DEEP SEA SCIENCE.

OCEAN NETWORKS CANADA SCIENCE

AMBIENT ACOUSTICS IN THE BARKLEY CANYON REGION

Kristen Kanes

5 Oct 2015

AN INITIATIVE OF University of Victoria

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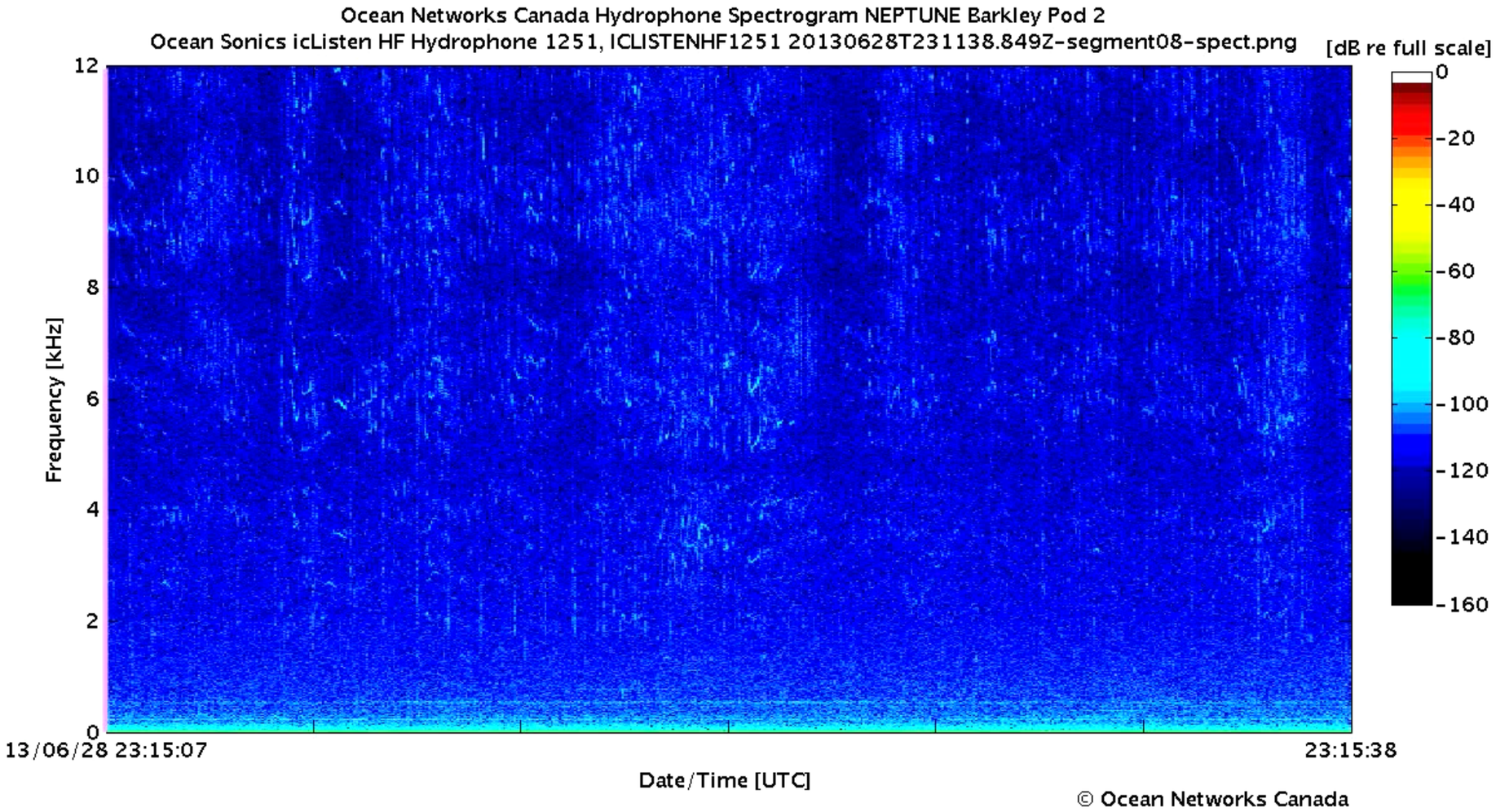
A TYPICAL DAY



Colour values indicate Intensity in decibels, with reference to the full scale of the wav file.
Higher values on the colour scale represent louder sounds.

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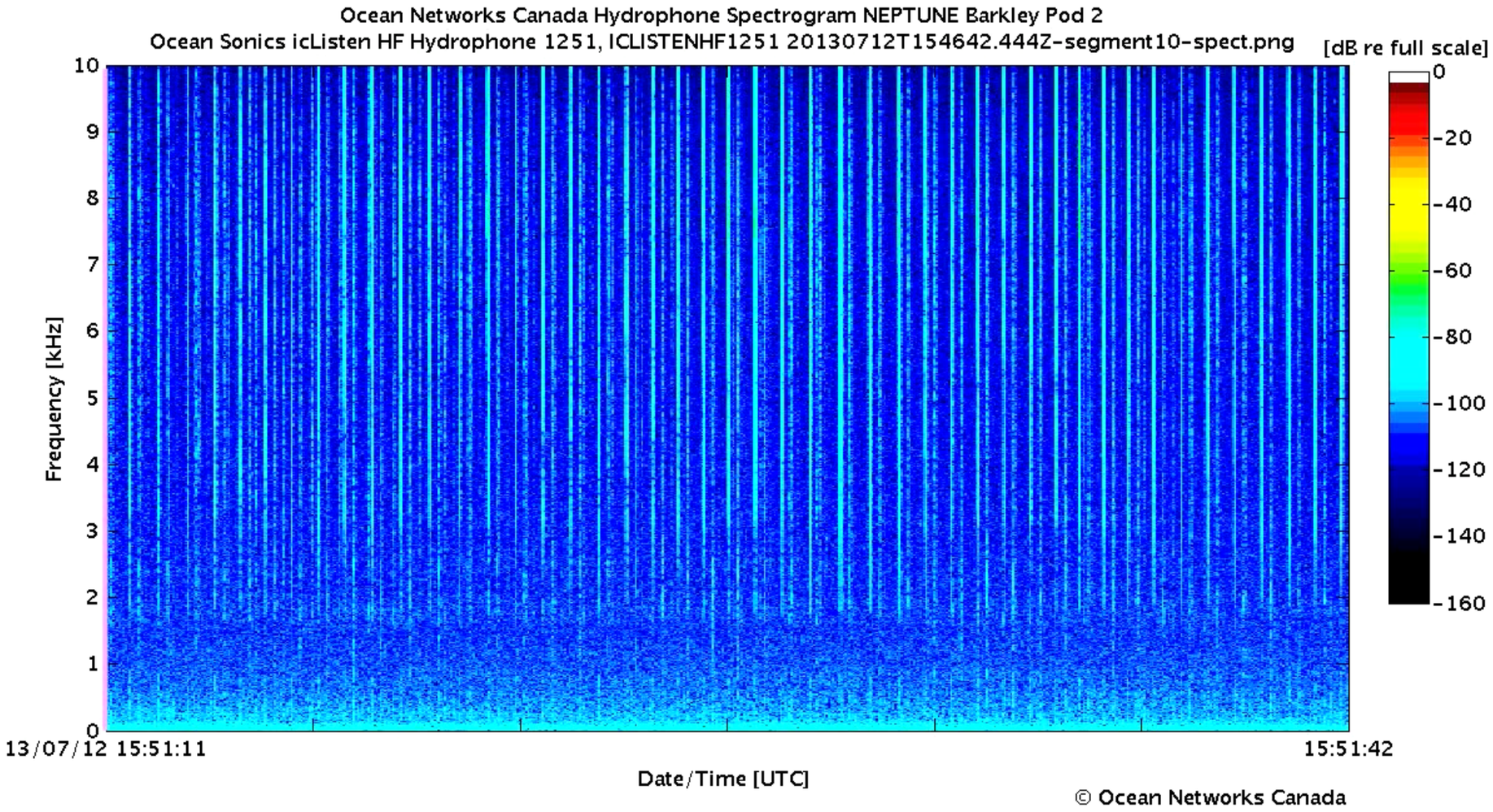

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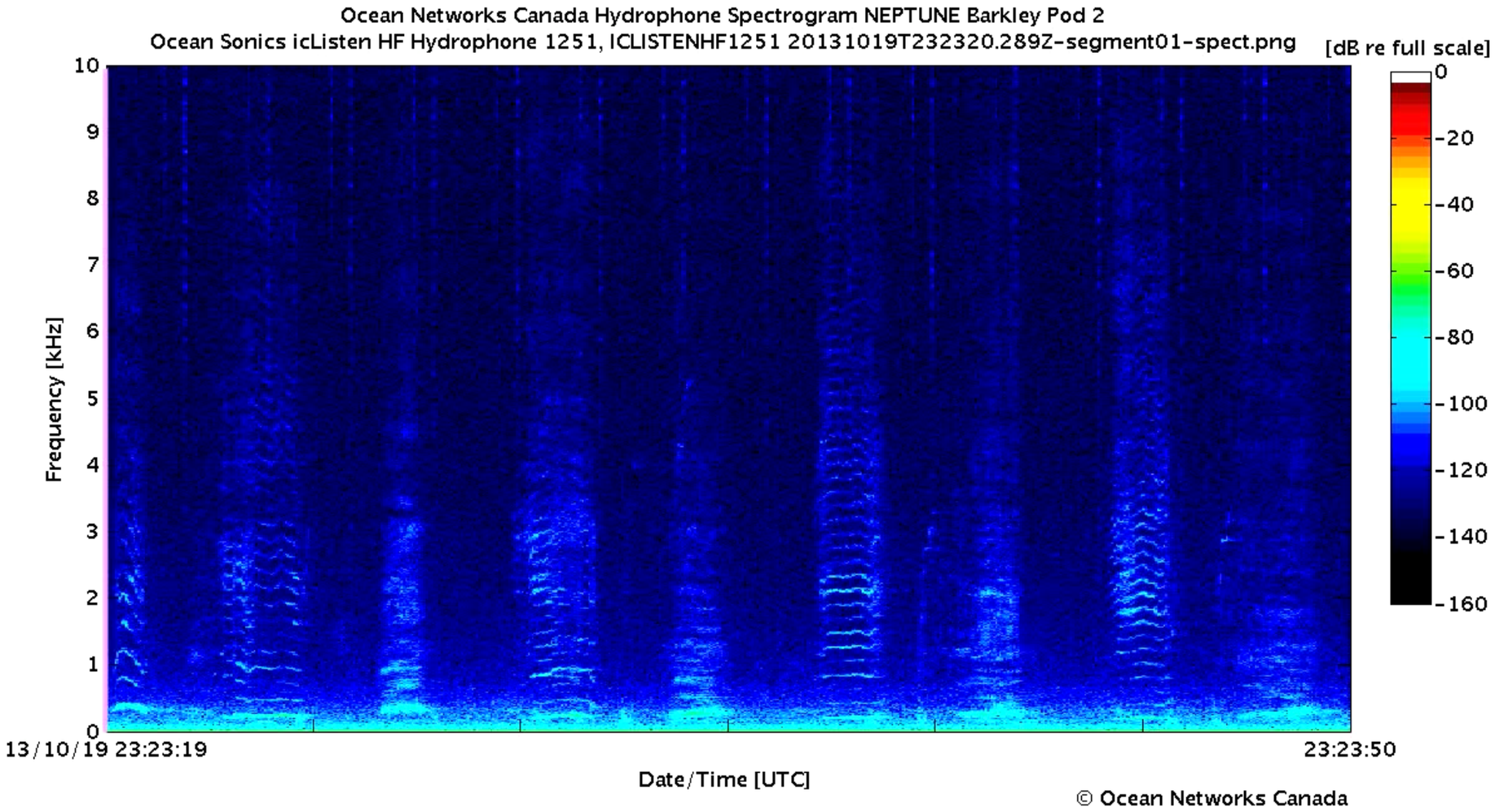

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SOUND AT OCEAN NETWORKS CANADA

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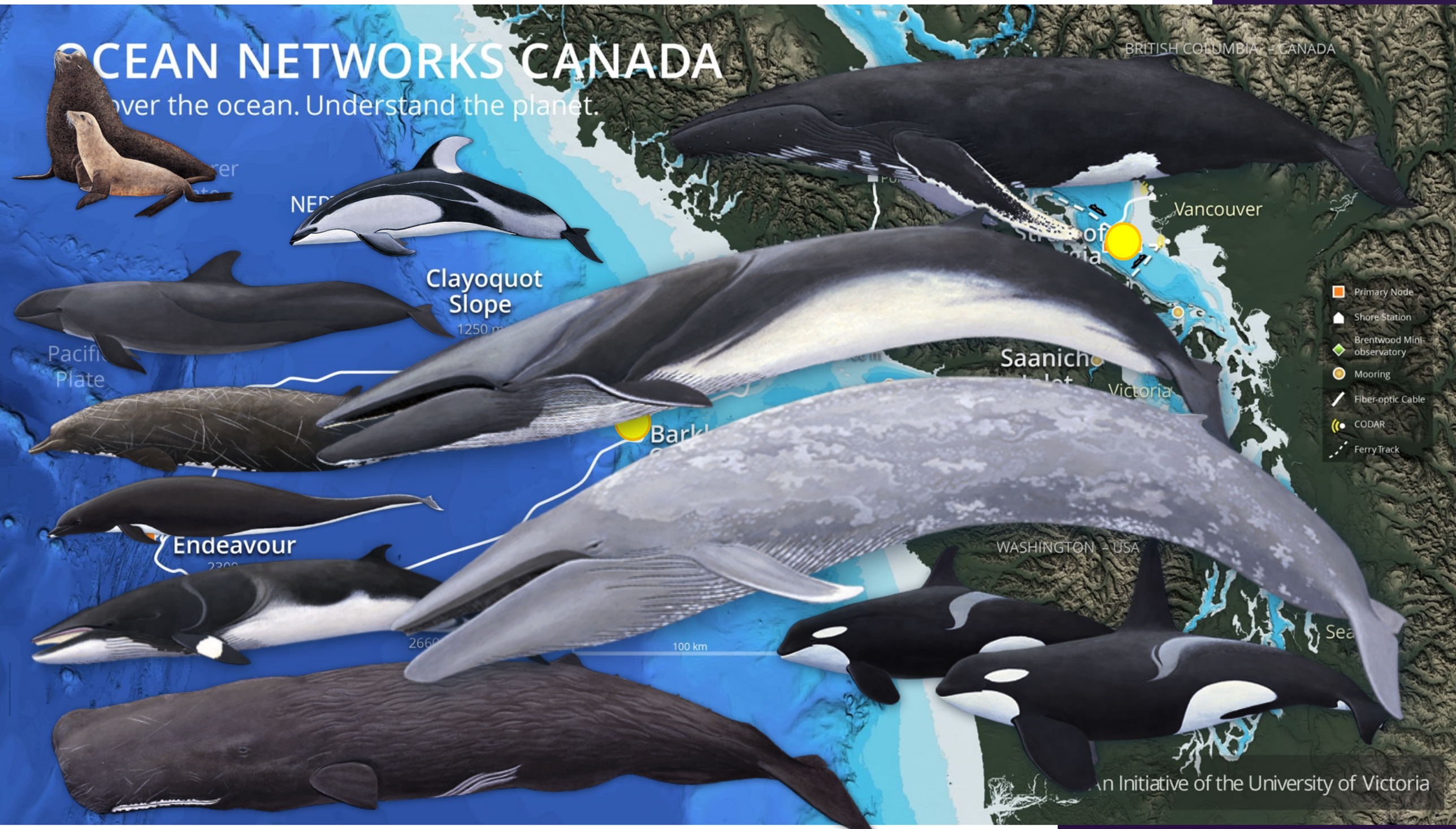

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SOUND AT BARKLEY CANYON

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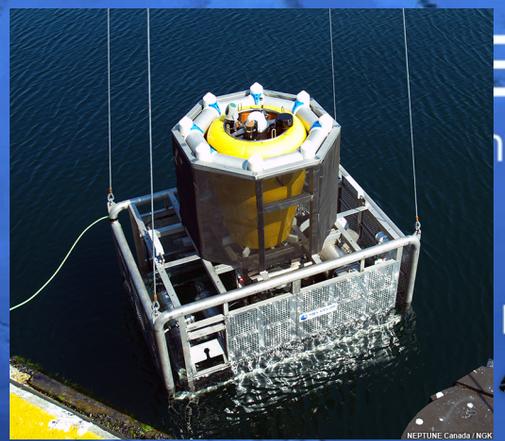

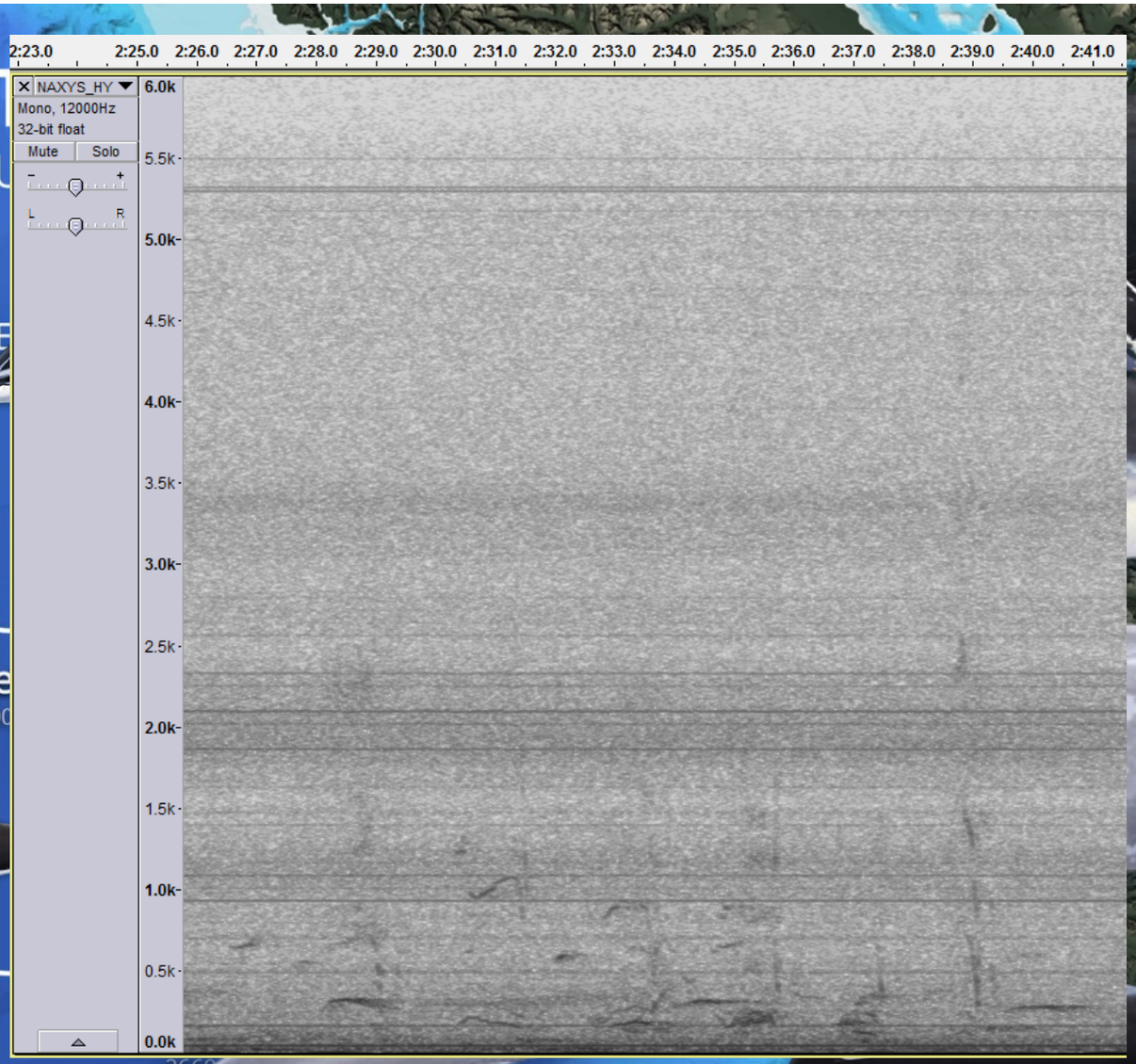

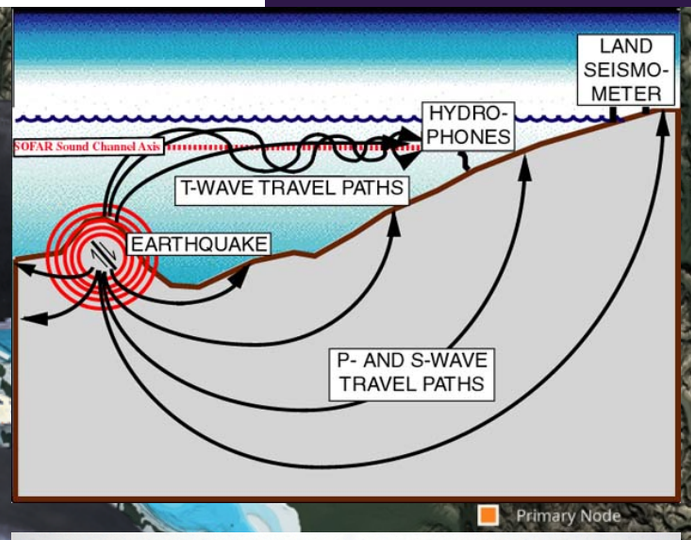

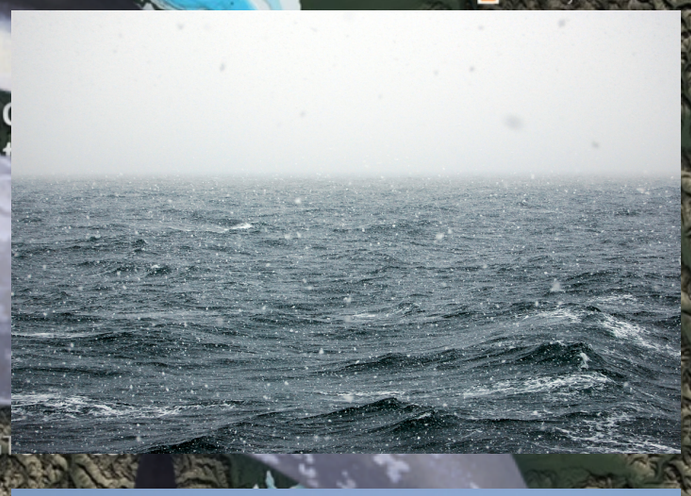

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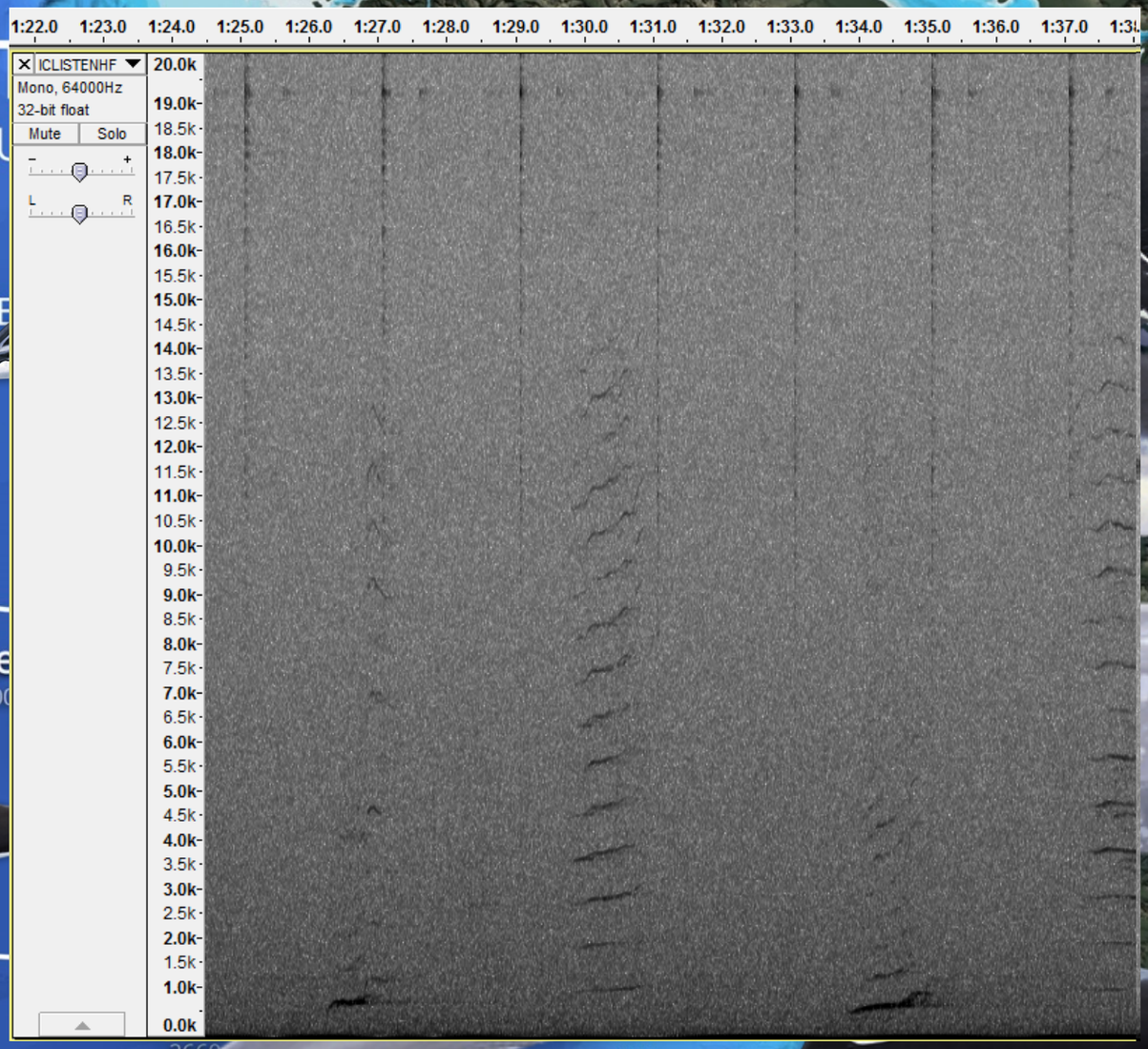
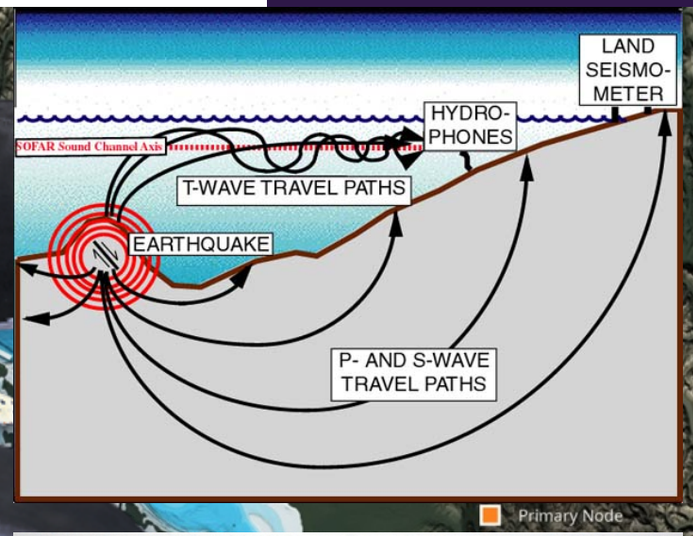
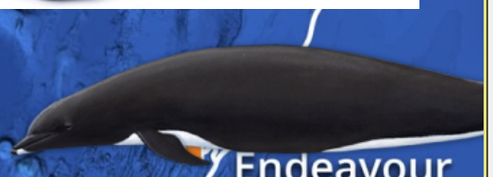
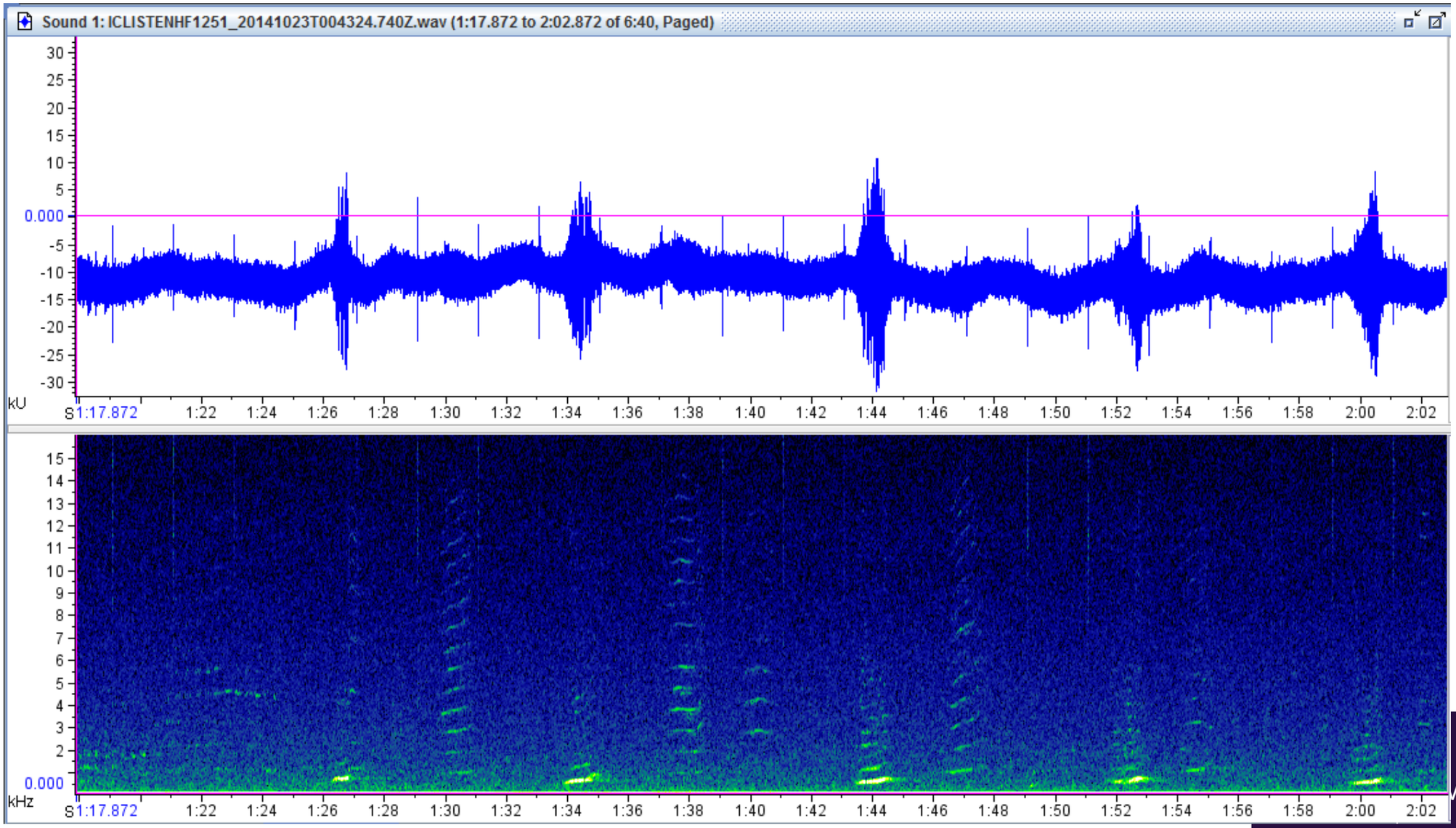






DATA MINING CHALLENGES

- Acoustic data are inherently difficult to search



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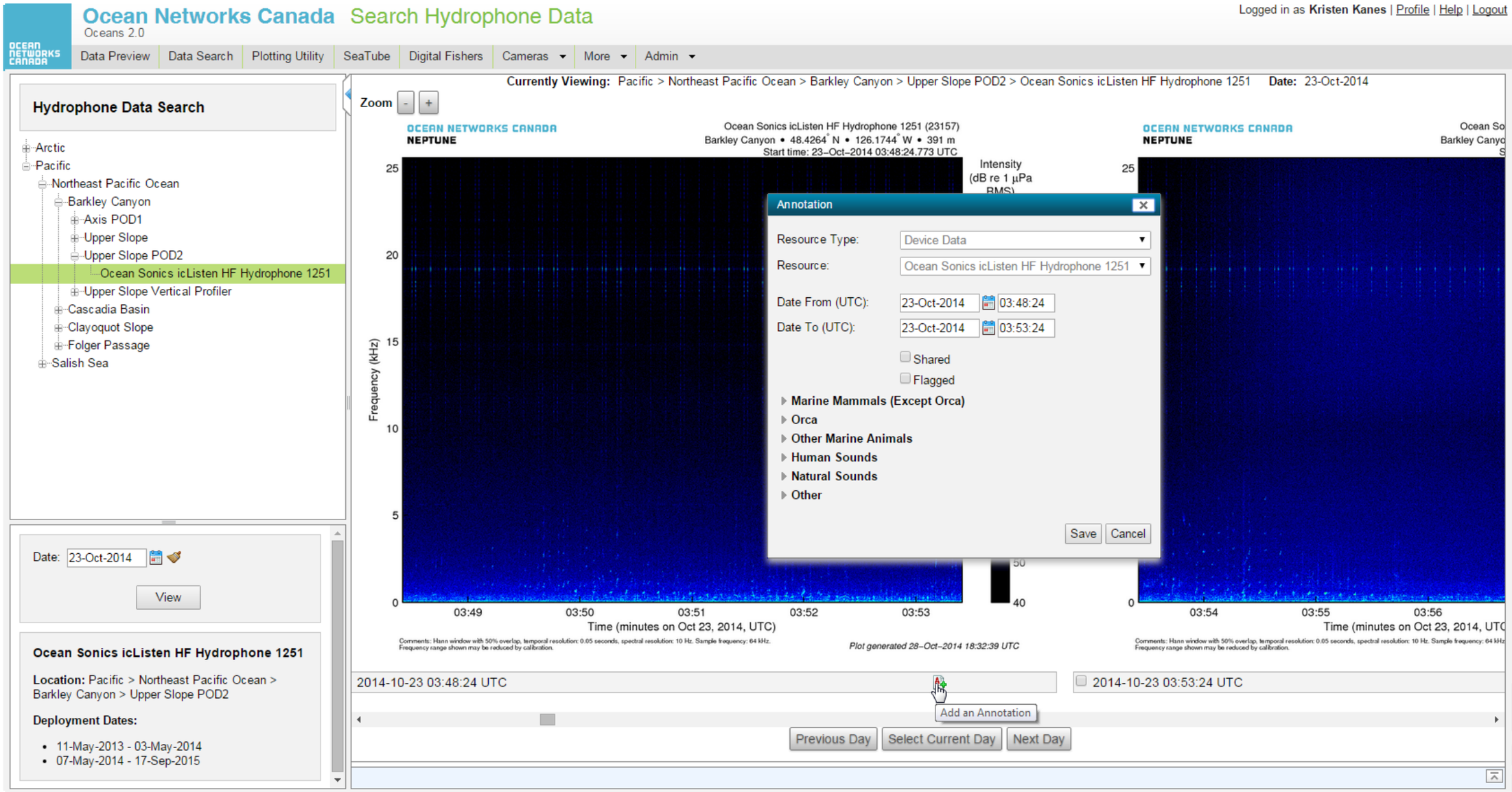

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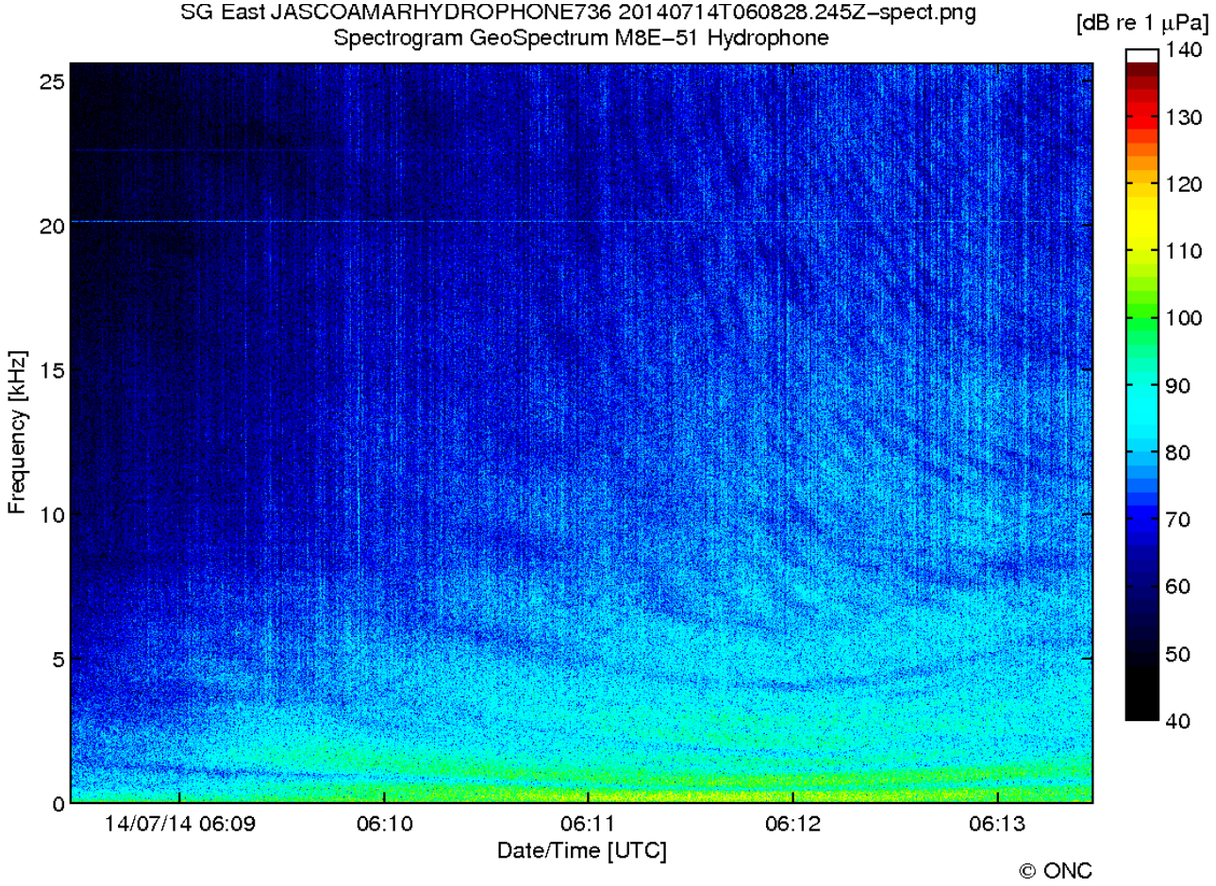
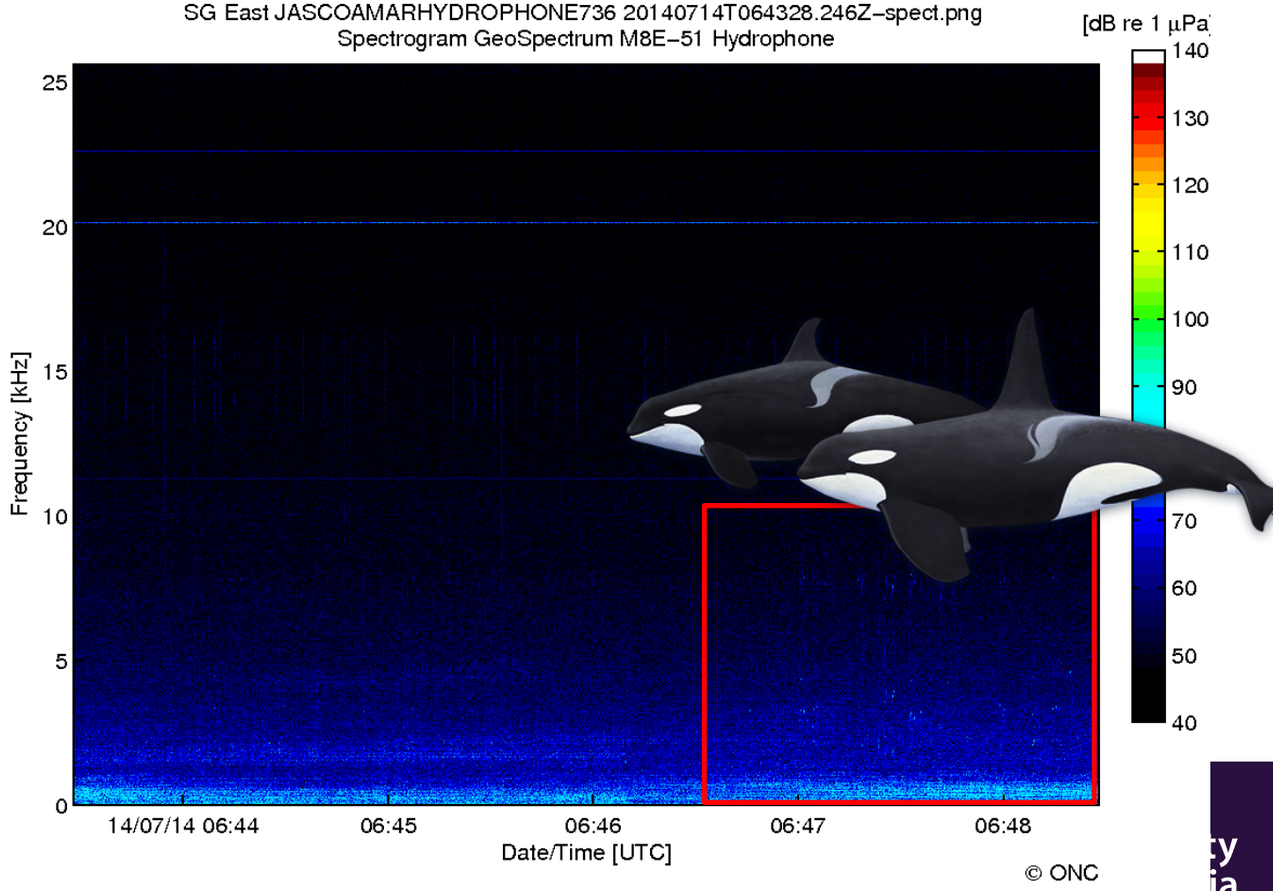
- Most spectrogram settings cannot visualize all signals





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- Most spectrogram settings cannot visualize all signals
- Quantity: 17 current hydrophones collecting continuous data

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DATA MINING CHALLENGES

- Acoustic data are inherently difficult to search
- Most spectrogram settings cannot visualize all signals
- Quantity: 17 current hydrophones collecting continuous data
- How can we make these data mineable for researchers?

ARE CLASSIFIERS THE SOLUTION?

- Imperfect accuracy
- Novel signals missed
- Human intervention unnecessary for annotating likely events
- For human analyzed quality, manual effort still vastly reduced

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JASCO COLLABORATION

- JASCO working on classifier to be run on all ONC acoustic data
- The trade: I can use their classifier to annotate my thesis data in exchange for manual annotations

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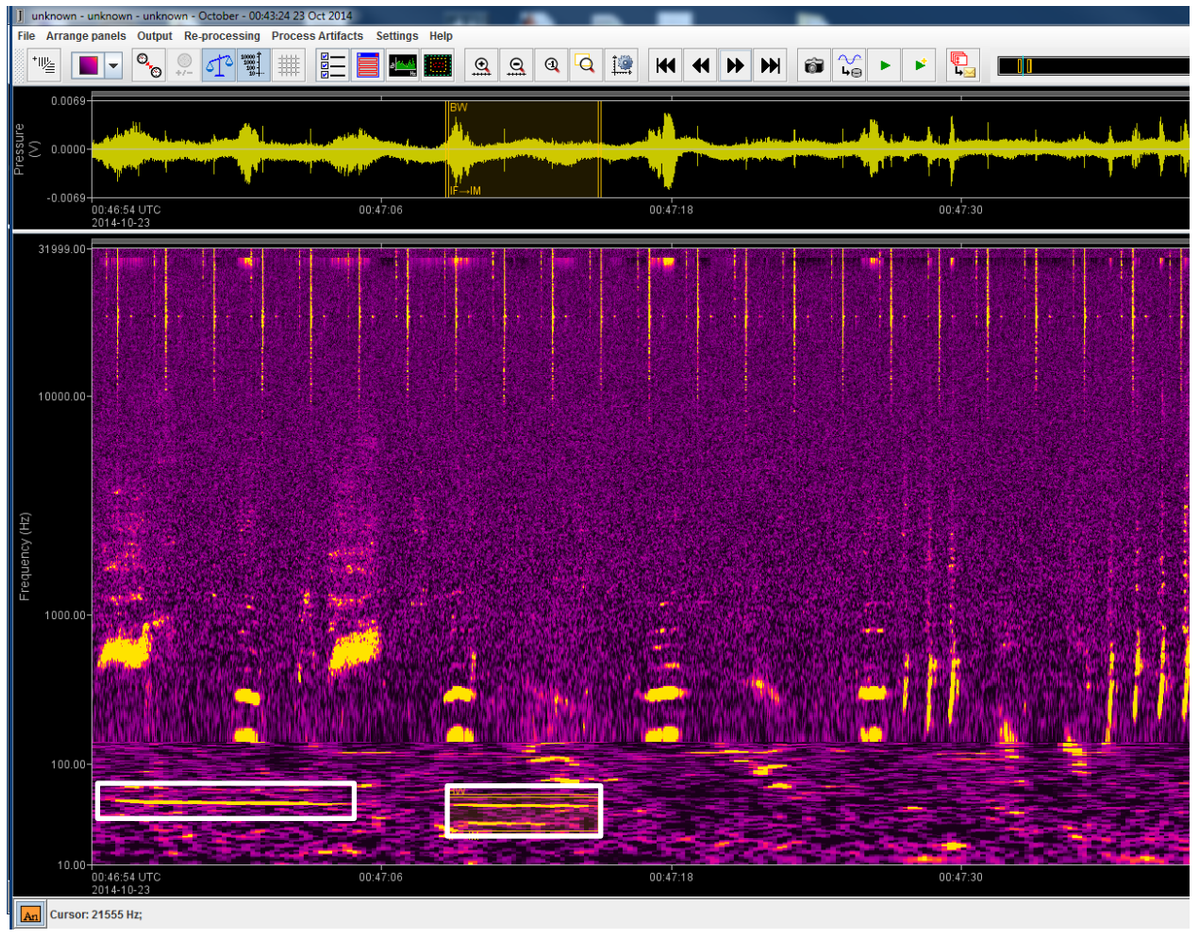
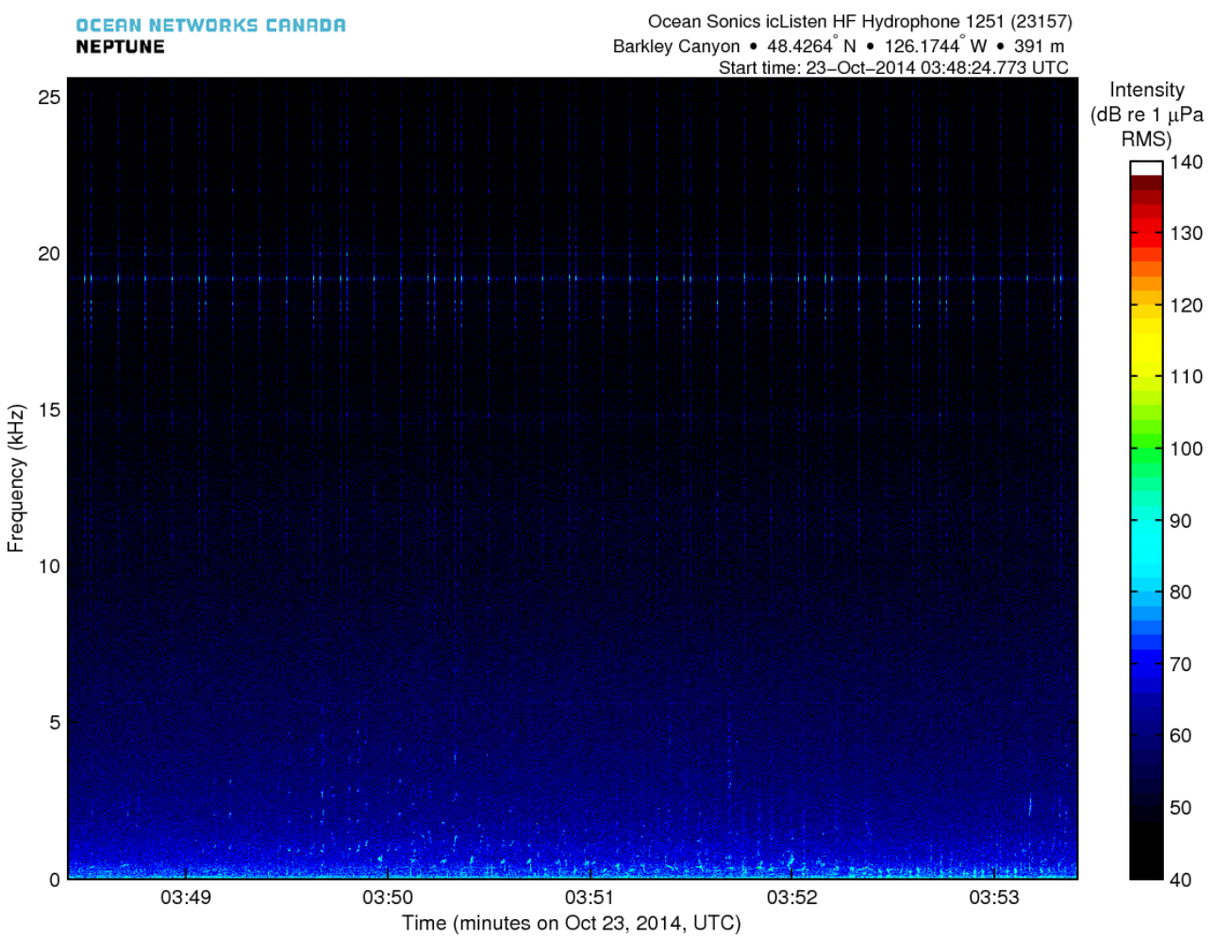
JASCO COLLABORATION

- Protocol: Manually annotate alternate files for the first 4 days of each month for 1 year in SpectroPlotter





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JASCO COLLABORATION RESULTS

- Humpbacks year-round!?
- Fin and blue whales
- **77%** of files had marine mammal vocalizations
- Most files had multiple species

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OTHER ACOUSTIC WORK AT BARKLEY

In House:

- Patterns of marine mammal vocalizations in relation to environmental variables
- Collaboration with Baum-Juanes lab on fish behaviour
- Collaboration with Dr. Hervé Glotin on humpback whale stock definition

Independent:

- Other classifiers being built using our data
- Orca call catalog composition for Offshores and Outer Coast Biggs by Dr. John Ford
- Sperm whale habitat usage by Elizabeth Ferguson

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SUGGESTED IMPROVEMENTS

- Implement classifiers
- Improve data mining functions to ease annotation searching
- Improve hydrophone viewer to better support work on different signal types
- Minimize active acoustic and mechanical interference
    - Distance
    - Debeeping

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Contact

Kristen Kanes| Underwater Acoustic Analyst | sitbdo@uvic.ca

AN INITIATIVE OF University of Victoria