

Vessels wanted for the science needed: National perspectives on scientific vessel capacity needs

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Friday June 2 from 10:30 am - 12:00 pm NDT

Moderator: Doug Wallace (he/him), MEOPAR's Scientific Director and NRVTT Chair



St. John's, Newfound and Labrador: During the Ocean Research Alliance in Canada (ORCA) Meeting on Friday, June 2, MEOPAR hosted a panel discussion convening national perspectives on scientific vessel capacity requirements. During the discussion, around 50 stakeholders from the Canadian ocean research community began a forward-looking discussion about opportunities and needs for future vessel access. In the session, end-users from various sectors and regions of Canada's ocean space presented and discussed their visions for "the vessels we need for the science we want". Ocean industry researchers and practitioners discussed how to recognize and address the diversity and enormity of the ocean space in Canada while addressing current vessel access issues by 2030.

The conversation was moderated by Dr. Doug Wallace, a researcher who has conducted considerable at-sea research. He is the Director of MEOPAR, teaches at Dalhousie University and co-chairs the National Research Vessel Task Team (NRVTT; Figure 1). During this session, Dr. Wallace fostered a forward-thinking dialogue and outlined how the NRVTT

can address these barriers while facilitating and coordinating solutions.

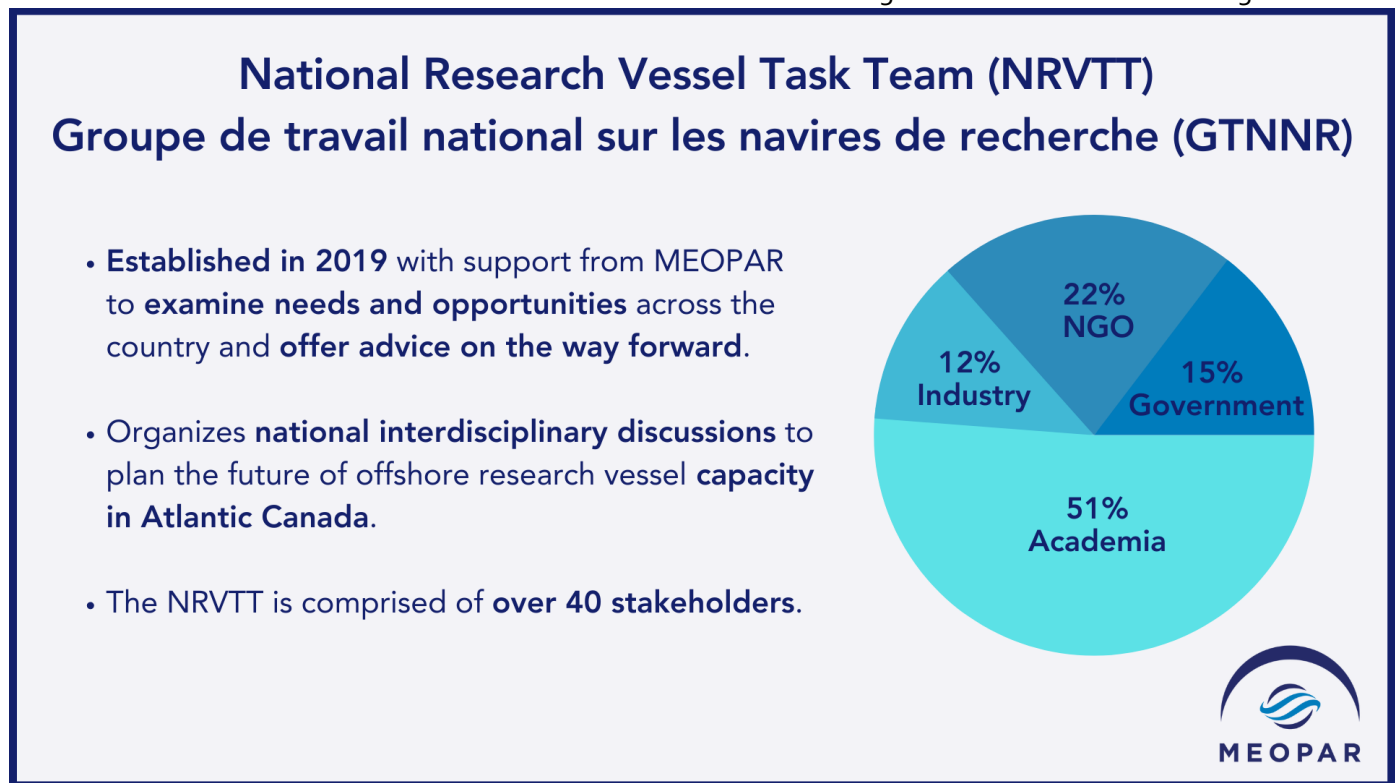


Figure 1. Overview the National Research Vessel Task Team (NRVTT) goal and membership (as of May 2023).

What We Heard

In advance of opening up the floor to audience questions, the discussion was guided by five panelists: Dr. Heather Reader ([Memorial University of Newfoundland](#) - MUN), Marc-Olivier Massé ([Centre de reserche sur les milieux insulaires maritimes - CERMIM](#)), Guillaume St-Onge ([Refomar](#)), Benoît Pirenne ([Ocean Networks Canada](#)), and Alexandre Forest ([Amundsen Science](#)) (Figure 2).

Meet the Panelists



Heather Reader (she/her/elle)
Assistant Professor Canada
Research Chair in Chemistry of
the Ocean and Atmosphere,
Department of Chemistry
Memorial University of
Newfoundland



Marc-Olivier Massé
(he/him)
Associate Director, Centre de
research sur les milieux insulaires
maritimes (CERMIM)



Guillaume St. Onge (he/him)
directeur de l'Institut des
sciences de la mer de Rimouski
(ISMER) de l'Université du
Québec à Rimouski (UQAR),
préside le conseil
d'administration de Reformar



Benoît Pirene
(he/him)
User Engagement
Director, Ocean Networks
Canada



Alexandre Forest
(he/him)
University Laval, Amundsen
Science



Figure 2. Overview of the panelists that shared their perspectives during the discussion at ORCA on June 2.

Heather Reader, Assistant Professor and Canada Research Chair in Chemistry of the Ocean and Atmosphere, Department of Chemistry Memorial University of Newfoundland, shared that as an ECR and new researcher coming to Canada, finding access to vessels has been challenging (Figure 3). Due to convoluted applications and lack of funding, she has been unable to lead research expeditions. Despite being unable to join, she's enabled her students to participate in DFO cruises and had folks from DFO cruises take samples for her.

Research Vessels Needed for the Science Wanted



- For Canadian scientists across all disciplines, **research vessels are crucial** for monitoring, observing, and understanding the vast ocean ecosystem.
- Our ocean environment needs scientific information more than ever, yet this **capability has declined** over the decades.
- User demand survey results helped the NRVTT understand Canadian research vessels needs:



Figure 3. Graphical overview of the current gap in research vessel access, supported by results from the user demand survey, which collected 50 responses from end-users.

As associate director of [CERMIM \(Center de recherche sur les milieux insulaires maritimes\)](#), Marc-Olivier Massé outlined a model to bridge research and industry by supporting Magdalen Island services and projects: Fishing vessels' off-time is leveraged to conduct research on CERMIM's projects, like their ROV Ghost Gear Retrieval work. By working with Captain Francis-Éric, they helped him obtain the proper vessel certification from Transport Canada for both research and fishing (Figure 4). This model is mobile and can be implemented in any province in Atlantic Canada. In addition, CERMIM is building a research center near the wharf on Magdalen Island for rapid analysis. The center will also be equipped with industrial equipment for quick repairs and the development of industrial solutions.

FRANCIS-ÉRIC

Research vessel (working class certification) based on Magdalen Island

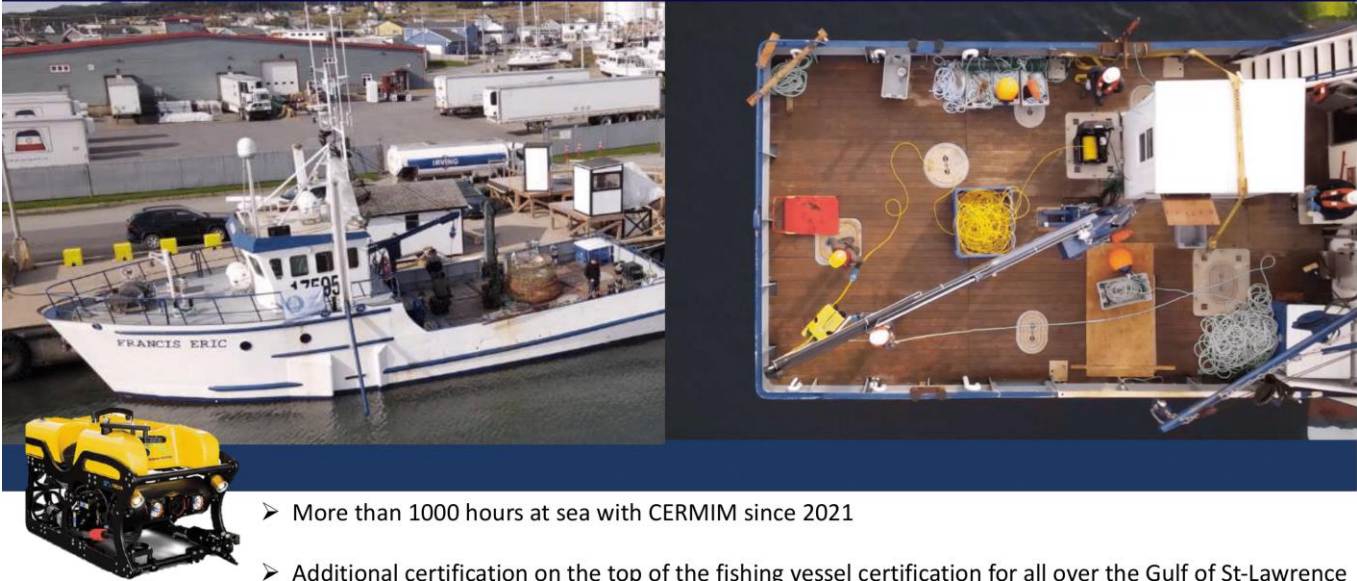


Figure 4. Captain Francis-Éric's vessel used by CERMIM for research outside of fishing season.

Guillaume St. Onge, Director of the Institut des sciences de la mer de Rimouski (ISMER) at UQAR, and Chair of Refomar's Board, discussed Refomar's role in managing ships for research institutions as an independent non-profit in the Gulf of St. Lawrence. Having its own research vessel allows Refomar to deploy more scientific cruises. For example, a new researcher who joined ISMER in 2021 has already led seven scientific cruises. The Réseau Quebec Maritime (RQM) has also enabled the academic community to gain access to vessels, which has steadily increased in Quebec. Innovative collaborations, particularly with MEOPAR on their TRex project, have also enabled this. Refomar's ship, however, is aging (currently 33 years old), so they must transition to the replacement ship as smoothly as possible to avoid an access gap.

Benoît Pirenne, Ocean Networks Canada's Director of User Engagement, explained that because the organization has invested over \$500 million in ocean research, they have a responsibility to provide researchers with vessel access. ONC relies on coast guard vessels and the US Navy for offshore work. However, when opportunities are not available, ONC charts other vessels.

Alexandre Forest, Executive Director of Amundsen Science, explained how the not-for-profit manages the Canadian Coast Guard Ship CCGS Amundsen and its equipment fairly. There is a process for submitting applications that facilitates access to the vessel. The Coast Guard owns and operates the vessel, but Amundsen manages its time and accesses it to make it available to researchers. Their co-management model allows them to support a wide range of researchers, with a particular emphasis on students and early career researchers. Other Canadian Coast Guard vessels could replicate their model.

In the question period, Mark Abrahams, Professor of Biology at MUN, mentioned that the University is considering purchasing a vessel that could provide access all year round. However, it was too expensive to operate the vessel, despite having adequate funding to purchase the vessel. He wanted to know how high operation costs could be overcome. In order to raise revenue for operations and maintenance, St. Onge suggested leveraging government grants. Refomar

requires funding for at least 100 days at-sea for vessel acquisition to be sustainable, but this may not always be feasible, especially considering federal funding is insufficient to support at-sea research.

The next question came from MUN graduate student Kabhir: Will international students be able to transition to ship time in any way? According to Dr. Wallace, MEOPAR is aware of this issue, and under the Strategic Science Fund (should their application be successful), they will be able to provide additional funding for ship time, where a portion will go towards underrepresented groups. The advantage of owning a ship, according to St. Onge, lies in the ability to control who gets time on it. Refomar has a specific cruise for ECR from underrepresented groups that was co-designed with that HQP group. Dr. Reader explained how it would be great to have HQP onboard a cruise together. However, in some instances it is just one student on the ship at a time, which can be daunting if you have never been at-sea; Working together is always better.

It is important for marine scientists to have opportunities to go to sea and learn about field equipment and provide training, according to Professor Paul Myers of the University of Alberta. However, that does not always happen for numerical modelers. What can be done to help modelers access this type of training? St. Onge pointed out that ISMER has been able to provide that kind of training to students. Summer schools and floating schools should be available for other institutions to use. A CREATE can be used to conduct training at-sea from coast to coast.

As part of the Atlantic Zone Monitoring Program, Frederic Cyr asked the panelists how monitoring programs fit into the larger picture. Dr. Reader agreed that such collaborations and partnerships are extremely valuable. However, one of the challenges with DFO monitoring is that births are limited and priority is given to DFO, but other researchers often do not have access to space. A good partnership between academia and DFO would be beneficial, but the vessels are becoming increasingly old. The need for regular monitoring stations is obvious. Perhaps CERMIM could be used as a model for long-term regularly scheduled cruises.

As one participant pointed out, every time the oil and gas industry downturns, vessel availability increases. What can we do about improving coordination with international vessels and groups that are interested in Canadian waters? Coordinating this work would be difficult due to its opportunism. Since DFO Science manages all permits and plans, as Kent Smedbol pointed out, the office can act as a point of contact, since they are required to share data with us. There is a need for gathering information and communicating schedules and intentions. MUN student Kavhi asked: Why is it that the government of Canada does not require Canadian scientists to travel on international ships? These requirements can be stipulated by the Canadian government in addition to UNCLOS. There is actually a good system in place in Ireland that provides information online and solicits cruise application submissions, where the model could be replicated.

There was a question about whether NRVTT covered inshore vessel access. Although the NRVTT focuses primarily on offshore research vessels, CERMIM's model of working with inshore vessels can be replicated and expanded. CERMIM intends to be a resource for the whole region and has the capacity to accomplish this.

On the last question of the session, Dr. Wallace asked the panelists to describe their vision of the future of scientific research vessels. Mr. Pirenne from ONC stressed that vessels at-sea will continue to be needed to perform maintenance and collect samples. In order to reduce the need to actually perform these operations at-sea, and maybe even eliminate the need for staff on board with lab equipment, sampling work will be transferred to dedicated instruments that can occur in-situ. As part of the

automated and integrated sampling process, sampling needs will be met. Nevertheless, expedition design and analysis still require scientific expertise.

To conclude the session, participants were encouraged to join the NRVTT by contacting info@meopar.ca to help advance solutions.