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# Reducing underwater noise from shipping

The Canadian approach

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Vancouver Fraser Port Authority

Enhancing Cetacean Habitat and Observation (ECHO)

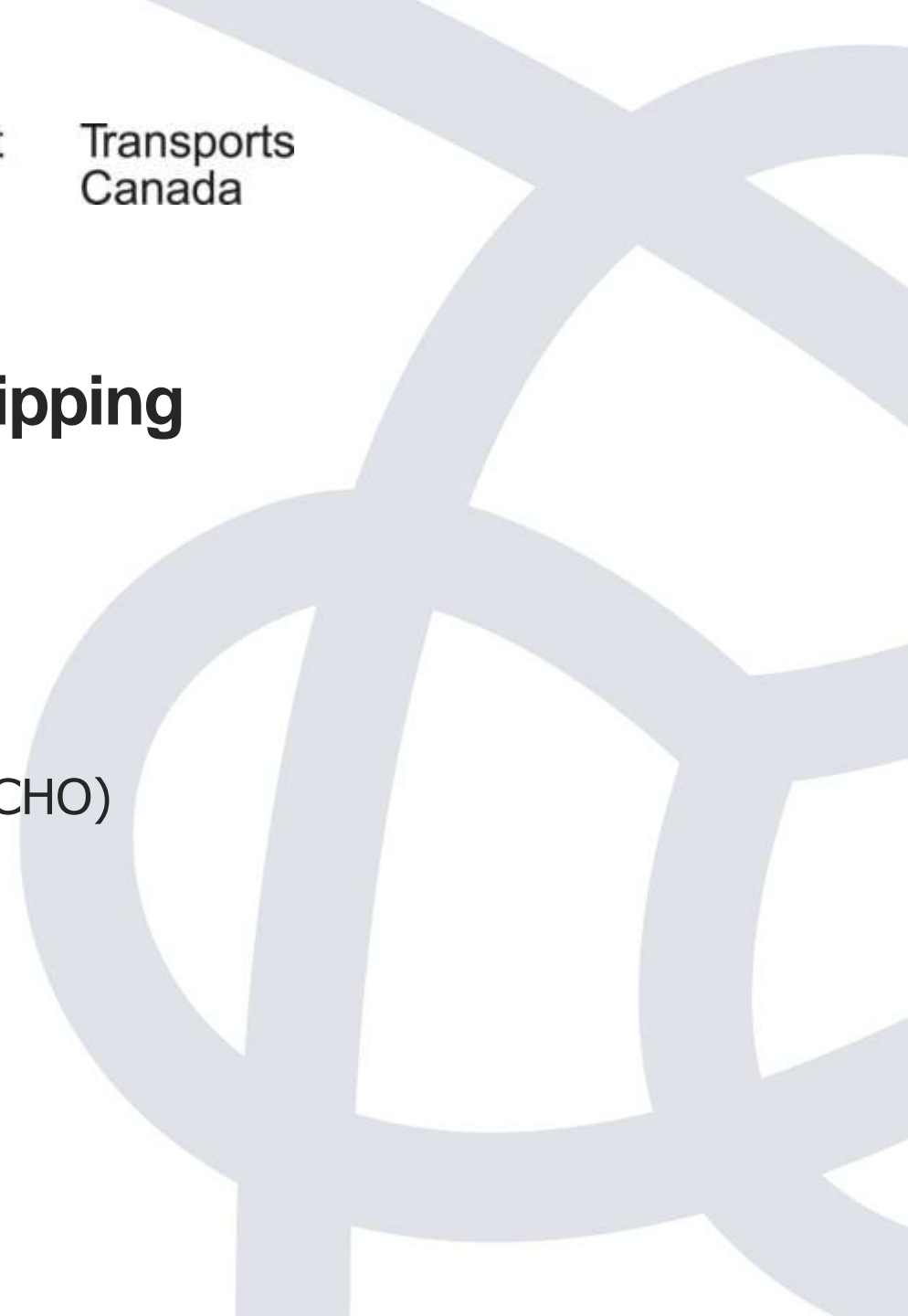
Project Manager

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Transport Canada

Director, Clean Water Policy Division

*September 10, 2019*



# Port of Vancouver

Enabling trade with more than 170 world economies



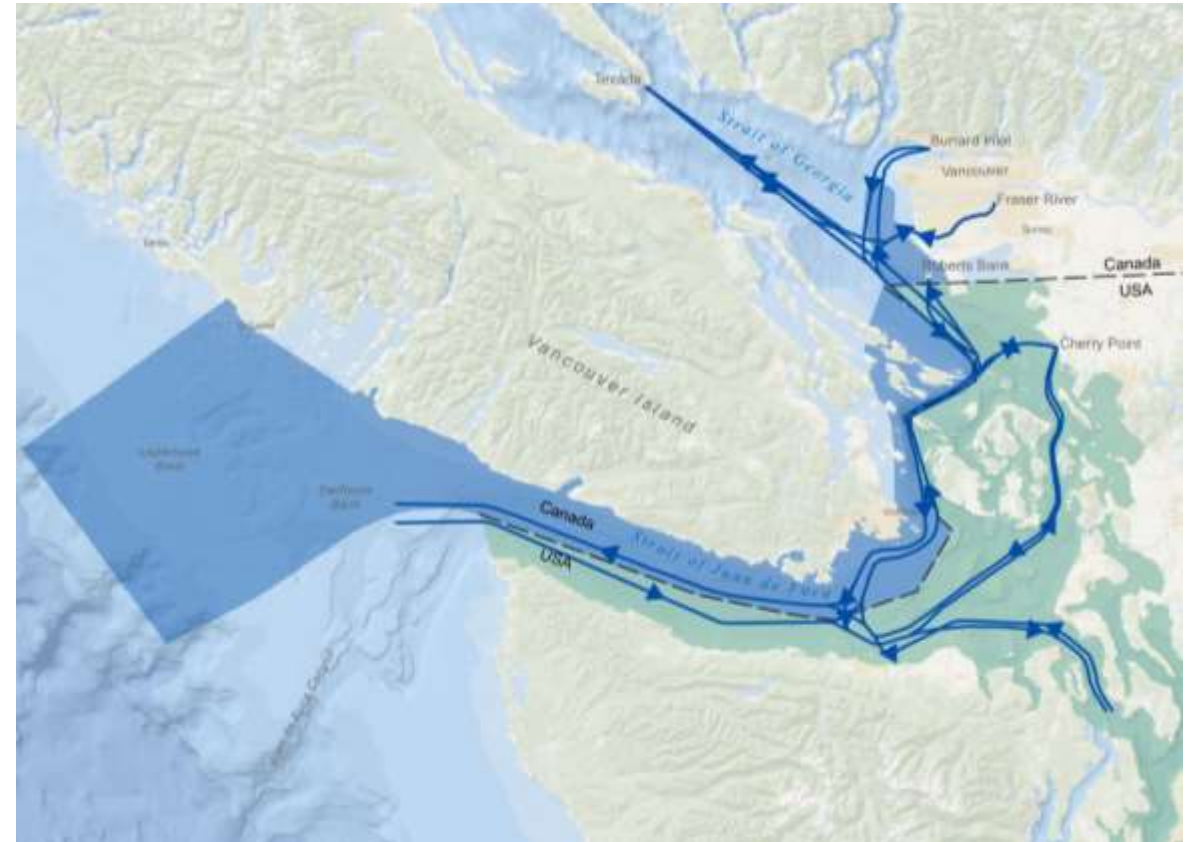
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# Commercial shipping activities and whales

## An international issue

- International shipping lanes overlap protected critical habitat for endangered southern resident killer whales and other at-risk species
- Underwater noise can affect whales' ability to feed and communicate
- Predicted shipping activity and human population growth in both Canada and USA
- Port authority mandate under the *Canada Marine Act*



# Enhancing Cetacean Habitat and Observation (ECHO) Program overview



**What?** A collaboration with marine transportation industries, conservation groups, scientists, Indigenous individuals and Canadian and US governments.

**When?** Convened Nov 2014

**Why?** To better understand and reduce the cumulative effects of commercial shipping activities on at-risk whales throughout the southern coast of British Columbia.

## **Key actions:**

- Collaborative international and regional relationships.
- Research projects, with an emphasis on underwater noise.
- Trial and implement threat reduction measures



# Research: Underwater listening stations

## Learning about:

- Vessel source levels (10,000+ measurements)
- Marine mammal detections
- Ambient noise

## To better understand:

- Vessel-generated underwater noise
- How to assist regional operators with noise reduction
- Habitat use by marine mammals
- Spatial and temporal trends in underwater noise



Photo: VFPA

# Measures: Voluntary vessel slowdown in Haro Strait

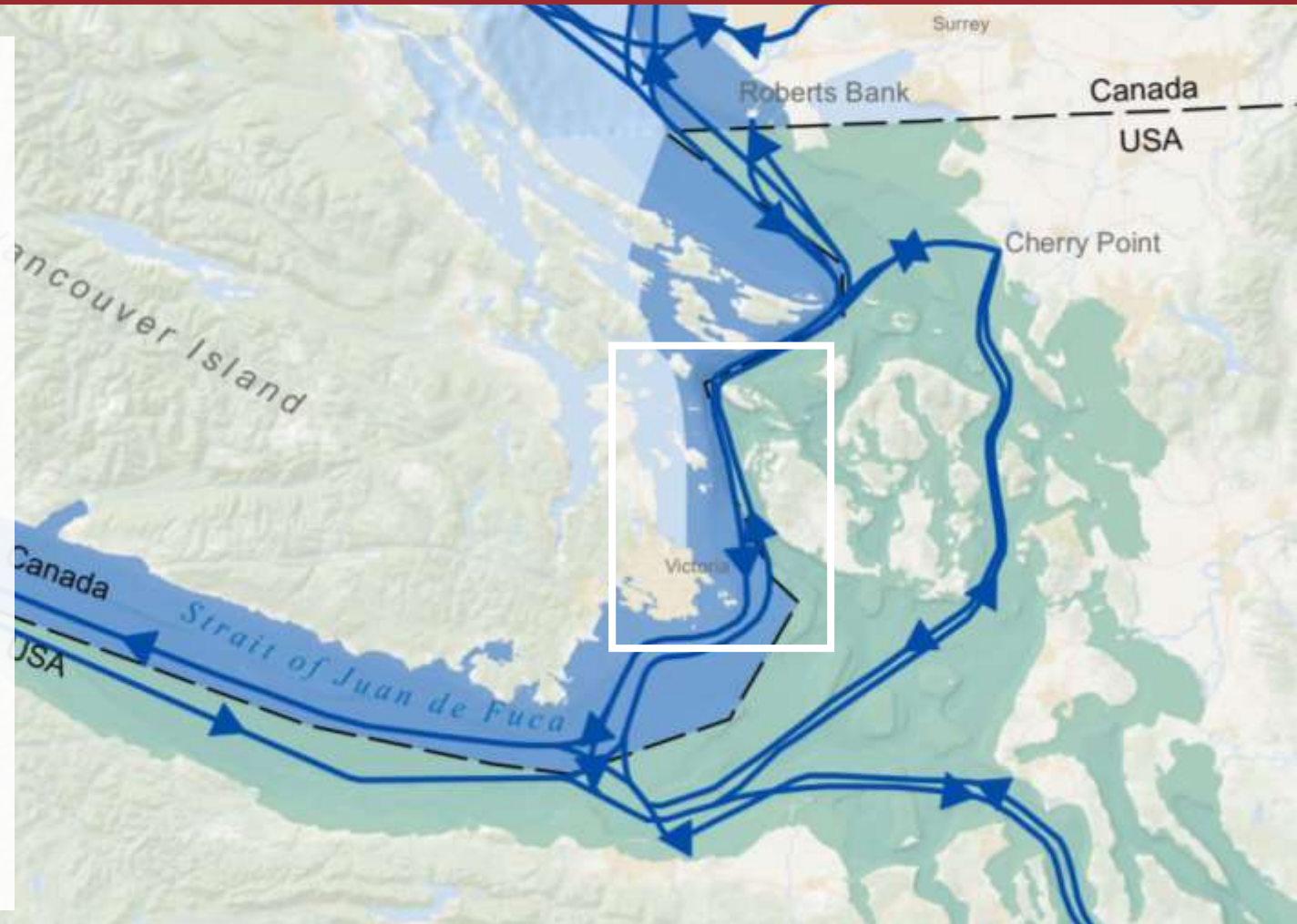
**Why:** To better understand the relationship between vessel speed, underwater noise and potential effects on killer whales

**Where:** ~16 nautical miles through critical whale foraging habitat in Haro Strait

**Who:** Over 70+ organizations

## **Monitoring:**






- Participation and vessel speeds
- Ambient noise
- Vessel source levels (*2017 only*)
- Killer whale presence and behavior





# Measures: Haro Strait voluntary vessel slowdown

## 2017 and 2018 summary

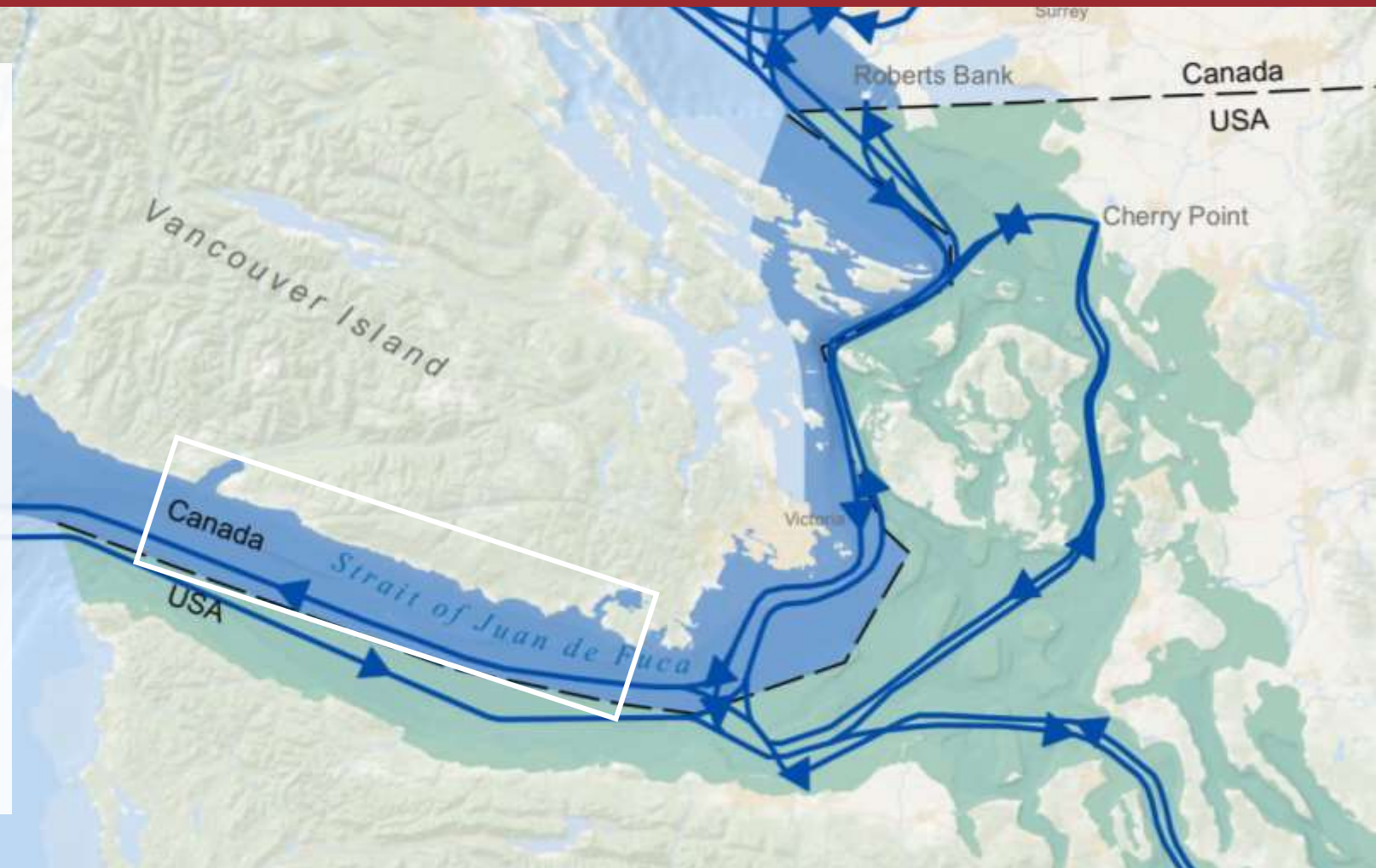
	Speed	Duration	Participation	Acoustics	SRKW
					
<b>2017</b>	11 knots through the water for all vessel types	Set: 61 days Aug 7-Oct 6	61% reported participation (578 of 951 vessels)	5-11 dB RNL reduction at vessel 1.7 dB reduction at Lime Kiln (filtered)	22% reduced impact to foraging time (modelled)
<b>2018</b>	Variable speeds 12.5 and 15 knots through the water	Dynamic: 111 days Jul 12-Oct 31	87% reported participation (1467 of 1678 vessels)	1.5 dB reduction at Lime Kiln (filtered)	15% reduced impact to foraging time (modelled)

# Measures: Voluntary lateral displacement trial in the Strait of Juan de Fuca

Ships asked to shift as far south as possible in existing lanes to reduce underwater noise in near-shore feeding areas.

## Results:

- Tugs: 88% in trial zone for some or all of their transit resulted in approximately 4dB reduction
- Deep sea vessels: 82% in trial zone for some or all of their transit resulted in less than 1dB noise reduction





# Measures: Raising mariners' awareness

## THE EFFECTS OF VESSEL UNDERWATER NOISE ON WHALES AND WHAT MARINERS CAN DO ABOUT IT

**SOURCES OF NOISE**

WHEN THE PROPELLER OF A SHIP ROTATES, IT CREATES A SOUND THAT CAN BE HEARD BY WHALES AT A DISTANCE OF 4.5 KILOMETERS.

**IMPACTS**

UNDERWATER NOISE CAN AFFECT THE ABILITY OF WHALES TO COMMUNICATE, FEED, AND REPRODUCE.

**WHAT YOU CAN DO**

IN 2014, THE PORT OF VANCOUVER AND THE COASTAL OCEAN RESEARCH INSTITUTE (CORI) INITIATED A TRIAL TO REDUCE UNDERWATER NOISE FROM SHIPS IN THE HARBOUR.

## HARBOUR STRAIT VESSEL SLOWDOWN TRIAL

**WHY THE TRIAL?**

Underwater noise from vessels is a significant threat to the recovery of the species in the Strait of Georgia.

**ABOUT THE TRIAL**

Between August 7 and October 6, 2017, all vessels are asked to slow down to 11 knots through the water.

**TRIAL EVALUATION**

Monitoring, Measuring, Reporting.

## Mariner's Guide TO WHALES, DOLPHINS, AND PORPOISES OF WESTERN CANADA

### WHALES IN OUR WATERS

Welcome!

As a mariner in our Pacific Northwest coast waters, you already know how unique and extraordinary the marine ecosystems are that you make it. But did you know what an important role you play in helping to protect at-risk whales in these waters?

This tutorial will help you learn what steps to take from the moment you spot one of these majestic creatures.

You will learn about the need for protecting these whales, receive tips for identifying their unique characteristics and behaviours and explore navigational tactics to consider while in their presence.

You will also explore ways to record your sightings and report marine animals in distress.

Much of the content of this tutorial was guided from the [Mariner's Guide to Whales, Dolphins, and Porpoises of Western Canada](#). A downloadable PDF version of the Guide can be accessed with the link above.

ocean wise.

COASTAL OCEAN RESEARCH INSTITUTE

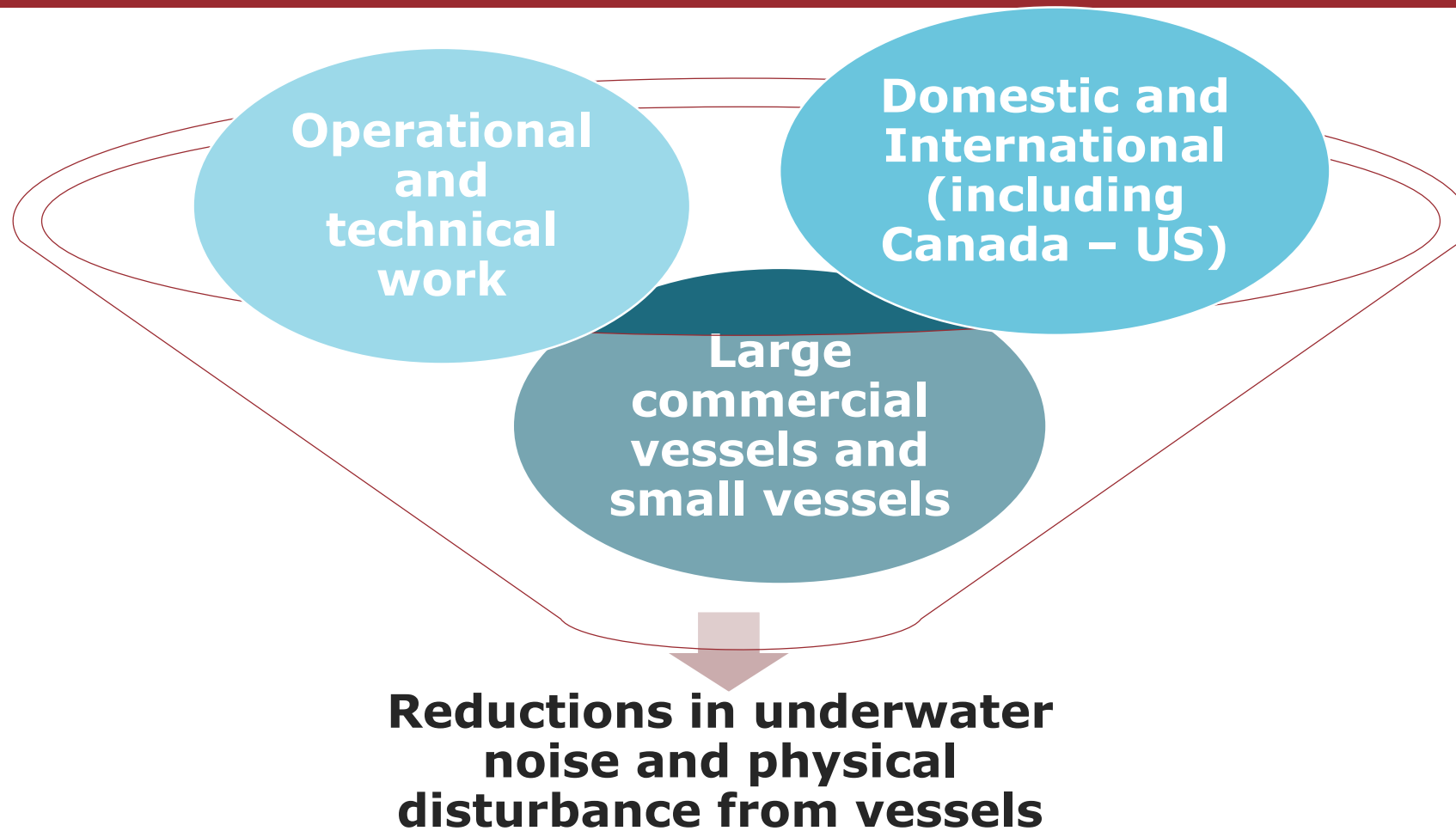
WhaleReport Alert System

# Measures: Vancouver Fraser Port Authority incentives for quieter ships

## Underwater noise reduction criteria added to existing EcoAction Program in 2017



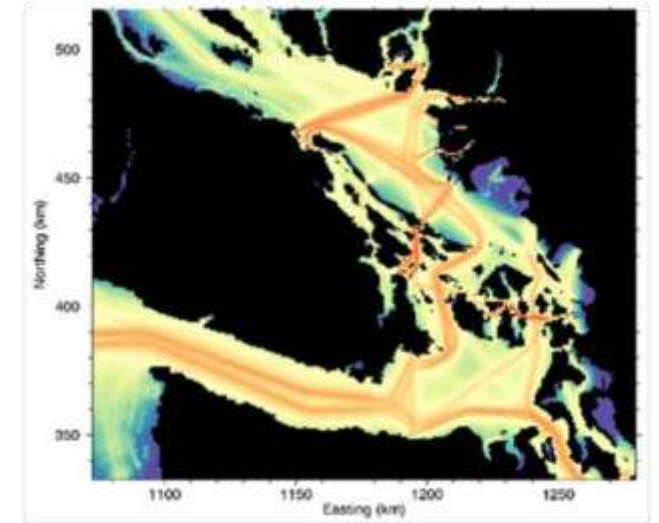
# Government of Canada initiatives





# Advancing work on quiet ship design and technologies

- Underwater noise management plans (UNMPs) with Canadian fleet owners and operators
- Ongoing research and development
- Study on quiet ship design and retrofit technologies
- Technical workshops on quiet vessel designs and retrofits (Halifax, Canada in November 2018 and London, UK in January 2019)
- Launched the Quiet Vessel Initiative (QVI)



# International collaboration

- Advancing discussion at International Maritime Organization
- Supported international survey to identify barriers that exist to implementation of underwater noise guidelines
- Continuing to advance other international efforts (e.g. PAME, UNICP, PIAQUO)
- On-going collaboration with US-Canada and State governments to align actions where possible



# Conclusions

- Collaborative approach for a common solution
  - Increasing mariner awareness and involvement
  - Industry and government working together to balance economic factors and optimize voluntary participation to benefit whales
- Use of research and technology to support science-based decision making
- Global support for advancing quiet ship design
- Species around the world can benefit from underwater noise reduction research and efforts





Thank you for listening!



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Photo: Joan Lopez