



An International study of the marine  
biogeochemical cycles of trace  
elements and their isotopes

<http://www.geotraces.org/>

Sponsored by



And many national agencies.

# Guiding mission

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.



# Programmatic Themes

## **Theme 1: Fluxes and processes at ocean interfaces**

Atmospheric deposition

Continental run-off

The sediment-water boundary

Ocean crust

## **Theme 2: Internal cycling**

Uptake and removal from surface waters

Uptake and regeneration in the sub-surface ocean

Regeneration at the seafloor

Physical circulation

## **Theme 3: Development of proxies for past change**

Factors controlling 'direct' proxy distribution in the ocean

Factors influencing the distribution of 'indirect' proxies in the ocean

Palaeoceanographic tracers based on sediment flux



# Program Elements to achieve Objectives

## **Enabling Activities**

- Standards and intercalibration
- Data protocols, management, archiving
- Modeling
- Baseline stations

## **Ocean Sections**

- Core activity - requires international cooperation
- 12-15 sections
- Covering regions dominated by major processes
- National cruises with international collaboration

## **Process Studies**

- Targeted at processes known to be important
- Targeted at “anomalies” detected in ocean sections
- Many will focus on coastal regions



## Timeline

Informal discussion -> first town meeting Dec. 2001

International workshop - Toulouse 2003

SCOR sponsorship - 2004

Science Plan written by Planning Group with extensive input from wider community - 2004/5

Science Plan reviewed (SCOR) & published - late 2006

2007 Basin Planning Workshops: Pacific, June; Atlantic, Sept; Indian, October

First cruises - **Intercalibration** and IPY cruises in 2007 -2009

Basin Surveys begun in 2010 - Decade-Plus Time scale



# Nations involved in cruises to date

**USA**

**Canada**

**China**

**Spain**

**UK**

**France**

**Netherlands**

**Sweden**

**Taiwan**

**Japan**

**Germany**

**India**

**S. Korea**

**New Zealand**

**Australia**



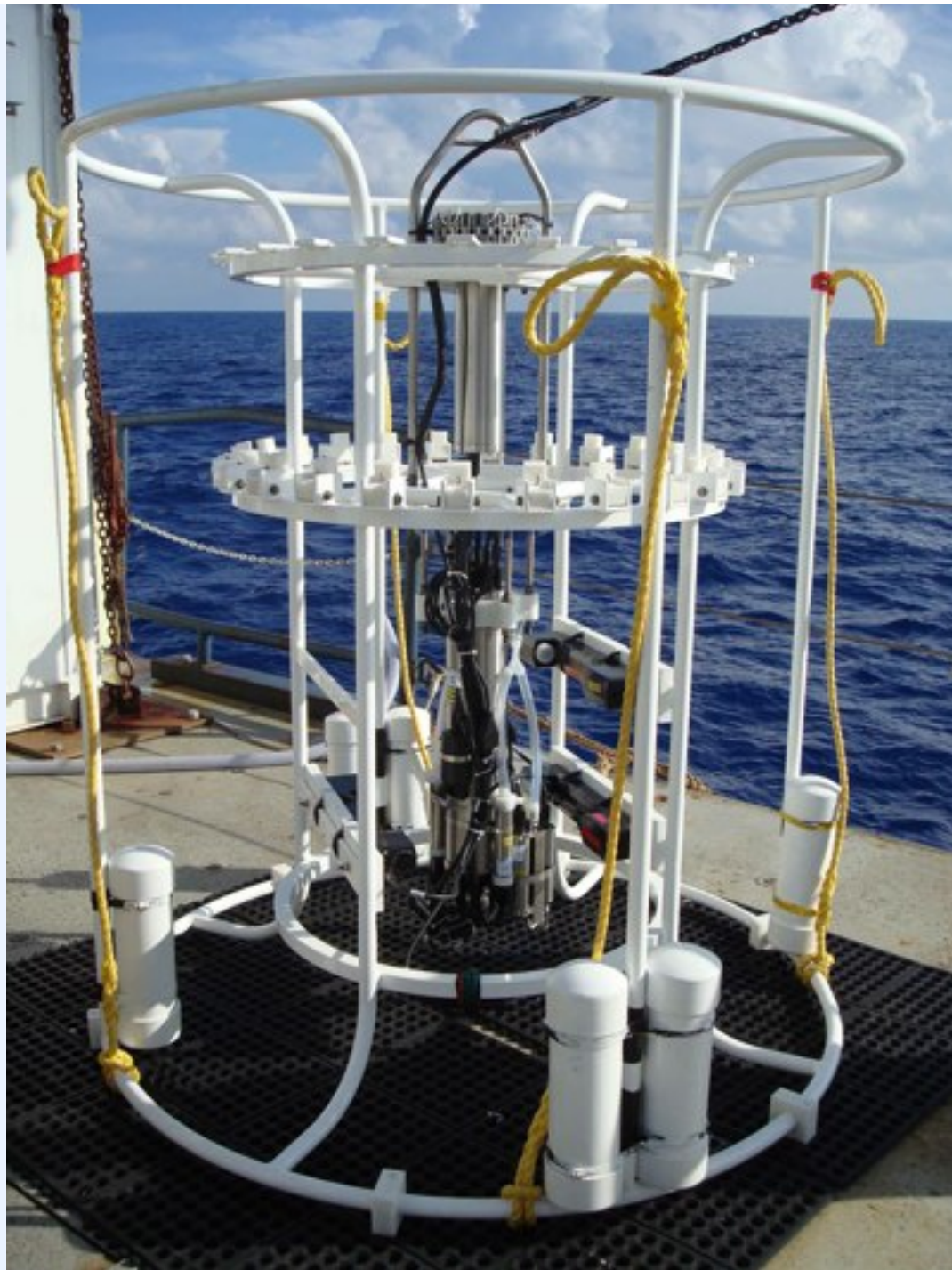
[www.geotraces.org](http://www.geotraces.org)

# US GEOTRACES Clean Sampling System

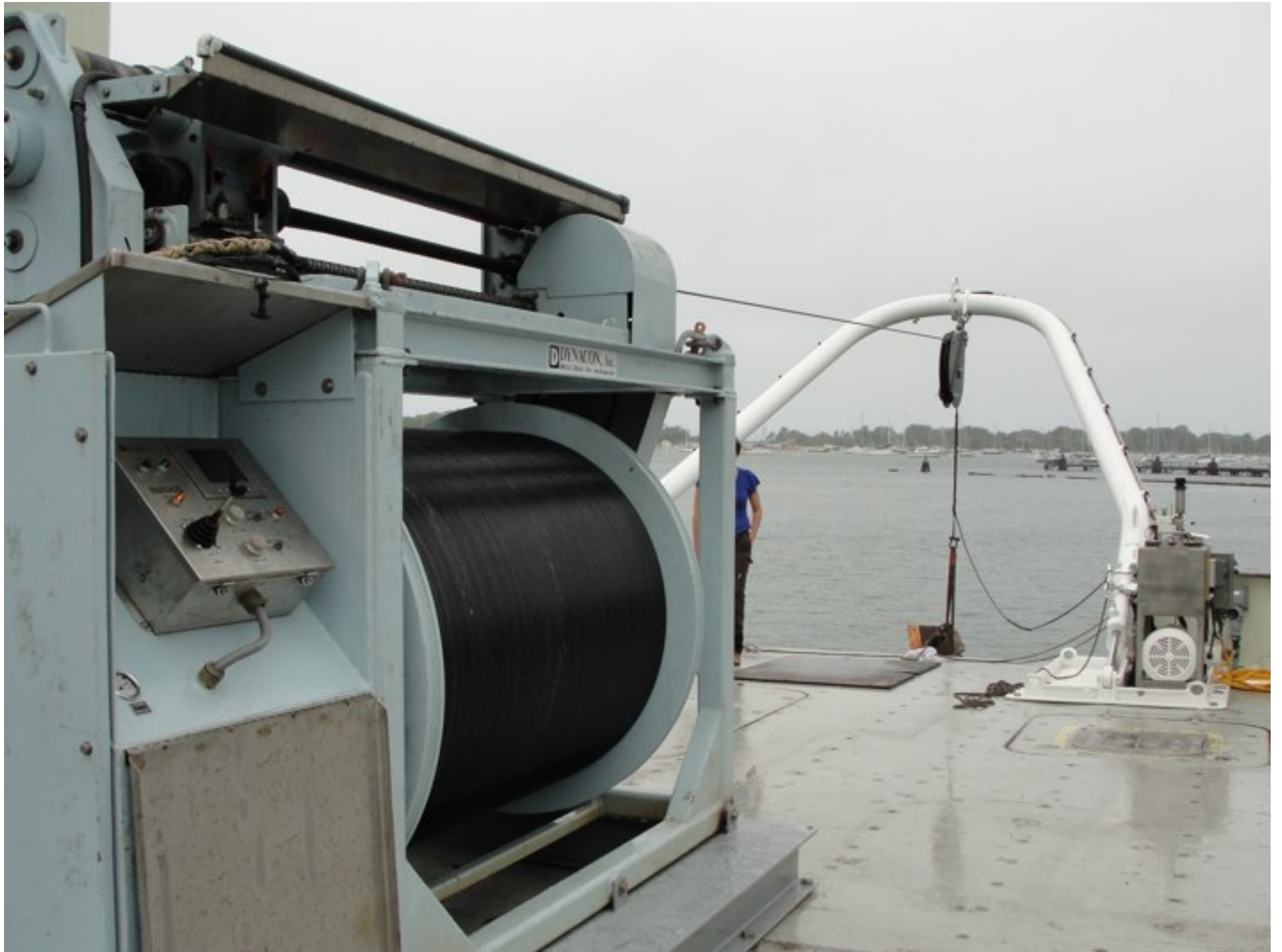
- Seabird Trace Element-clean Carousel with (24) 12 L GO-FLO bottles, capable of firing up to 3 at once, Ti housings on CTD and sensors (T, S, O<sub>2</sub>, fluor, trans); back up sensors and 52 GO-FLOs
- Dynacon winch with 7800 m of 14 mm Vectran conducting cable (+ 20' flat rack container)
- Clean lab van/container (UNOLS compliant)
- Allied portable A-frame and Dynacon composite overboarding sheave (+ 20' flat rack container)
- Boom, etc. for towing underway, clean “fish”











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