



Royal Netherlands Institute for Sea Research

# Dutch contribution to GEOTRACES

GEOTRACES SSC meeting 2014

Micha Rijkenberg & Hein de Baar

# Dutch contribution to GEOTRACES 2013/2014

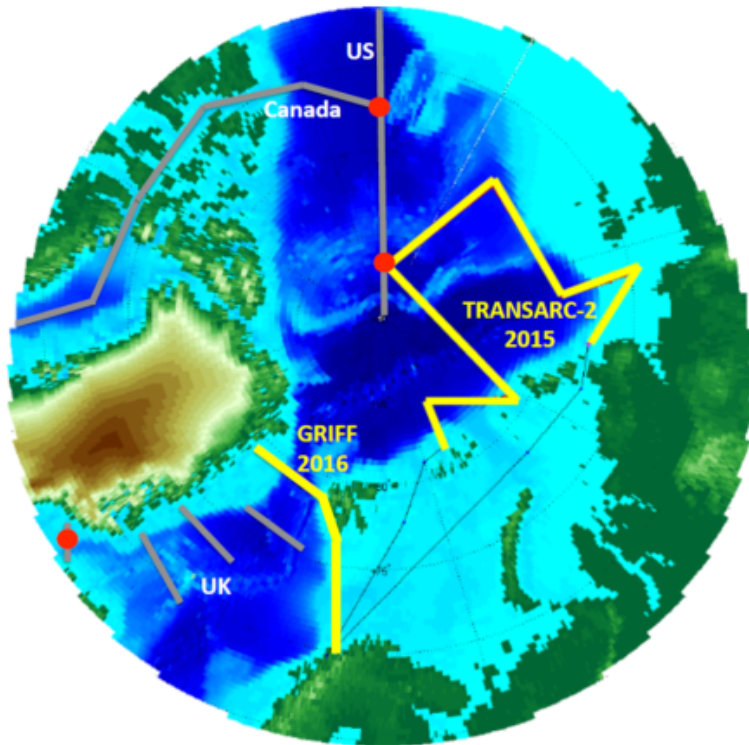
In 2013/14 our work focused on:

- i) the preparation of a GEOTRACES cruise with Polarstern to the Arctic (TransARCII)
- ii) Cruise of opportunity “DustTraffic”
- iii) the further compilation and analysis of data collected in the Mediterranean Sea and Black Sea in 2013
- iv) finalizing the field work on Rothera

# GEOTRACES in the Arctic: TransARC II

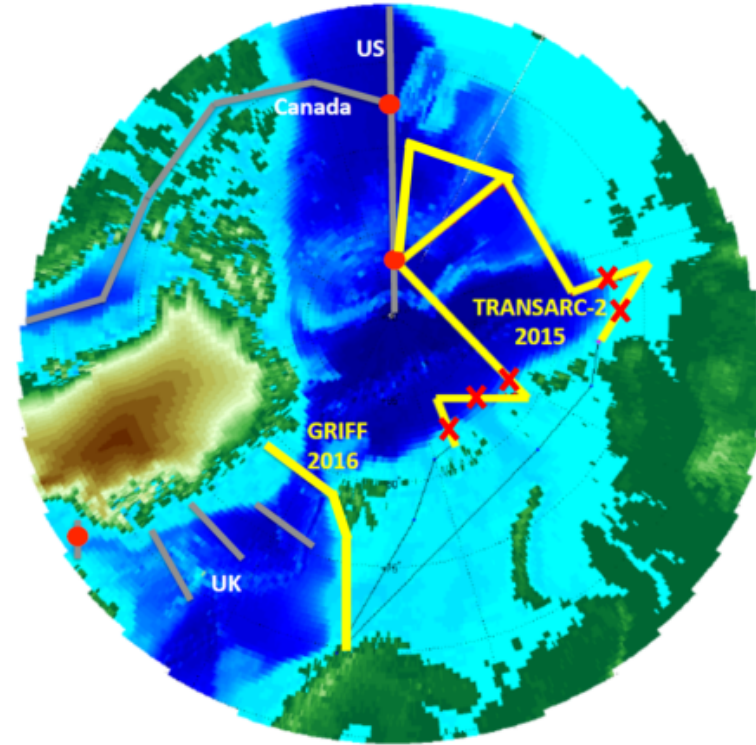
## Cruise track TransARC II

a.



with Russian

b.



without Russian

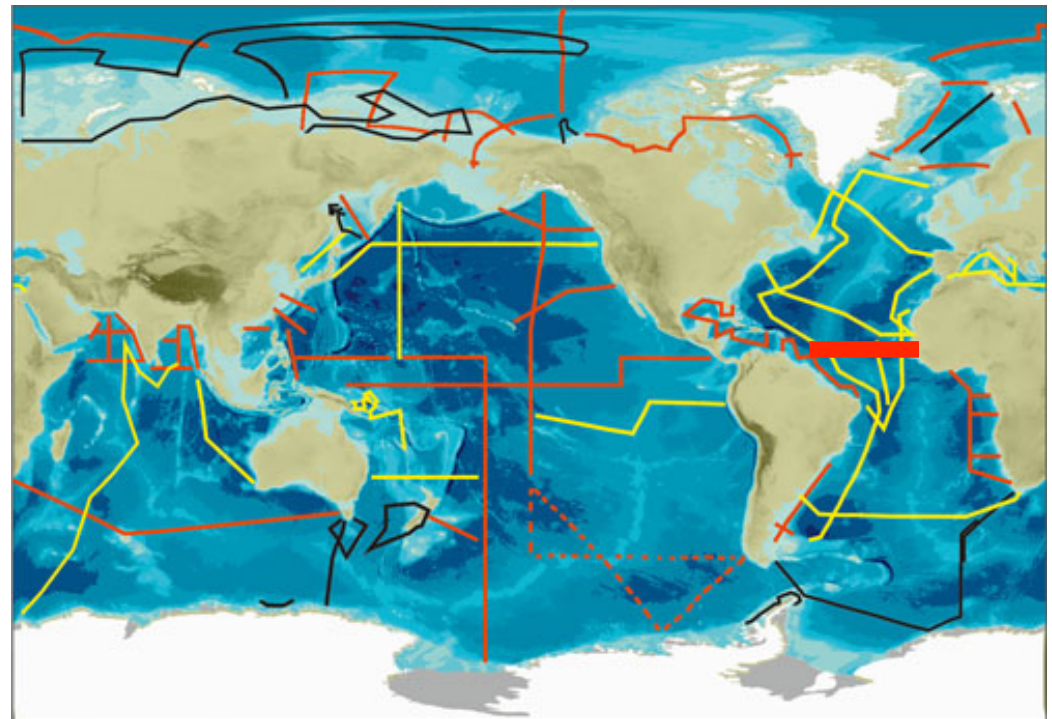
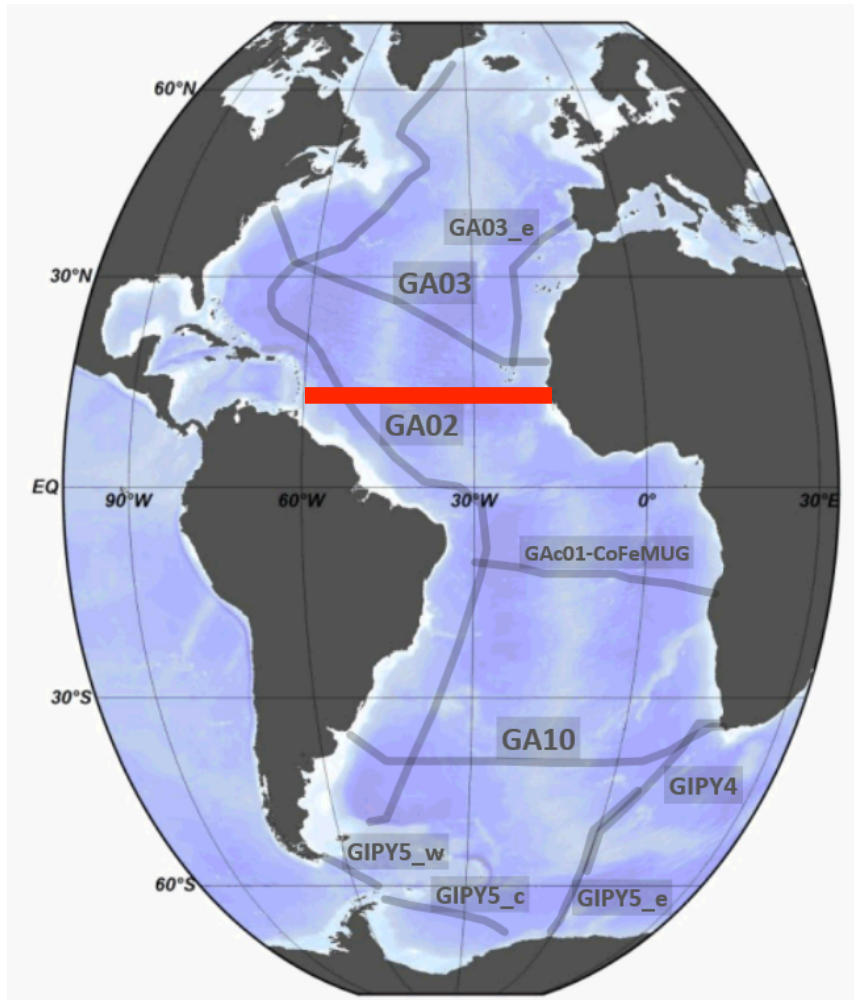
permission to sample in EEZ

- Trace metal clean sampling equipment (UCC, sampling container, winch)
- Swedish contribution
- Additional funding

# DustTraffic: cruise of opportunity

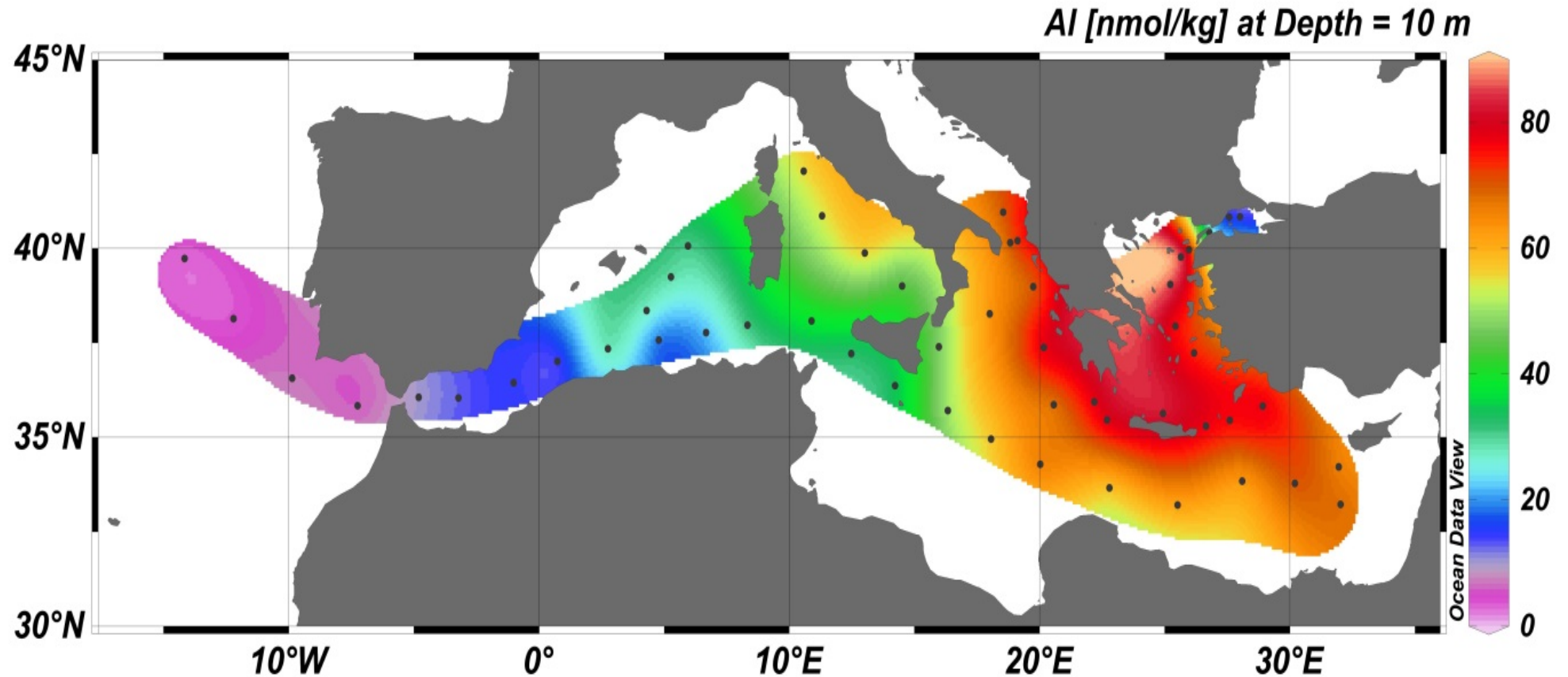
Just for information:

- one person (Patrick Laan)
- trace metals (Fe, Zn, Ni, Cd, Pb, Mn ...etc.)
- calibrated CTD sensor and nutrient data



# DAI in the Mediterranean Sea

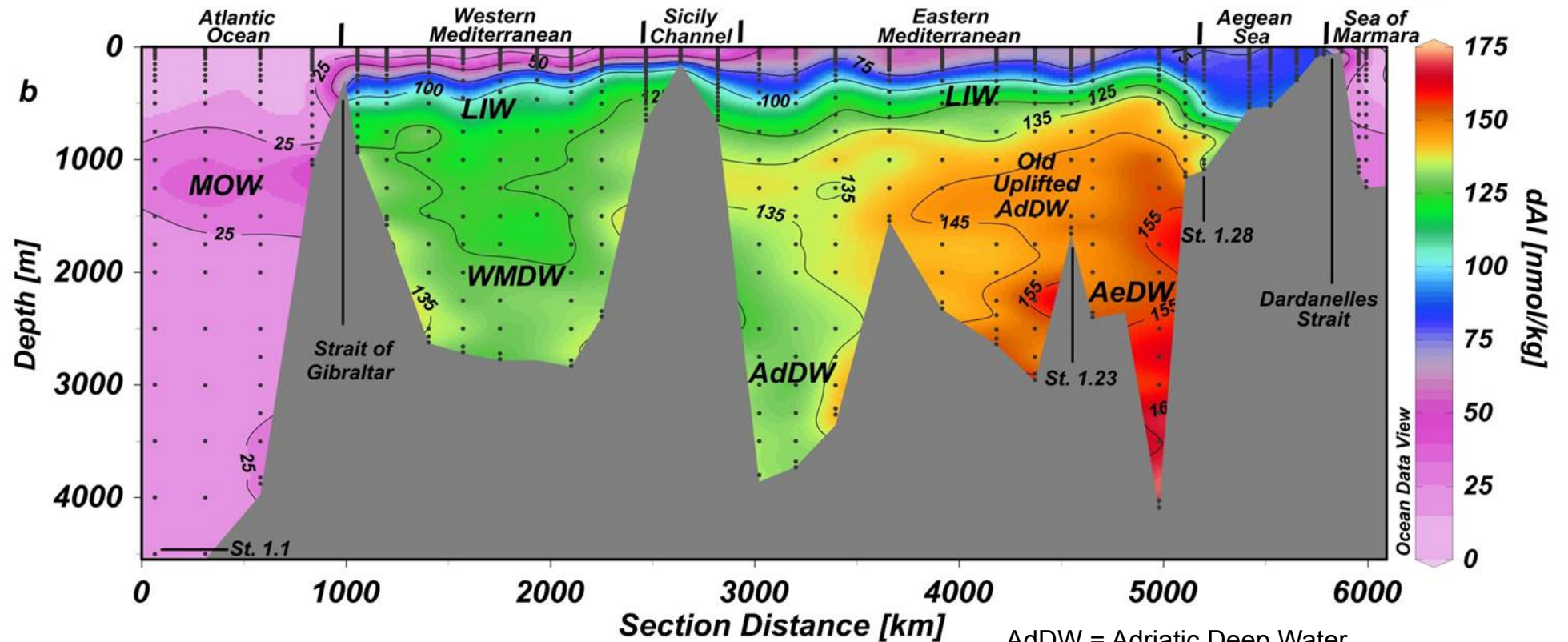
Data John Rolison & Rob Middag (University of Otago, NZ)



- a strong east to west gradient
- due to mixing of inflowing Atlantic water with Mediterranean water

# DAI in the Mediterranean Sea

Data John Rolison & Rob Middag (University of Otago, NZ)



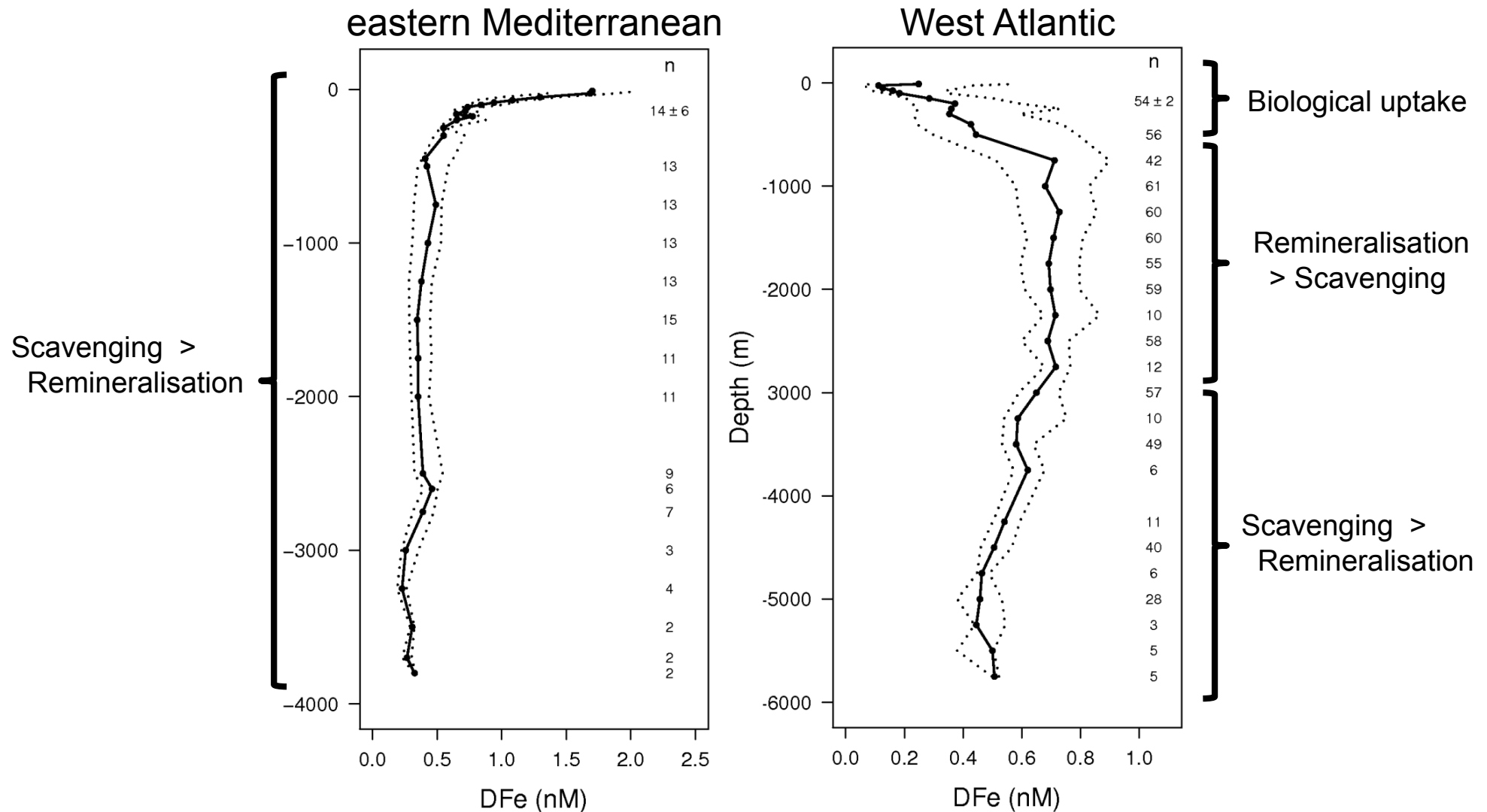
- also at depth a strong east to west gradient
- both AeDW as AdDW enriched in DAI compared to source waters

# WA Ocean DFe versus Mediterranean DFe profile

Data Micha Rijkenberg, Patrick Laan & Johann Bown (NIOZ)

Scavenged-type depth profile

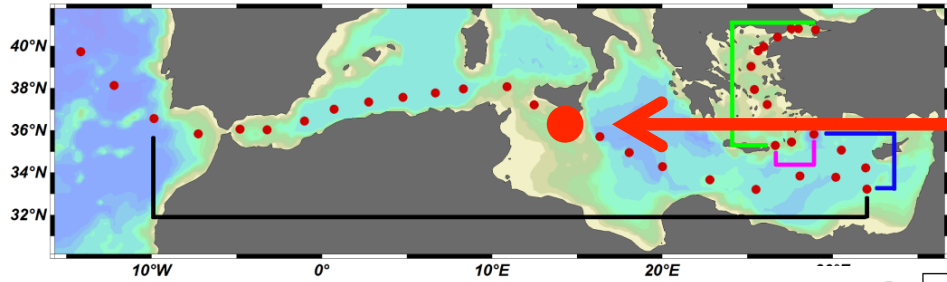
Hybrid-type depth profile



The median DFe concentration with 50% of the data between the dotted lines

# Organic Fe-binding ligands in the Mediterranean Sea

Data Loes Gerringa & Hans Slagter (NIOZ)

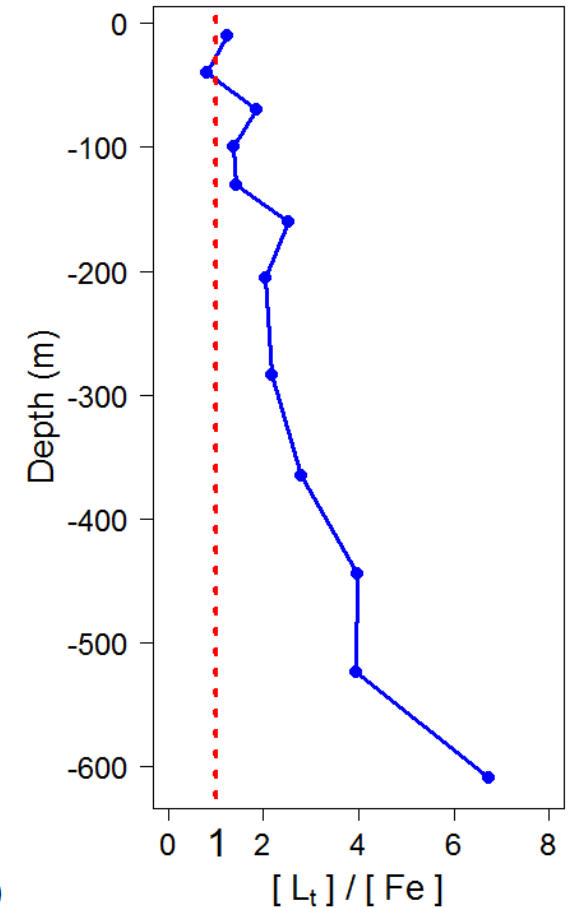
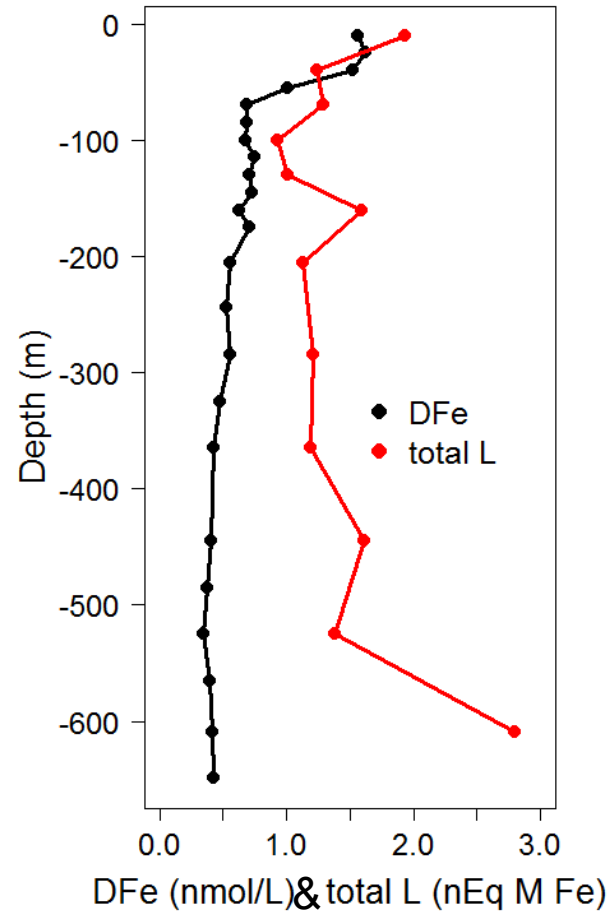


64PE370 Station 15

Scavenged type DFe distribution

Increasing total Fe-binding ligand concentration with depth

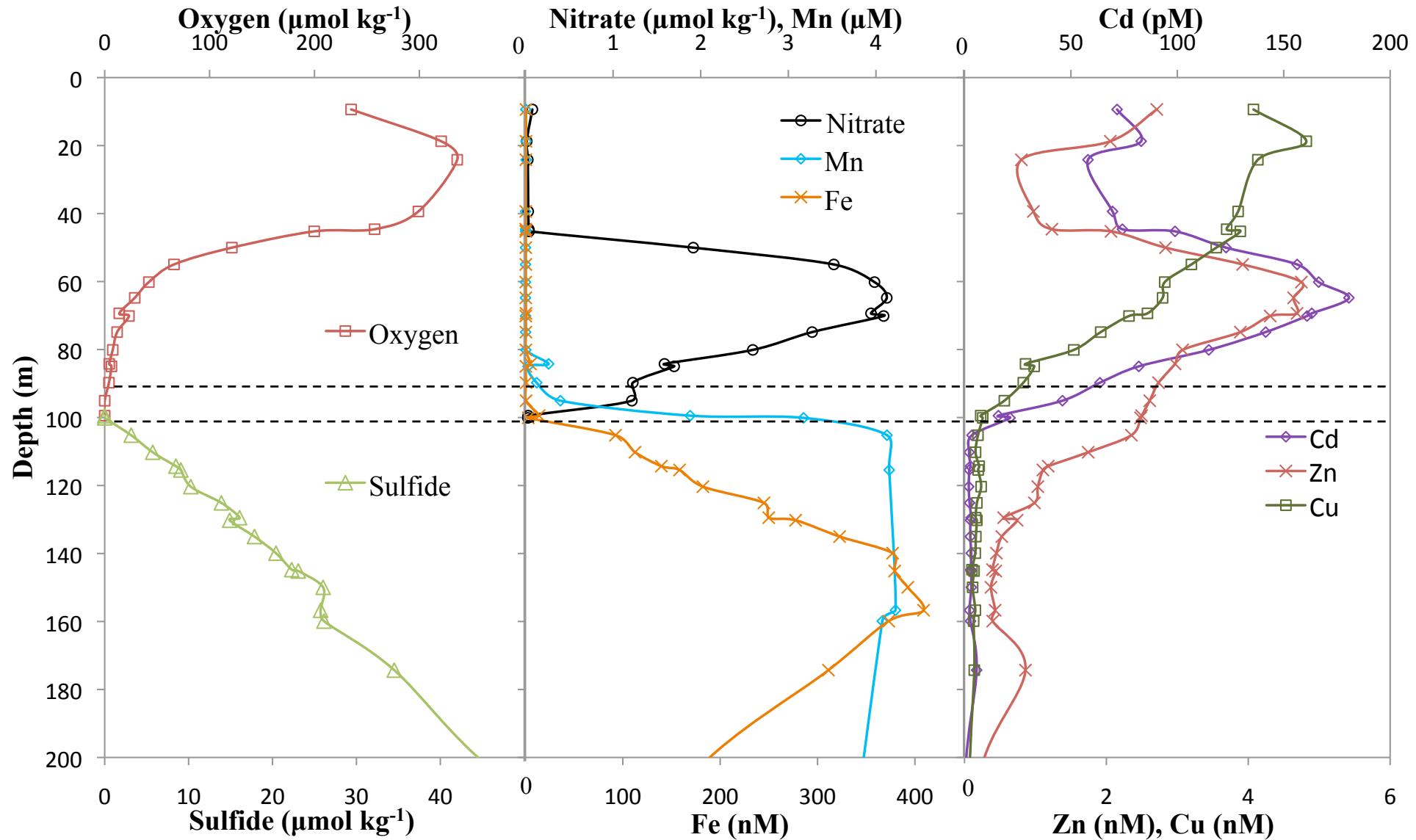
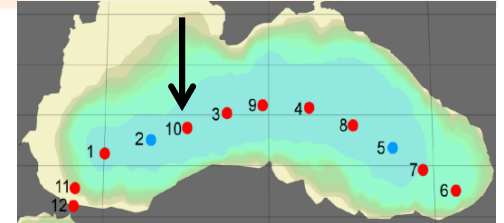
Total L: DFe ratio close or below 1 therefore saturated ligands in surface





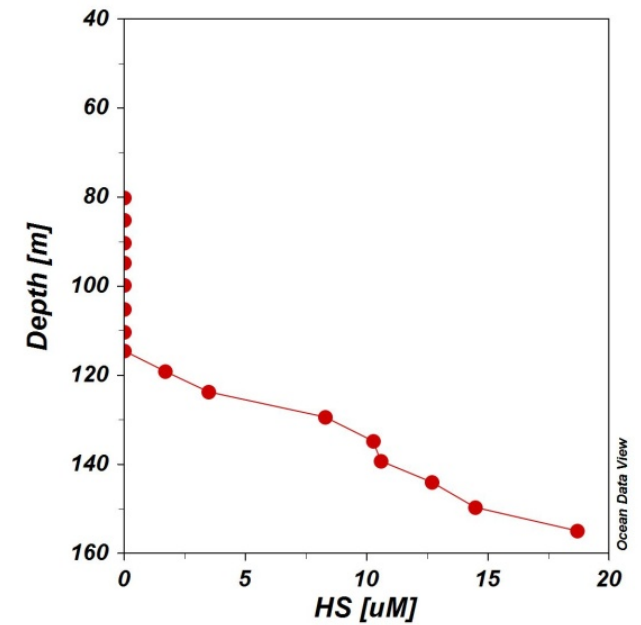
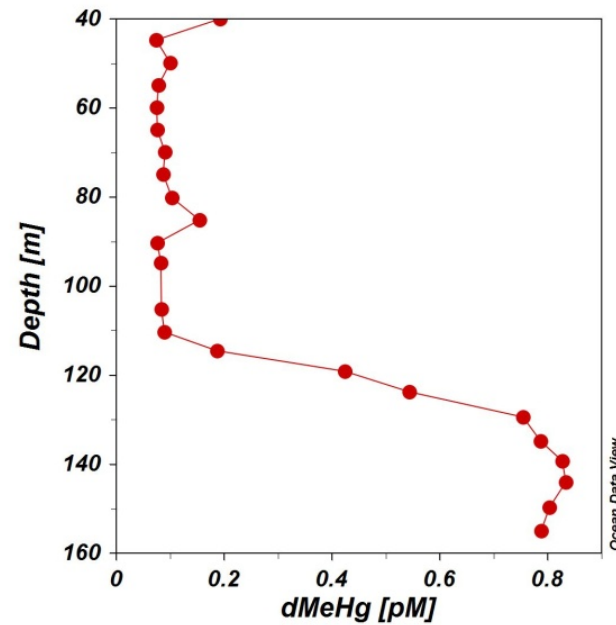
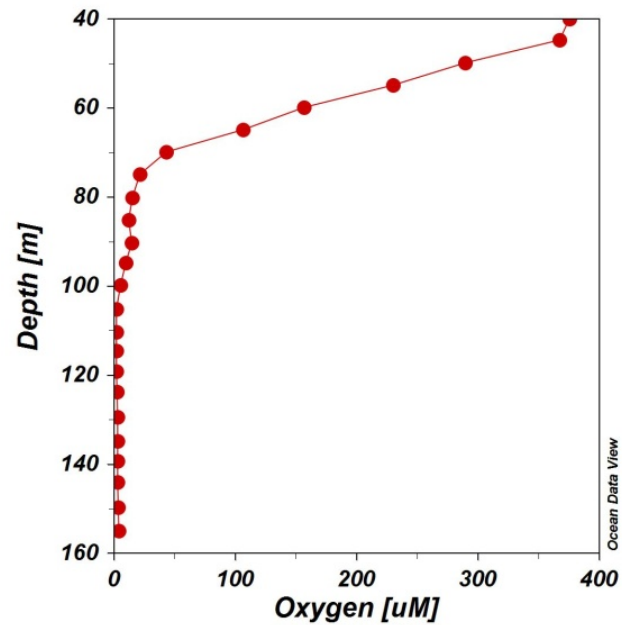
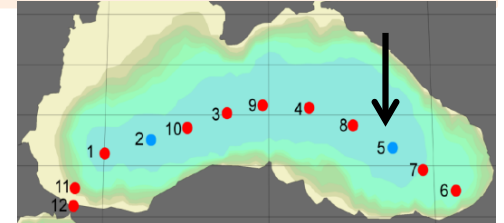
# Trace metals in the Black Sea

Data Rob Middag & John Rolison (University of Otago, NZ)



# MeHg in the Black Sea

Data Lars-Eric Heimbürger & Jeroen Sonke  
(CNRS-OMP-GET, Toulouse, France)

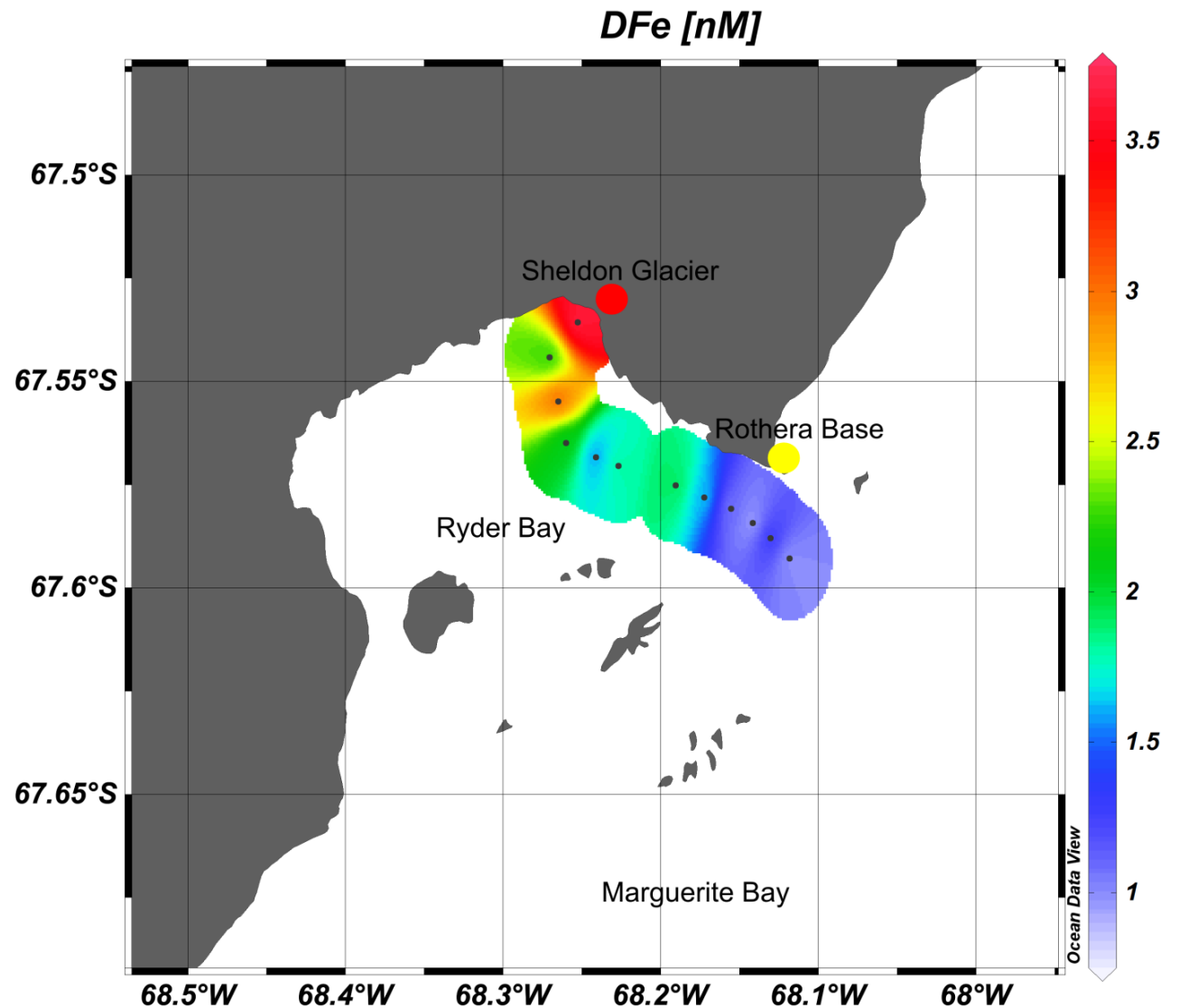


- A previous study reported that there was no MeHg in the anoxic part of the Black Sea
- This study shows that there is MeHg
- The hydrogen sulphide interfered with the analytical method

# DFe in Ryder Bay, Rothera

Data Johann Bown (NIOZ)

**DFe concentration  
at 5m depth**

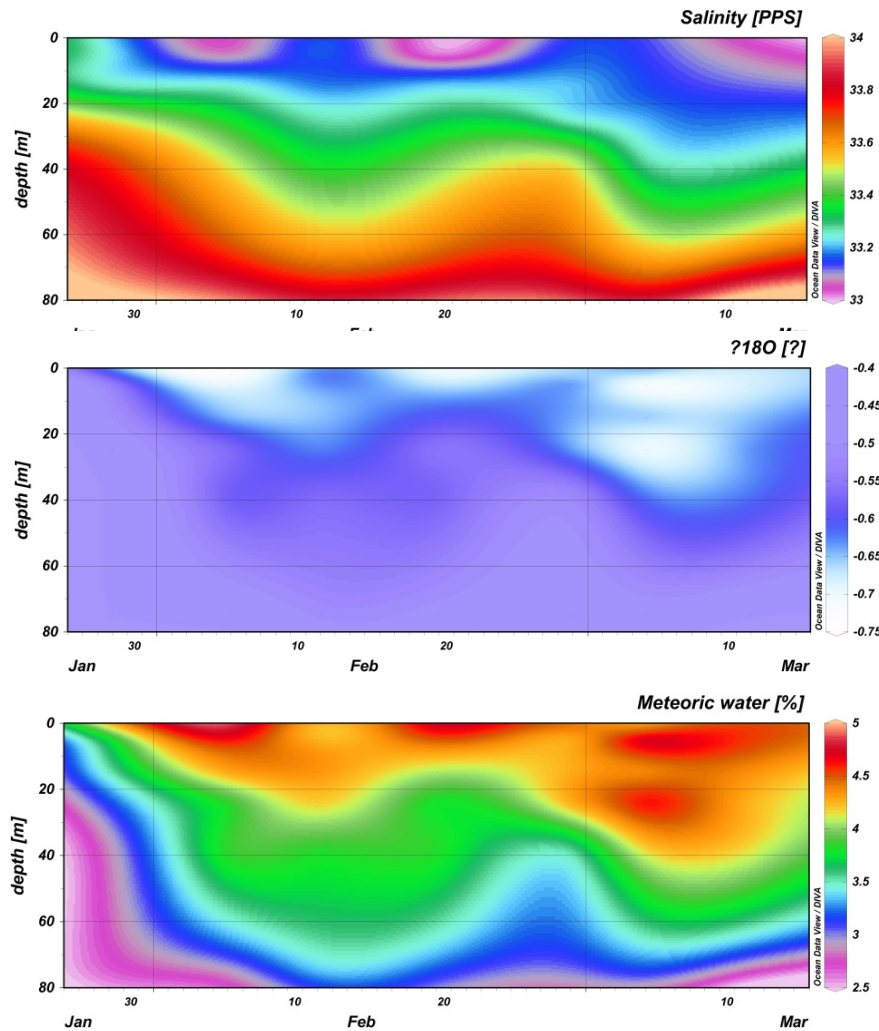


Decreasing DFe from Sheldon glacier to the offshore station  
**Sheldon Glacier can be a source of DFe**

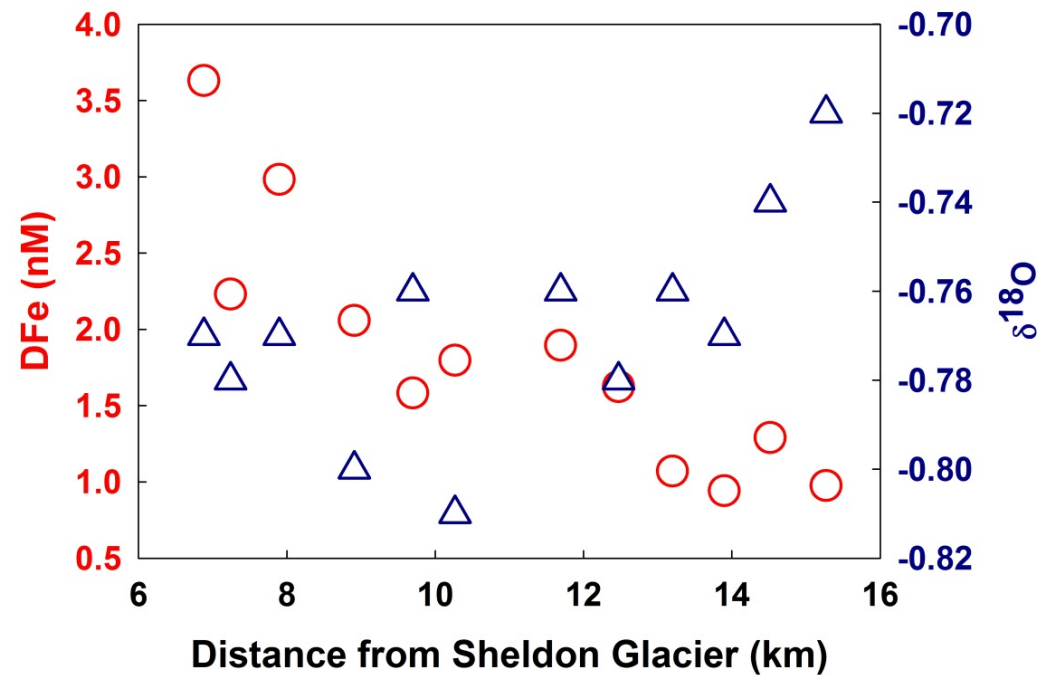
# DFe in Ryder Bay, Rothera

Data Johann Bown (NIOZ),  $\delta^{18}\text{O}$  data (M. Meredith, BAS)

## Using $\delta^{18}\text{O}$ and DFe to investigate glacier melt inputs

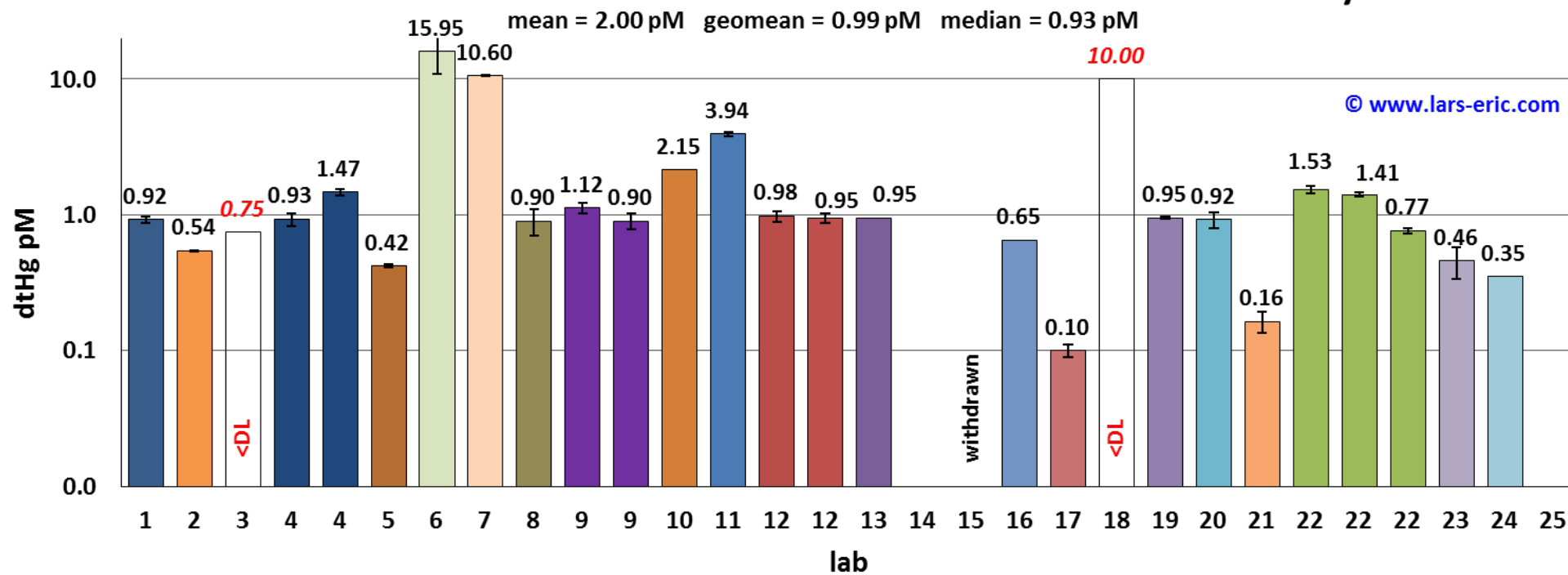


**Glacier melt water input can impact Ryder Bay's surface waters**



**Glacier melt water is a DFe source for Ryder Bay's surface waters**

## 2013 GEOTRACES Intercalibration exercise for dissolved total mercury



## 2013 GEOTRACES Intercalibration exercise for dissolved total methylmercury

mean = 0.290 pM geomean = 0.070 pM median = 0.056 pM

