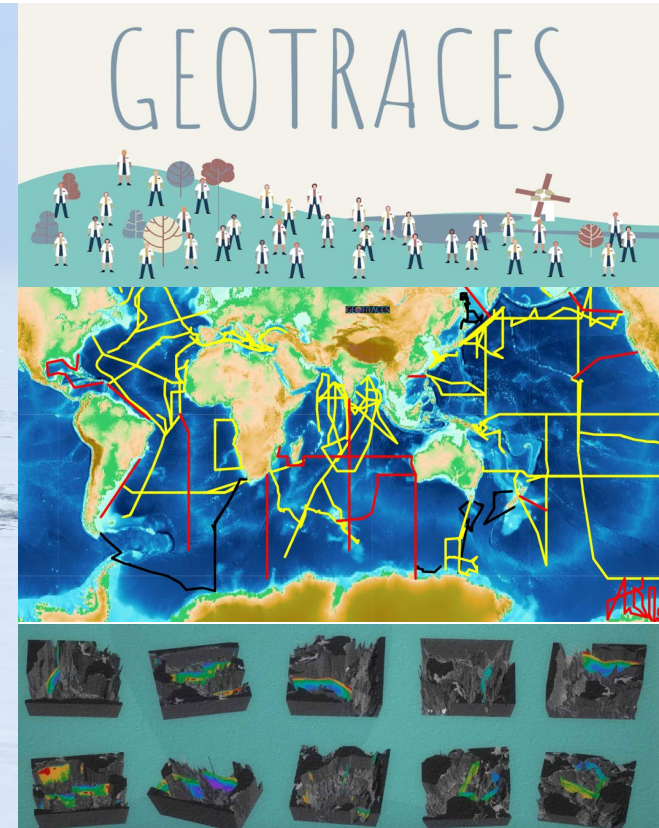


# GEO TRACES

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



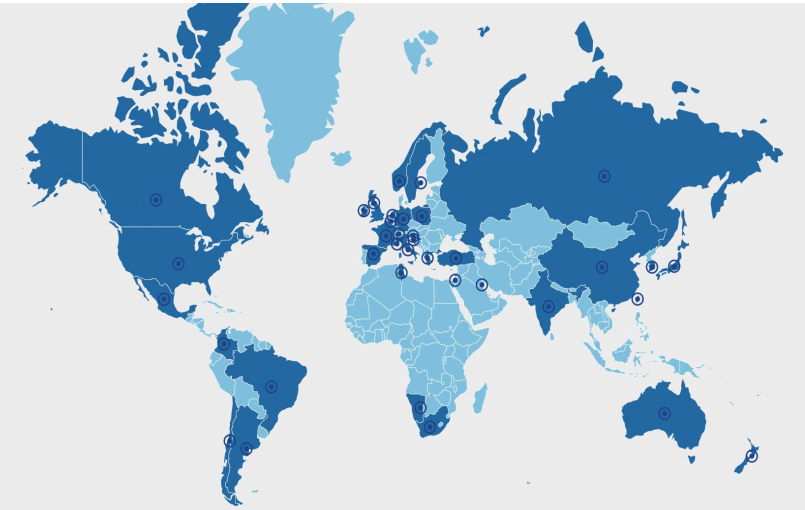
2021  
2030 United Nations Decade  
of Ocean Science  
for Sustainable Development



**Co-chairs: Karen Casciotti, Stanford University**  
**Jun Nishioka, Hokkaido University**  
**Alessandro Tagliabue, University of Liverpool**

# 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
- **GEOTRACES mission to be completed by 2033** (but science will continue!)
- To accomplish the mission **GEOTRACES will:**
  - release 3 more data products (2025, 2028, 2031);
  - undertake synthesis workshops;
  - work towards a state estimate product that synthesises both the data and the knowledge generated;
  - and ensure longevity of GEOTRACES processes and tools, including knowledge gaps, for the next generations



## To date:

**36** countries

**153** cruises completed

**2,606** publications

**30** scientific workshops

**Data Products** in 2014, 2017 and 2021

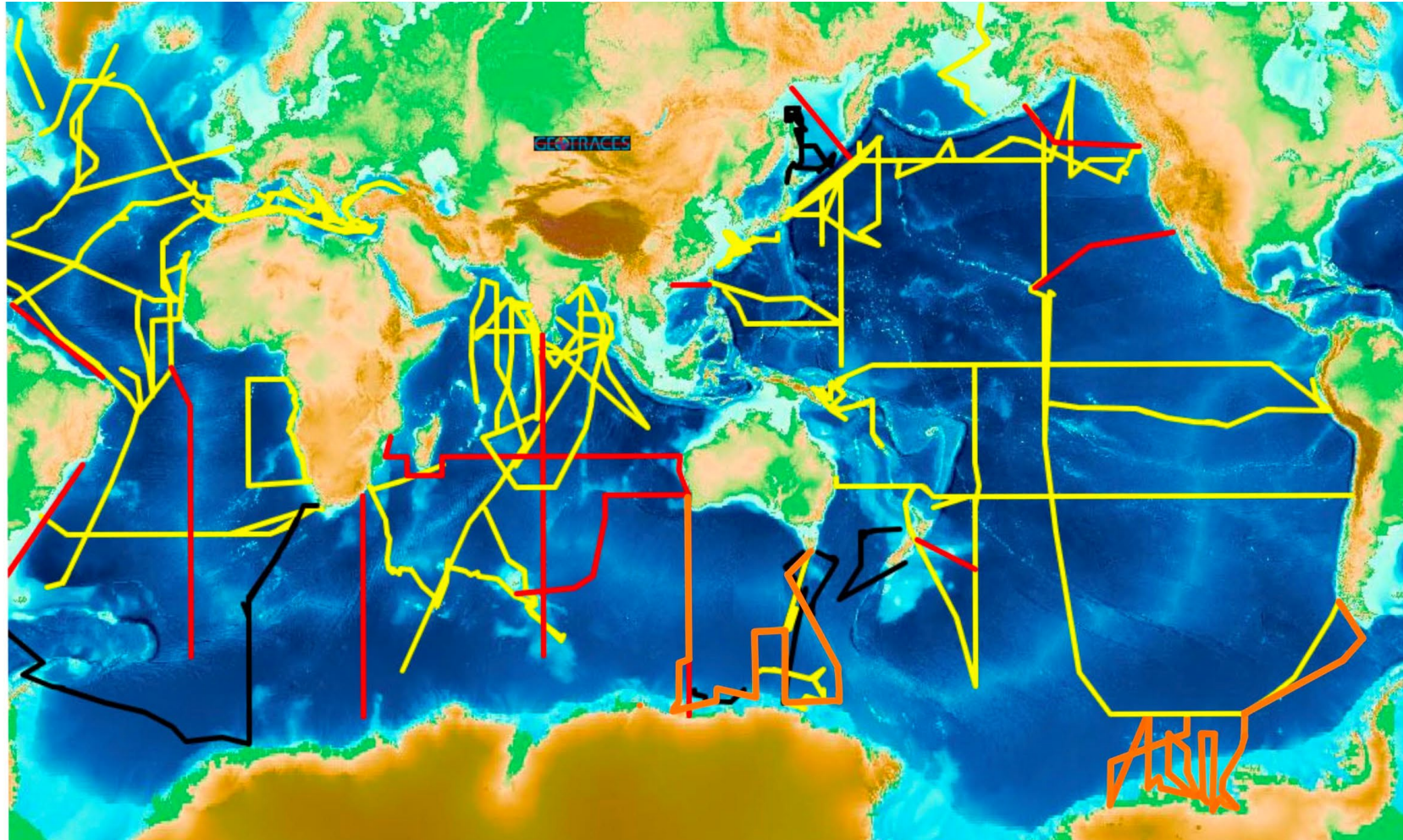
**Synthesis Workshops** in 2015, 2016, 2018



# GEOTRACES Field Programme

Global GEOTRACES Cruise Section Map:

[https://www.bodc.ac.uk/geotraces/cruises/section\\_maps/interactive\\_map/](https://www.bodc.ac.uk/geotraces/cruises/section_maps/interactive_map/)



Since last year's report:

**2** new section cruises completed (Australia and USA) – *marked in orange*

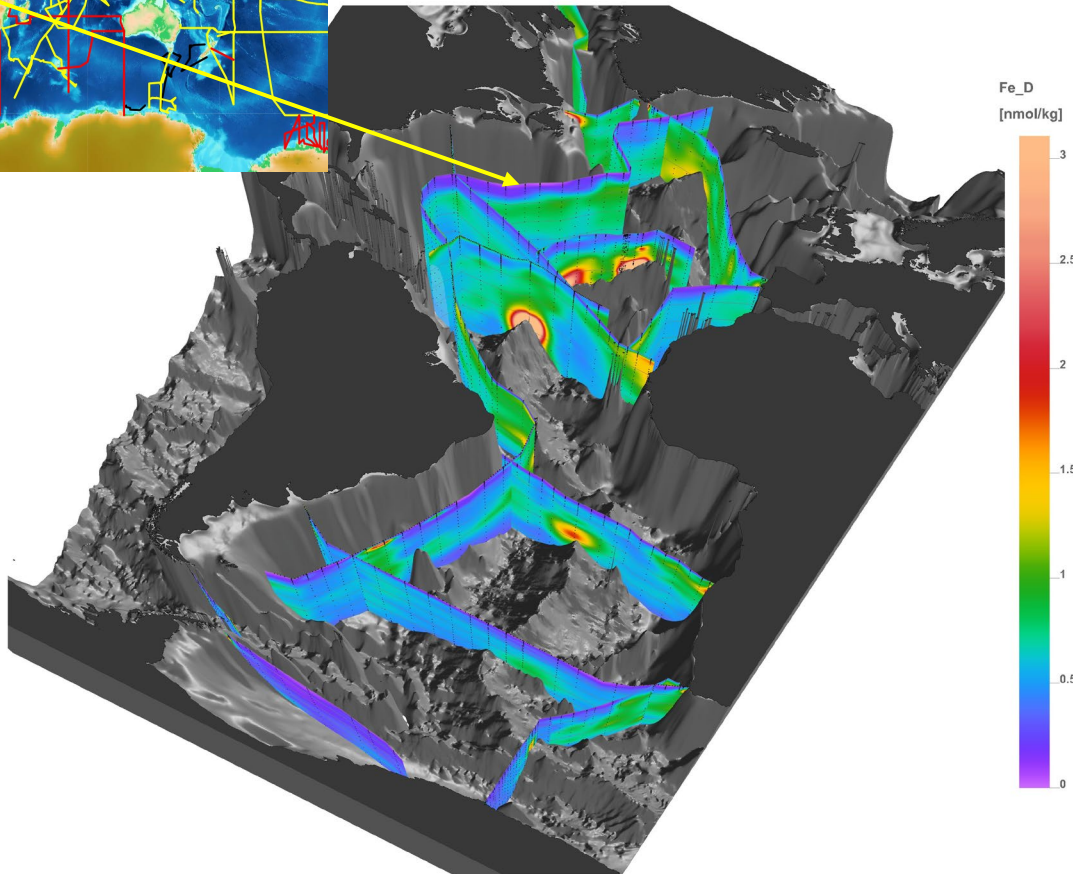
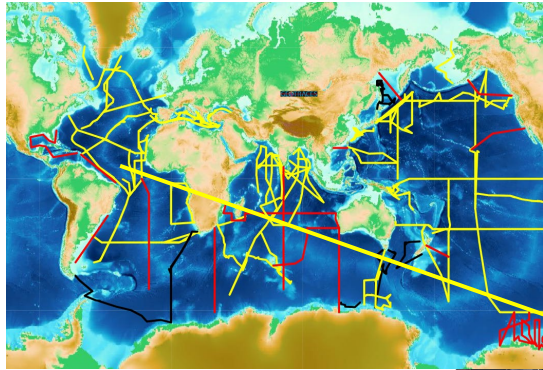
**4** new process studies completed

**1** new compliant dataset

# GEOTRACES Intermediate Data Product



Freely available on-line!



**Trace metal data from more than 3362 stations and 89 cruises...**

It includes:

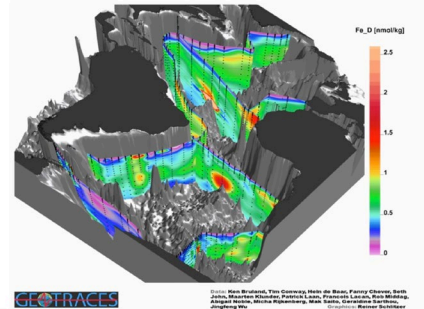
- (1) a compilation of digital hydrographical and biogeochemical data and associated metadata ([geotraces.org/dp](http://geotraces.org/dp))
- (2) the *eGEOTRACES Electronic Atlas* ([egeotraces.org](http://egeotraces.org))

GEOTRACES is eager to foster collaborations with other ocean scientific communities and ocean professionals.



# Access GEOTRACES data: 4 ways to accommodate different users:

- 1 Bulk (full packages) download**  
(BODC site, 3 formats: CSV-ASCII, NetCDF and Ocean Data View (ODV) collections)
- 2 Online subsetting and extraction\***  
(webODV Extractor, easy to select variables, region, cruises, etc.)
- 3 Online analysis and visualization\***  
(webODV Explorer, very user friendly, no need to download software or data)
- 4 eGEOTRACES.org Atlas\***



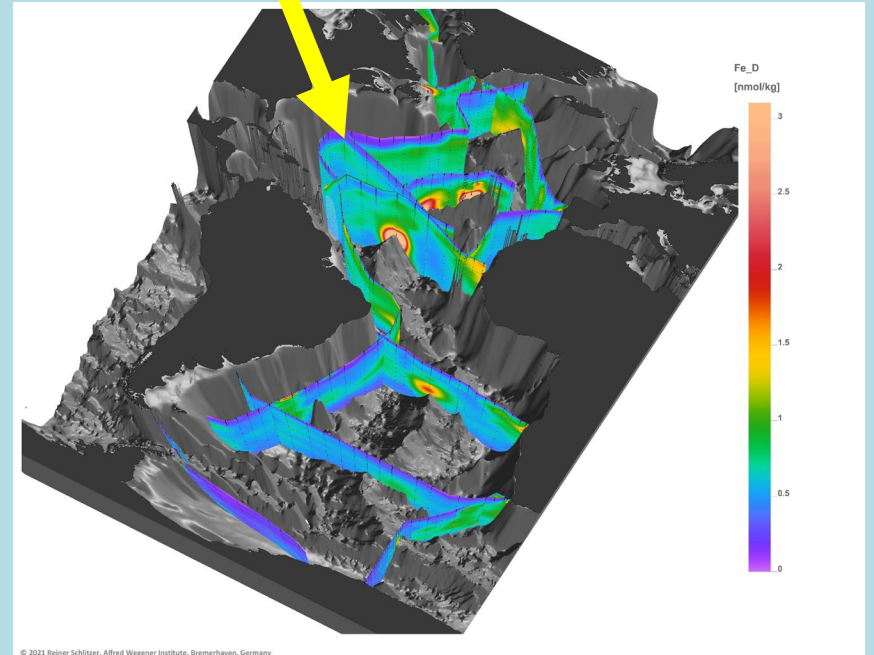
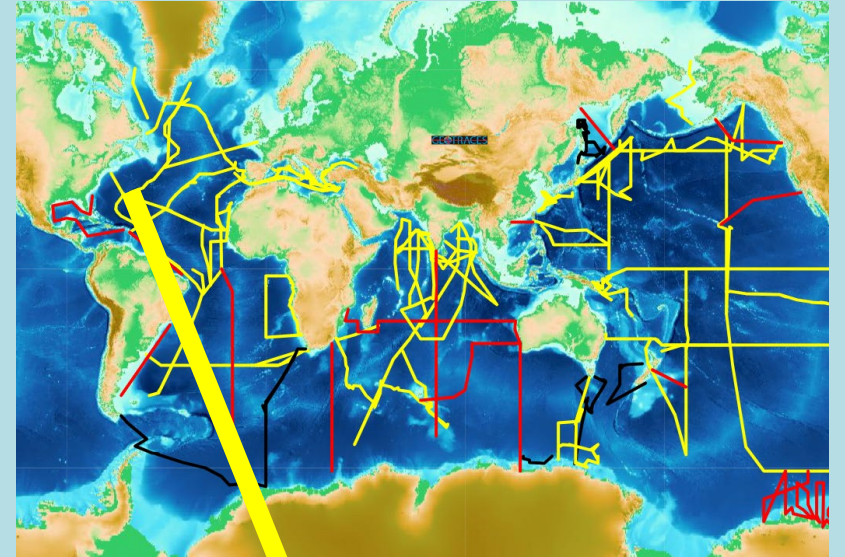
The image shows two screenshots of the webODV interface. The top screenshot is the 'webODV Extractor' interface, which includes a map of the Atlantic Ocean with a selected region, a 'CRUISES' list, a 'MAP DOMAIN' section with zoom controls, a 'TIME RANGE' section with date pickers, and a 'SELECTION STATUS' panel. The bottom screenshot is the 'webODV Explorer' interface, which features a tree structure for navigating through data collections (Ocean, Atmosphere, Ice, Rivers, Sediment) and a central visualization area.



\*Reiner Schlitzer, Alfred Wegener Institute (AWI), Germany

# 4 main highlights:

- 1) **compilation of data from scientists from 35 nations into a single database** where data are presented systematically using **uniform parameter names**
- 2) **internal consistency of data** generated by different labs in different nations
- 3) **active data management:** effort to ensure FAIR-compliant datasets
- 4) **Enabling visualization and/or partial download** of desired data from the GEOTRACES database by all ocean scientists **in a way that is simple and meets FAIR data objectives**



# Forthcoming GEOTRACES Intermediate Data Product

Fourth Intermediate Data Product (IDP) to be released on

15 November 2025

**\*\*\*\*FINAL DEADLINE\*: 15 December 2024\*\*\*\***

**\*Final deadline** for submission of datasets to GDAC (or national data centres) using DOR templates and the complete intercalibration reports via DOR.

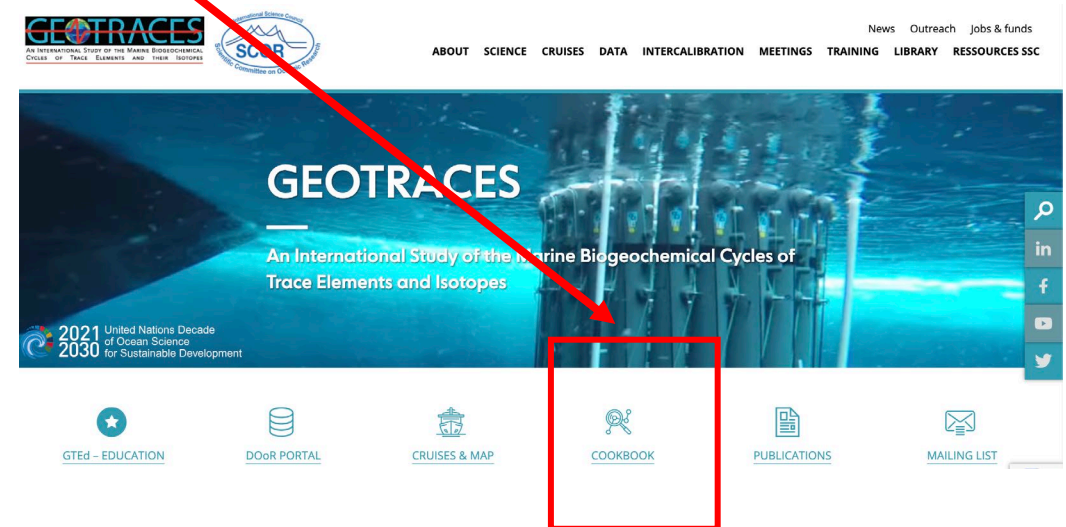


# Updated Cookbook (version 4.0, 2024)

- Available on the GEOTRACES site:

<https://www.geotraces.org/methods-cookbook/>

- a general update of all sections; and
- addition of new sections such a section on *Submission of data, metadata and intercalibration reports* that includes a description of the [DOoR portal](#) and protocols for metadata acquisition.





# Early Career Scientist Committee

The GEOTRACES ECS committee act as a strategic and operational body to promote and coordinate early career activities within the framework of GEOTRACES science.

Co-chairs:

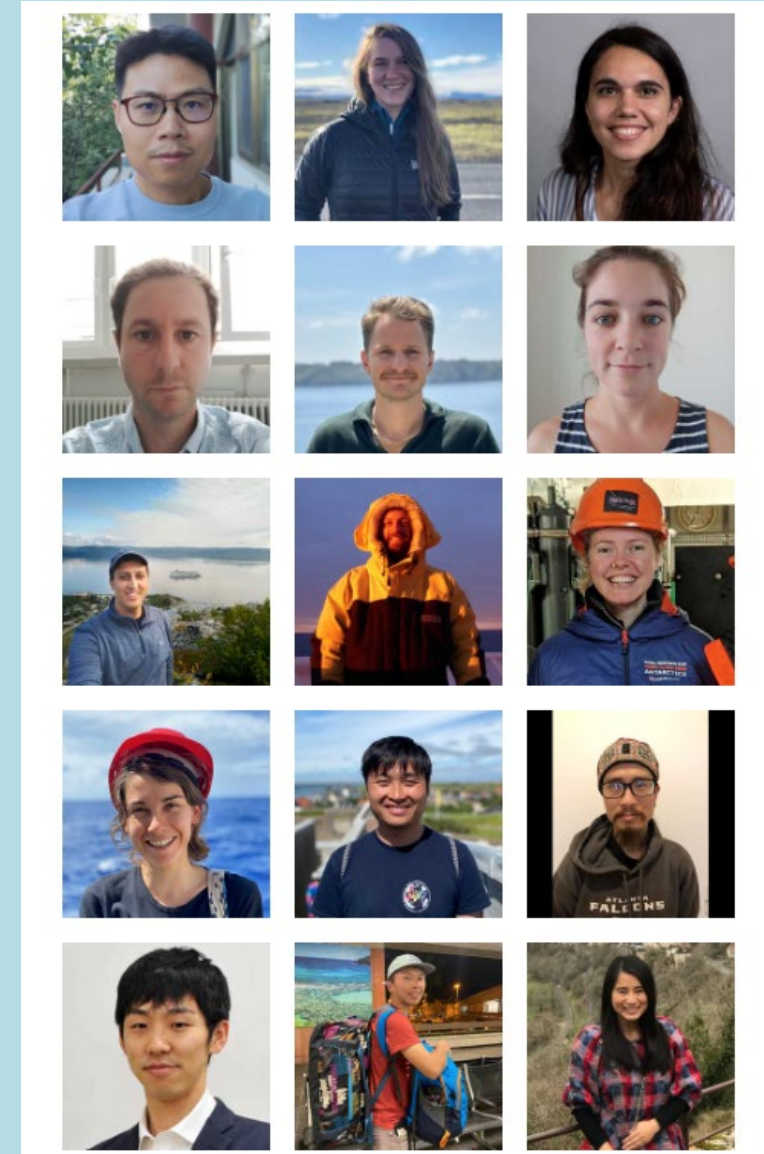
**Jianghui Du**

*Peking University, China*

**Laramie Jensen**

*University of Washington, USA*

Co-chairs represent GEOTRACES in the [UN Decade ECOP programme](#) and attend annual GEOTRACES SSC meeting.



*GEOTRACES selected as UN Ocean Decade contribution – July 2021.*

The IPO and the DMC co-chairs met with the **Decade Coordination Office (DCO) for Ocean Data Sharing (ODS)** on 2 August 2023.

The following actions followed this year:

- GEOTRACES as one of the **4 primary attached projects of DCO-ODS**
- Presentation of GEOTRACES at the first **webinar of the DCO-ODS** (talk by Bill Landing)
- Contribution of a **study-case on GEOTRACES** a the Ocean Decade Toolkit for Data Sharing.
- Presentation of GEOTRACES/DOoR at the Ocean Data Sharing Helpdesk during the **UN Ocean Decade Conference** in April 2024 in Barcelona.

## DCO-ODS associated Programmes

### OceanData 2030



Development of an open-source data and information system that will link existing ocean information systems around the world, and enable more efficient discovery of data, information and knowledge products.

### World Ocean Database Programme (WODP)



WOD is the world largest unrestricted, uniformly formatted, quality-controlled, digital ocean profile database available with data from 1778 to present.

### GEOTRACES



GEOTRACES is an international program designed to coordinate efforts and data regarding marine biogeochemical cycles of trace elements and their isotopes (TEIs).

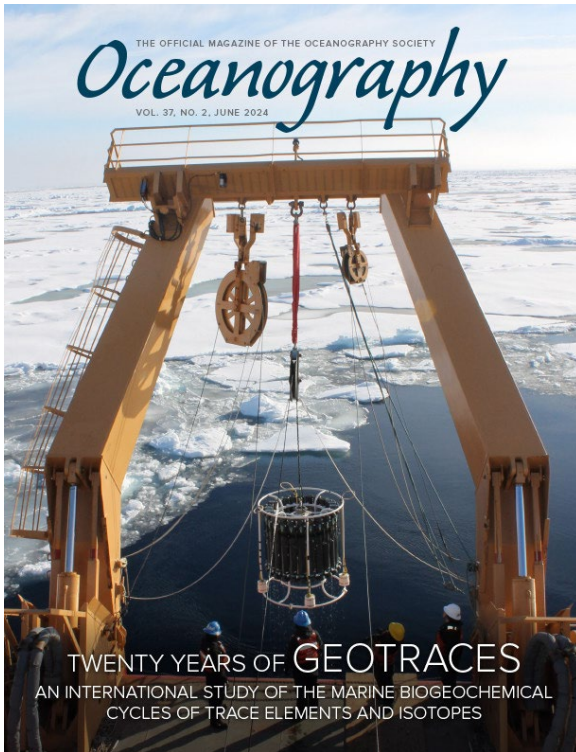
### Digital innovation Hand-in-Hand with fisheries and ecosystems scientific monitoring



The Fisheries and Environmental Atlas will use Open Data and Open Science to support fisheries and ecosystems scientific monitoring.



# Two Special Issues

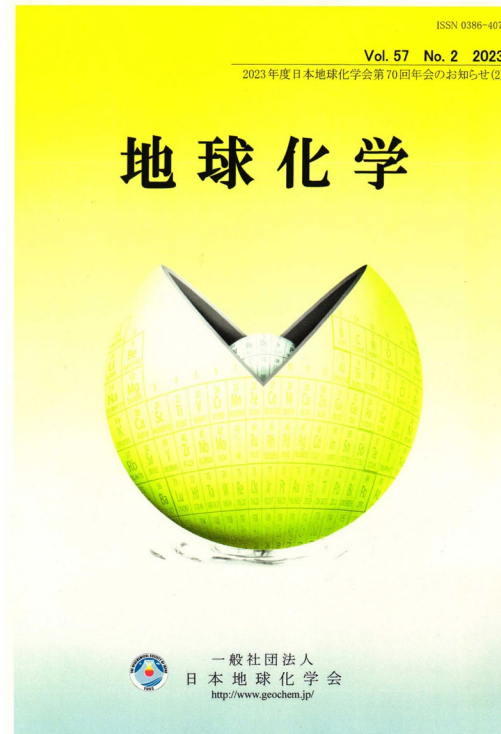


## Twenty Years of GEOTRACES: An International Study of the Marine Biogeochemical Cycles of Trace Elements and Isotopes

*Oceanography*, Volume 37 |  
Number 2 | June 2024

**Editors:** Tim M. Conway,  
Jessica N. Fitzsimmons, Rob  
Middag, Taryn L. Noble, and  
Hélène Planquette.

**19 papers** - It reviews the  
transformational findings of  
GEOTRACES in chemical  
oceanography, 20 years after  
drafting of the GEOTRACES  
Science Plan in 2004.



## Marine Geochemistry of Trace Elements and Their Isotopes *Chikyukagaku*, Volume 57, Issue 2 – June 2023

**Editors:** Hajime Obata, Yoshiko  
Kondo, Keiji Horikawa, Shotaro  
Takano, Kazuya Tanaka

This special issue has been  
published in the Japanese journal  
“*Chikyukagaku*” by the  
Geochemical Society of Japan.

**13 papers** (main text in Japanese,  
abstracts available in English).



# Planned events for 2025

- 4th GEOTRACES Summer School, planned for November 2025, in Cape Town, South Africa  
*Theme: How do trace elements get into the ocean, how are they chemically cycled in the ocean, how do they interact with biology*
- GEOTRACES Synthesis Workshop, 1 July-4 July 2025, Institute for Advanced Studies Delmenhorst, Germany





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# Thank you!

[www.geotraces.org](http://www.geotraces.org)

## International Coordination:

**GEOTRACES International Project Office**  
(LEGOS-OMP, Toulouse, France)

**Catherine Jeandel** (Scientific Director)  
**Elena Masferrer Dodas** (Executive Officer)  
[ipo@geotraces.org](mailto:ipo@geotraces.org)

## Data Management:

**GEOTRACES Data Assembly Centre**

**Donna Cockwell** (Data Manager)  
Centre (BODC, Liverpool)  
[geotraces.dac@bodc.ac.uk](mailto:geotraces.dac@bodc.ac.uk)

