You are making a difference for the whales

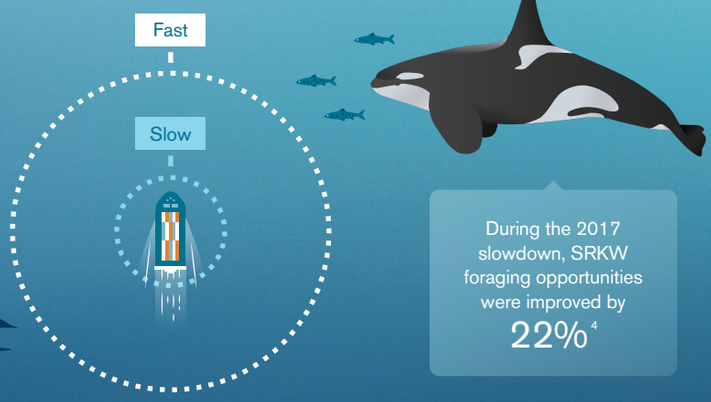
Thank you for your ongoing participation in the ECHO Program voluntary slowdown. You are reducing underwater noise, one of the key threats to the recovery of the southern resident killer whale (SRKW) population.

Here's how:

1 Research shows that underwater noise intensity from large vessels can be **reduced by half** during the slowdown periods[1]

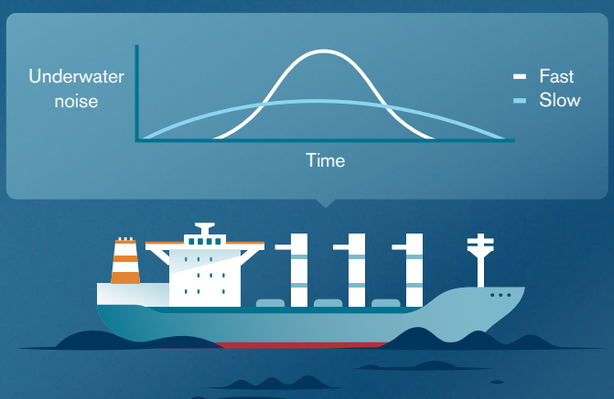
2 Foraging is easier when vessels transit slowly[2]

Reducing vessel speed makes it easier for SRKWs to use echolocation to find their food. For example, a SRKW's echolocation space is reduced by half within 3.5 km of a fast-moving (17 knots) car carrier, but reduced by half within 0.6 km when it slows to 11 knots.[3]

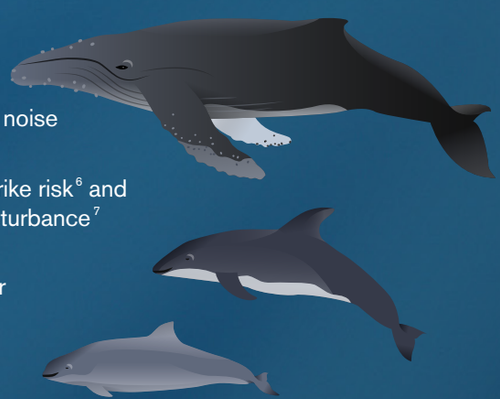


During the 2017 slowdown, SRKW foraging opportunities were improved by 22%[4]

3 Even though slower vessels spend **more time** in SRKW feeding areas, slowing down means **less noise** overall[5]



4 Slowing down reduces several threats to marine mammals



- Decreased underwater noise
- Lowered strike risk[6] and physical disturbance[7]
- Reduced air pollution[8]

5 You are not alone, others are also doing their part

Ferries are slowing down too

Small vessels are staying 400 m from SRKWs and avoiding sanctuary zones

Fishers are avoiding designated areas to leave more salmon for whales

Government is investing in the research and design of quieter vessels

Environmental organizations and scientists are raising awareness and conducting important research

Thank you for your continued participation in the ECHO Program voluntary vessel slowdown initiatives.
We, and the whales, thank you.

The Enhancing Cetacean Habitat and Observation (ECHO) Program, led by the Vancouver Fraser Port Authority, aims to better understand and reduce the cumulative effect of shipping on at-risk whales throughout the southern coast of British Columbia.

The goal of the voluntary vessel slowdown initiative is to reduce underwater noise from large commercial vessels in key southern resident killer whale foraging areas, which can be achieved only with the ongoing commitment and participation of vessel operators.

For more information and footnote references, visit **portvancouver.com/echo**

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ECHO Infographic: You're making a difference for the whales

Footnotes

1. Research shows that underwater noise intensity from large vessels can be reduced by half during the slowdown periods.
   - JASCO Applied Sciences and SMRU Consulting. 2020. ECHO Program 2019 Voluntary Vessel Slowdown Hydroacoustic Studies: Final Report. Document 01994. Technical report by JASCO Applied Sciences and SMRU Consulting for Vancouver Fraser Port Authority.

2. Foraging is easier when vessels transit slowly
   - Williams R., Ashe E., Siple M., Wood J., Yruretagoyena L. 2019. Behavioural response study of Southern Resident Killer Whales to the 2018 voluntary ship slowdown in the Haro Strait. Prepared by Oceans Research and Conservation Association (ORCA) for Vancouver Fraser Port Authority.

3. SRKW use echolocation to find their food. A SRKW's echolocation space is reduced by half within 4 km of a fast-moving (20 knots) container ship, and is reduced by half within 0.5 km of a container ship that slows to 11 knots.
   - Heise K., et al. 2017. "Proposed Metrics for the Management of Underwater Noise for Southern Resident Killer Whales." In Coastal Ocean Report Series, 31. Vancouver, Canada: Report for the Coastal Ocean Research Institute. http://wildwhales.org/wp-content/uploads/2017/09/Read-the-Report.pdf
   - NOTE: Statement based on a car carrier ship in Haro Strait. At the "50% SRKW echolocation space reduction" threshold, masking by vessel noise will reduce the echolocation space available to an SRKW by 50%. Echolocation space is the volume of ocean within which an SRKW can use returning echolocation clicks to find prey. Echolocation space reduction is calculated inside the frequency range of echolocation for SRKW (15,000–100,000 Hz).

4. During the 2017 slowdown, SRKW foraging opportunities were improved by 22%
   - Joy R., Tollit D., Wood J., MacGillivray A., Li Z., Trounce K. and Robinson O. 2019. Potential benefits of vessel slowdowns on endangered southern resident killer whales. Frontiers in Marine Science 93. https://doi.org/10.3389/fmars.2019.00344.

5. Participating in the ECHO Program slowdowns reduces noise overall, even though the transits take longer
   - JASCO Applied Sciences and SMRU Consulting. 2020. ECHO Program 2019 Voluntary Vessel Slowdown Hydroacoustic Studies: Final Report. Document 01994. Technical report by JASCO Applied Sciences and SMRU Consulting for Vancouver Fraser Port Authority
   - Leaper R. 2019. The Role of Slower Vessel Speeds in Reducing Greenhouse Gas Emissions, Underwater Noise and Collision Risk to Whales. Front. Mar. Sci. 6:505. doi: 10.3389/fmars.2019.00505

6. Slowing down reduces several threats to many marine mammals including lowered strike risk
   - Leaper R. 2019. The Role of Slower Vessel Speeds in Reducing Greenhouse Gas Emissions, Underwater Noise and Collision Risk to Whales. Front. Mar. Sci. 6:505. doi: 10.3389/fmars.2019.00505

7. Slowing down reduces several threats to many marine mammals including lowered physical disturbance
   - Erbe C, Marley SA, Schoeman RP, Smith JN, Trigg LE and Embling CB. 2019. The Effects of Ship Noise on Marine Mammals—A Review. Front. Mar. Sci. 6:606. doi: 10.3389/fmars.2019.00606

8. Slowing down reduces several threats to many marine mammals, including reduced air pollution
   - Leaper R. 2019. The Role of Slower Vessel Speeds in Reducing Greenhouse Gas Emissions, Underwater Noise and Collision Risk to Whales. Front. Mar. Sci. 6:505. doi: 10.3389/fmars.2019.0050