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OCEAN SCIENCE NEWS

| | |
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| <p><i>This section of your newsletter provides an opportunity to highlight your research programs to the Ocean Science Community.</i></p> <p><i>Your are invited to send contributions to David Greenberg, david.greenberg@dfo-mpo.gc.ca</i></p> | <p><i>Mettez en valeur vos programmes de recherche en publiant un article dans cette première section de votre bulletin.</i></p> <p><i>Faites parvenir vos contributions à David Greenberg, david.greenberg@dfo-mpo.gc.ca</i></p> |
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The Canadian Arctic GEOTRACES Program: Biogeochemical and Tracer Study of a Rapidly Changing Arctic Ocean

Roger François, University of British Columbia

The Arctic marine system is undergoing rapid change as a result of climate-driven alterations in sea-ice cover and surface ocean circulation, which in turn can strongly influence biological productivity, air-sea exchange of climate-active gases and the distribution of contaminants. Against this background of climate-driven changes, we expect significant expansions of commercial fishing, shipping and exploitation of fossil fuel and mineral resources. Our present ability to fully evaluate the impacts of these changes and predict their future trajectory is limited by a poor understanding of the interacting chemical, physical and biological processes that shape the functional characteristics and resiliency of Arctic marine ecosystems. To bridge this critical gap in knowledge, the Canadian Arctic GEOTRACES program, involving 27 co-principal investigators from 11 Canadian universities and 3 government laboratories has completed two back-to-back research cruises in summer 2015 onboard the *CCG Amundsen* to examine the distribution and modification of geochemical tracers on a transect starting from the southern Labrador Sea and ending in the western Beaufort Sea (**Fig. 1**). International collaboration is at the core of the GEOTRACES program,

CNC-SCOR

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The Canadian National Committee of the Scientific Committee for Oceanic Research (CNC-SCOR) fosters and facilitates international cooperation. It is a non-governmental body that reflects the multi-disciplinary nature of ocean science and marine technology.

Le Comité national canadien du Comité scientifique de la recherche océanographique (SCOR) favorise et facilite la coopération internationale. Il reflète la nature multidisciplinaire de la science océanique et de la technologie marine.

and the 2015 Arctic GEOTRACES program was built on the coordination of field work between 3 nations (US, Germany, Canada) to produce a quasi-synoptic database over the entire Arctic Ocean. The Canadian transect links the North Atlantic, which was visited in 2014 by the French GEOVIDE program, to the US GEOTRACES Arctic transect, which entered the western Beaufort Sea from the North Pacific. The German GEOTRACES transect started from Fram Strait and overlapped with the US transect at the North Pole. An important goal of the Canadian section is documenting the transformation of Pacific water as it transits through the Canadian Arctic Archipelago (CAA) towards the North Atlantic.

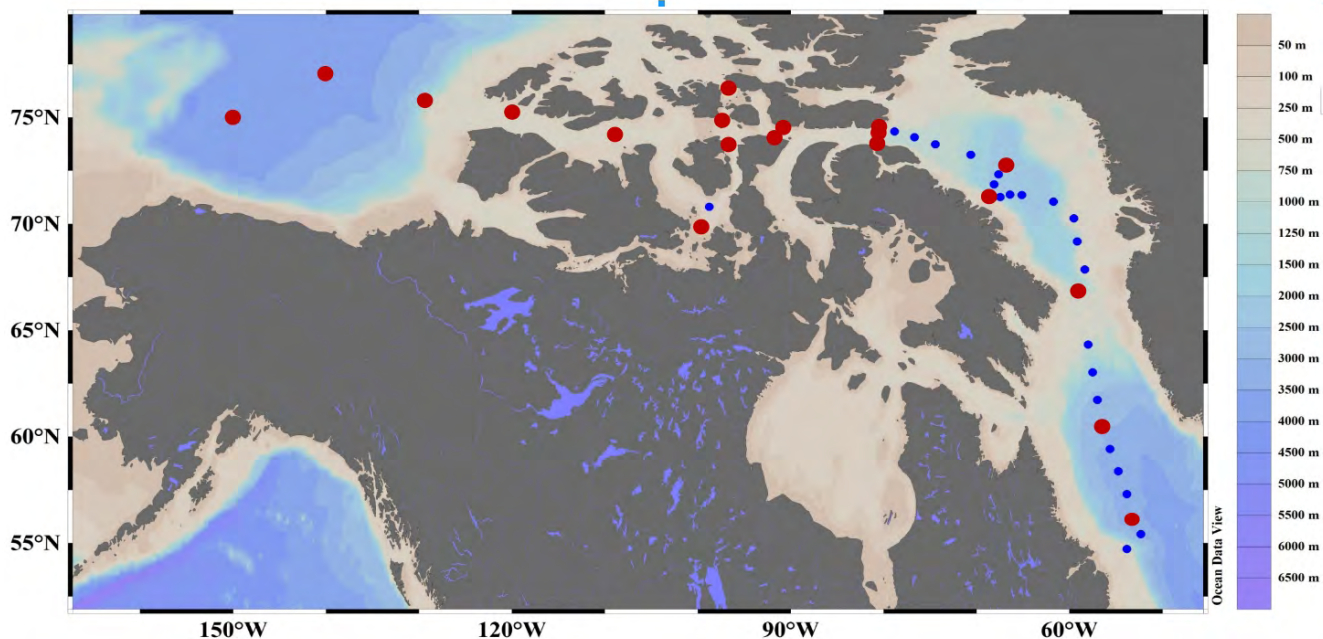


Figure 1: Section of GEOTRACES stations occupied between July 10 and October 1, 2015. Red circles indicate full hydrographic stations; blue circles indicate supplementary XCTD.

2015 CCGS Amundsen expedition LEG 2 GEOTRACES/ARCTICNET
 July 10 – August 20, 2015
 Quebec City – Kugluktuk

The first leg was shared between the Canadian Arctic GEOTRACES project and ArcticNet. As part of the international GEOTRACES program, the principal mandate of our project was to study the input, removal and cycling of trace elements and isotopes in the water column, and to use this information to document, monitor, and predict the evolution of physical and biogeochemical processes in the Arctic Ocean. Our project was also complemented by very extensive biological and trace gas measurements, which not only met the broader requirements of NSERC’s CCAR program but were also of direct relevance to the long-term goals of ArcticNet, facilitating coordination of sampling between the two programs.

Sampling operations for GEOTRACES during this leg consisted of seawater sampling with ArcticNet’s 24 x 12 L rosette – CTD (Niskin-type bottles) and GEOTRACES’ 12 x 12 L

rosette - CTD (Go-Flo bottles) to sample seawater under trace metal clean conditions, marine particle sampling with 6 McLane large volume in-situ pumps, aerosol sampling with a volumetric flow controlled high volume sampler, and underway trace gas analysis with a Membrane Inlet Mass Spectrometer (MIMS) and a Gas Chromatograph (GC). Additional GEOTRACES activities included incubations for productivity measurements with different isotopic tracers (^{13}C , ^{15}N , ^{32}Si , ^{18}O , 2h ^{14}C and FRRF) complementing incubations conducted by ArcticNet (24-h ^{14}C incubations) and productivity estimates from water column measurements (O_2/Ar , triple O isotopes, ^{234}Th deficit). In addition, ship-board manipulation experiments were also conducted to examine the impacts of ocean acidification and enhanced mixed layer stratification on phytoplankton productivity and physiological ecology, and fifteen rivers were sampled to assess continental input into the the Canadian Arctic Archipelago.

The initial GEOTRACES plan for this leg was to occupy 2 stations in the Labrador Sea, 4 in Baffin Bay, and 9 in the Canadian Arctic Archipelago. Additional stations were to be occupied for ArcticNet on a section between Greenland and Devon Island, and in Kane Basin, Kennedy Channel and Petermann Fjord. Time was also allocated for additional stations in Queen Maud Gulf as part of The W. Garfield Weston Foundation - Parks Canada - ArcticNet collaborative project.

The work in the Labrador Sea was completed on schedule. However, as we were crossing Davies Strait, things went suddenly (and literally) south, as the ship was unexpectedly diverted to Hudson Bay for ice-breaking duties! The resulting 2-week! hiatus (from July 19th to August 3rd) demanded a dramatic re-organization of the cruise plan. To the benefit of the GEOTRACES program, ArcticNet cancelled nearly all its stations and the remaining science plan was reduced to occupying 3 of the 4 GEOTRACES Baffin Bay stations and 7 of the 9 archipelago (CAA) stations (**Fig. 2**). GEOTRACES sampling strategy in the CAA was also adjusted to existing ice conditions and to optimize scientific return within the remaining time. By the end of this leg, GEOTRACES only lost 1 station in Baffin Bay and 2 in the CAA, but the latter two could be recovered during the following leg. We managed to complete 67 hydrocasts with ArcticNet's CTD-rosette, 31 hydrocasts with GEOTRACES' trace metal clean CTD- rosette, and 24 casts with GEOTRACES' six large volume pumps, resulting in 1,545 seawater and marine particle samples for multi-element and isotopic analysis (**Table 1**). We also conducted 278 incubations for carbon fixation and nutrient uptake measurements (88 two-hour ^{14}C incubations/FRRF, 60 ^{13}C and ^{15}N incubations, 60 ^{32}Si incubations, 60 ^{18}O incubations, 10 ^{55}Fe incubations), which were complemented by ArcticNet's 156 twelve-hour ^{14}C incubations. Finally, two CO_2 / light manipulation experiments and sampling at 15 Arctic rivers draining in the CAA were also successfully completed.

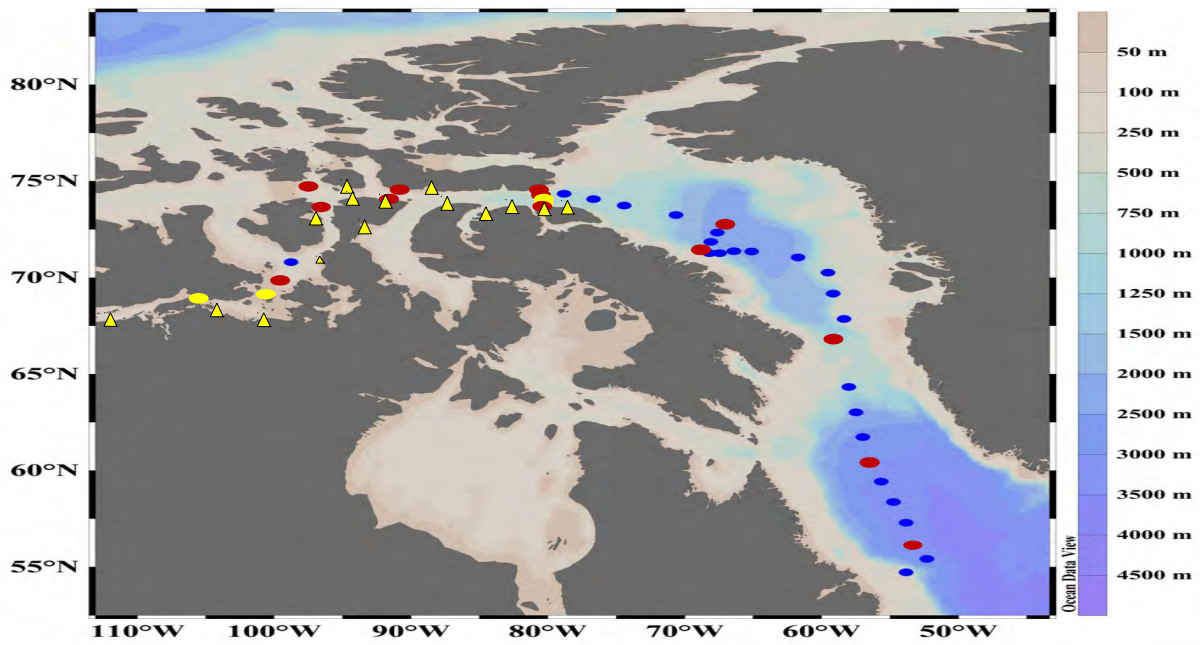


Figure 2: Sampling stations during the first leg. Red and blue circles are as for Fig. 1. Yellow triangles indicate the location of the sampled rivers. Yellow circles are ArcticNet stations.

2015 CCGS Amundsen Expedition LEG 3b GEOTRACES/ARCTICNET
 September 4 – October 1, 2015
 Sachs Harbour – Resolute

The second (**Fig. 3**) leg was also shared between the Canadian Arctic GEOTRACES project and ArcticNet and was comparatively uneventful but for the visit of three swimming polar bears showing undue interest to the Kevlar line supporting our trace metal rosette (<https://www.youtube.com/watch?v=JC2befNa1Y>). As during our first leg, the main GEOTRACES sampling operations consisted of seawater sampling with ArcticNet's rosette, GEOTRACES' trace metal clean rosette, and particle sampling with large volume in-situ pumps. The biogeochemical study conducted during this leg (**Table 2**) was complemented by a 4-day process study during which a Moving Vessel Profiler was deployed to study mixing in Wellington, Maury and Perry Channels. The goal of this work is to assess the impact of physical processes on the supply of micronutrients to surface waters. Toward the same goal, a glider was deployed in Canada Basin during the preceding Leg 3a (August 21 – September 3). The glider data provided high resolution observations of water column hydrography and micro-structure that will provide new insight into mixing and turbulence across the Arctic continental shelf.

Overall, the Canadian Arctic GEOTRACES summer field program was a resounding success, notwithstanding the unexpected change in ship-operations during the first leg that resulted from our 2-week diversion for ice-breaking duties. It must be noted,

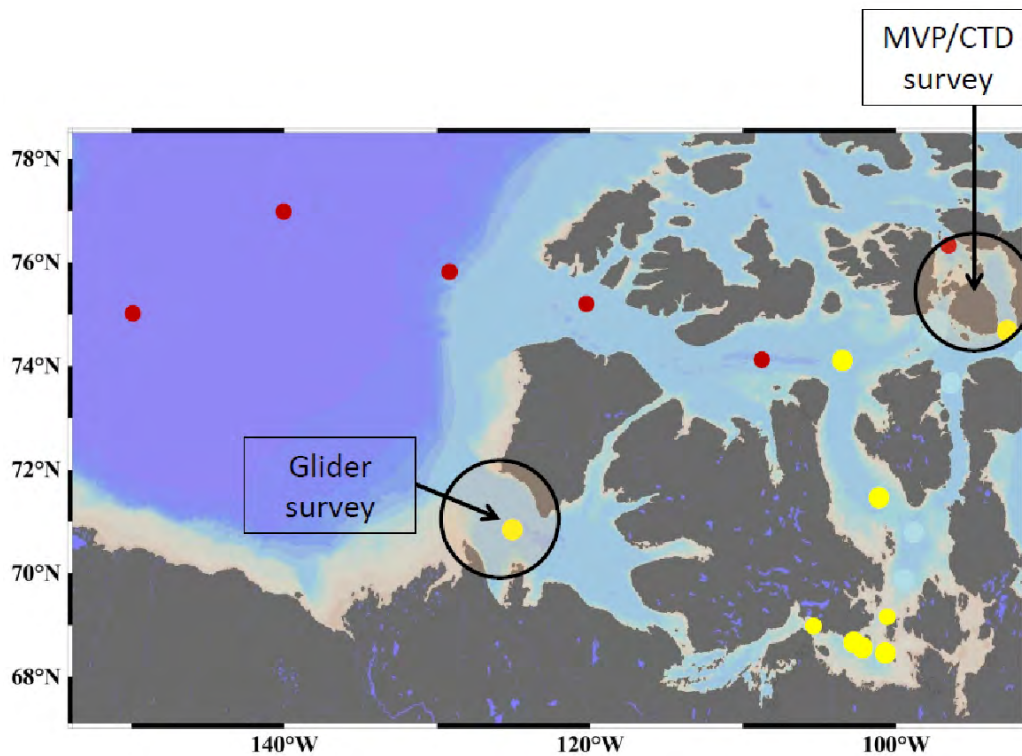


Figure 3: Sampling stations during the second leg. Red circles indicate GEOTRACES stations and yellow circles are ArcticNet stations. The two black circles show the location of the MVP/CTD survey and glider deployment

however, that this excursion to Hudson Bay had a large negative impact on the work plan of our colleagues from ArcticNet, and we are extremely grateful for their willingness to reduce their program to ensure that our field campaign was successful. If anything, the situation we faced this summer further points out the blatant inadequacies for ship time funding, allocation, and availability for oceanographic research in this country. Canada claims to be a country where excellence in oceanographic research is conducted. Indeed, Canadian oceanographers continue to make important contributions to remain at the forefront of their field. However, their efforts are continuously hampered by the lack of a dedicated fleet for ocean research and the lack of sensible mechanisms for the allocation of ship time needed to conduct large scale operations. While improving the infrastructure takes time, even when there is a will, organizational changes to better coordinate ocean research funding and platform availability could and should be undertaken as soon as possible by our funding agencies. The ocean science community must start a coordinated effort to send a clear message that the existing funding mechanisms for ship time allocation are inadequate to meet the needs of ocean research, and a new approach needs to be developed with consultations between NSERC, DFO, CCG and Canadian oceanographers.

[Note: An overview of this work and other elements of the international collaboration, is given in the GEOTRACES article in the General section below.]

Table 1: List of parameters measured or sampled during the first leg

| | |
|--|--|
| Hydrography/CTD sensors | Trace gases |
| Pressure | Biogenic gases |
| Temperature | CH ₄ , N ₂ O |
| Salinity | O ₂ /Ar, N ₂ /Ar (K1; LS2; BB1, 2, 3; CAA1, 3, 4, 5, 6, 7) |
| Oxygen | Triple oxygen isotopes (K1; LS2; BB1, 2, 3; CAA1, 3, 4, 5, 6, 7) |
| Fluorescence | Noble gases (K1 and BB2) |
| Light transmission | Trace elements and isotopes |
| Nutrients | Dissolved and particulate trace metals |
| Phosphate | Al, Mn, Fe, Cd, Zn, Cu, Pb, Ga, Ba, REE, Hg, MeHg |
| Nitrate/Nitrite | Dissolved and particulate radioisotopes |
| Ammonia | ²³⁰ Th, ²³¹ Pa, ²³⁴ Th, ²²⁸ Ra, ²²⁴ Ra, ²²³ Ra |
| Silicate | Dissolved and particulate radiogenic isotopes |
| Chemical parameters | Nd, Pb |
| Dissolved inorganic carbon | Dissolved and particulate stable isotopes |
| Total alkalinity | $\delta^{18}\text{O}$ in water |
| pH | $\delta^{13}\text{C}$ in DIC |
| Dissolved organic carbon | $\delta^{15}\text{N}$ and $\delta^{18}\text{O}$ in nitrate |
| Fluorescent dissolved organic matter | $\delta^{30}\text{Si}$ |
| Coloured dissolved organic matter | $\delta^{53}\text{Cr}$ |
| Thiols | $\delta^{56}\text{Fe}$ |
| Organic ligands | Anthropogenic isotopes |
| Biological parameters | ¹²⁹ I, ²³⁶ U, ¹³⁵ Cs |
| Particulate organic carbon | Large volume in-situ pumps |
| Particulate organic nitrogen | Particulate ²³⁰ Th, ²³¹ Pa, ²³⁴ Th |
| Size fractionated chlorophyll a | Particulate Si, Nd and Cr isotopes |
| Pigments | |
| Particulate biogenic silica | |
| Flow cytometry | |
| Genomics | |
| Proteomics | |
| Incubations | |
| ¹⁴ C uptake (K1; LS2; BB1, 2, 3; CAA1, 2, 3, 4, 5, 6, 7; VS) | |
| ¹³ C uptake (K1; LS2; BB1, 2, 3; CAA1, 3, 5, 6, 7) | |
| ¹⁵ NO ₃ uptake (K1; LS2; BB1, 2, 3; CAA1, 3, 5, 6, 7) | |
| ¹⁵ NH ₄ uptake (LS2; BB1, 2, 3; CAA1, 3, 5, 6, 7) | |
| ³² Si uptake (LS2; BB1, 2, 3; CAA1, 3, 5, 6, 7) | |
| H ₂ ¹⁸ O uptake (K1; LS2; BB1, 2, 3; CAA1, 3, 5, 6, 7) | |
| ⁵⁵ Fe uptake (CAA3, 7) | |

Table 2: List of parameters measured or sampled during the second leg

| Hydrography/CTD sensors | | Trace elements and isotopes | |
|--------------------------------------|--|--|--|
| Pressure | | Dissolved and particulate trace metals | |
| Temperature | | Al, Mn, Fe, Cd, Zn, Cu, Pb, Ga, Ba, REE, Hg, MeHg | |
| Salinity | | Dissolved and particulate radioisotopes | |
| Oxygen | | ²³⁰ Th, ²³¹ Pa, ²³⁴ Th, ²²⁸ Ra, ²²⁴ Ra, ²²³ Ra | |
| Fluorescence | | Dissolved and particulate radiogenic isotopes | |
| Light transmission | | Nd, Pb | |
| Nutrients | | Dissolved and particulate stable isotopes | |
| Phosphate | | $\delta^{18}\text{O}$ in water | |
| Nitrate/Nitrite | | $\delta^{13}\text{C}$ in DIC | |
| Silicate | | $\delta^{15}\text{N}$ - nitrate | |
| Chemical parameters | | $\delta^{30}\text{Si}$ | |
| Dissolved inorganic carbon | | $\delta^{53}\text{Cr}$ | |
| Total alkalinity | | $\delta^{56}\text{Fe}$ | |
| pH | | Anthropogenic isotopes | |
| Dissolved organic carbon | | ¹²⁹ I, ²³⁶ U, ¹³⁵ Cs | |
| Fluorescent dissolved organic matter | | Large volume in-situ pumps | |
| Coloured dissolved organic matter | | Particulate ²³⁰ Th, ²³¹ Pa | |
| Thiols | | Particulate Si, Nd and Cr isotopes | |
| Organic ligands | | | |
| Biological parameters | | | |
| Particulate organic carbon | | | |
| Particulate organic nitrogen | | | |
| Pigments | | | |
| Particulate biogenic silica | | | |
| Genomics | | | |
| Proteomics | | | |

Christopher Harley, The 2015 CNC-SCOR Eastern Lecture Tour (Update)

The 2015 CNC-SCOR Eastern Lecture tour speaker is Dr. Christopher Harley from the University of British Columbia in Vancouver BC. He is speaking on **Global warming, ocean acidification, and the importance of shifting species interactions in coastal marine ecosystems.**



Dr Harley studies climate change impacts on rocky coasts. He is interested in how climatic factors, such as temperature, CO₂, and pH, and biological relationships, such as predation and facilitation, interact to create ecological patterns in time and space. Ongoing research projects include: temperature, carbon dioxide, and interspecific interactions; the thermal ecology of a marine symbiosis; simulating global warming on rocky shores; and Darwin's barnacle and the invasion of Argentina. He is the 2015 recipient of the Parsons Medal awarded by Fisheries and Oceans Canada, to a scientist for outstanding lifetime contributions to multidisciplinary facets of ocean

sciences or for a recent exceptional achievement while working within a Canadian institution.

The Eastern tour is being held in two stages. In the first stage Chris spoke to several packed houses generating a lot of discussion in St. John's, Halifax (at The Bedford institute of Oceanography and Dalhousie University) and in Rimouski. On the final leg of the tour he visits Ottawa on March 14 and Laval on March 15. For timing and venues please contact Brigitte Robineau at Laval (Brigitte.Robineau@go.ulaval.ca) and Anne McMillan in Ottawa (mcmillan@storm.ca).

For more information on Dr Harley, see:

<http://www.zoology.ubc.ca/person/harley>

https://www.zoology.ubc.ca/~harley/Harley_Lab/Home.html

<http://cmosarchives.ca/Parsons/LoweHarleyFamily2015.html>

Paul Snelgrove, The 2015 CNC-SCOR Western Lecture Tour (Update)

The 2015 Western Lecture tour speaker is Dr Paul Snelgrove, Canada Research Chair in Boreal and Cold Ocean Systems at Memorial University's Ocean Science Centre. He is speaking on ***Sustaining Marine Biodiversity in Canada and Globally***.

Dr Snelgrove's interests include marine community ecology, larval ecology of invertebrates and fish, ecology of benthic invertebrates; hydrodynamic effects on benthic communities and populations, deep-sea ecology, coral reef ecology, biodiversity, disturbance and anthropogenic impacts. He led the group that pulled together the findings of the Census of Marine Life, synthesizing 10 years of data from 540 expeditions and collaborating with 2,700 scientists from 80 countries.



The western tour is split into two parts. Paul will be speaking at the University of Alberta on February 8. On February 9 he will be at the University of Victoria and on February 10 will be in Nanaimo at DFO's Pacific Biological station. On March 3 he will visit the University of British Columbia and Simon Fraser University. For venues and timing please contact Paul Myers pmyers@ualberta.ca (UAlberta), Laurence Coogan lacoogan@uvic.ca (Uvic), Ian Perrie Ian.Perry@dfo-mpo.gc.ca (PBS), Susan Allen sallen@eos.ubc.ca (UBC) and Karen Kohfield kohfeld@sfu.ca (SFU).

For more information on Dr Snelgrove, see:

<http://www.mun.ca/osc/psnelgrove/bio.php>

https://www.ted.com/speakers/paul_snelgrove

<http://www.ucs.mun.ca/~psnelgro/pauls%20webpage.htm>

MEETINGS

CMOS abstracts deadline February 15

The Canadian Meteorological and Oceanographic Society and Canadian Geophysical Union joint-congress will be held from 29 May to 2 June, 2016 at the Fredericton Convention Centre, Fredericton, NB, Canada. The theme of the congress is "Monitoring of and Adapting to Extreme Events and Long-Term Variations". The congress will bring together a wide range of scientists and other professionals from across Canada and other countries with a focus on topics in atmospheric, ocean and earth sciences. [Abstract submissions](#) are now open and are due by Feb 15 2016.

Coastal Zone Canada Conference June 12-16

At the upcoming CZC 2016 coastal zone meeting scientists and practitioners get together to share their knowledge from their research and projects conducted all over the world. The conference will be full out plenary sessions, workshops, networking opportunities, and career development opportunities in this specific niche of science and coastal conservation. Individuals, government departments, environmental consultants, and non-profit practitioners will meet to discuss various issues that they see in their part of the world. [Abstract submissions](#) are now open and are due by January 31 2016.

Webinar: Introduction to QGIS Wed, Feb 17, 2016 2:00 - 3:00 PM AST

Raphael Vanderstichel (UPEI), Introduction to QGIS: a free and open-source geographical information system. [Free Registration](#).

Science Atlantic Aquaculture & Fisheries and Biology Conference 2016

Science Atlantic is celebrating students working on research in both Biology, as well as Aquaculture & Fisheries. This year, Saint Mary's University is proud to host this annual student conference taking place March 11-13, 2016. This [conference](#), which is attended by faculty and students from institutions throughout the Atlantic Provinces, will feature oral and poster presentations by students, a keynote speaker, and awards for the best student presentations. [Abstract submission](#) closes February 13.

International Conference on Aquatic Invasive Species - Winnipeg

The Manitoba Environmental Industries Association is hosting the 19th [International Conference on Aquatic Invasive Species](#) that will be held at the Fort Garry Hotel, in Winnipeg, Manitoba, Canada, April 10-14, 2016. This conference series is widely considered the most comprehensive international forum on aquatic invasive species and continues to evolve to address new and emerging issues.

CANADIAN JOBS and TRAINING

Dalhousie University tenure track position Assistant Professor, Physical Oceanography, Diversity Faculty Award program

The Department of Oceanography at Dalhousie University invites applications for a probationary tenure track position at the rank of Assistant Professor in Physical Oceanography. This position is part of the Dalhousie Diversity Faculty Award program. The Department of Oceanography at Dalhousie is Canada's premier location for ocean research and education. The research in the Department is highly interdisciplinary and focuses on integrating observations and understanding of ocean processes to better predict the past and future ocean on a wide range of temporal and spatial scales. The review Process will commence on March 1 and continue until the position is filled.

[Announcement](#)

African Discovery Camp for Research-based Training March 29 - April 29, 2016



RGNO Research Discovery Camps offer training courses on specialized oceanographic topics. Hands-on work on a research vessel at sea, instruction in the classroom and work in the laboratory make RGNO Research Discovery Camps unique experience. By working across disciplinary fields and initiating partnerships with scientists from internationally leading research institutions, The Discovery Camp in Namibia addresses questions relevant to the Benguela Current Ecosystem (BCE) and the consequences of global changes and local disturbances for its functioning. We would like to invite 12 to 14 open minded, motivated and passionate young scientists from SADC countries (Southern African Development Community), but also worldwide. All students must fulfill the same criteria. The course fee is 9500 NAM\$ (850\$C, [but variable]), which covers accommodation (room and board) on land and at sea and local transport. We envision a 1:1 ratio of African to non-African participants. Applications due by February 1 2016.

[Poster](#)

PhD Fellowships, TOSST - Transatlantic graduate research school, Canada - Germany

The NSERC Collaborative Research and Training Experience (CREATE) program for Transatlantic Ocean System Science & Technology (TOSST) has new ocean science PhD fellowships available! To apply for 1 of 11 PhD positions, please visit our website at www.tosst.org. Each fellowship covers tuition and living expenses for four years. We will begin reviewing applications on June 10th, 2016 for a September start date.

[Details](#)

NF-POGO CofE training courses October 2016 to August 2017

Applications are now being accepted for Year 4 of the Nippon Foundation-POGO Centre of Excellence (NF-POGO CofE) at the Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI). Located in the North Sea, the NF-POGO Centre of Excellence at AWI will be conducted on the offshore island of Helgoland and the UNESCO reserve Waddensea island of Sylt. Helgoland provides opportunities for the study of open-ocean sciences; shelf/basin interactions are topics of study at Sylt. The deadline for applications is February 20 2016.

[Details](#)



[Sylt](#) and [Helgoland](#), sites of the NF-POGO CofE training courses.

Looking for work? Try the CMOS site ([click](#))

Vous recherchez un emploi? Visitez le site SCMO ([click](#))

GENERAL

GEOTRACES Arctic expeditions successfully completed

From [GEOTRACES News](#): Published: Friday, 06 November 2015 13:07

On October 14, the German Polarstern expedition arrived in Bremerhaven's port. This cruise completed the International Arctic GEOTRACES field programme for 2015 consisting of four cruises from Canada, Germany and USA.

Canadian Arctic Programme

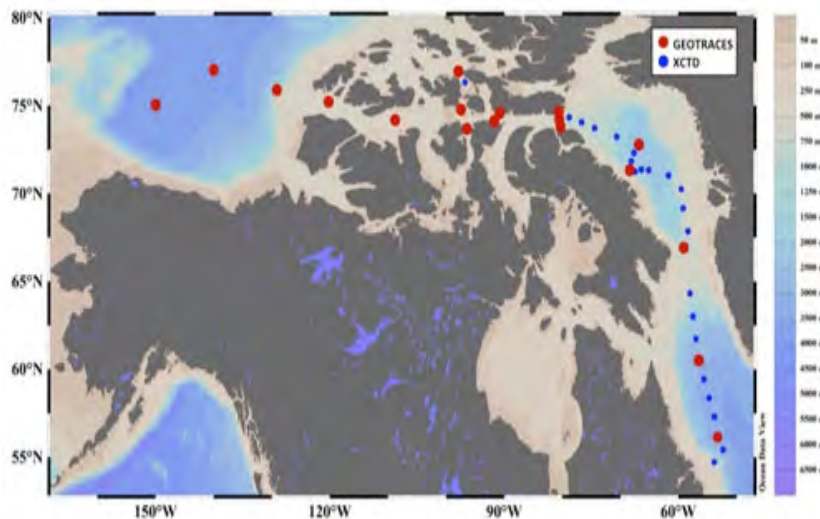
[Note: A more detailed look at the Canadian program is given in the lead article in this newsletter.]

The Canadian Arctic Programme "A biogeochemical and tracer study of a rapidly changing Arctic Ocean" consisting of two cruises (July 10 – August 20: Quebec City – Kugluktuk; September 4 – October 1: Sachs Harbour – Resolute) on board the CCGS Amundsen was successfully completed, notwithstanding a two-week hiatus in research during the first leg, arising from the diversion of the CCGS Amundsen to Hudson Bay to open sea lanes for commercial vessels (July 19 – August 3). All planned stations were occupied with the exception of one station in eastern Baffin Bay. This was achieved in large part thanks to our colleagues from the ArcticNet program, who cancelled most of their research planned for this leg to leave us enough time to complete most of our work.

During the first leg, 13 stations (two in the Labrador Sea, three in Baffin Bay, 8 in the Canadian Arctic Archipelago) were sampled for seawater with a regular and a trace metal clean rosette, and for marine particles with six large volume in-situ pumps. Productivity measurements using multiple isotopic methods and incubation experiments were also conducted, while trace gases measurements and aerosol sampling were performed under way. Twenty three XCTD were also deployed between stations in the Labrador Sea and Baffin Bay to supplement the hydrographic data.

During the second leg, 6 stations (three in Canada Basin and three in the Canadian Arctic Archipelago) were sampled for seawater and marine particles as during the first leg, and aerosols were sampled underway.

Chief Scientists of the cruise: Roger François and Philippe Tortell, University of British Columbia, Canada.



This map shows the stations from the Canadian Arctic expedition. Please click [here](#) to view the figure larger.

U.S. Arctic Programme

The U.S. expedition returned safely to Dutch Harbor (Alaska, U.S) on October 11 following a long and successful Arctic cruise on board the U.S. Coast Guard Cutter Healy (HLY1502, GN01). A combined total of 66 GEOTRACES and Repeat Hydrography stations were occupied from August 9 to October 11.

The cruise accomplished its goals, which included ship-board collection of water and particles for both contamination and non-contamination prone elements, and aerosol sampling. Ice floe operations included sampling of under-ice seawater, snow, ice, and melt ponds. The expedition encountered surprisingly thin ice which led to relatively rapid transit, but reduced the number of sea ice stations that could be safely occupied. Although fall storms at the end of the cruise required that 3 of the final stations be abandoned, the majority of an ambitious cruise plan was fulfilled. In addition to a wealth of new science, this expedition marked the first time a U.S. surface ship reached the North Pole unescorted, a consequence of Arctic warming and reduced ice cover.

Chief Scientists of the cruise: David Kadko (Florida International University) and Bill Landing (Florida State University, co-chief).

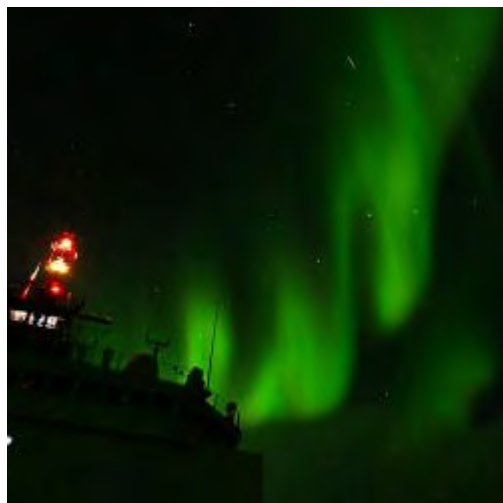


Figure © Bill Schmoker, PolarTREC.

German Arctic Programme

Polarstern expedition PS94, named Transarc II, to the central Arctic Ocean arrived home on October 14. It had successfully completed GEOTRACES section cruise (GN04). In total 33 stations were sampled by a team of GEOTRACES scientists from the Netherlands, France, Spain, Germany, United Kingdom, Switzerland, Sweden, and Denmark. They carried out a transect from the Barents Sea through the Nansen and Amundsen Basin to the Makarov Basin, crossing the Lomonosov Ridge. Highlight of the expedition was the rendez-vous within USCG Healy at the North Pole where German and US teams had a memorable opportunity for occupying the same sampling station (crossover station), sharing experiences and knowledge.



USCGC Healy and RV Polarstern at the North Pole, 7 Sept. 2015. ©Stefan Hendricks. Source: blogs.helmholtz.de.

The expedition had to be interrupted because of a medical emergency. After bringing the patient safely to Tromsø they were able to complete a section through the Bear Island trough between Svalbard and Norway, characterizing the Atlantic inflow to the Arctic through the Barents Sea, and therefore one of the Gateways to the Arctic Ocean.

Chief Scientist of the cruise: Ursula Schauer, AWI, Bremerhaven, Germany.

GEOTRACES Scientists: Michiel Rutgers van der Loeff (AWI, Germany) and Micha Rijkenberg (NIOZ, Netherlands).

Outreach Programme

The International Arctic GEOTRACES field programme had a broad outreach programme including [cruise blogs](#), [videos](#), the participation of a [PolarTREC teacher](#) on board the U.S. expedition, [the “Float the Boat” programme](#), [radio interviews](#), educational outreach to U.S. Coast Guard personnel, [outreach to local populations who depend on the Arctic Ocean for their livelihood](#),... Follow GEOTRACES outreach activities [here](#). More outreach and educational materials from these expeditions will be developed!

Discovery of a parasitic alga affecting the blue mussel

From [Québec-Océan Newsletter 16, October 2015](#)

Drs. Michel Zuykov, Nicolas Lemaire and Claude Belzile, as well as Profs. Michel Gosselin, Émilien Pelletier (UQAR-ISMER) and France Dufresne (UQAR), are involved in research that has led to the identification of a new parasitic alga affecting the blue mussel in the St. Lawrence estuary. Originating in Asia and observed in Newfoundland, as well as in the coastal waters of Europe and South America, the alga has recently been discovered in the Rimouski area. This is the first time it has been reported in Québec. Normally, mussels filter water and occasionally consume this alga of the *Coccomyxa* genus. What is surprising is that *Coccomyxa* is able to live in the mussel’s tissues and in time becomes harmful to its host. *Coccomyxa* does not release toxins and does not directly kill the mussel that it colonizes, but it can significantly weaken the bivalve after a certain time. Faced with the risks this phenomenon may mean for aquaculture sites, research is continuing.

[Paper](#)



The green colour in this Mussel is due to the presence of Coccomyxa.

CNC-SCOR Early Career Ocean Scientist Award

- The Early Career Ocean Scientist Award is presented to an early career oceanographer/marine scientist for an outstanding contribution to marine sciences (in the broadest sense) within Canada. The award can be based on a single work/paper that provides a seminal contribution to the field, or ongoing work at a sufficiently high level of excellence that provides an outstanding overall contribution.
- The Award: The award winner will receive a plaque with the award, as well as funds, from CNC-SCOR, to travel to the upcoming CMOS congress to receive the award and present a paper. Additionally, the award winner will be invited to sit on the CNC-SCOR committee for 1 year beginning with the CMOS Congress associated with their award
- Obligations of winner: The winner will acknowledge CNC-SCOR on their presentation at the CMOS-Congress, and will be asked to provide a 1 to 2 page article on their research for the Canadian Ocean Sciences Newsletter.
- History of the Award: The award will be presented for the first time in 2016. It is open to candidates (Canadians, working in Canada or overseas, or permanent residents) who are within 10 years of completion of their Ph.D. (note that periods of leave (e.g., parental, health) during this period do not count against the 10 year duration, provided appropriate documentation is provided). The candidate can work in any area of marine sciences, including academia, government, industry, NGO's, etc.
- Award Nomination Instructions:
 - Nominations are to be received no later than 15 February, by email to the CNC-SCOR secretary: David.Greenberg@dfo-mpo.gc.ca to be considered by the selection Committee. Receipt of submissions will be provided if requested.
 - Nominations will be adjudicated by the CNC-SCOR committee
 - Nominations will require a nomination letter highlighting the nominee's merits (maximum 2 pages), plus 2-4 supporting letters as well as an up to date CV of nominee
 - Nominations not selected for the award in previous years will be maintained active for three subsequent years (although they can be updated) or until the 10-year deadline has passed.

CMOS AWARDS Nominations Deadline: Feb 15.

February 15th is the deadline for nominations for the CMOS Prizes and Awards. It may seem far away, but it always seems to arrive faster than we thought. Please take a moment to visit <http://www.cmos.ca/site/awards> for a list of the eight awards, for instructions on how to make a nomination and then submit something on behalf of one of your colleagues or students. CMOS has a rich history recognizing deserving persons (members and non-members) through its awards programs. But regrettably, there are many deserving candidates who go unrewarded each year because we were too busy to work up a nomination. Don't wait - do it now!

Note that any inquiries and all nominations are to be forwarded to the CMOS Awards Coordinator (Denis Bourque) at awards-coord@cmos.ca.

CANADIAN OCEAN SCIENCE NEWSLETTER LE BULLETIN CANADIEN DES SCIENCES DE L'OcéAN

Previous newsletters may be found on the CNC/SCOR web site.

Newsletter #86 will be distributed in January 2016. Please send contributions to David Greenberg david.greenberg@dfo-mpo.gc.ca

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Le Bulletin #86 sera distribué en janvier 2016. Veuillez faire parvenir vos contributions à David Greenberg, david.greenberg@dfo-mpo.gc.ca

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