

1ST RUSSIAN GEOTRACES WORKSHOP: FINAL STATEMENT

GEOTRACES is an international programme studying the chemistry of trace elements and isotopes in the oceans. These trace elements include nutrients critical for marine life; contaminants with potential to damage ecosystems and human health; and proxies used to reconstruct past climates. GEOTRACES seeks to understand the sources, transport and fate of these elements in marine settings around the globe, including their exchange between land, sediments, atmosphere, and seawater. This research will improve knowledge of carbon and nutrient cycles in the open and coastal ocean, and their response to changing global environments.

The first Russian GEOTRACES Workshop was held in Moscow at the Shirshov Institute from 27th to 29th November 2012. Ninety Russian Scientists from more than six institutes participated, together with scientists leading the GEOTRACES programme in Europe and the USA. The workshop established international contacts and identified priorities for research into the marine chemistry of the Arctic Ocean.

Particular Russian interests include estuarine chemistry of major rivers, biogeochemical processes on the broad Russian shelf, sedimentary and chemical fluxes between the shelf and open Arctic Ocean as well as the fluxes from atmosphere to the Arctic Seas. These are questions where this is significant existing Russian expertise, but where there is much still to learn. Research in these areas would address important basic science questions, and deepen understanding about the future of critical Arctic ecosystems and about contaminant dispersion in Russian waters. Such research is made particularly timely by the significant changes of sea-ice, permafrost, and high latitude climate presently underway.

Research cruises that would address these scientific questions were identified during discussion at the workshop. These cruises could form a significant component of GEOTRACES activities in the Arctic. These cruises would build on existing Russian expertise and activities, linking existing research programmes, and increase the scientific reward from research investment. Several other countries are planning Arctic GEOTRACES cruises in 2015, and Russian cruises would complement this work to provide a very complete understanding of trace-metal behaviour in the Arctic. Approximate positions of potential Russian cruises, and those planned by other nations, are shown in the accompanying figure.

Workshop participants suggested the rapid formation of Russian GEOTRACES Committee to develop GEOTRACES activities and guide the scientific goals and implementation of the programme in Russia. This committee should include high-level scientists representing leading Russian institutes with oceanographic and related expertise.

There is significant capacity for knowledge exchange between Russian oceanographers and those in other nations. Russians have expertise in areas including snow and ice sampling and submarine research that have not yet formed part of the GEOTRACES Programme. But lack of specialist equipment, and expertise in its use, prevents collection of uncontaminated seawater samples for analysis of trace metals. Identifying opportunities for international exchange of sampling equipment and analytical expertise, and for the training of young Russian scientists, could be another task for a Russian GEOTRACES Committee and would achieve greater international integration of trace-metal oceanography.

Further details about the GEOTRACES programme are available at: <http://www.geotraces.org/>

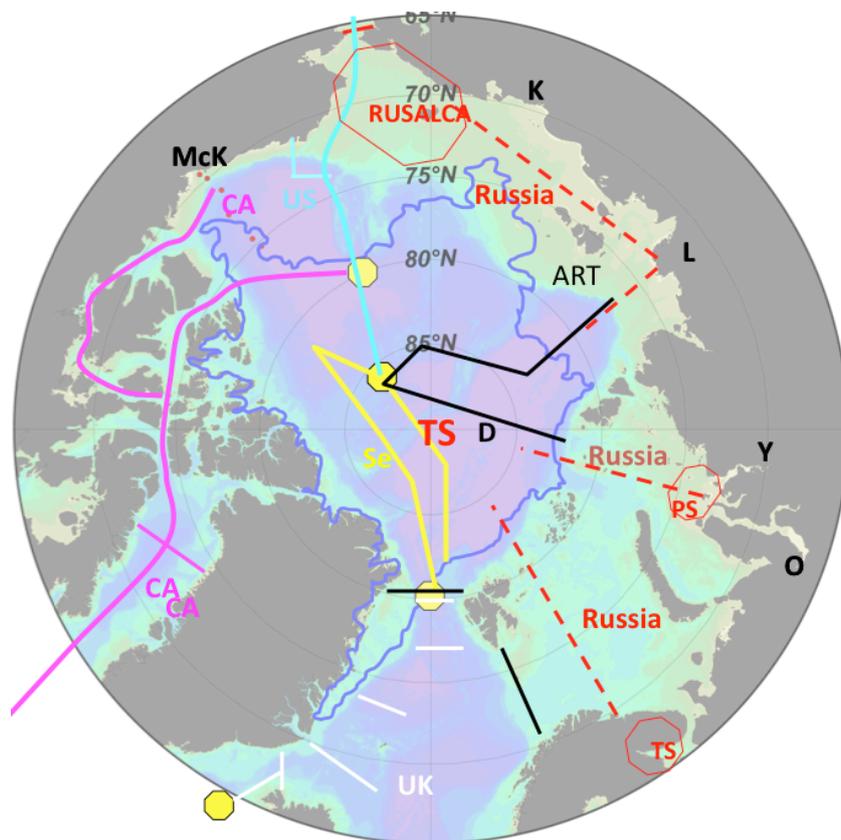


Figure 1: Approximate position of potential Russian GEOTRACES research in the Arctic Ocean, along with cruises planned by other nations (CA = Canada, D = Germany, Se = Sweden, UK = United Kingdom, USA = United States). Russian cruises were suggested: in the Barents Sea on an existing Russian repeat section (to assess shelf processes and the modification of inflowing Atlantic waters); in the Kara Sea (to assess the near and far-field effects of major river inputs and the removal of metals at the shelf-margin); and on the Eastern Siberian Shelf (to assess the impact of methane release from permafrost and the mixing between Lena River waters with Pacific and Arctic waters). Time-series (TS) of GEOTRACES measurements were suggested in the White Sea and at the North Pole to build on considerable existing Russian research in these areas. And process studies (PS) were suggested for the major river estuaries of the Ob and Yenisei and for the Bering Strait. The latter might be conducted as part of the joint Russian-US RUSALCA programme in that region. Filled yellow polygons indicate possible intercalibration sites between various nations.