

French **GEOTRACES** activities, 2016-2017

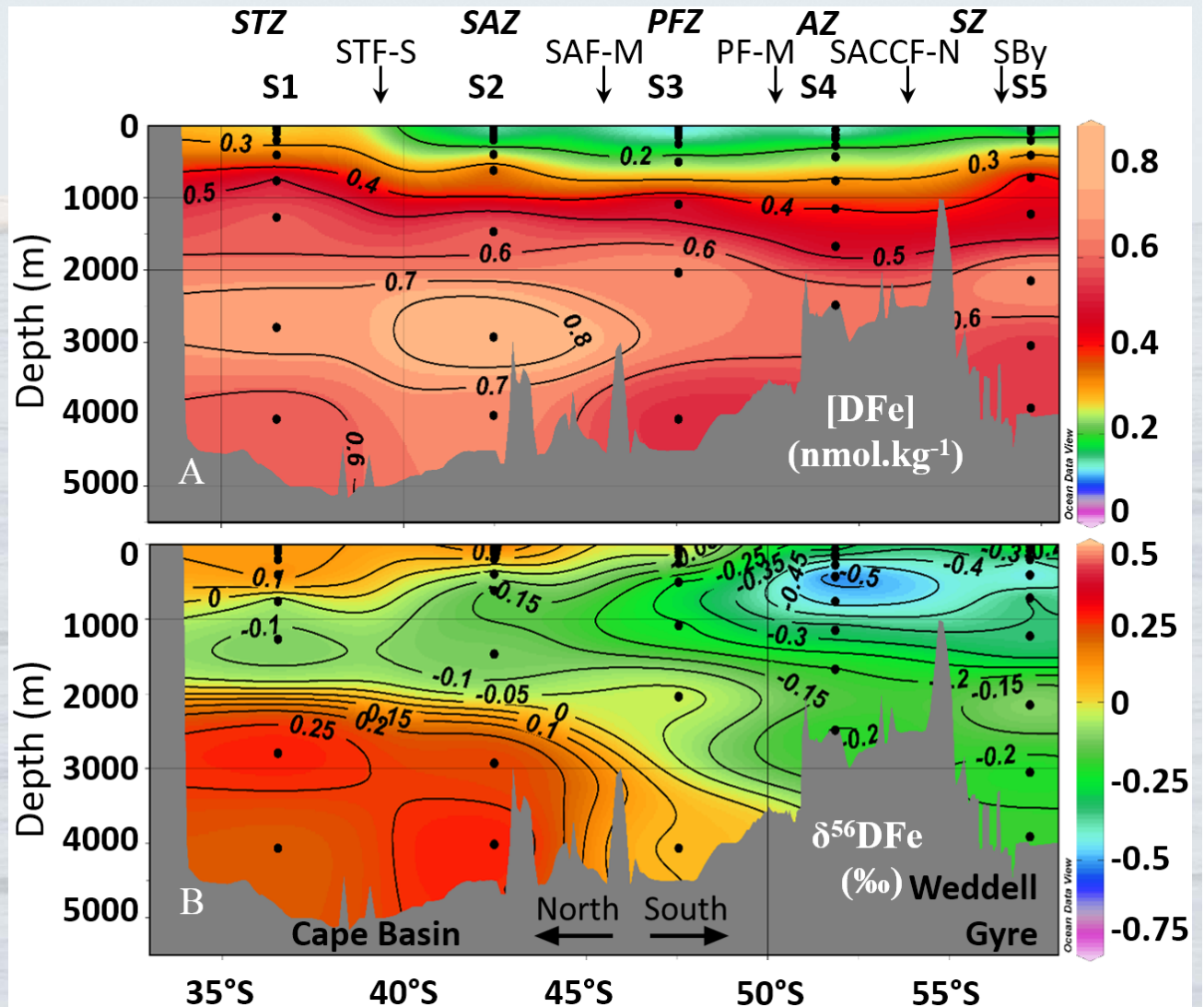
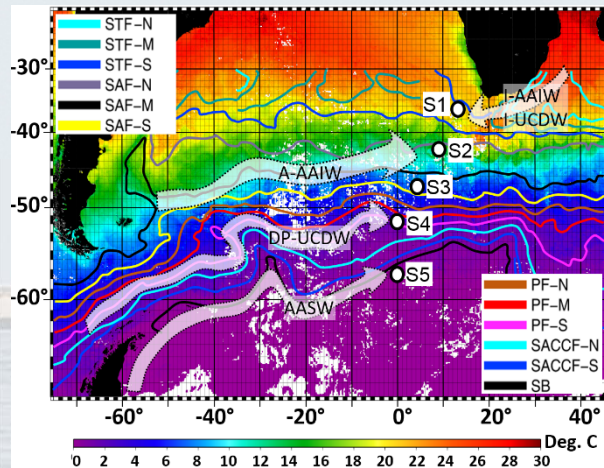


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GEOTRACES SSC meeting, Salvador, Brazil, 18-20 September 2017

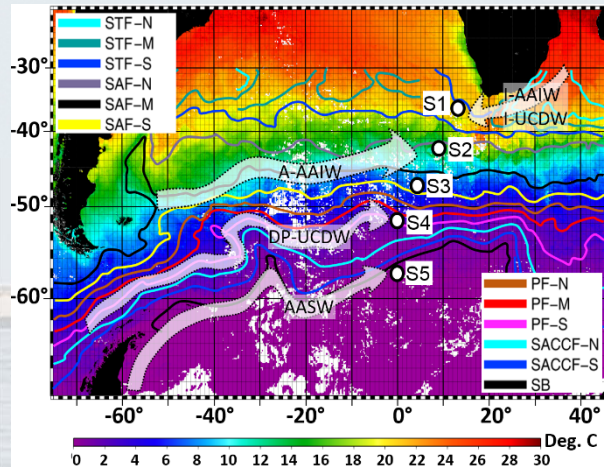
Science highlights (1/3)

Fe isotopic composition along the Bonus-GoodHope section (Abadie et al., 2017, PNAS)



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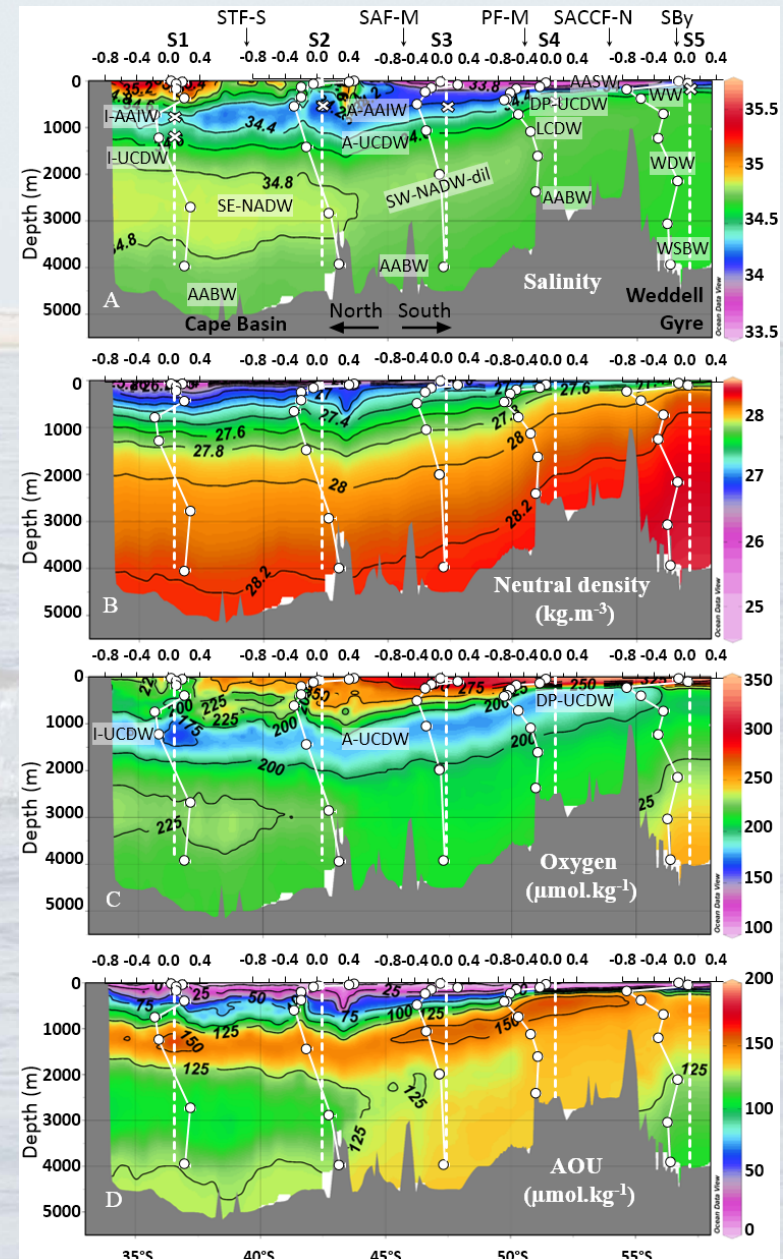


A striking $\delta^{56}\text{DFe}$ minimum is observed all along the section at intermediate depth (200-1300 m)

- Organic matter remineralisation (water column/continental margins)

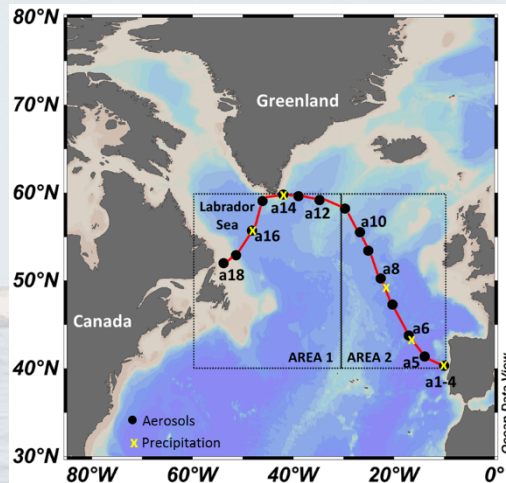
$\delta^{56}\text{DFe}$ increases at depth

- Abiotic non-reductive release of Fe from particulate Fe (dissolution/desorption)

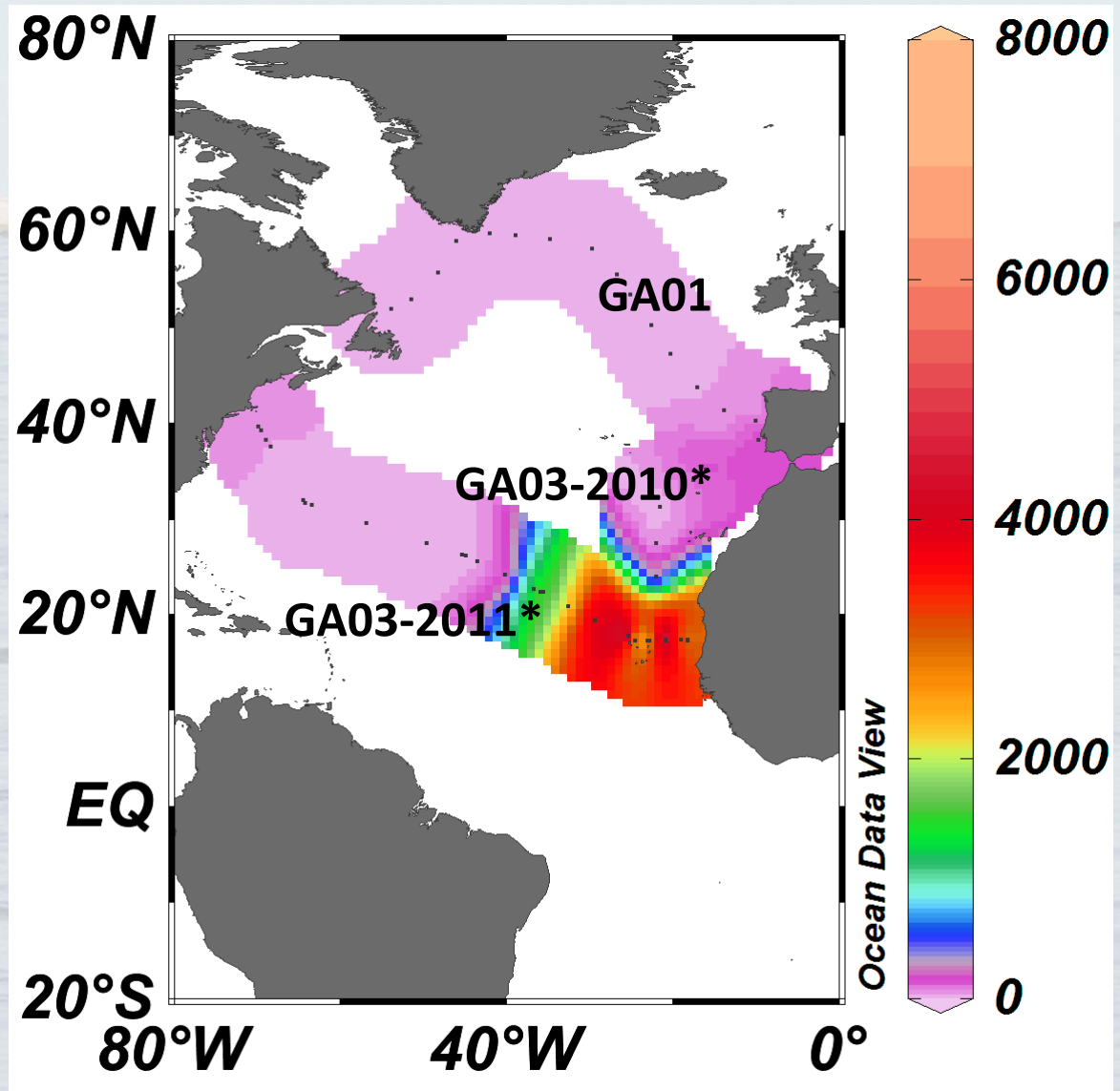


Science highlights (2/3)

Atmospheric deposition fluxes along the GEOVIDE section (Shelley et al., 2017)



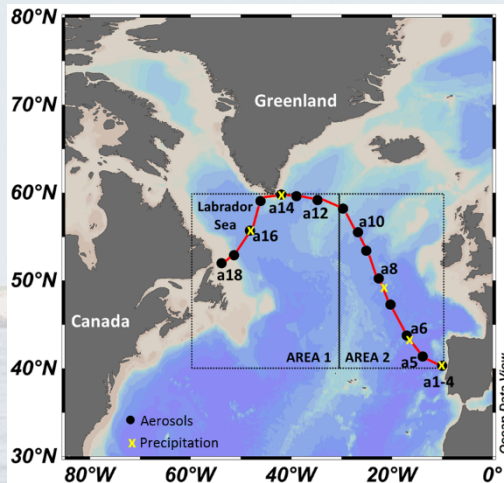
Al aerosol concentrations (in ng m^{-3})



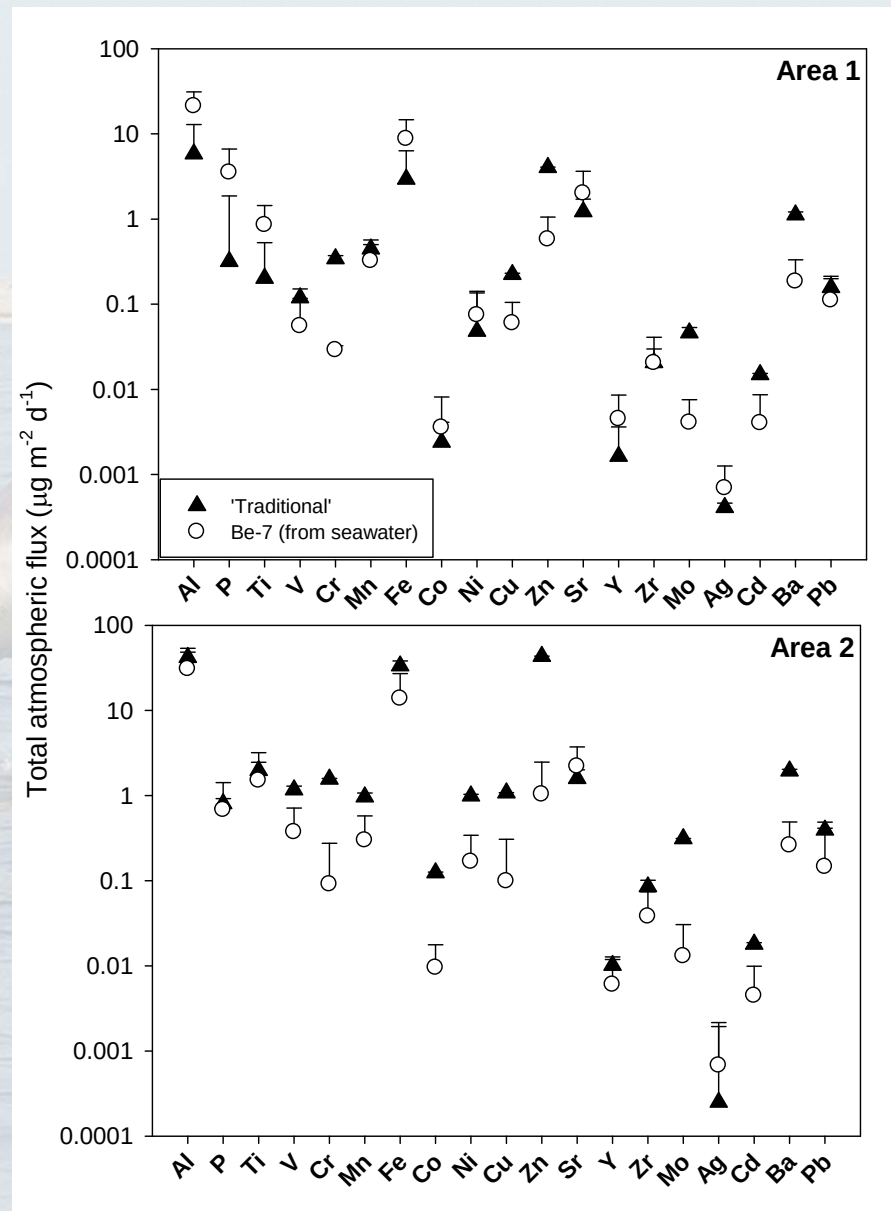
*Shelley et al. (2015)

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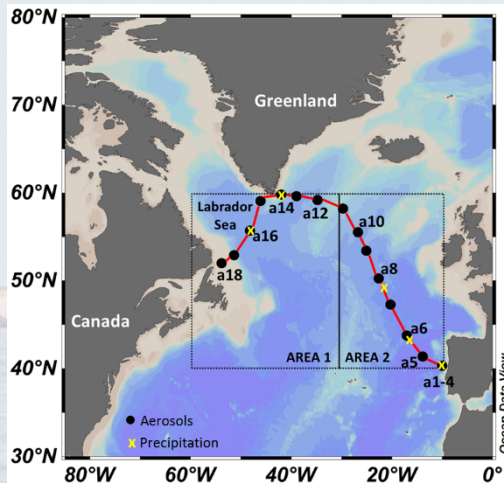


**Traditional approach = wet + dry
deposition TE fluxes
Inventory of ^7Be in the upper water
column**



Science highlights (2/3)

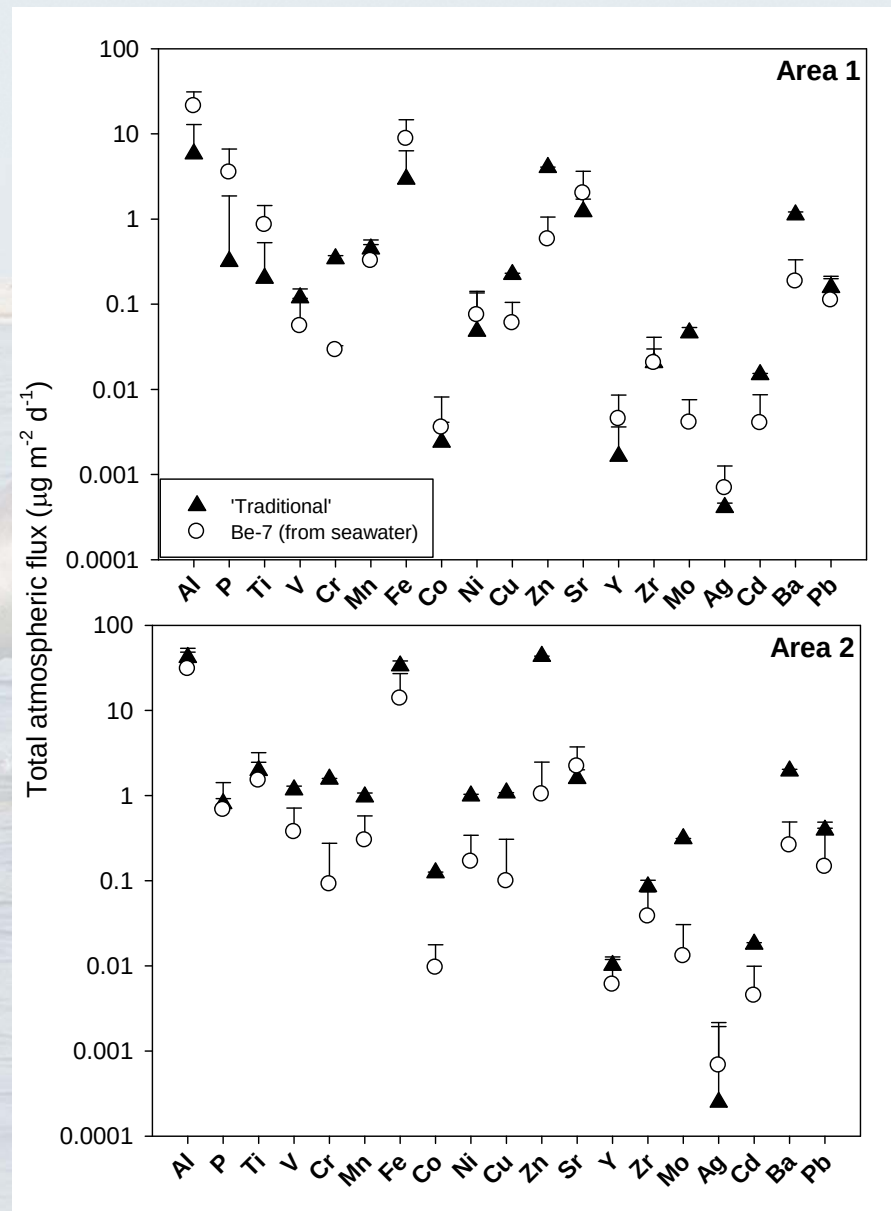
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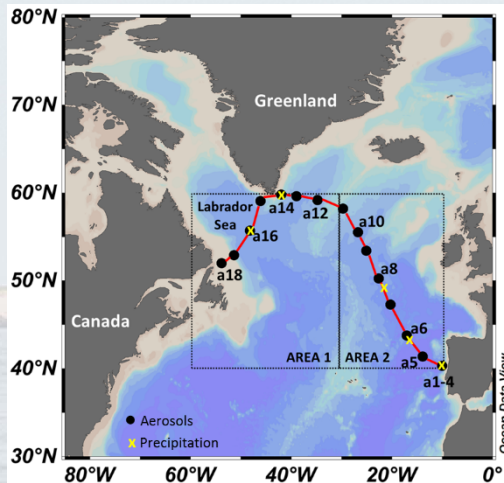
**Inventory of ^7Be in the upper water
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- Good agreement for ~ half of the TEIs
- For the other TEIs, differences ranged from 2 to 40 times.



Science highlights (2/3)

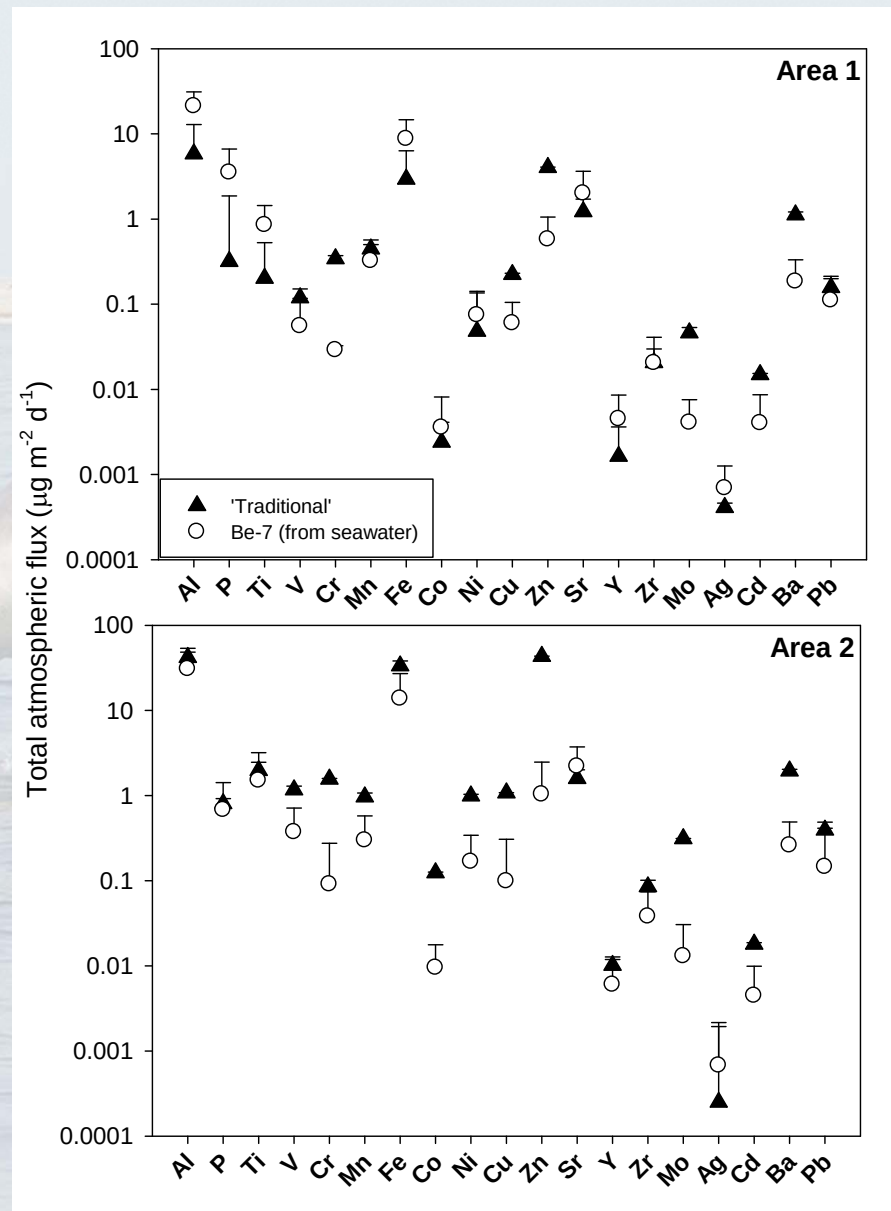
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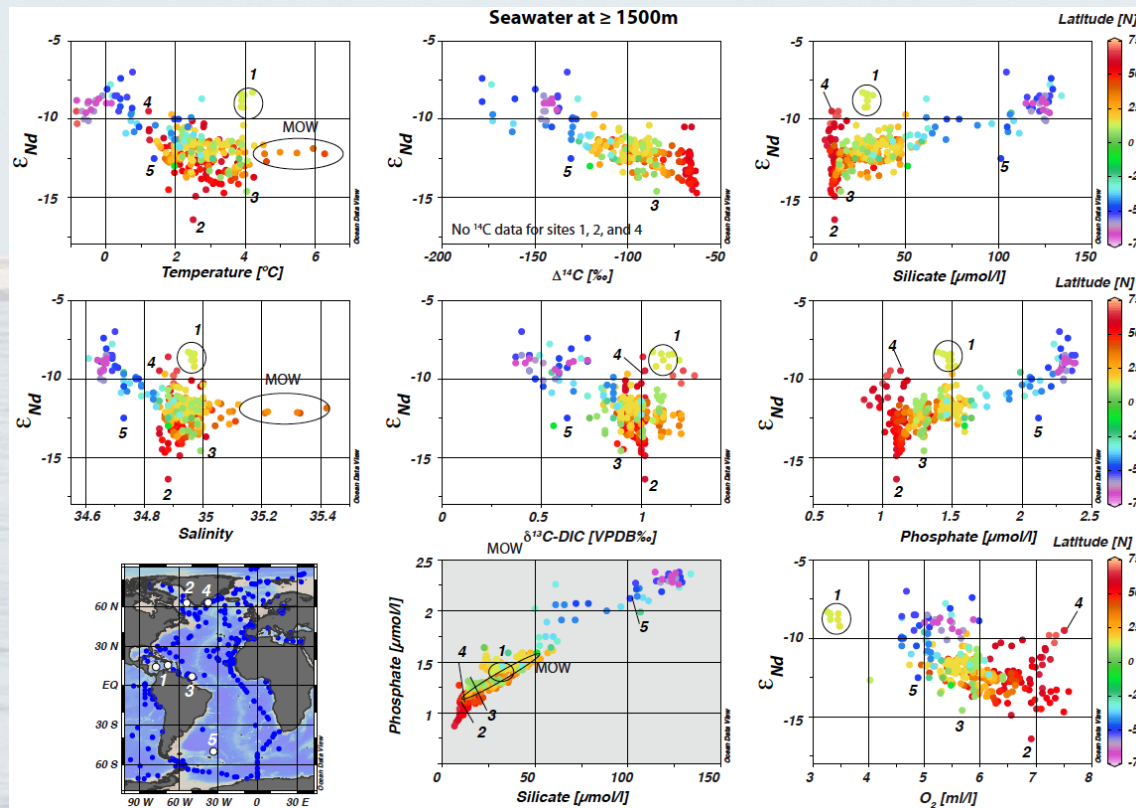
**Inventory of ^7Be in the upper water
column**

- Good agreement for ~ half of the TEIs
- For the other TEIs, differences ranged from 2 to 40 times.
- ❖ Timescale of integration
- ❖ Representative deposition velocity and precipitation rates



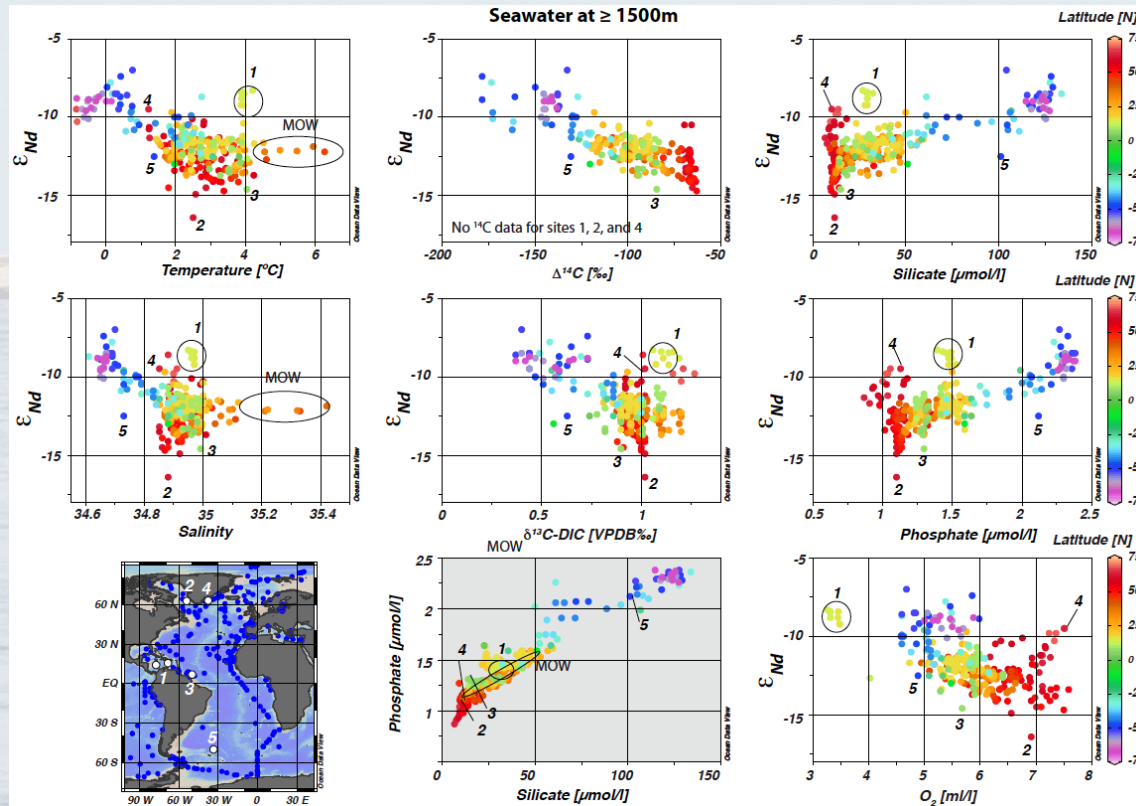
Science highlights (3/3)

Global seawater ϵ_{Nd} database (Tachikawa et al., 2017)



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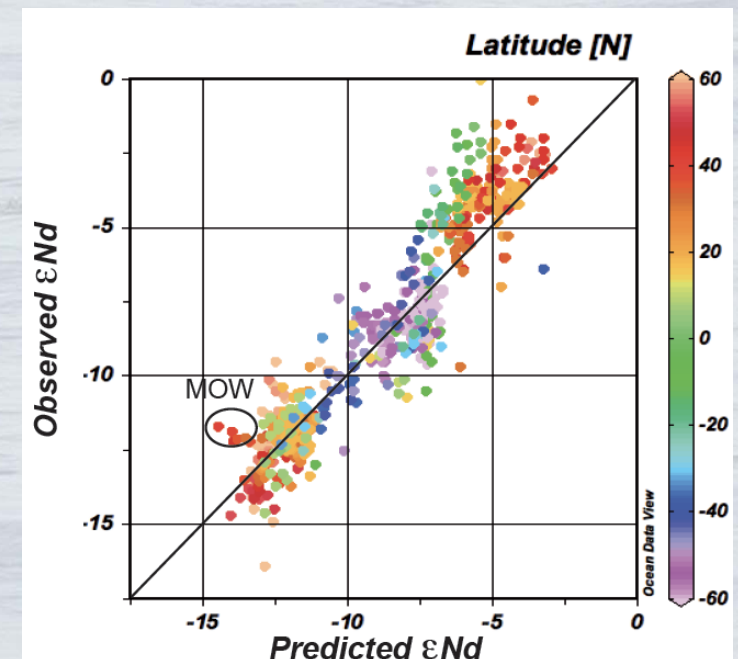
At water depths $> 1500\text{ m}$, property-property plots show clear correlations between seawater ϵ_{Nd} and the other variables, suggesting that large-scale water mass mixing is a primary control of deepwater ϵ_{Nd} distribution.

Atlantic Ocean:

$$\epsilon_{Nd} = -0.7372 * T - 0.9385 * \text{O}_2 - 4.4207 \quad (r = 0.705)$$

Other global Oceans:

$$\epsilon_{Nd} = 2.252 * \text{PO}_4 + 0.04635 * \text{SiO}_2 - 9.958 * S + 0.28614 * T + 326.95 \quad (r = 0.845)$$



Oceanographic cruises

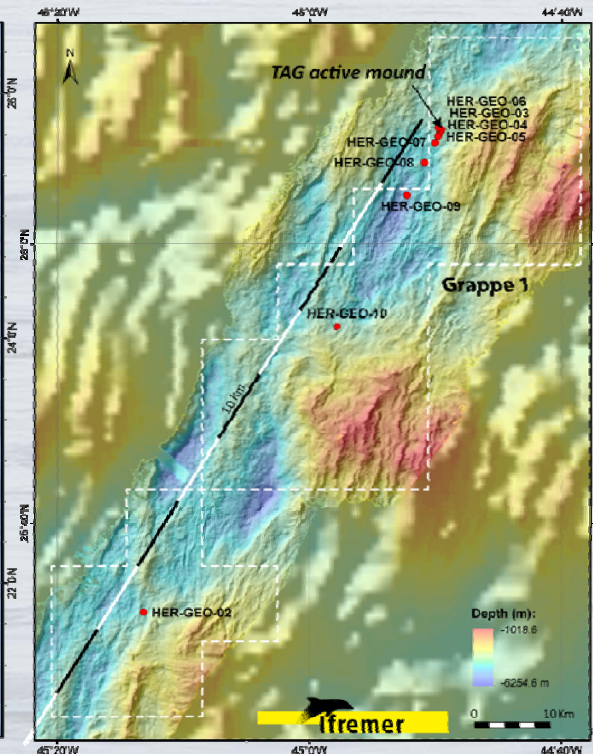
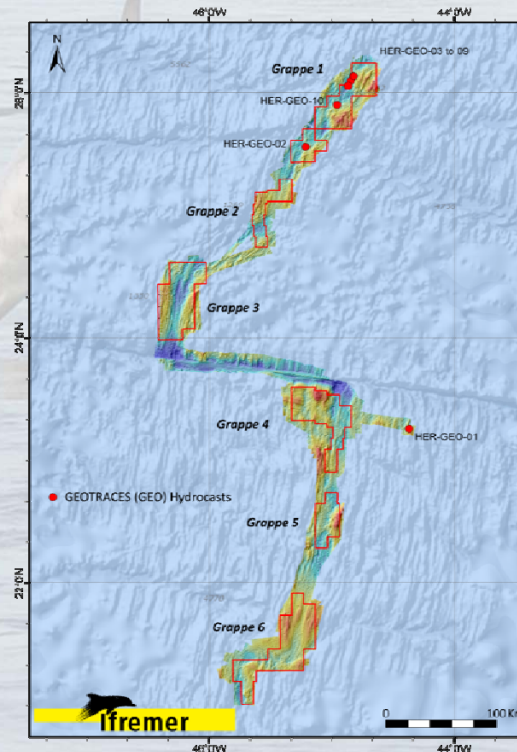
HERMINE

Hydrothermal Exploration and Research for Mineralisation In New Environments

GEOTRACES Scientists: H. Planquette, G. Sarthou (LEMAR/IUEM, Plouzané), L.-E. Heimbürger (MIO, France), Catherine Jeandel (LEGOS, France), Olivier Rouxel (Ifremer), Peter Croot (Univ. Galway), Joe Resing (Univ. Washington)

Chief Scientists: Y. Fouquet, C. Cathalot, and E. Pelleter (Ifremer, REM/UGM/LCG, Plouzané)

15 March – 28 April 2017, on board R/V Pourquoi Pas?



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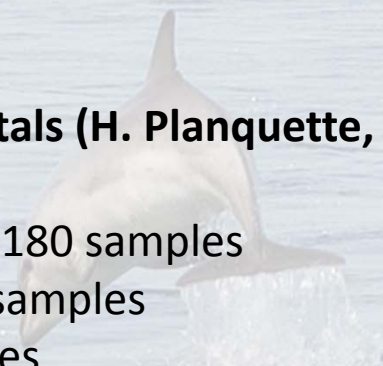
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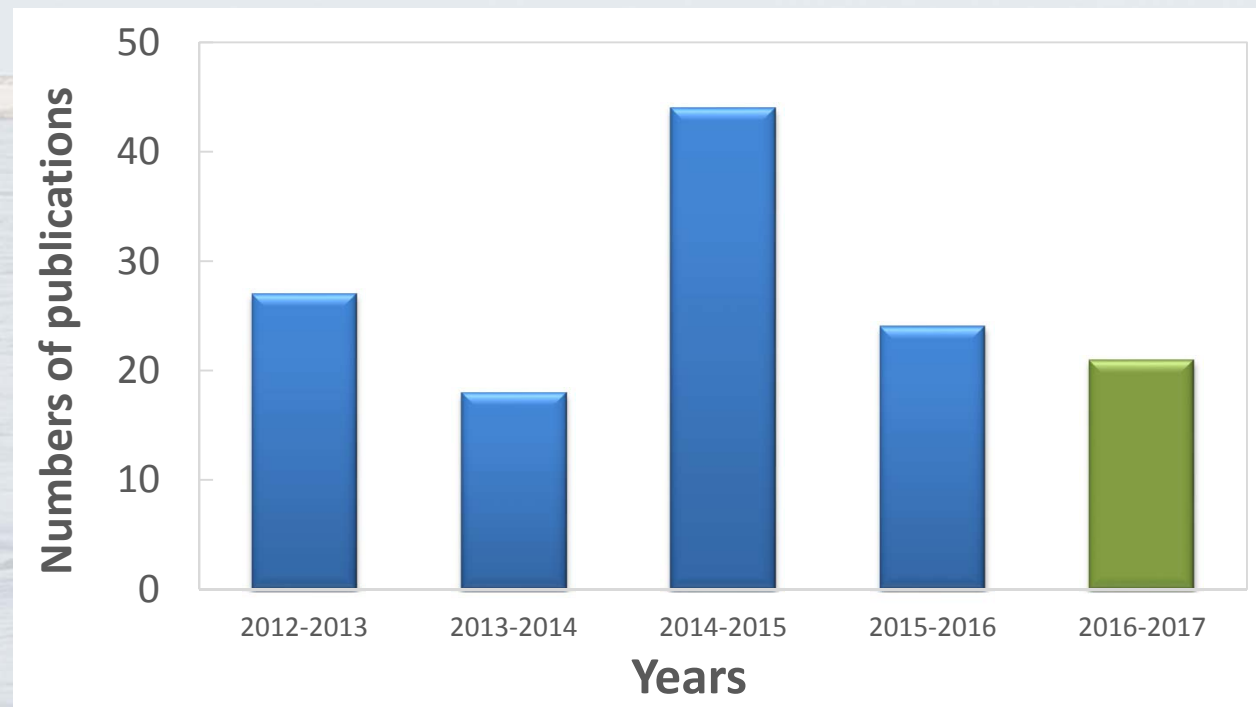
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- 
- 1- Particulate and dissolved trace metals (H. Planquette, G. Sarthou, C. Cathalot, and A. Laës), 240 samples**
 - 2- REEs and Nd isotopes (C. Jeandel), 180 samples**
 - 3- Hg species (L.-E. Heimbürger), 240 samples**
 - 4- Dissolved Al (J. Resing), 240 samples**
 - 5- Fe, Cu, Ni, Cd, and Ge isotopes (O. Rouxel), 35 samples for Ge, 80 samples for the others**
 - 6- Li isotopes (V. Chavagnac), 180 samples**
 - 7- Cu speciation (P. Croot), 60 samples**
 - 8- Humic substances (H. Whitby), 240 samples**
 - 9- Microbial activity and diversity (E. Roussel), 40 samples**

Publications/Conferences

21 peer-review articles in 2016-2017
(~ 2/3 as first authors) in 13 different journals
+ 1 book



5 int. conferences with a total of 10 presentations
(1-6 presentations/meeting)

2 PhD defended in 2016 + 5 new PhD students

Other activities

- Some outreach activities in Toulouse (visit of the LEGOS clean lab by high school teachers and communication about the PNAS article Abadie et al., 2017)



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GEOVIDE, an international GEOTRACES study along the OVIDE section in the North Atlantic and in the Labrador Sea (GA01)

Editor(s): G. Henderson, M. Lohan, L. Bopp, C. Jeandel, and G. Reverdin

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20-26 August 2017, Plouzané, France



Thanks for your attention!