

NSF OCE 1455924: Collaborative Research: Management and Implementation of the U.S. Arctic GEOTRACES Study

Award Amount: \$ 485,000

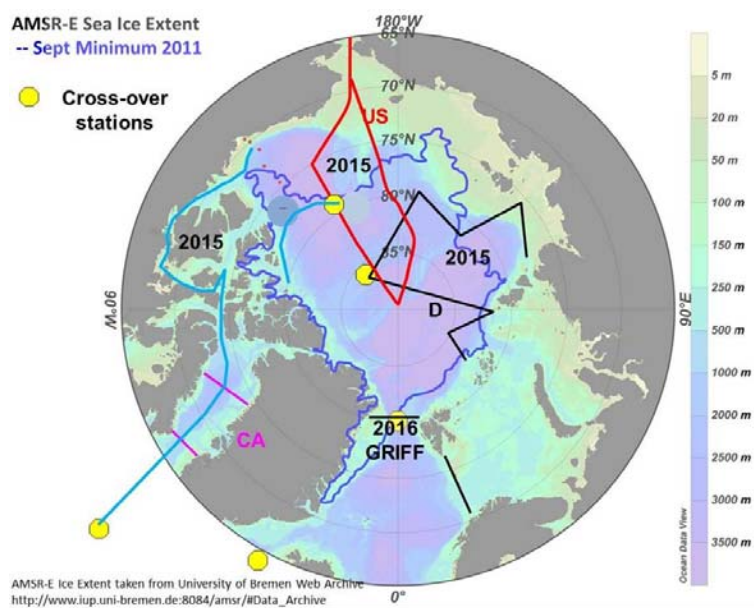
Award Time Period: 7/1/14-6/30/17

This project supports the core activities to carry out the US GEOTRACES transect in the western Arctic, in collaboration with pan-Arctic efforts from a large international community. These expeditions involve the deployment of ice-capable research ships from 3 nations (US, Canada, Germany) across different parts of the Arctic Ocean in 2015-16, and application of state of the art geochemical tracers to unravel the complex biogeochemical dynamics of the Arctic Ocean and its continental shelves. Scientists from countries without

icebreaker capability will also participate in this endeavor. The program would be unprecedented in regional scope and scientific breadth. This will

- 1) establish a baseline against which to measure varying conditions in the future
- 2) provide data to model climatic feedback mechanisms and future trajectories of Arctic change.

David Kadko is the lead PI and chief scientist of the US effort, aboard the USCGC Healy.



This project (multi-national, multi-icebreaker field effort) is of historic significance; it is unprecedented in regional scope and scientific breadth and will provide a comprehensive, pan-Arctic geochemical data set. German (black), Canadian (blue) and US (red) cruise tracks are shown.

GEOTRACES is an international research program focused on understanding the cycling of trace elements and isotopes (TEIs) in the oceans. The GEOTRACES mission is:

To identify processes and quantify fluxes that control the distributions of key trace elements and isotopes in the ocean, and to establish the sensitivity of these distributions to changing environmental conditions. This is extremely relevant to the Arctic, where *rapid climate change* and *accompanying biogeochemical responses* are occurring. For this reason there has been strong interest in carrying out studies in the Arctic Ocean since the inception of GEOTRACES. The Arctic Ocean is at the epicenter of climate change, and warming climate will likely have profound impact on the carbon budget, geochemical cycles, and ecosystem of the Arctic. Furthermore, these changes will ultimately be felt globally, through feedbacks related, for example, to melting ice and release of carbon from permafrost.