

Agenda for GEOTRACES Intercalibration Workshop 1

8-9 December 2007, Cartwright Hotel, San Francisco, California

(Please note that this is largely an outline and we will endeavor to fill in gaps as we go and make this a very interactive workshop. It will be 2 very full days and I suspect an evening as well.)

A. Introductions – Everyone and their TEIs

B. US Intercalibration Cruise Goals *(these parallel those of International GEOTRACES)*

1. Perfect a working (representative sample, no contamination) sampling system for as many TEIs as possible that will be available for future US GEOTRACES cruises.
2. Conduct an intercalibration for dissolved and particulate TEIs for the US and International GEOTRACES communities

C. Workshop Goal – create a detailed cruise plan, including evaluation of sampling systems and collection of intercalibration water and particle samples

D. Overview of our proposed cruise plan to date *(before the workshop!)*:

(1) US sampling systems *(Note: other sampling systems to be used on the cruise will be discussed later)*

New carousel, GO-Flo bottles, CTD and sensors, sampling van
Underway/upper water column fish and pumping system
Filtration – bottles only (in situ pumps supplied by other groups)

(2) Dissolved TEI intercalibration system for US and International GEOTRACES

Tanks, filtration, etc

(3) Cruise plan

Leg 1 (Norfolk-BATS-Bermuda; 18-20 days...*to be determined at workshop*):

1. Evaluate/modify carousel system to take representative and uncontaminated samples compared to samples taken with conventional GO-Flo deployments, MITESS samplers, and surface pumps, and using shipboard determinations of at least Fe and Zn, but hopefully Hg and perhaps Pb. GO-Flo bottles rinsed/cleaned on the transit out to BATS.
2. Once the sampling system is working (clean), we will acquire 500-1000 L of filtered water for intercalibration of TEIs at 2 depths; we'll likely do this several times, with the first rinses providing water for TEIs not prone to contamination. Thereafter, when the 500 L tanks have been verified as clean we will use them for the intercalibration of contamination-prone TEIs. The 0.5 L bottles for dissolved trace

elements (LDPE bottles with LDPE caps and acidified with HCl) will be provided by us, but sample containers (of the appropriate size and materials, and cleaned in an appropriate manner) for other TEIs will be provided by each of the element groups (via the TEI group/Element Coordinators).

3. Obtain a full water column profile for as many dissolved and particulate TEIs as possible (volume constraint; maybe just the small volume, trace elements) to establish BATS as a Baseline Station
4. Evaluate particle collection methods for the GO-Flo bottles (e.g., filter type and pore size); limited pump experiments
5. Test and intercalibrate nM nutrient methods

Leg 2 (Bermuda-BATS-Shelf Break-Norfolk, 10-12 days):

1. Particle intercalibration using carousel GO-Flos and in situ pumps
2. Collect 500-1000 L at 2 depths for intercalibration of radionuclides
3. Do a full water column profile for dissolved and particulate radiogenic and radioactive TEIs to establish BATS as a Baseline Station
4. Collect particles (filters) for intercalibration
5. Repeat #2 (one depth) and #4 at a shelf break (or slope; to be discussed) station for short-lived radionuclides and particles

E. Presentations by each of the Element Coordinators and PIs bringing other sampling and analytical equipment (and individuals if they're not covered by the ECs) - their goals and sample, lab/deck, volume, and time needs for the cruise, plus any equipment they're bringing (ca. 5 min each):

- **Dissolved and particulate sampling systems, “core” trace elements** – G. Cutter, K. Bruland, and R. Sherrell – already covered
- **Si isotopes** - Mark Brzezinski
- **N (and O) isotopes**– Karen Casciotti
- **P (O isotopes)** – Albert Colman
- **Hg** – Rob Mason for Carl Lamborg
- **Metal stable isotopes and MITESS Samplers** – Ed Boyle
- **Nd and Hf** – Tina van de Flierdt
- **Os** – Bernhard Peucker-Ehrenbrink could not attend; anyone?
- **Speciation** - Jim Moffett, moffett@usc.edu
- **Pu, ¹³⁷Cs** – Bob Anderson for Tim Kenna
- **Ra** – Billy Moore
- **Th, ²³¹Pa, ¹⁰Be** - Bob Anderson
- **Pb-, Po-210** – Mark Baskaran
- **Part. Th and in situ pumps** - Ken Buesseler
- **CLIVAR Sampling System** - Bill Landing + Chris Measures
- **MULVFS pump** – Jim Bishop
- **Vane samplers** – Jingfeng Wu

F. Begin break-out group discussions, with the first ones to discuss plans/experiments to evaluate sampling for “dissolved” vs. particulate TEIs. The foci of these two groups should include filter types and pore sizes (contamination, representative samples, flow rates, etc) and how to test them on this cruise, comparing bottles vs. in situ pumps, and the logistics of performing these evaluations (Note: colloid sampling will not be addressed on Cruise 1, but rather on Cruise 2). With respect to particle sampling during GEOTRACES, there will be 2 means of collection, from the GO-Flos and via pumps. The division into 2 working groups poses the question, to which group those interested in the GO-Flo particles go? I suggest that they attend the “dissolved” discussions, but we can all decide on this at the Workshop; 2+ hrs. When we reconvene in plenary, we’ll compare ideas and figure out how to combine the needs of sampling both of these phases to meet the intercalibration goals and those of future GEOTRACES cruises. For example, if the dissolved TEI group feels 0.4 μm filtration is adequate, then the particle group can figure out where the filtrate can be acquired in the filtration process. Once we have a group plan for separating dissolved and particulate TEIs, the second set of working group discussions will be to coordinate and combine sample handling and processing plans, sample storage, etc. (suggested Break-out #2 groups: radiogenics + long lived radionuclides, short-lived radionuclides, contamination-prone trace elements, and nutrients-isotopes); ca. 2 hours. We will reconvene in plenary to compare notes, plans, and problems, with a particular emphasis on minimizing sample volume requirements while still getting everyone the samples they need (keep in mind that volume is not such an issue with the intercalibration, but it is for doing the vertical profiles to establish the Baseline station...and for future GEOTRACES cruises). From these break-out discussions, we can then create a detailed cruise plan.

G. Metadata. There are strict data policies for everyone involved in GEOTRACES (see Science plan and Data Management Report on the GEOTRACES web site) and we need to begin gathering the metadata for the intercalibration and for each TEI that we are examining. Chris Measures will briefly describe what level of detail is needed, and task each participant with assembling what they believe are the metadata required for their TEIs. This information will be transferred to the Data Management Committee for their creation of the GEOTRACES Data Center.

H. Logistics discussions (partial list and not in order of importance):

1. deck and lab space needs (lay it all out; count the # of vans and winches, etc. coming) – create an inventory of equipment to be brought on the cruise
2. Evaluate whether we can perform some in situ pump vs. GO-Flo comparisons on Leg 1, with the remainder on Leg 2
3. Shipping to Norfolk and back; when and where
4. Cruise dates
5. Leg 1 vs. Leg 2
6. Assemble participant list
7. volume calculations
8. Assemble a sample recipient list (remember that with the exception of the 0.5 L dissolved trace metal samples which will be distributed by us, the distribution of

all the other samples will be overseen by the Elemental Coordinators (we'll assist as needed. Each EC will therefore be responsible for their own recipient list)

9. Do we need a rad van?
10. Bottle preparation for filling in the clean van (i.e., how they should be packaged for filling in the clean lab)