GEOTRACES

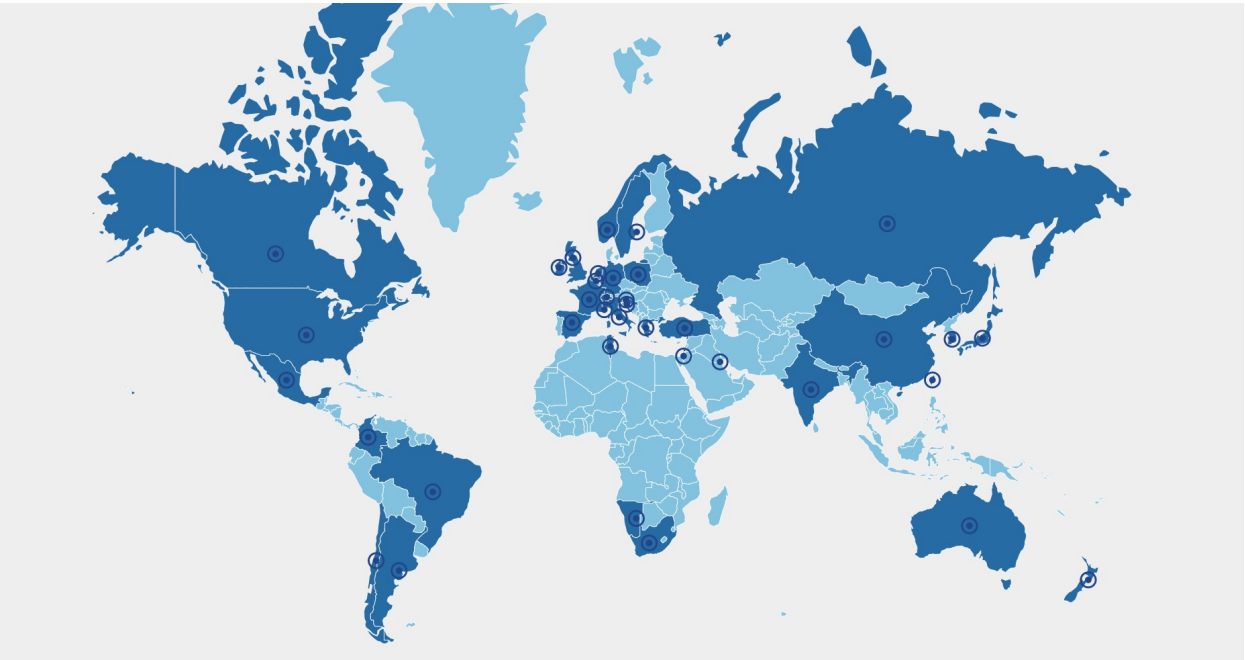
An International Study of the Marine Biogeochemical Cycles of Trace Elements and their Isotopes

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

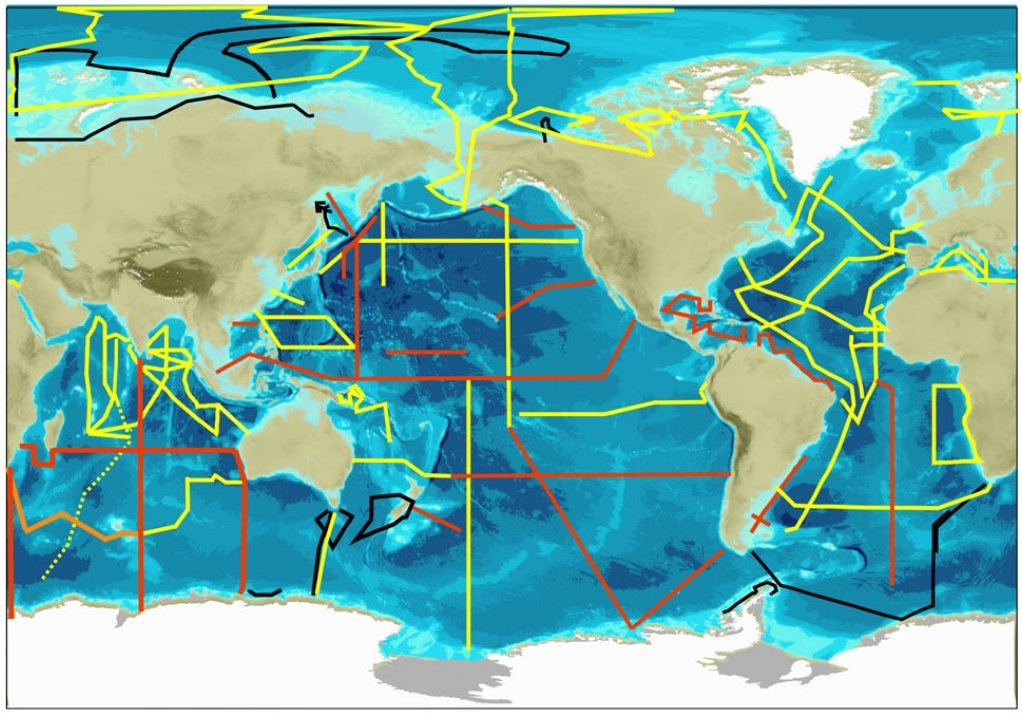
International Council for Science
SCOR
Scientific Committee on Oceanic Research

GEOTRACES mission

- **GEOTRACES** mission is to identify processes and quantify fluxes that control the distributions of key trace elements and isotopes (TEIs) in the ocean, and to establish the sensitivity of these distributions to changing environmental conditions
- Scientists from more than **35 nations** have been involved in the programme, which is designed to study all major ocean basins
- Co-chairs: Karen Casciotti (University of Stanford, USA)
  Maeve Lohan (University of Southampton, UK)



GEOTRACES presentation card



To date:

35 nations

130 cruises completed
(+10 completed during the reporting period)

43 sections completed
(+1 completed during the reporting period, in orange)

1,688 publications

Data Products in 2014 and 2017

New data product forthcoming in Nov21

Map legend: Map of GEOTRACES sections. In red: Planned Sections. In yellow: Completed Sections. In orange: Section completed during the reporting period. In black: Sections completed as GEOTRACES contribution to the IPY.

GEOTRACES Intermediate Data Product

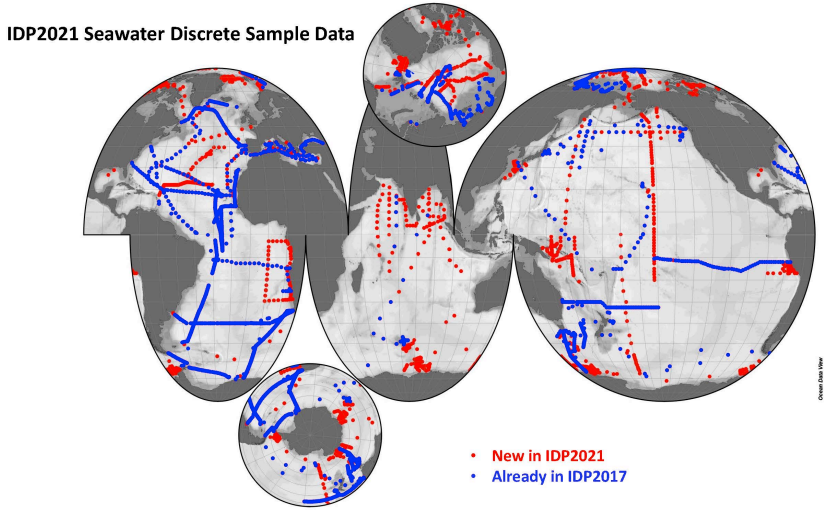
New GEOTRACES Intermediate Data Product 2021!

Just published (17 November)!

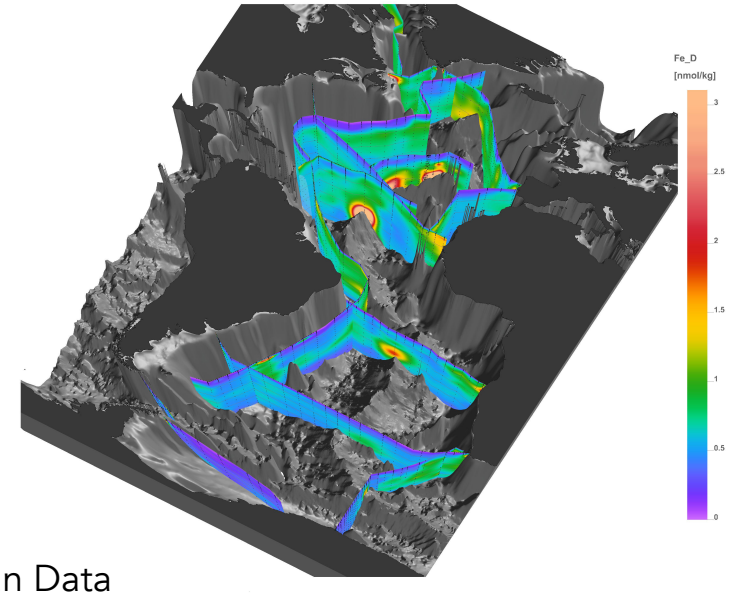
IDP2021 consists on:

Freely available on-line!
Thanks to 350 data contributors!

(1) a **compilation of digital trace metal data** 100,000 samples from 77 cruises (geotraces.org/dp)



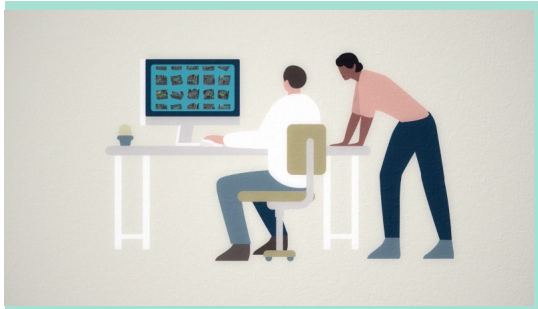
(2) the **eGEOTRACES Electronic Atlas** (egeotraces.org)



Dissolved Fe in the Atlantic Ocean

Data available in 3 formats: csv ASCII, NetCDF and as Ocean Data View collections. Analysis, exploration and visualisation without download possible thanks to the **web ODV tool** (https://geotraces.webodv.awi.de/)

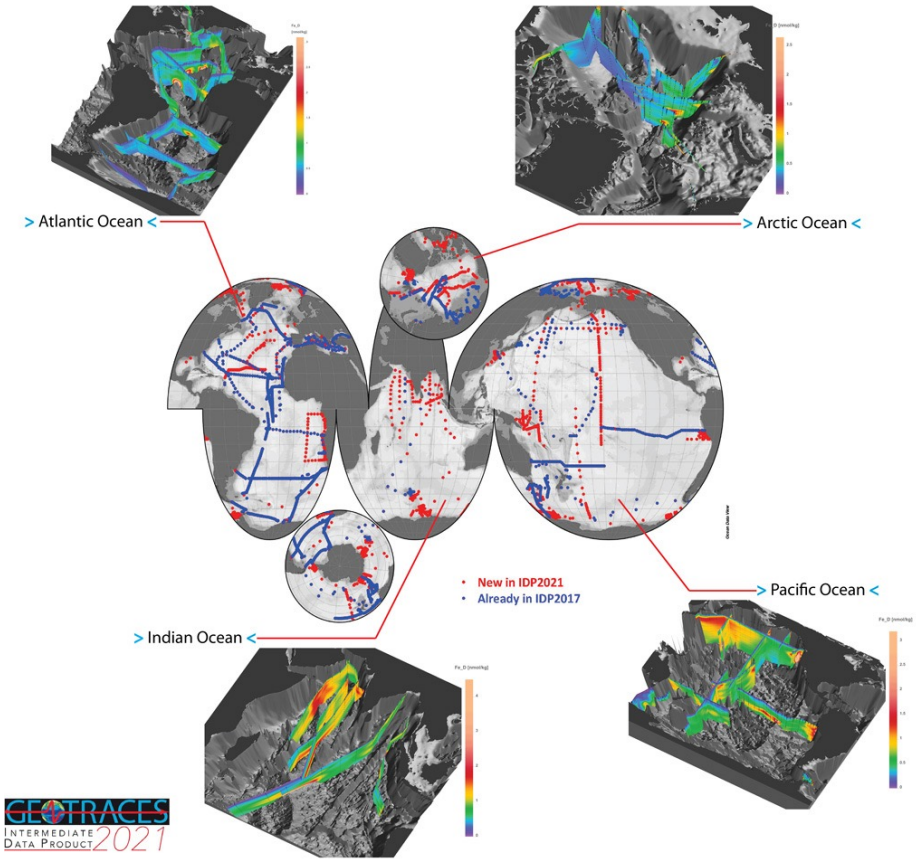
GEOTRACES Intermediate Data Product



Just published!

New GEOTRACES Intermediate Data Product, IDP2021!

www.bodc.ac.uk/geotraces/data/dp



Freely available on-line!
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Released on 17 November.
View video of the release event:
https://youtu.be/bgaQUHZFJtc

What does IDP2021 include and how can be accessed?
View video:
https://youtu.be/j3mjfh-RSjU

GEOTRACES Intermediate Data Product

IDP2021 consists on:

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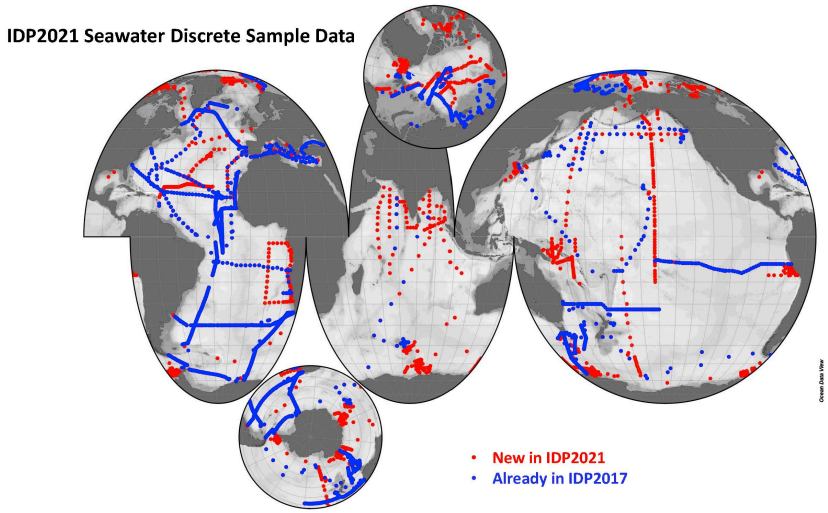

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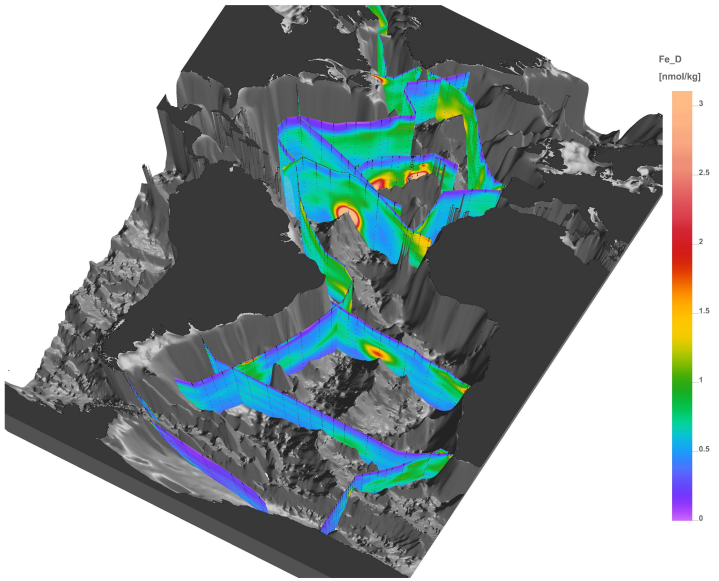

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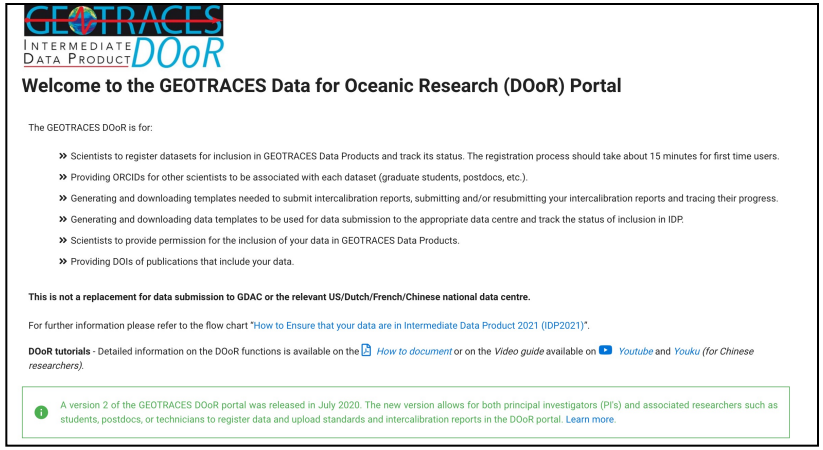
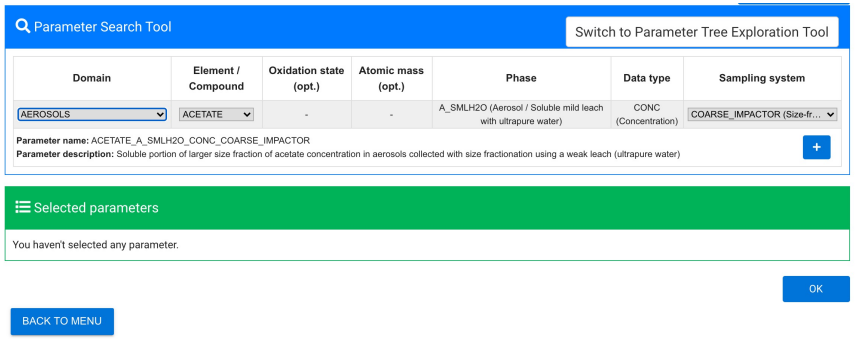
GEOTRACES Data for Oceanic Research (DOoR)

- **Dedicated on-line portal to register data sets** for intercalibration and potential inclusion in IDP2021, generate templates for data submission and provide necessary metadata for the building of the IDP2021.

- **Management tool** for GEOTRACES subcommittees and the GEOTRACES Data Centre to work on the preparation of the IDP2021.





https://geotraces-portal.sedoo.fr/pi/

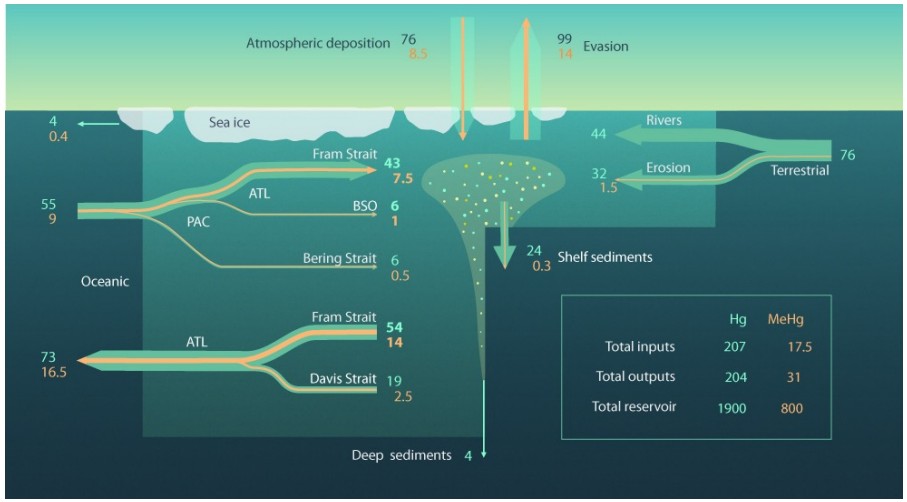
Precise estimate of the mercury export from the Arctic to the Atlantic Ocean

- Using new observations acquired during several GEOTRACES cruises a refined arctic Hg budget was established.
- The Hg concentrations in the East Greenland Current (EGS 1.29 ± 0.43 pM) were higher, compared to the West Spitsbergen Current (WSC 0.80 ± 0.26 pM), resulting in a northward flow of 43±9 Mg y−1 and a southward flow of 54±13 Mg y−1 at Fram Strait.
- The updated arctic Hg mass balance shows that the Arctic Ocean exports about 18 Mg y−1 Hg to the Atlantic Ocean, 40% of which is in the form of methylmercury.

Reference:

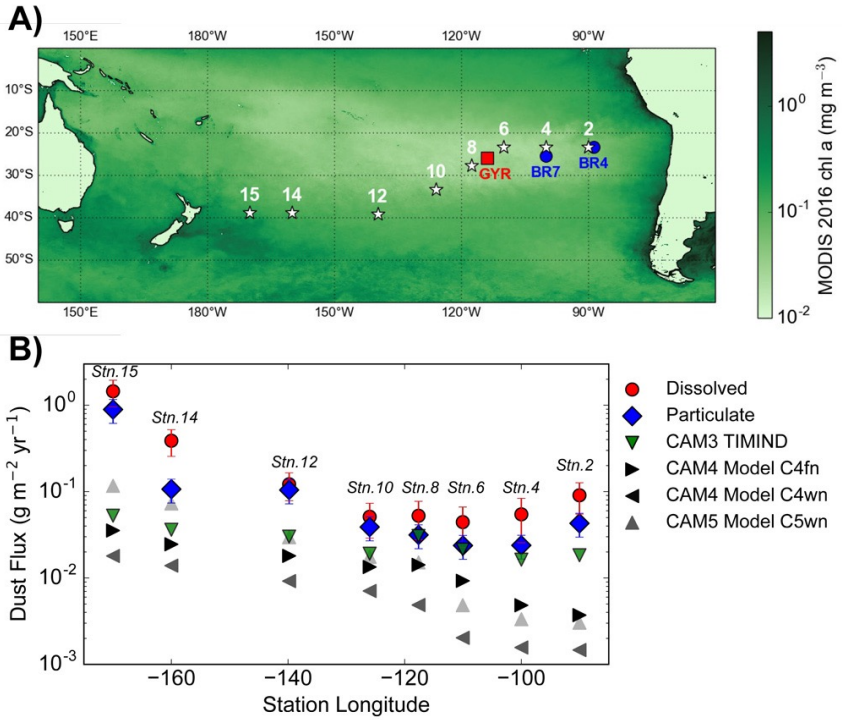
Petrova, M. V.; Krisch, S.; Lodeiro, P.; Valk, O.; Dufour, A.; Rijkenberg, M. J. A.; Achterberg, E. P.; Rabe, B.; van der Loeff, M. R.; Hamelin, B.; Sonke, J.E., Garnier, C.; Heimbürger-Boavida, L.E. Mercury Species Export from the Arctic to the Atlantic Ocean. Mar. Chem. 2020, 103855.

DOI: https://doi.org/10.1016/j.marchem.2020.103855



Surface water trace element and isotope data challenge dust flux models

- Using measurements of dissolved and particulate thorium-230 (230Th) and thorium-232 (232Th) along a section across the South Pacific authors estimated the dust flux over this remote area.
- Although the calculated dust input rates stand among the lowest ever determined, they are 1–2 orders of magnitude higher than those estimated by global dust models.
- Using published dissolved iron (Fe) data, Fe/232Th ratios and solubility of these tracers in aerosols, the authors also estimated the dust-borne Fe flux over the South Pacific Gyre (SPG).
- They reveal that in contrast to previous studies, atmospheric deposition and not the physical transport, is the most important process supplying Fe to phytoplankton at the surface of the SPG.



Pavia, F. J., Anderson, R. F., Winckler, G., & Fleisher, M. Q. (2020). Atmospheric Dust Inputs, Iron Cycling, and Biogeochemical Connections in the South Pacific Ocean From Thorium Isotopes. Global Biogeochemical Cycles, 34(9).

DOI: https://doi.org/10.1029/2020GB006562

3rd GEOTRACES Summer School planned for 2021

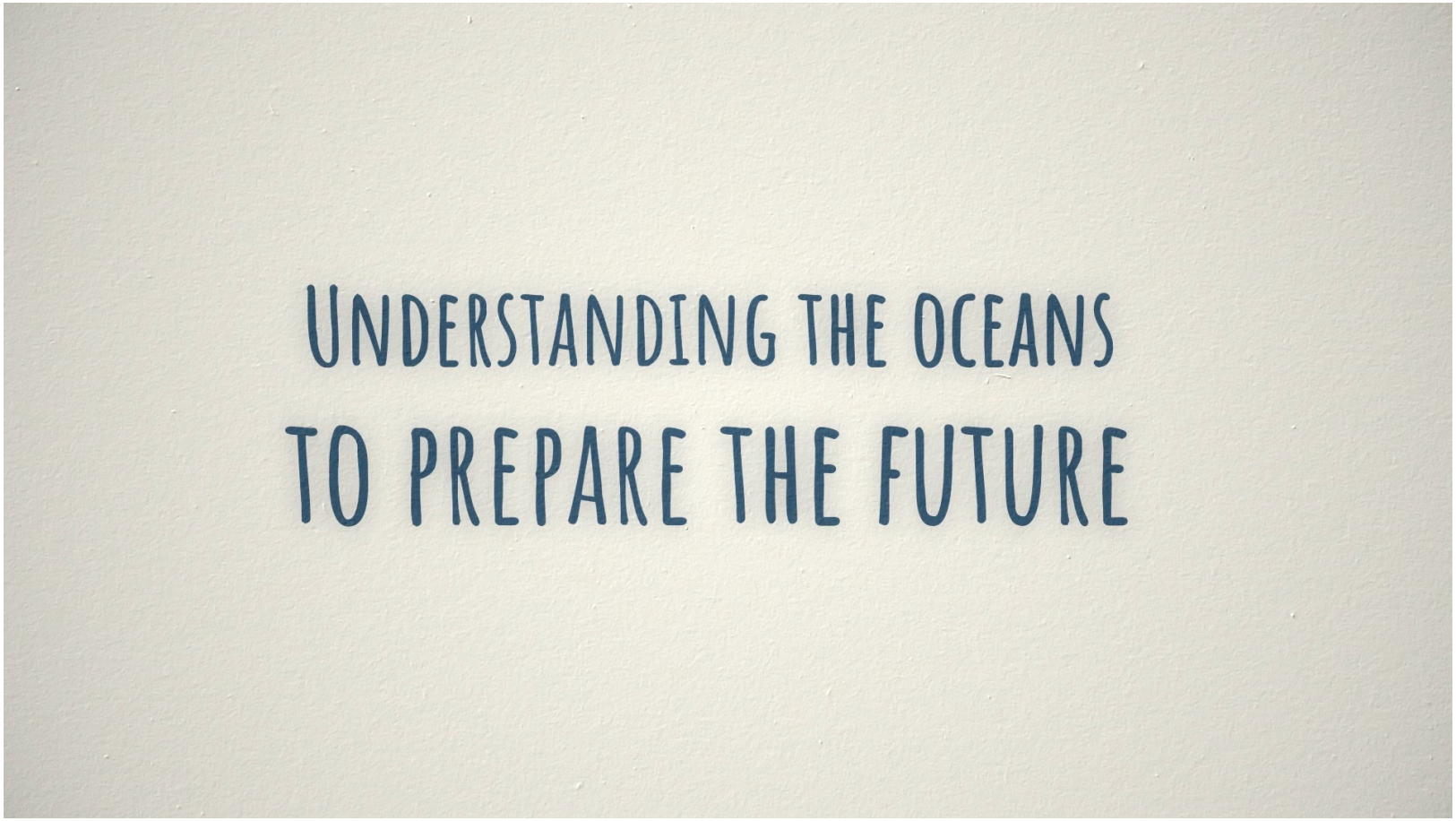
- **International GEOTRACES Summer School: Introducing Polar Parameters**

  15 – 21 July 2022 in Bremerhaven, Germany

- 50 students and 16 lecturers
- Course to include:
  - Lectures
  - Training in shipboard sampling (*RV Heincke*)
  - Lab/computer practicals (ICP-MS analysis, sample processing, sensor mesurements, ODV visualisation)

- **Organisers:** Walter Geibert (AWI), POLMAR Graduate School @AWI (Claudia Hanfland)

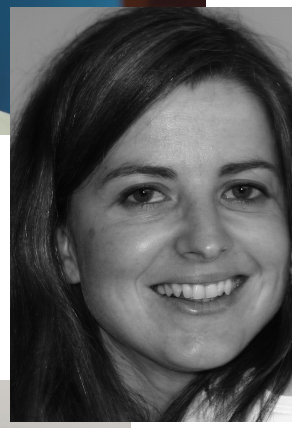
GEOTRACES Video for the general public



Animation by Adrian Artis
Directed by Catherine Jeandel and Elena Masferrer
Voice by Thomas Boutilier / Thanks to Rogue Elephant
Youtube link: https://youtu.be/FoGnPTpOlCg

Thank you very much!

Contact us



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