

GEOTRACES Intercalibration

Intercalibration – *The process, procedures, and activities used to ensure that the several laboratories engaged in a monitoring program can produce compatible data. When compatible data outputs are achieved and this situation is maintained, the laboratories can be said to be intercalibrated (Taylor, 1987).*

Intercalibration therefore is an active process between laboratories that includes all steps from sampling to analyses, with the goal of achieving the same accurate results regardless of the method or lab.

Intercalibration Activities Within GEOTRACES

As defined in the GEOTRACES Science Plan, intercalibration is an integral part of the program and in fact was the first phase before actual field work began. It is continuing throughout the program, with a standing committee overseeing it. The overall goal is to achieve the most precise and accurate data for the suite of Trace Elements and Isotopes (TEIs) being examined.

GEOTRACES Standards and Intercalibration Committee

Currently (2011):

Greg Cutter, Old Dominion U., USA, Chair

Per Andersson, Swedish Museum of Natural History

Lou Codispoti, U. Maryland, Horn Point Lab, USA

Peter Croot, Plymouth Marine Laboratory, UK

Roger Francois, U. British Columbia, Canada

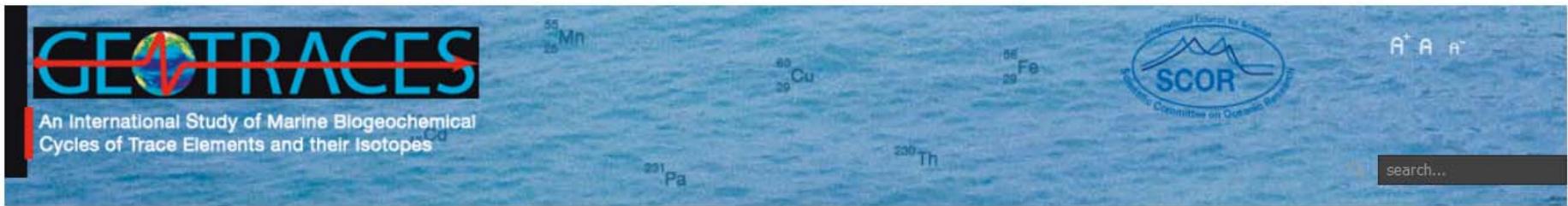
Maeve Lohan, U. Plymouth, UK

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Intercalibration requirements during GEOTRACES transect cruises

- Use GEOTRACES protocols (www.GEOTRACES.org) for accurate sample acquisition and handling.
- Occupy 1-2 Baseline and/or Crossover (same station on a different cruise) stations during the cruise.
- If Baseline or Crossover Stations cannot be occupied, at 2 stations and 3 depths per station, acquire replicate samples for distribution to various labs to evaluate sample storage and analytical accuracy.
- Intercalibration includes dissolved and particulate phases.
- Use appropriate reference materials during analyses (e.g., SAFe and Geotraces intercalibration samples)
- Evaluate results from Baseline and Crossover stations as soon as possible to verify accurate results; submit metadata and results to S&I Committee for evaluation.



QUICK LINKS

- GEOTRACES Policies
- Data and Data Management
- **Standards, Methods & Intercalibration**
- Calendar of Meetings
- GEOTRACES Brochure

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Cruise and Methods Manual (CookBook)

Please click [here](#) to download the Sampling and Sample-handling Protocols for GEOTRACES Cruises.

Sampling and Sample-handling Protocols for GEOTRACES Cruises

Edited by the 2010 GEOTRACES Standards and Intercalibration Committee:

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GEOTRACES Baseline Stations

- Ocean stations where TEI distributions, concentrations, and speciation have been extensively studied (established). Ideally, there should be > 2 per ocean basin.
- Occupying these during a GEOTRACES transect allows de facto intercalibration for each cruise. In addition, these locations facilitate the testing of new sampling or analytical methods.
- Ocean Time Series Stations are potentially good Baseline Stations – regular occupation, large data base, and most are logistically convenient or located in GEOTRACES-relevant ocean regimes
- As of 2011, there are only two Baseline Stations, BATS in the N. Atlantic and SAFe in the N. Pacific

Intercalibration Samples

- The SAFe program (Ken Bruland) collected 500+ samples from the “deep” and surface N. Pacific Ocean for worldwide distribution to labs doing trace metal analyses. This has created consensus values for a suite of key GEOTRACES TEIs. They are not certified reference materials (CRMs).
- The US GEOTRACES Intercalibration program created a similar library of samples from the deep and surface N. Atlantic, and surface N. Pacific; consensus values are being compiled.
- These are excellent for improving analytical accuracy, but do not evaluate sampling or handling.
- The Protocols suggest/demand that Intercalibration (e.g., SAFe) samples be analyzed regularly to assess accuracy (i.e., like the use of a CRM). BUT, there are no equivalent samples for radionuclides (for obvious reasons), particles (working on this), or large volume TEIs.

Outcomes of S&I Data Reviews

- Annual reviews
- After careful consideration of supplied data (including results for CRM or consensus SAFe and GEOTRACES standards, as well as metadata), and comparisons with existing (past) data, the Committee will recommend:
 1. Data are acceptable
 2. Some analytical and/or computational work (e.g., recalibrate, rerun samples) are needed - intercalibration
 3. Data are unacceptable/unrecoverable (e.g., due to sampling contamination)
- These decisions will be communicated to: investigators and chief scientists; DMO; SSC