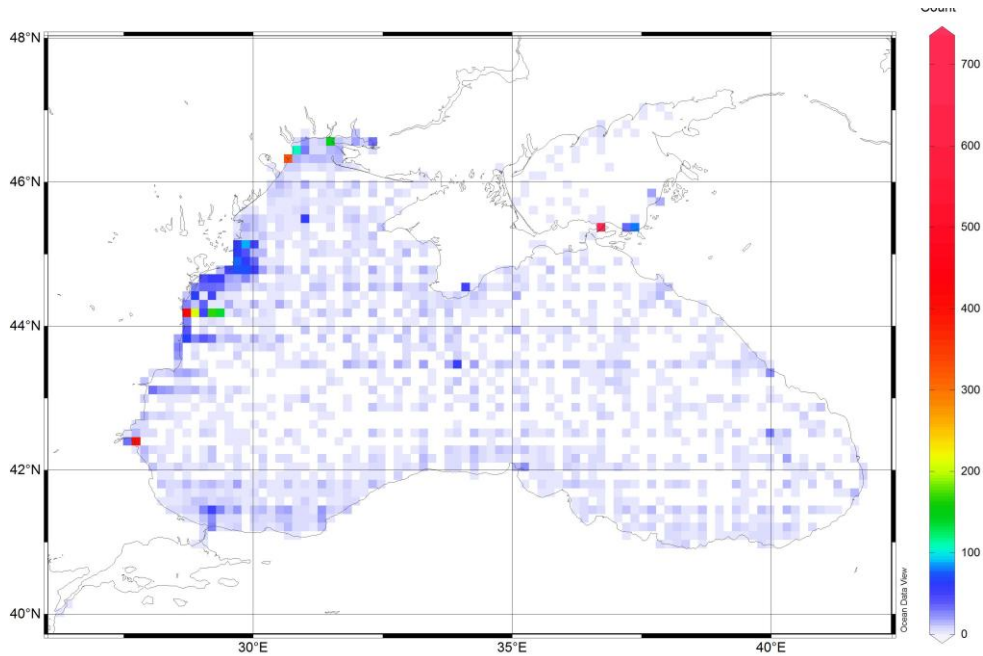
Spatial coverage and plot of NO_x (NO₂_NO₃) data set



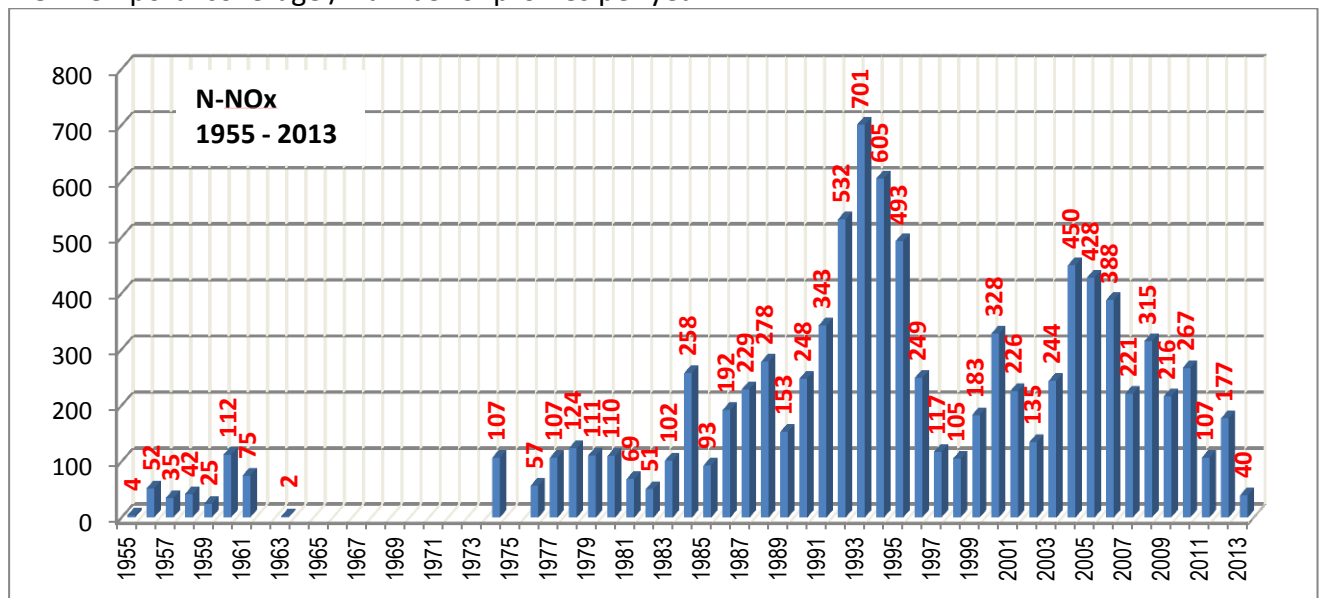
Aggregated NO_x (NO₃ & calculated NO_x)
Data with QV=0, 1, 2 (NO₃)
Data with QV=1 (NO_x)
"0" values with QV=3 (NO₃)



NOx Stations density distribution



NOx Temporal coverage / number of profiles per year

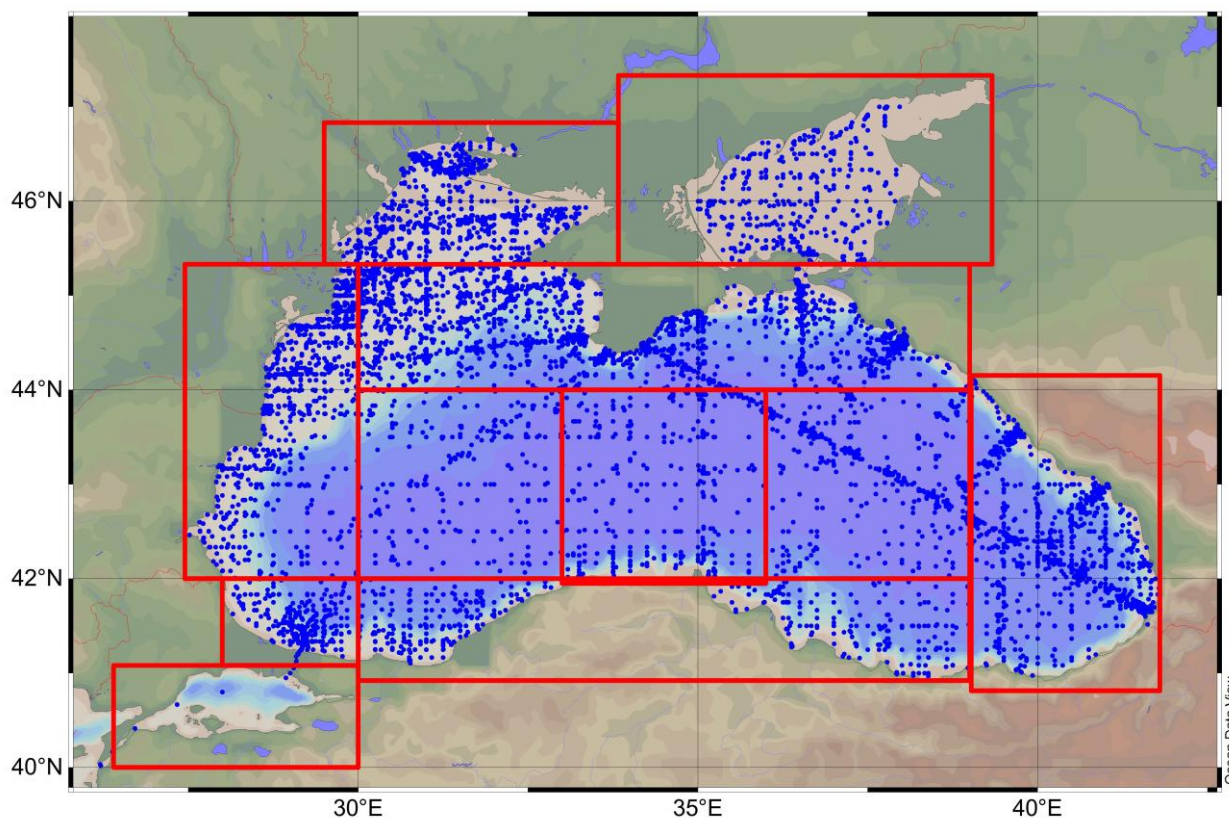


8. Nutrients data Quality Control

After the second MARIS ROBOT harvesting for nutrients data sets, the new data will be proceeded following the same steps as described in 1.2. Workflow.

The new obtained individual EDMO_code ODV Spreadsheet files will be imported into ***Black_Sea_collection***

Due to the high variability of the nutrients values (from the coast to the center of the Black Sea) and to the different characteristics of entire basin **MEDAR/MEDATLAS Sub-domains for Black Sea** will be used for setting the minimum-maximum nutrients values.



- For every sub domains, Specialist Quality control (in collaboration with Black Sea partners) will be done especially for high values ⇒ outliers: possible/impossible values.
- For DIVA products only values with QV = 0, 1, 2 will be used.
- Specialist selection on periods: Years vs selection of years (decades and/or trends periods)