



Transport Canada's Innovation Centre

An Update on Marine RD&D

November 27-28, 2019 (Ville de Quebec, Quebec)



Transport
Canada

Transports
Canada

Canada 

Transport Canada's Innovation Centre

- Transport Canada's Innovation Centre is an engineering and science research branch within Transport Canada.
- We undertake research to enhance the safety, security, efficiency, and environmental performance of Canada's transportation system.
- Our Marine Research, Development and Deployment (RD&D) is comprised of engineers, policy analysts, naval architects, and marine biologists.



Innovation Centre Marine RD&D

GOALS

CLEAN MARINE – REDUCING EMISSIONS FROM THE MARINE SECTOR

Issues related to reducing greenhouse gas emissions, criteria air contaminants, and black carbon

REDUCING UNDERWATER NOISE AND VESSEL STRIKES TO SUPPORT MAMMAL PROTECTION

Mitigation impacts of shipping on marine mammals and their ecosystem



RD&D INITIATIVES

Support fundamental clean technology research and demonstrations

Validate pre-market clean technologies

Improve test methodologies

Collection and analysis of noise data

Support noise mitigation operational measures, such as slowdowns

Investigate technologies to reduce underwater vessel noise and improve marine mammal detection



TC Activities– Clean Marine

➤ IMO Emission Standards

➤ Pan-Canadian Framework

➤ Paris Agreement

➤ Transportation 2030



TC Activities– Clean Marine

- **Initial IMO Strategy on reduction of greenhouse gas emissions from ships** - TC is actively participating in discussions at IMO
- **Fourth IMO GHG study** - TC is providing financial support and is a member on the steering committee
- **Comparative Analysis of Emissions from Cape Islander Vessel with Electric and Diesel Propulsion Systems** – ongoing by Glas Ocean Electric, with numerous other partners
- **Queen of Oak Bay Performance Monitoring** – ongoing by BC Ferries, with NRC
- **Impact of Hull and Propeller Maintenance, CCGS Cygnus** –completed by CCG, with NRC



Credit: Glas Ocean

TC Activities – Marine Mammal Protection

North Atlantic Right Whale (NARW)

- Gulf of St. Lawrence
- Key threats - vessel strikes and entanglement

Southern Resident Killer Whale (SRKW)

- Salish Sea
- Key threats - underwater noise, lack of prey, contaminants

Saint-Lawrence Estuary Beluga (SLEB)

- St. Lawrence Estuary, Saguenay Fjord and Northwest GoSL
- Key threats - underwater noise and physical disturbance



TC Activities – Marine Mammal Protection

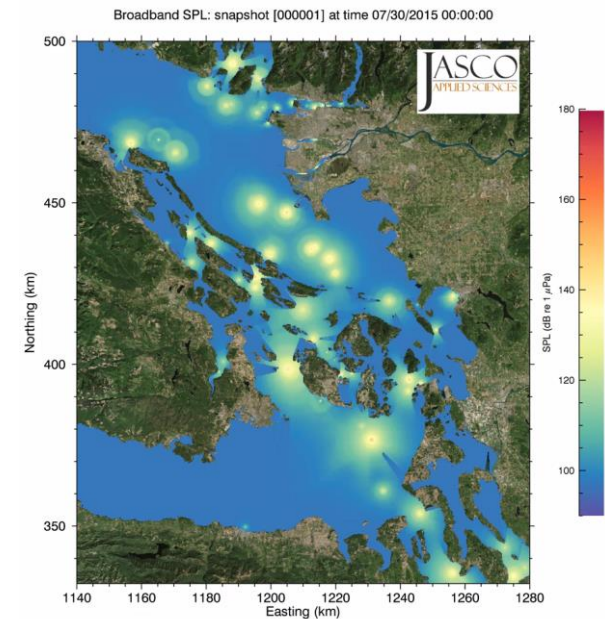
Policy and Management Measures:

- **National Aerial Surveillance Program** – increased flights
- **Speed restrictions** - in the shipping lanes north and south of Anticosti Island since about 2017
- **Vancouver Fraser Port Authority's ECHO Program** - measures for large commercial vessels such as voluntary slowdown and traffic shift
- **General vessel measures** – measures for small vessels such as minimum approach distances, sanctuary zones, echosounder use, idle or slowdown
- **Underwater Vessel Noise Management Plans (UVNMP)** - concept under development for fleet owners/operators
- **Leadership at IMO Marine Environment Protection Committee** – developing proposal to MEPC 75 for new work output

TC Activities – Marine Mammal Protection

Support for Policy and Management Measures

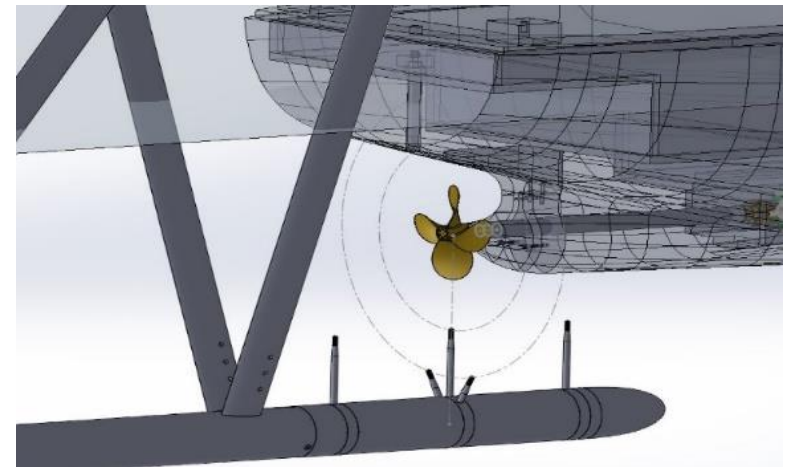
- **Short-term data collection and analysis**
- **Honguedo Strait glider for NARW detection** - ongoing by University of New Brunswick
- **Cumulative noise model of the Salish Sea** - completed by JASCO Applied Sciences
- **Low-speed navigation simulations** - completed by Lantec Marine
- **Mitigation of impact of echolocation devices** - completed by Vard Marine



TC Activities – Marine Mammal Protection

Reduction of Vessel Noise Source Levels

- **Underwater Listening Station in Boundary Pass** - Ongoing by JASCO Applied Sciences)
- **Scan of technologies for reducing vessel underwater noise** - completed by VARD Marine
- **Evaluation of class society quiet notations** - completed by JASCO Applied Sciences
- **Propeller-induced noise and vibration** - ongoing by NRC and MUN
- **Parametric propeller noise study** - ongoing by BC Ferries with DnV-GL



PINOV- 3D model of test setup with improved shaft drive system (Photo Credit: NRC)

Marine RD&D Request for Proposals (RFP)

Objectives:

- inform the sector of Transport Canada's research goals
- gather proposals for projects to help reach those goals
- provide a transparent and competitive process

**up to \$21.1M;
three streams;
four years**

**Open to indigenous
groups and
Canadian
stakeholders**

**Close mid Jan 2020
(to be confirmed)
contracts awarded
by April 1, 2020**

Marine RD&D Request for Proposals (RFP)

CLEAN MARINE

- 1) Emerging Technologies
- 2) Testing & Validation of Pre-Commercial and Commercial Technologies

MARINE MAMMAL PROTECTION

- 1) Safety Assessments and Technology Scans
- 2) Development of Models and Predictive Tools
- 3) Testing and Evaluation of Technologies

COMBINED STREAM

Identify, test and validate technologies and/or designs that address objectives of both clean and marine mammal protection streams

RFP – Clean Marine

Emerging Technologies

Fundamental science and research

Adaption or development of new technologies (TRL 2-5)

Testing of technologies at a higher TRL but with limited implementation in the marine sector

Pre-Commercial and Commercial Technologies

Testing of pre-commercial and early commercial technologies (TRL 6-9)

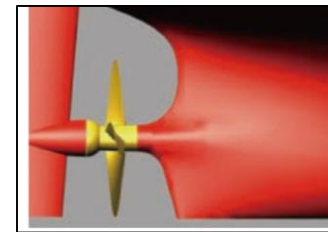
Evaluate operational costs, emission reduction potential and opportunities for further development.



Technologies to monitor emissions
(Photo cred: EmSys Maritime)



Alternative Fuels
(Photo cred: Maritime Executive)



Novel Vessel Design/Retrofits
(Photo cred: Nakashima Propeller)

RFP – Marine Mammal Protection

Safety Assessments and Technology Scans

Impact of URN Reduction
On Compliance With EEDI
Criteria

Feasibility of Real-Time
Shipboard Cavitation
Monitoring and Management

Development of Models and Predictive Tools

Standards for Measurement
of Underwater Noise from
Ships in Shallow Water

RFP – Marine Mammal Protection

Testing and Evaluation of Technologies:

Identification and validation of technologies (TRL 6-9) and designs

Reduction of underwater radiated noise or improvement of the detection of marine mammal presence

Vessel types – ferries, tugs, fishing vessels, whale watching vessels



Anti-singing edge
Photo Cred: Subsea
Solutions



Acoustic Enclosure
Photo Cred: Alara lukagro



Pump Jet
Photo Cred: Natchan World

RFP – Combined Stream

Projects should meet the objectives of both Clean Marine and Marine Mammal Protection streams

Testing and validation projects are preferred



Electric/Hybrid Electric Vessels
Photo Cred: Safety4Sea



Hull Lubrication System
Photo Cred: Safety4Sea

Public Services and Procurement Canada

How to find the Call for Proposal and other Processes

- Go to: <https://buyandsell.gc.ca>
- Enter file number in Search field: T8009-190223
- Click on Link on resulting file.



Contact Information

Abigail Fyfe

Senior Research Development Officer

Transport Canada

Abigail.Fyfe@tc.gc.ca

(343) 999-7384



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