

US GEOTRACES Report

Bob Anderson - US GEOTRACES Project Office

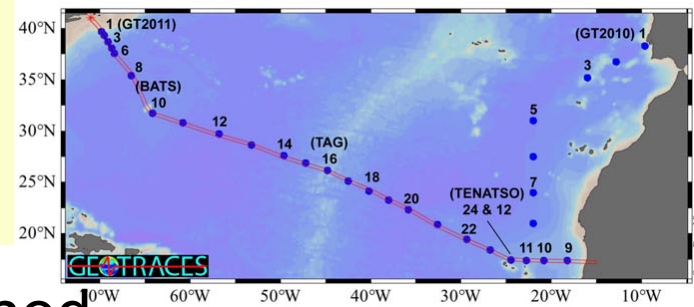
GEOTRACES SSC Meeting

Salvador, Brazil

18 – 20 September 2017



US GEOTRACES GA03



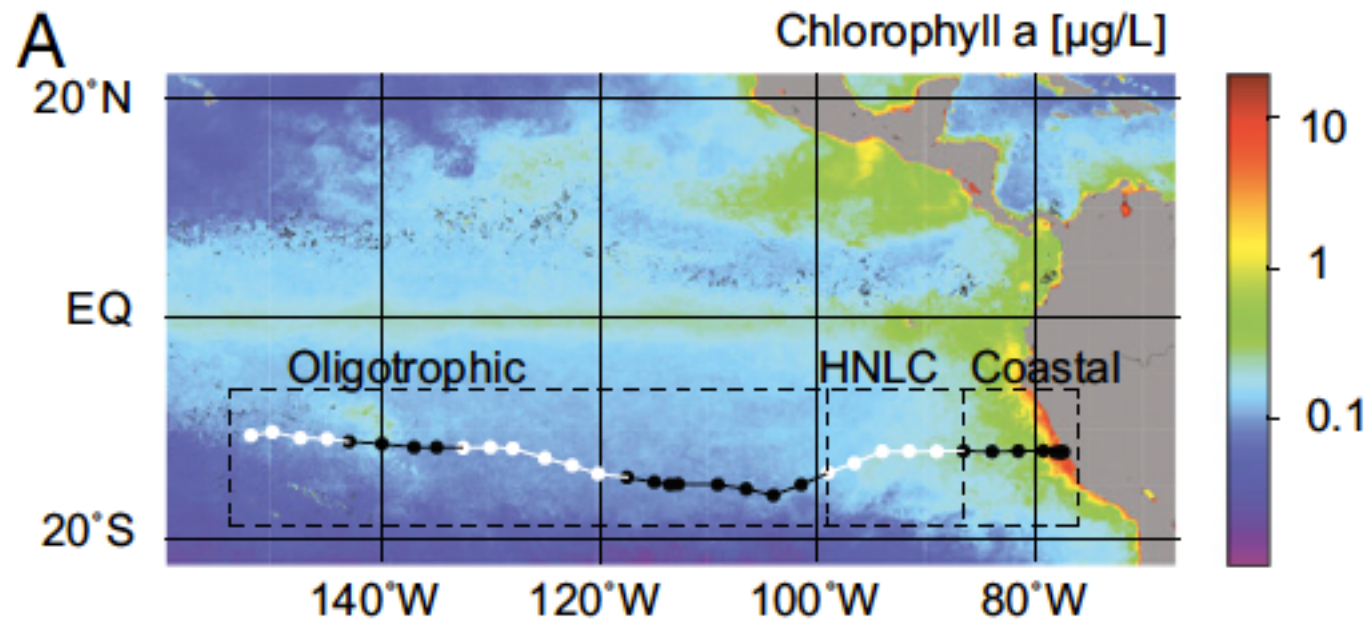
- Individual papers continue to be published.
- GA03 data used for **synthesis papers**:
 - Anderson et al., 2016, Intercomparison of methods to assess flux of dust to the ocean. Phil. Trans. Roy. Soc.
 - Hayes et al., submitted, Residence times of trace metals in the water column
 - Hayes et al., in prep., Intercomparison of radionuclide-based methods to quantify sinking fluxes of POC and particulate TEIs
 - Holzier and Smethie, in prep, Tracer-constrained water masses and ventilation times along GEOTRACES section GA03.

US GEOTRACES GP16 – Novel Findings

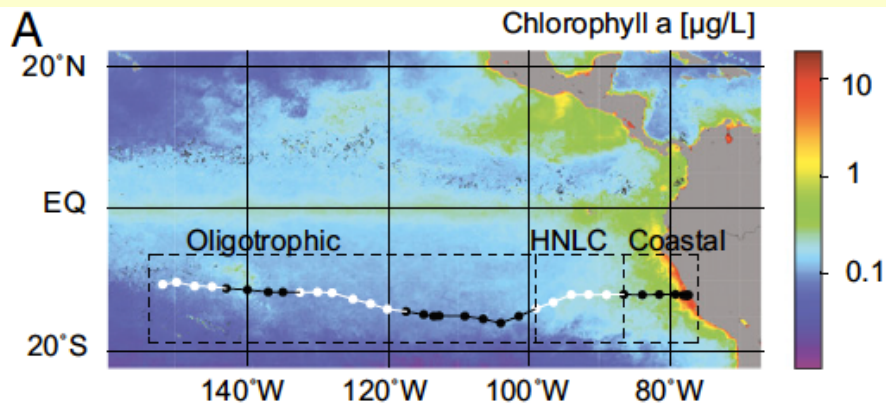
Siderophore-based microbial adaptations to iron scarcity across the eastern Pacific Ocean

Rene M. Boiteau^{a,b}, Daniel R. Mende^c, Nicholas J. Hawco^{a,b}, Matthew R. McIlvin^a, Jessica N. Fitzsimmons^{b,d}, Mak A. Saito^a, Peter N. Sedwick^e, Edward F. DeLong^c, and Daniel J. Repeta^{a,1}

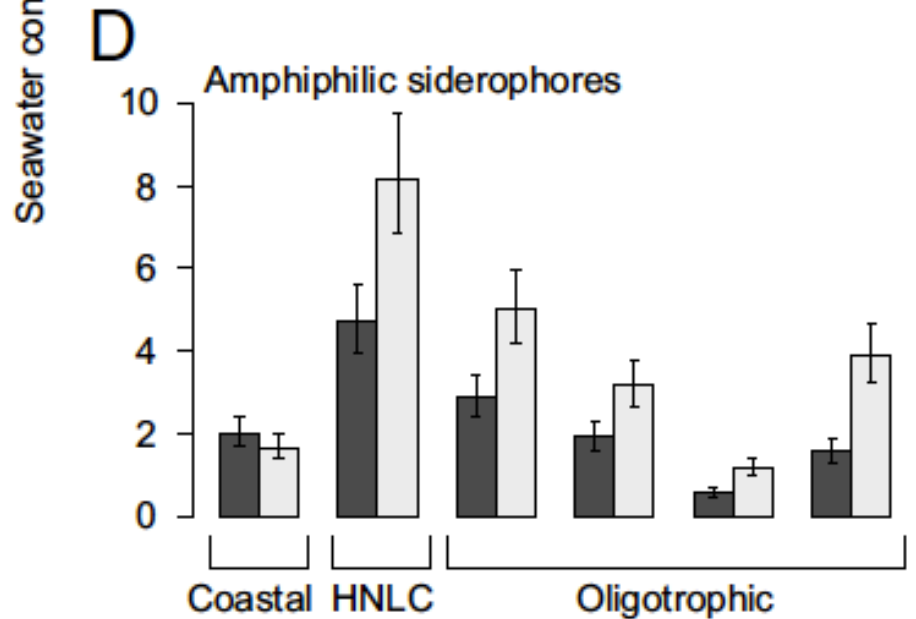
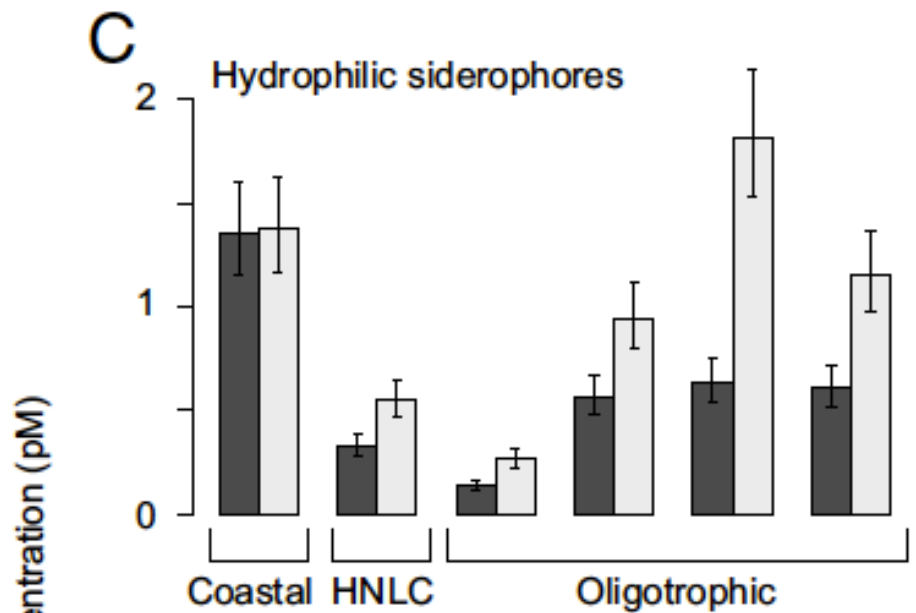
^aDepartment of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, Woods Hole, MA 02543; ^bDepartment of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA 02139; ^cCenter for Microbial Oceanography Research and Education, University of Hawaii at Manoa, Honolulu, HI 96822; ^dDepartment of Oceanography, Texas A&M University, College Station, TX 77843; and ^eDepartment of Ocean, Earth and Atmospheric Sciences, Old Dominion University, Norfolk, VA 23529



US GEOTRACES GP16 – Dominant siderophores reflect local nutrient stress



Boiteau et al., PNAS, 2017



■ Fe bound □ Total

US GEOTRACES GP16

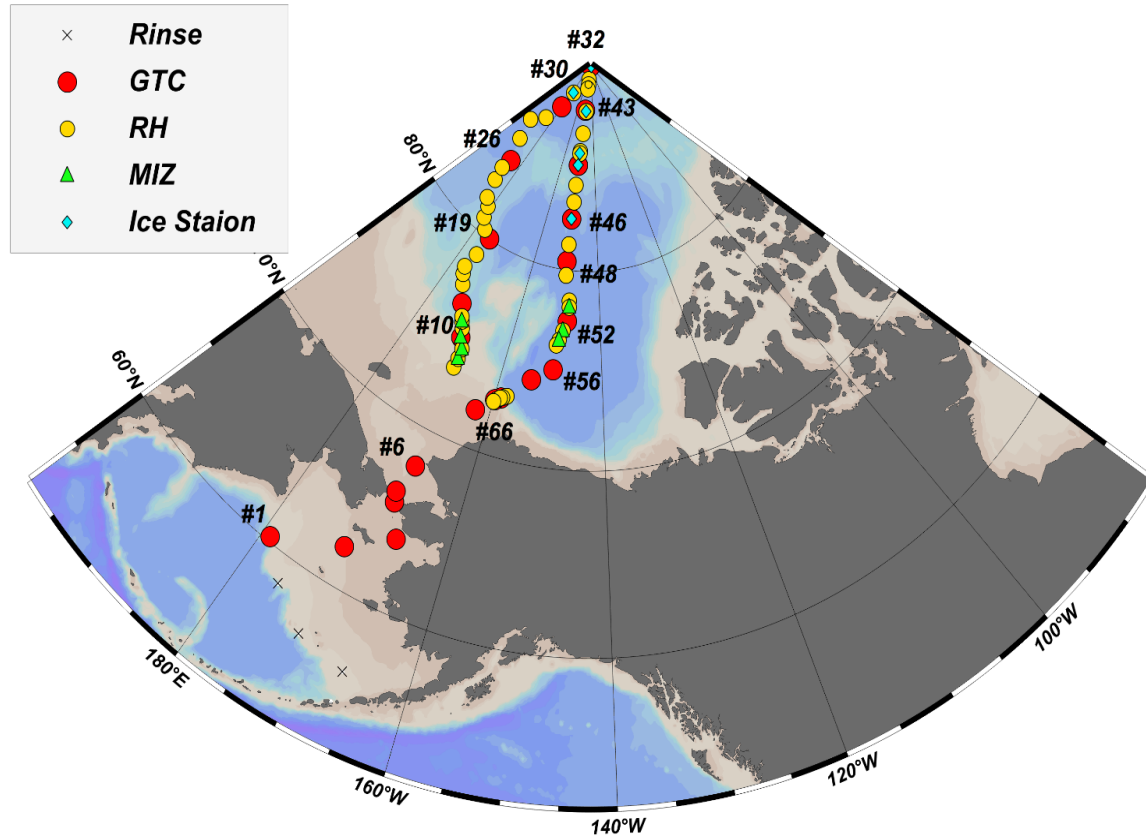
Special volume of Marine Chemistry:

Jim Moffett, guest editor

16 papers through the review process

Others are still under review

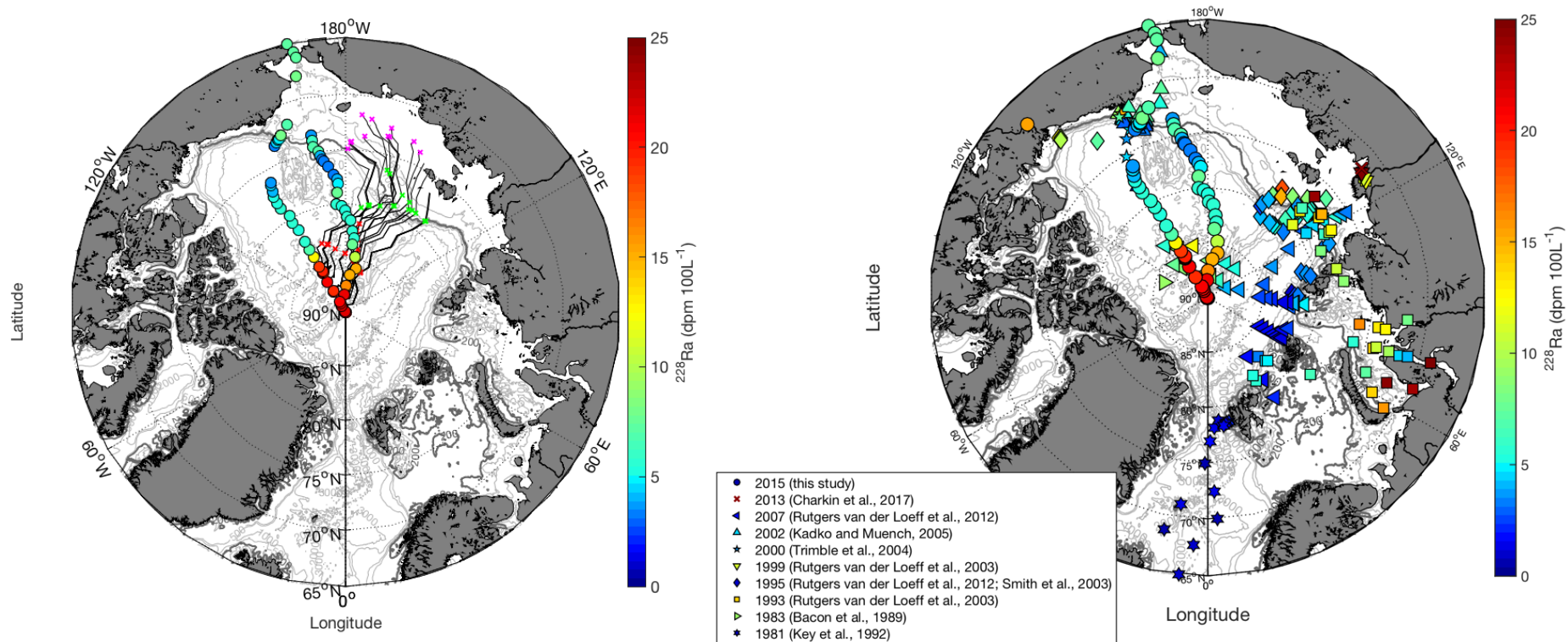
US GEOTRACES GN01



Data Workshop 23-26 October, 2017, Miami Florida
Host, Dave Kadko

US GEOTRACES GN01 - ^{228}Ra

North Pole influenced by Transpolar Drift



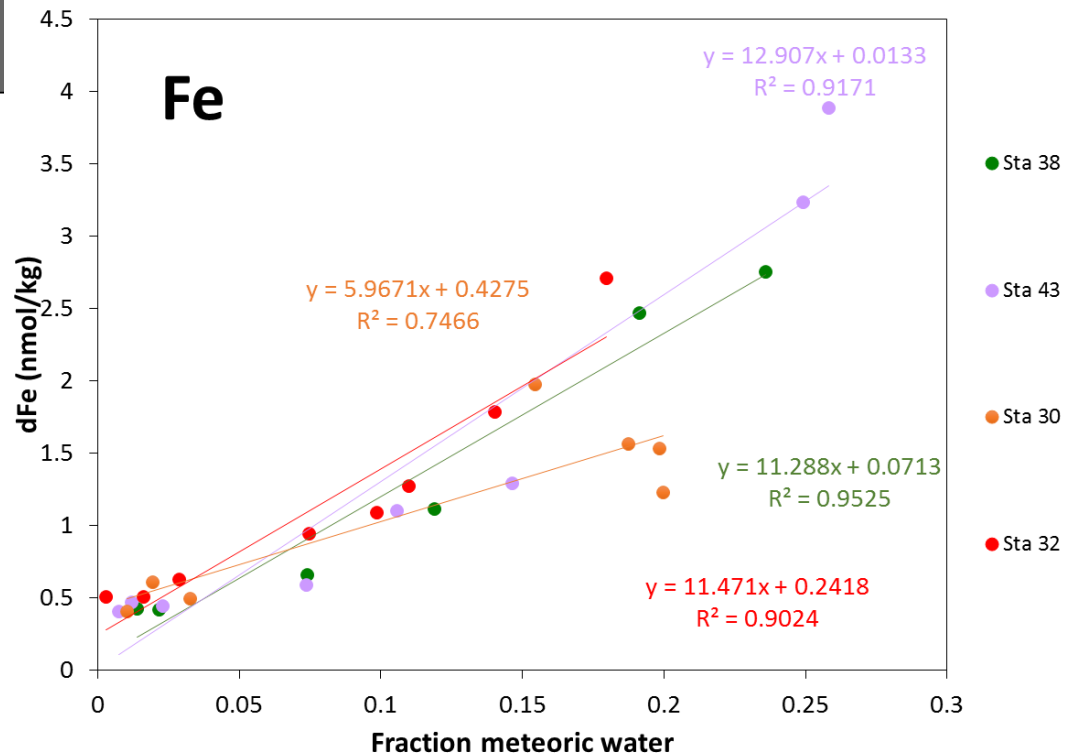
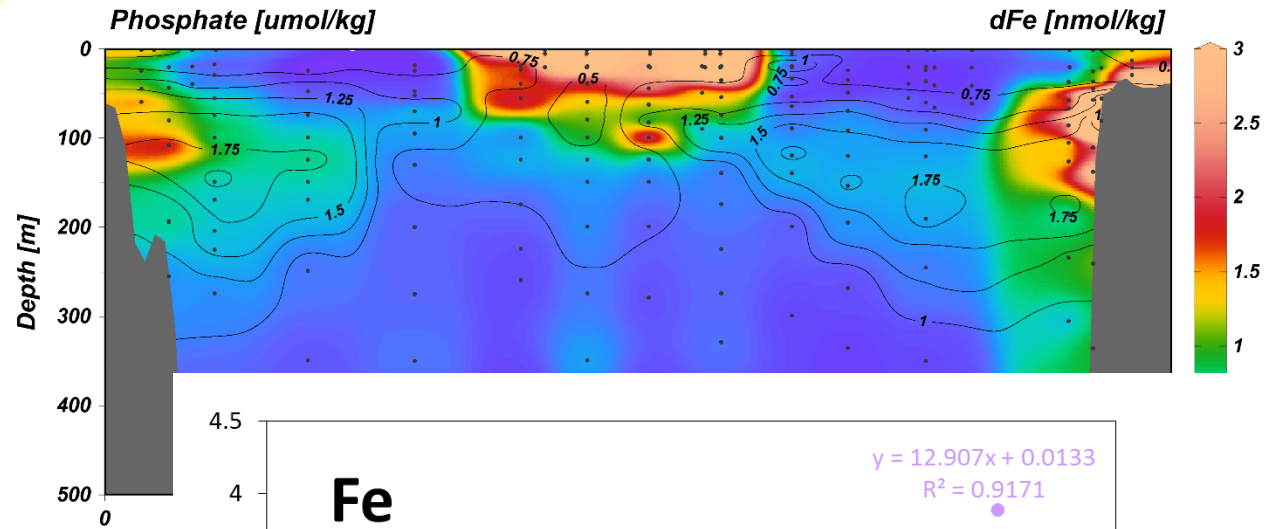
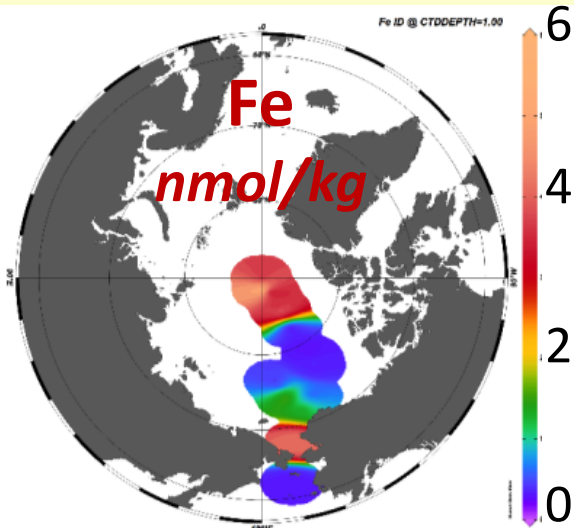
Sea ice trajectories

Historical shelf data

N Pole ^{228}Ra in 2015 > potential source areas, but key regions missing data.

US GEOTRACES GN01 - dFe

North Pole influenced by Transpolar Drift



Potential river source for dFe in TPD.

Courtesy Jessica Fitzsimmons Texas A&M

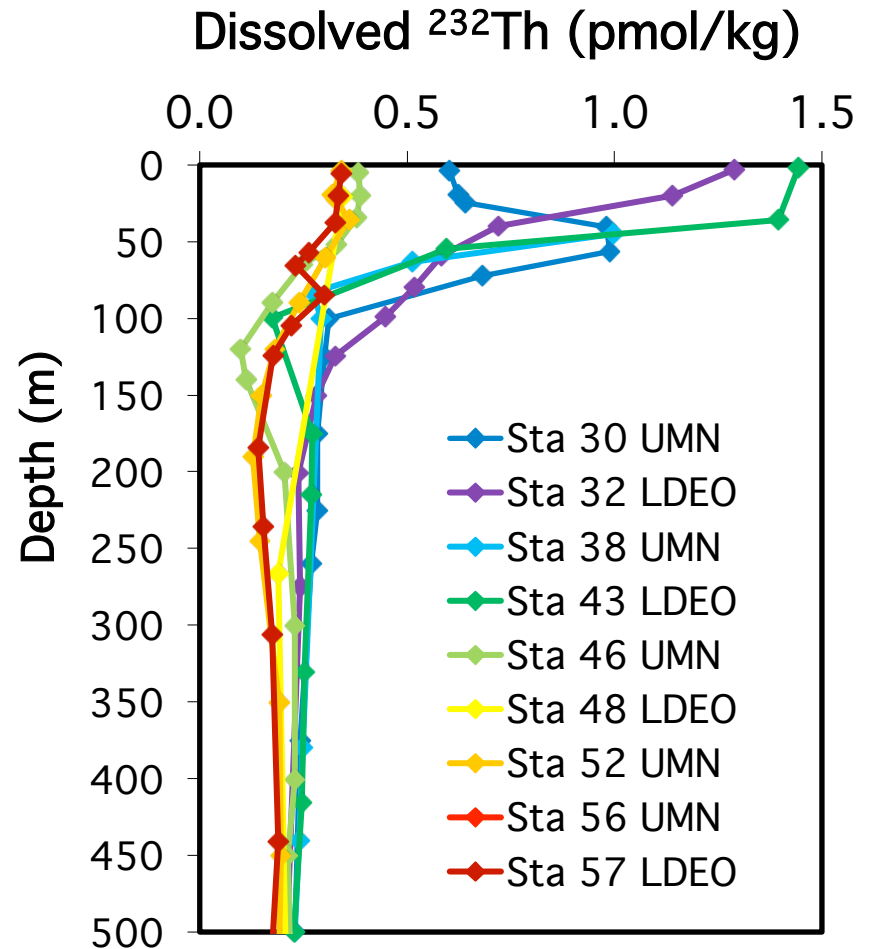
US GEOTRACES GN01 – d²³²Th

North Pole influenced by Transpolar Drift

High d²³²Th in surface water of TPD (Sta 30, 38, 43) indicates rapid transport from the shelf to the North Pole.

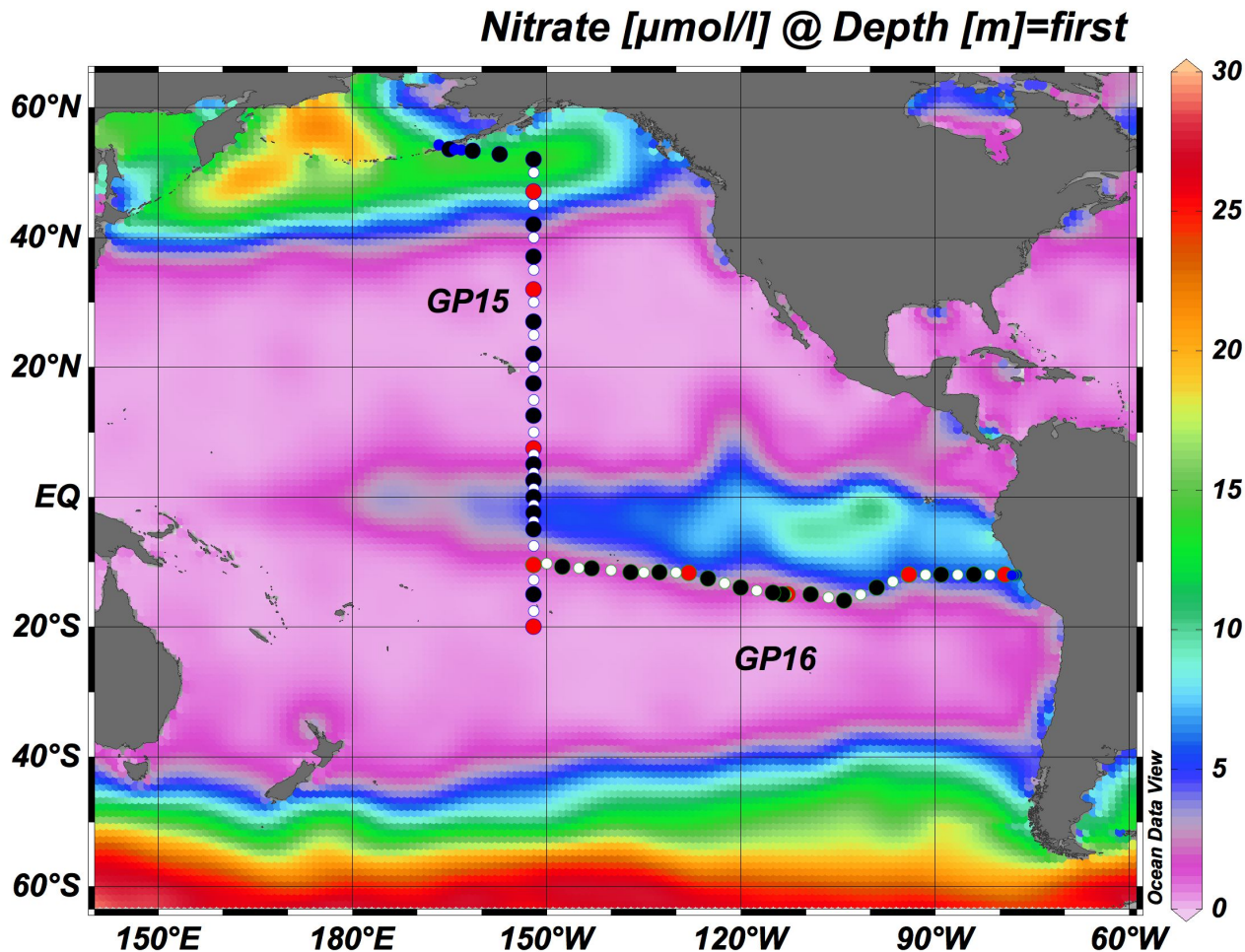
dTh residence time is months.

*Unpublished data from
Anderson, Vivancos (LDEO)
Edwards, Zhang (Minnesota)*



US GEOTRACES – GP15

Planned stations



Cruise and most key
TEIs funded.

23 Sept. – 27 Nov. 2018.

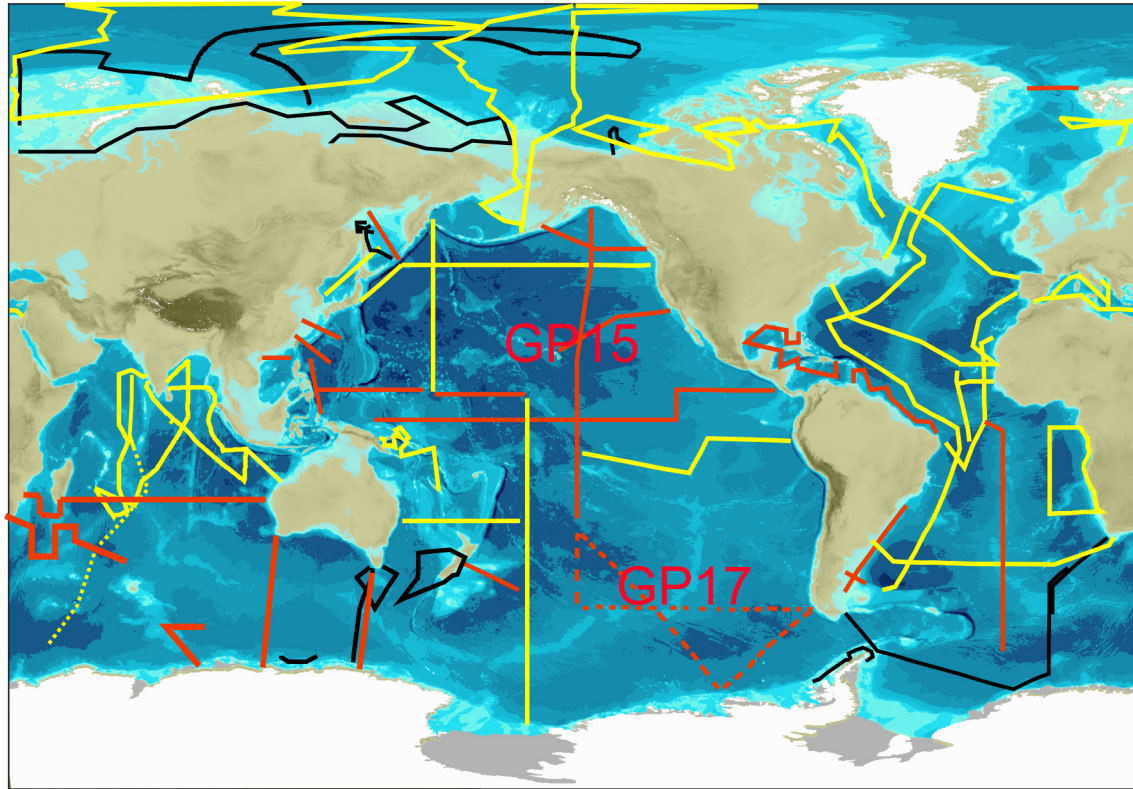
Kodiak Alaska to
Papeete Tahiti.

Cruise leaders:
Greg Cutter
Phoebe Lam
Karen Casciotti

Logistics workshop:
Week of 5 March 2018
Norfolk, Virginia

US GEOTRACES

Long-range plans

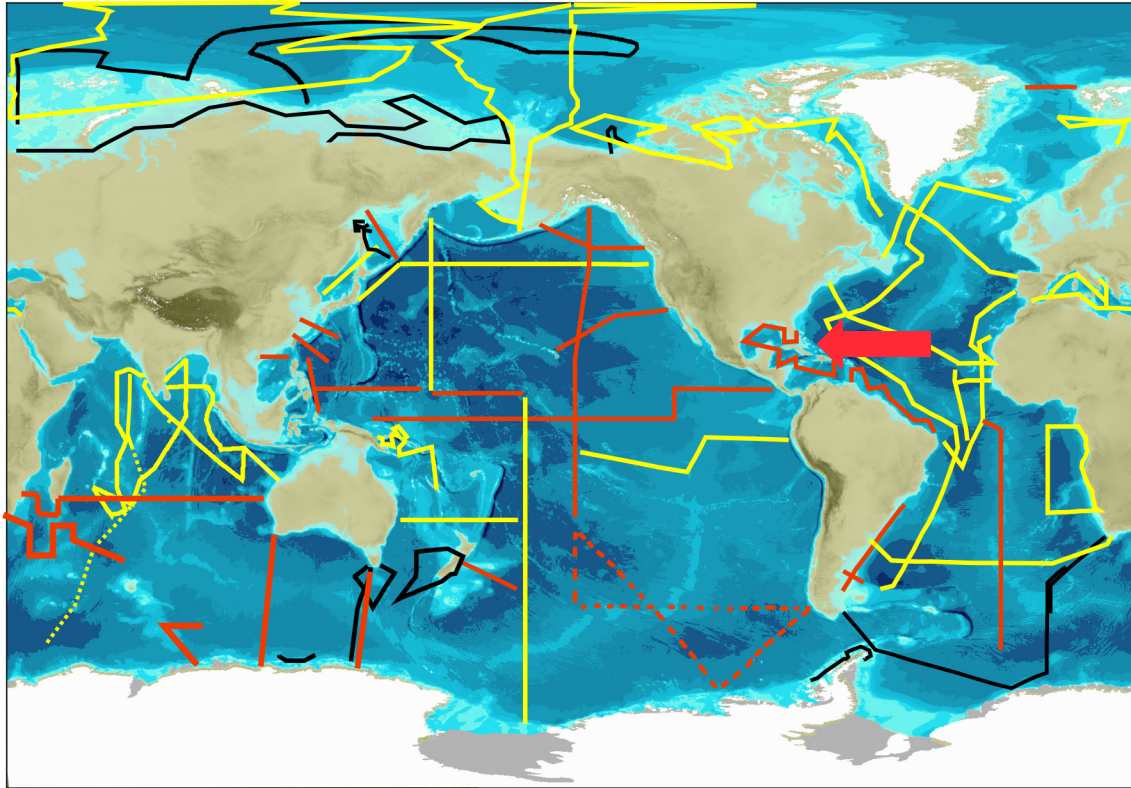


June, 2017: The US GEOTRACES SSC approved:

2021 or 2022: Tahiti - Antarctica (GP17)

US GEOTRACES

Long-range plans



OS2018: Town hall to explore a process study in Gulf of Mexico in collaboration with the OCB program.

Point of Contact:

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US GEOTRACES Outreach

A children's book, by Katlin Bowman and Elizabeth Saito, entitled "To the Top of the World" features GEOTRACES Arctic Activities; available on the web site:

<http://www.geotraces.org/outreach/other-outreach-materials/educational-initiatives/1293-geotraces-expedition-children-book-2>

US GEOTRACES Publication Summary

During the 2016 – 2017 period covered by the annual report to SCOR,

US GEOTRACES investigators authored or co-authored:

30 peer-reviewed journal papers

3 books or book chapters

4 PhD dissertations

Details are provided in the annual report to SCOR

End

US GP15 Research Objectives

The cruise track was chosen to achieve the science goals of the US GEOTRACES program:

- 1) Boundary exchange with volcanic margin waters; TEI supply to Subarctic HNLC region
- 2) TEI distribution within the ocean's oldest water mass
- 3) Distal portions of hydrothermal plumes of Juan de Fuca Ridge and East Pacific Rise
- 4) Distal portions of oxygen deficient zones
- 5) TEI distributions in equatorial zonal jets and upwelling regime
- 6) Ultra-oligotrophic waters of the southern subtropical gyre
- 7) Baseline TEIs in western sector of planned sea-bed mining