

Dr. Robert Anderson / GEOTRACES  
Lamont-Doherty Earth Observatory  
Rte 9-W  
Palisades NY 10964

4 October 2013

Dear Bob,

This letter is to inform you of my interest in leading in a GEOTRACES/Arctic proposal in collaboration with Scott Tumey (Lawrence Livermore) to determine the  $^{129}\text{I}$  content of total inorganic iodine in Arctic Ocean samples collected during GEOTRACES/Arctic. In addition to  $^{129}\text{I}$ , we would also be determining (via ICPMS) the concentration of iodine, a weakly biophilic element.

*Scientific goals include but are not exclusive to:*

Using  $^{129}\text{I}$  and related tracers to determine the time and dilution sequence of water that originates in the high Atlantic as it passes and mixes into the Arctic Ocean. In doing so we would be taking advantage of the point source tracer history from Sellafield and La Hague which as a consequence of nuclear reprocessing have released significant amounts of  $^{129}\text{I}$  into North Atlantic surface waters. In the Arctic, and for water sourced from the North Atlantic, this signal swamps the 'conventional' bomb-pulse  $^{129}\text{I}$  transient tracer. TTDs based on  $^{129}\text{I}$  and transient tracers with different source functions (eg., CFCs) would be used to calculate and estimate water mass ages and dilution history.

*Anticipated collaborators:*

PIs using radiochemical tracers that can be influenced by nuclear reprocessing (eg.,  $^{137}\text{Cs}$ , Np)  
PIs using "conventional" transient tracers (eg.,  $^3\text{H}/^3\text{He}$ ,  $^{14}\text{C}$ , CFCs, etc)

*Berths and Logistics:*

Water needs are minimal (1 liter) and could be from the non-trace metal clean casts.  
Value added to the measurements requires coordinated sample collection (same cast/bottles).  
One berth is anticipated for a participant on the project to participate on the cruise in taking  $^{129}\text{I}$  samples.

Sincerely,  
Tom Guilderson

DEPARTMENT OF OCEAN SCIENCES  
UNIVERSITY OF CALIFORNIA – SANTA CRUZ  
ALSO AT  
CENTER FOR AMS, LLNL