Reducing underwater noise from shipping
The Canadian approach

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Port of Vancouver
Enabling trade with more than 170 world economies
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
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

<table>
<thead>
<tr>
<th>Speed</th>
<th>Duration</th>
<th>Participation</th>
<th>Acoustics</th>
<th>SRKW</th>
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<tbody>
<tr>
<td>11 knots through the water for all vessel types</td>
<td>Set: 61 days Aug 7-Oct 6</td>
<td>61% reported participation (578 of 951 vessels)</td>
<td>5-11 dB RNL reduction at vessel</td>
<td>22% reduced impact to foraging time (modelled)</td>
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<tr>
<td>Variable speeds 12.5 and 15 knots through the water</td>
<td>Dynamic: 111 days Jul 12–Oct 31</td>
<td>87% reported participation (1467 of 1678 vessels)</td>
<td>1.5 dB reduction at Lime Kiln (filtered)</td>
<td>15% reduced impact to foraging time (modelled)</td>
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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
Underwater noise reduction criteria added to existing EcoAction Program in 2017

**GOLD**
Quiet ship notation from ship classification society

47% discount

**SILVER**
Noise reduction performance indicator from Green Marine

35% discount

**BRONZE**
Technologies that help reduce cavitation

23% discount
Government of Canada initiatives

- **Operational and technical work**
- **Domestic and International (including Canada – US)**
- **Large commercial vessels and small vessels**

**Reductions in underwater noise and physical disturbance from vessels**
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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