



PORT of
vancouver

Enhancing Cetacean Habitat and Observation (ECHO) Program

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American Association of Port Authorities (AAPA)
Energy & Environment Seminar

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BACKGROUND CONTEXT: BC MARINE MAMMALS

BC cetacean ID and species at-risk status



Harbour Porpoise
(Special Concern)



Humpback
(Threatened)



Fin
(Threatened)



Sei
(Endangered)



Blue
(Endangered)



North Pacific Right whale
(Endangered)



Biggs (transient) killer whale
(Threatened)



Resident killer whale
(Endangered)

BACKGROUND CONTEXT: ENDANGERED WHALES IN OUR WATERS

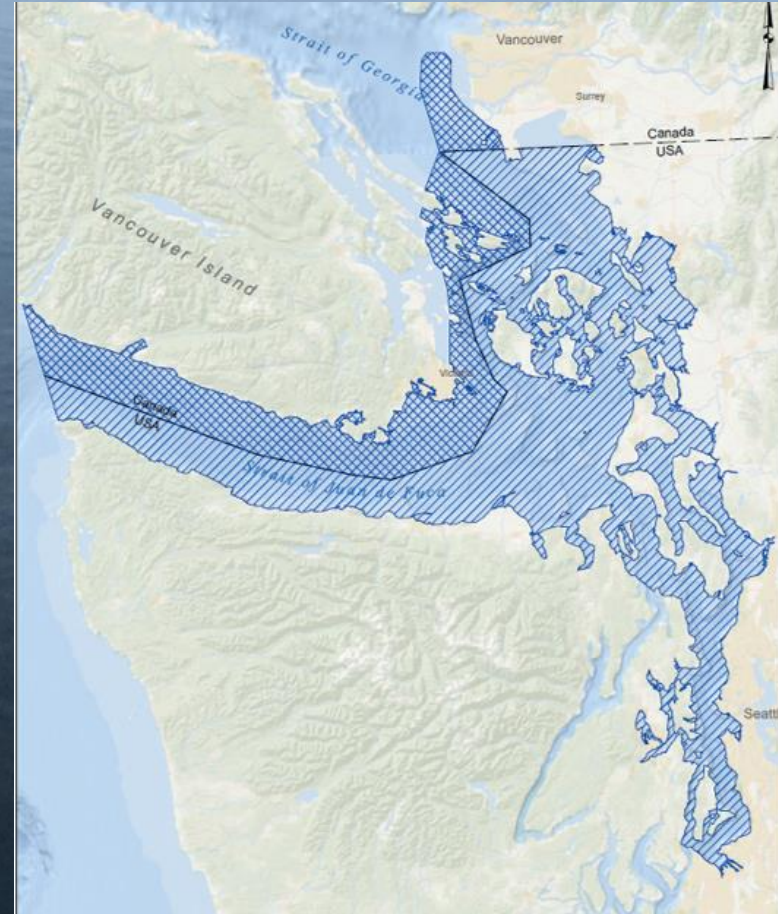


Source: Orcalab

Photo: Joan Lopez

REGULATORY CONTEXT FOR THE ECHO PROGRAM

- DFO Species at Risk Act (SARA)
- NOAA Endangered Species Act (ESA)
- Designated Canadian and US Critical Habitat
- Legal protection to species and habitat
- *Canada Marine Act* mandate



REGULATORY CONTEXT FOR THE ECHO PROGRAM

- DFO Southern Resident Killer Whale Recovery Strategy & Action Plan
 - 94 Measures
- NOAA Southern Resident Killer Whale 5-year action plan:
 - “Protect killer whales from harmful vessel impact through enforcement, education and evaluation”
- IMO Guidelines on reduction of underwater noise from commercial shipping to address adverse impacts to marine life

Southern resident killer whale critical habitat in US and Canadian waters overlap international shipping lanes



ECHO PROGRAM

ECHO: Enhancing Cetacean Habitat and Observation

What? A **collaboration** with marine transportation industries, conservation and environmental groups, First Nations, governments and scientists

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

**Cetacean: order of whales, dolphins and porpoises*

Photo: Joan Lopez

ECHO PROGRAM STRUCTURE

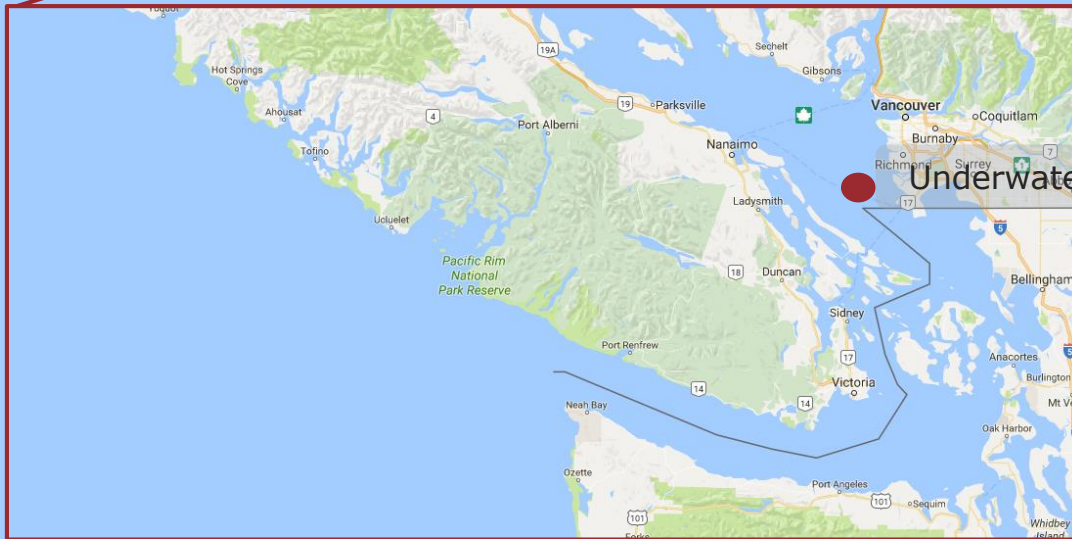


*Program funded by VFPA, and industry
and government partners*

ECHO PROGRAM SCOPE

- Regional issue
- Beyond port jurisdiction
- Cross-boundary engagement

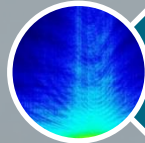
ECHO Program study area



Underwater listening station

ECHO PROJECT CATEGORIES

Advancing research projects and initiatives focusing on the key threats to whales in this region with a view to informing mitigation solutions



Acoustic Disturbance



Physical Disturbance



Environmental Contaminants

PROJECT HIGHLIGHT

UNDERWATER LISTENING STATION

- First of its kind in North America (non-Military)
- Four hydrophone array
- Connected to ONC's cabled Venus Observatory
- Inbound shipping lane
- Measuring ambient noise, marine mammal detections, and vessel source levels

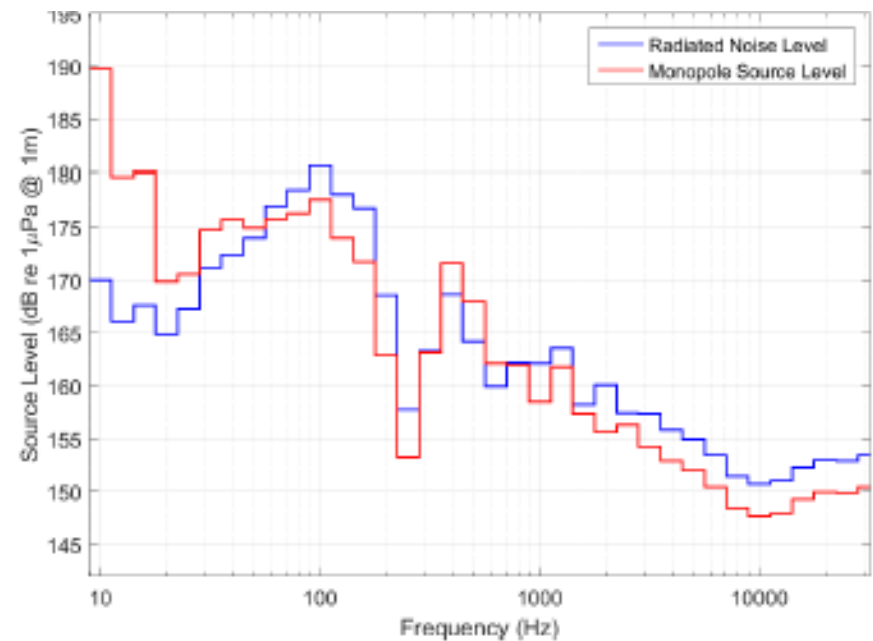
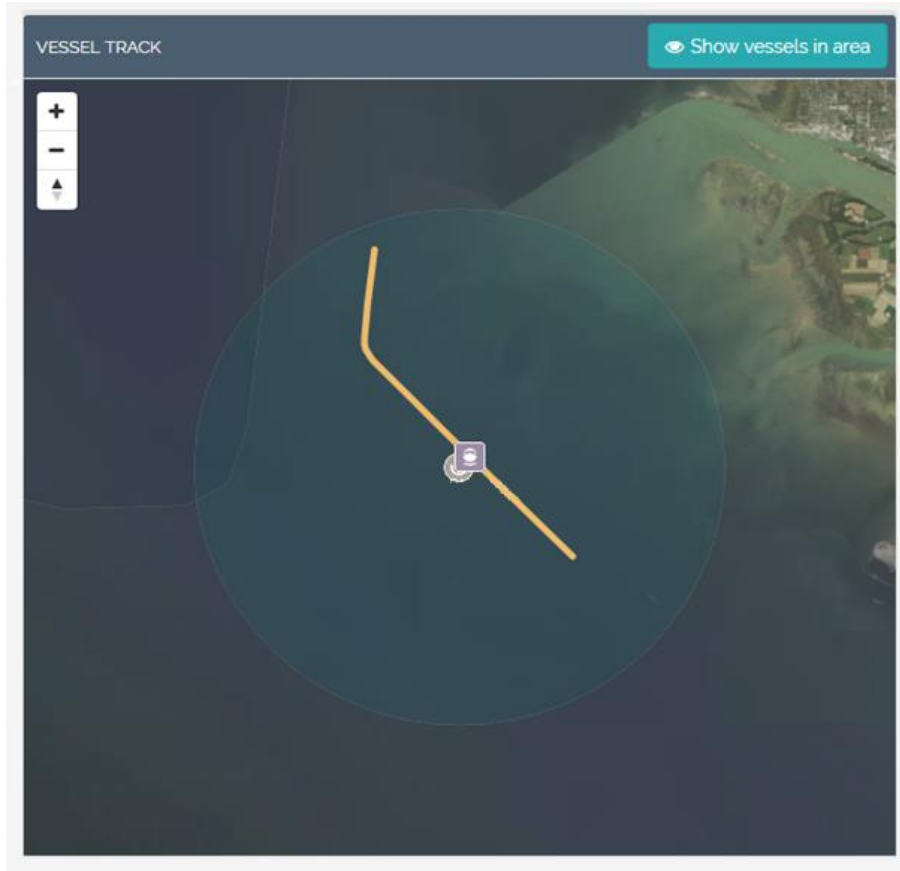


Photo: Ocean Networks Canada

PROJECT HIGHLIGHT

UNDERWATER LISTENING STATION

Vessel source level - underwater radiated noise



UTILITY OF THE DATA

- Informs potential incentive programs
- Trialing mitigation measures
- Aggregated data set correlating: vessel type, speed, design, age, propeller configuration
- Informs modelling
- Helps vessel owner/operators understand noise contribution and identify mechanical issues
- Ambient noise over time and location
- Presence of marine mammals



VFPA Actions

INFOGRAPHIC FOR MARINERS

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

SOURCES OF NOISE

While there are plenty of naturally occurring sounds in the ocean, an increase in commercial vessel traffic is the main reason for increased underwater noise.¹

In the North Pacific Ocean, underwater noise has been **DOUBLING** in intensity **EVERY DECADE** for the past

60 YEARS.²



Sound travels

4.5 TIMES

FASTER in water than in air.

WHERE VESSEL NOISE COMES FROM

ENGINE AND ONBOARD MACHINERY

DRAW FROM POOR HULL MAINTENANCE

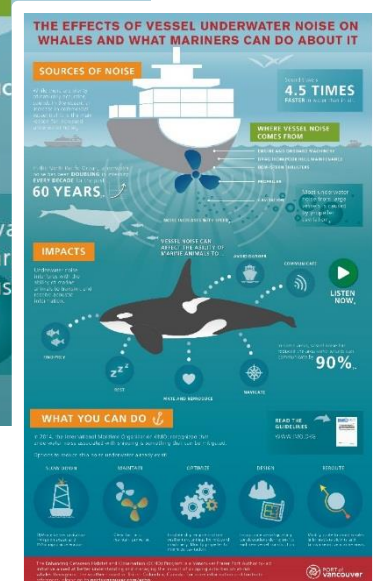
BOW/STERN THRUSTERS

PROPELLER

CAVITATION

NOISE INCREASES WITH SPEED⁴

Most underwater noise from large vessels is caused by propeller cavitation.³



MARINER'S GUIDE

- Species identification and abundance maps
- Marine mammal reporting
- Collaboration with PRPA, and Vancouver Aquarium
- Due for release Oct 2016

Mariner's Guide

TO WHALES, DOLPHINS,
AND PORPOISES OF
WESTERN CANADA



PROPOSED UNDERWATER NOISE CRITERIA FOR VFPA ECOACTION 2017

Quiet vessel notations



Bureau Veritas –
Underwater radiated noise (URN)



DNV-GL - SILENT E

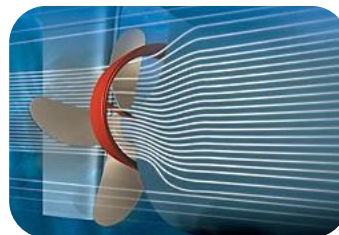


RINA - DOLPHIN

Vessel technologies (modifications to reduce cavitation and improve wake flow)



Schneekluth duct



Becker Mewis duct



Propeller boss
cap fins

ECHO PROGRAM NEXT STEPS

2014-2017:

Plan and execute research projects to inform threat reduction

2016-2018:

Develop and trial potential incentive and threat reduction measures and set targets

2017-onwards:

Implement, monitor and report on voluntary measures



GLOBAL APPLICATIONS

- Collaborative approach, bringing stakeholders together for a common solution
- Research and technology to support science-based decision making
- Increasing mariner awareness and providing opportunities for involvement

RAISE YOUR HAND. Q&A.



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