

INTERVIEW OF THE MONTH



**SYLVAIN LAFRANCE**  
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**ABOUT THE MARS (MARINE ACOUSTIC RESEARCH STATION) PROJECT**



Sylvain Lafrance has been active in the maritime sector for more than 30 years. He started out working as a researcher in the field of fisheries for a few years, notably in West Africa. For 25 years now, he has headed organizations involved in both economic development and applied research. Mr. Lafrance has been the Executive Director of Innovation maritime (IMAR) ([www.imar.ca](http://www.imar.ca)) since summer 2013. Based in Rimouski and active since 2001, IMAR seeks to contribute to the development of the marine sector through innovation. Its areas of activity are marine engineering, environmental technologies, marine intelligence, marine transport/navigation and underwater intervention. At IMAR, some 30 individuals are actively involved in applied research. Mr. Lafrance holds a Bachelor's degree in Science and a Master's degree in Marine Resources Management.

**Question 1: What is the MARS (Marine Acoustic Research Station) project?**

**Answer 1:** It is an applied research project initiated by the Université du Québec à Rimouski's (UQAR) Institut des sciences de la mer de Rimouski (ISMER) and Innovation maritime (IMAR), with the support of Multi-Électronique (MTE) and OpDAQ Systèmes. The MARS project entails implementing and operating an international-calibre marine acoustic research station in the St. Lawrence River, in the centre of the Laurentian Channel, offshore from Rimouski.

Known for the abundance and diversity of the marine

mammals inhabiting it, this zone has a number of characteristics conducive to establishing the research station (bathymetry, weak current, etc.).

These features and the configuration of the moorings envisioned for the station will allow the acoustic signature of vessels operating on the St. Lawrence to be measured in keeping with internationally recognized standards. To our knowledge, no such station exists worldwide. Its unique nature will allow Québec to stand out in terms of acoustic research, while providing practical answers with regard to mitigation measures that could be implemented to reduce the impact of vessel noise on marine mammals.



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The MARS project brings together a number of research players and companies wishing to improve their environmental impact. It has received the support of a number of organizations interested in the harmonious cohabitation of marine transport and marine mammals. The ship operators associated with the project are CSL, Transport Desgagnés, Fednav and Algoma. Two Rimouski SMBs active in the maritime sector, OpDAQ Systèmes and Multi-Électronique, will also be partners. The project is already under way and will run until March 2024. It has received funding from Transport Canada, the Ministère de l'Économie et de l'Innovation du Québec (MEI) and private partners.

**Question 2: Where did the idea to learn more about the impacts of underwater noise come from, and what action had to be vis-à-vis ship operators to make the project possible?**

**Answer 2:** We know that vessel noise significantly affects marine mammals, which use sounds to communicate with one another (mother/calf) and to feed (search for prey). Many studies have been conducted to better understand the impact of noise on marine mammals, especially anthropogenic noise, like that generated by ships. However, there are fewer studies on vessels' noise footprint, sources of noise on board ship and mitigation measures.

In 2017, Innovation maritime joined private partners to propose an initial large-scale project on vessel acoustics and implementation of a research station on the St. Lawrence River. Unfortunately, this project did not receive the funding sought. At a workshop on underwater noise pollution organized in 2018

by MeRLIN (Technopole maritime du Québec), the idea of setting up a research station was revived.

This workshop provided the momentum required to rally several partners to the project and to define project goals and activities. Since 2018, we have been working in close collaboration with ISMER and private partners to hone the methodology and, especially, to obtain the funding required to implement the project.

The involvement of CSL, Desgagnés, Fednav and Algoma allowed us to take ship operators' need into account and to highlight the project's considerable importance to the MEI and Transport Canada. The support of SODES, Green Marine, and the Montréal, Québec, Trois-Rivières and Saguenay port authorities, among others, also helped move the project forward.

Overall, the project has required considerable work, over the past three years, on the part of our organization and our partners! We are pleased to be able to move into the implementation phase now.

**Question 3: What work will be carried out and what will be the spinoffs for the maritime industry?**

**Answer 3:** The project has two main goals. The first, under ISMER's lead, seeks to measure the noise levels of vessels transiting the St. Lawrence in keeping with international standards.

The second, under IMAR's lead, is to link vessel noise levels to their operating conditions and the



noise-generating elements on board ship in order to assess and develop mitigation measures. The expertise of OpDAQ Systèmes and Multi-Électronique will be put to use in deploying measurement tools in deep waters and in vessel instrumentation.

The project will make information available to ship operators so they can take action with regard to the underwater noise generated by their vessels. Simply put, the project envisages four main activities:

- Measuring vessels' acoustic signature
- Identifying noise sources and mapping the pathways for transmitting noise on board ship
- Developing autonomous instrumentation for continuous noise measurement
- d) Assessing the impact of mitigation measures.

Numerous results are expected for ship operators and the companies associated with the project, including:

- Detailed diagnoses of noise sources on board ship (for the vessels used as measuring platforms)
- A proven tool for continuous measurement of noise on board ships
- Vessel-specific measurements of at-source noise levels in keeping with international standards
- Analyses of mitigation measures that can be implemented to reduce vessel noise.

The repercussions of the MARS project will be significant, tangible, and, above all, quickly available to both our partners and government stakeholders.

In addition to the spinoffs for the industry, the project will allow Québec to develop solid expertise in acoustics applicable to the maritime domain.

It will also enable new research collaboration between Québec and France to be developed since the MARS project team will collaborate closely with the project team for PIAQUO, a major European research initiative targeting acoustics in the maritime domain.

**Question 4: Will all ship operators operating on the St. Lawrence be able to benefit from the work done in the context of the MARS project?**

**Answer 4:** Four ship operators – Fednav, Algoma, Desgagnés and CSL – are directly associated with the project. They will be involved in funding, use their expertise to orient the project and, if need be, will make their vessels available, from time to time, for project requirements.

We will be working closely with these four ship operators and the reports produced, affecting their vessels directly, will be submitted to them confidentially. These reports could take the form of customized technical sheets on their vessels' acoustic signature or technical diagnoses of noise and vibrations on board ships.

The team also plans to produce more global technical reports presenting the project findings. These reports will cover numerous subjects and will be destined for both financial partners and maritime community stakeholders. All ship operators will be able to inform themselves of the project findings.



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It is also deemed important, for research purposes, to create a database on vessel acoustic signatures. The signatures of our partner ship operators will not be sufficient to provide the wealth of data we would like to have for research purposes.

Consequently, we would also like to establish collaboration with other domestic ship operators wishing to obtain information on their vessels' acoustic footprint. It is likely that this could take place in fall 2021 or in 2022. Subsequently, we will also determine whether there is an interest on the part of foreign ship operators. The terms of such collaboration remain to be defined.