

Ban the Boom!

Seismic surveys threaten Canadian marine life



Screenshot from: <https://www.youtube.com/watch?v=kFa3x13d5Co>

Seismic surveys are a common method used in Canadian waters to locate hydrocarbons for oil drilling exploration. Noise from a single seismic survey travel thousands of square kilometers through the ocean and can affect marine mammals both near and far. Noise pollution can harm marine species and threaten habitats of endangered whales and interfere with commercial fisheries. The destructiveness of this oil exploration technique may be mitigated but its harmfulness can't be removed until the method is removed. To protect important marine species along Canadian coastlines, seismic surveying should be banned and replaced by less harmful techniques.

Introduction

The use of seismic surveys for oil exploration has been a topic of controversy for sometime. These surveys use sound waves to determine the geological features under the ocean, specifically looking for hydrocarbons for oil deposits¹. The sound waves are focused pulses that are concentrated towards the ocean bottom, reflect off the surface, and return to a sound receiver to create a map¹. However, sound travels much faster in water than in air so the sound from the blast may last for weeks to months and be carried thousands of miles away². Seismic surveys increase noise pollution by 20dB, that's twice the normal level³, which can severely impact marine life.

Not only do seismic blasts pose a threat to marine species, they are also not very efficient in an engineering perspective. This survey technique produces a great amount of 'sound waste', meaning that more noise is created than what is needed to find hydrocarbons⁴. The only truly effective way to protect our oceans from the harmful effects of seismic surveys is to discontinue their use. To protect important marine species along Canadian coastlines, seismic surveying should be banned and replaced by less harmful techniques.

Why Noise Hurts

Noise pollution can cause permanent damage to hearing⁵ and disrupts communication, navigation, predator avoidance, mate finding and foraging habits of marine mammals². Even some threatened and endangered species along Canada's coastlines that are vulnerable to seismic survey blasts including blue whales and Atlantic cod.

Additionally, sonic waves can physically damage or destroy fish's air bladders, eggs and larvae, and influences many species to disperse to other areas³. These effects also impact commercially viable fish and can harm the fishing industry by decreasing catch rates over 1000 km from the survey sites².

The most harmful characteristics of this type of noise pollution are that it is long lasting (weeks to months) and generates peak levels that are often higher than what is required for exploration². The statement of mitigation of seismic sound by Fisheries and Oceans Canada admits that:

"If seismic surveys were to occur in areas and times when a large enough aggregation of these marine organisms were engaged in critical biological functions the behavioral impacts might have important ecological and population-level impacts"¹.

Seismic airgun testing is used to locate oil and gas deposits deep below the ocean floor.

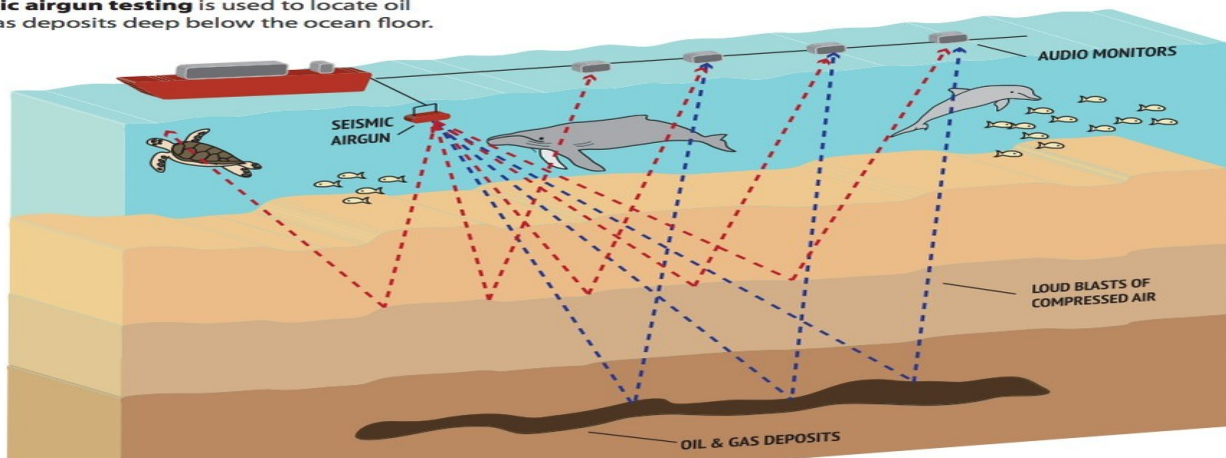


Image from:
<https://sites.duke.edu/soundscapes/files/2015/11/seismic-survey.jpg>

“Imagine dynamite going off in your living room or in your backyard **every ten seconds** for days to weeks at a time.”

– Matthew Huelsenbeck, Oceana

What has Canada done?

So far the Canadian government has outlined mitigation requirements for planning and conducting seismic surveys, creating and monitoring safety zones, and having marine mammal detection measures to inform start-up and shut-downs¹. Although these measures are useful in lessening the impacts they are not enough to protect important marine species from the impacts of seismic blasts. The only effective way to protect marine species from this type of noise pollution is to ban the use of airguns and invest and promote less harmful alternatives to oil exploration technologies.

Steps Forward

Due to the negative effects mentioned above quieter, and less harmful alternatives are needed to replace the seismic surveys for oil exploration. Such technologies include:

- marine vibroseis: uses the same energy spread over a longer duration and therefore eliminating high peak pressure times⁵.
- Low frequency acoustic projector⁴.
- Solid state piezo-ceramic Helmholtz resonator⁴.

Controlled, non-impulsive, and oscillating sound sources provide the opportunity to reduce peak amplitudes and decrease waste sound. Additionally these alternative sources should be placed closer to the ocean floor to reduce sound level required, and the amount needed⁴. *For more available and upcoming alternate technologies please refer to the References section below**.

In order to move away from harmful seismic surveys, the Canadian government along with oil and gas exploration companies should fund and support the use and development of alternate exploration technologies such as the above. Working with scientists and experts to understand the environmental impacts of new and alternate technologies is also necessary to ensure the protection of Canada’s marine life.

References & Further Readings

1. "Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment." *Fisheries and Oceans Canada* (2016). Government of Canada. <http://www.dfo-mpo.gc.ca/oceans/publications/seismic-sismique/index-eng.html>
2. "Boom, Baby, Boom: The Environmental Impacts of Seismic Surveys." *Ocean Facts* (2010): Natural Resource Defence Council (NRDC). <https://www.nrdc.org/sites/default/files/seismic.pdf>.
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