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UNDERWATER NOISE

What is underwater noise?

Underwater noise can include natural sounds like wind, waves, rain and ice, as well as human-made sounds from vessels, oil rigs, seismic airguns, pile driving and sonars, among others. With a rapid increase in marine traffic, shipping is known to be the main contributor to the doubling of low-frequency, underwater noise since 1960 and is now widely recognized as a global issue. Low-frequency sounds can travel great distances in deep water without losing much energy and are mainly produced by propellers and onboard machinery. Ships also generate high-frequency noise which can overlap with the frequencies used by killer whales for echolocation and communication.

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What are the impacts of underwater noise?

Noise from ships can disturb marine wildlife — from fish to invertebrates to marine mammals — in many ways. In general, marine animals use sound for communication, locating mates, socializing, finding prey, and avoiding predators and other dangers. Chronic underwater noise can affect an animal's behavior, physiology, anatomy and development. It can affect its ability to communicate, find prey and feed successfully, force it to avoid preferred habitats, increase stress hormones and, ultimately, can lead to fewer offspring and higher death rates. There are still substantial scientific knowledge gaps concerning the impacts of shipping noise on marine life.

What are Canada's underwater noise regulations?

Canada does not have specific national regulatory requirements for underwater noise. However, underwater noise is a high-risk threat to species protected by Canada's *Species at Risk Act* (SARA) and is included in several marine mammal recovery strategies — for example, the St-Lawrence Estuary beluga, southern resident killer whales, North Atlantic right whale and blue whale.

To date, minimal mitigation has been undertaken by the commercial shipping industry, notwithstanding five years ago, when the International Maritime Organization (IMO) — to which Canada is a signatory member — adopted voluntary ship-quieting guidelines. These have had limited success in terms of driving change.

What needs to be done?

- **Create long-term monitoring programs** to evaluate the impacts from shipping noise on noise-sensitive marine life.
- **Develop policy and regulations** to improve underwater noise management. The lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
- **Encourage industry to implement best practices** to reduce and mitigate vessel noise through technological innovation or quieter operation (e.g., slow steaming).
- **Manage shipping noise** as part of marine protected areas.

Why address this now?

Shipping activity is expected to increase on all of Canada's coasts driven by economic development and as the shipping season becomes longer in the Arctic due to climate change. Consequently, underwater noise will become a more pervasive issue in Canadian waters that will require a strong regulatory regime to effectively mitigate the negative impacts of shipping noise on Canada's marine wildlife.