Capturing Information on Vessels and Cetaceans: developing a passive monitoring system for Boundary Pass

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Speaker
Lauren McWhinnie, Patrick O'Hara, Gregory O'Hagan, Molly Fraser, Sarah Berry, Leh Smallshaw, Norma Serra-Sogas, and Rosaline Canessa

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Capturing Information on Vessels and Cetaceans: a passive monitoring system for Boundary Pass

Dr. Lauren McWhinnie (lmcwhin@uvic.ca), Dr. Patrick O’Hara, Gregory O’Hagan, Sarah Berry, Ben Hendricks, Leh Smallshaw, Molly Fraser, Norma Serra-Sogas and Dr. Rosaline Canessa
Lecture Overview

• Boundary Pass
• Acoustic Data Collection
• Automatic Identification System (AIS) data
• Photographic Observation Study (POS)
• Early Findings...
• Future Work and Research Goals
Boundary Pass

Location:

The Issue: This passage is a bottleneck for both cetaceans and vessels, as such there are significant concerns related to vessel disturbance, particularly from marine noise.

The Goal: Using passive data collection techniques, quantify the amount of vessel traffic (both AIS and non-AIS) and marine mammal presence within Boundary Pass.
Acoustic Data Collection

Location:

Monarch Head - 48N 45’ 45.997” 123W 05’ 05.461” -20 m depth
East Point - 48N 46’ 49.501” 123W 03’ 5.4” -27m depth

Type: icListen HF hydrophones by Ocean Sonics
Configuration: 128000 samples per sec – 10Hz-50kHz bandwidth
24bit resolution – 48dB to 175 dB re 1 uPa
Calibration: 0.1Hz to 200kHz
Early Findings...Hydrophones
Early Findings...Hydrophones

Killer Whale Detections 2016

Killer Whale Detections 2017

- East Point
- Monarch Head
Automatic Identification System (AIS) Data
Early Findings..AIS
Photographic Observation Study (POS)

- Single board Raspberry Pi 3 Linux CPU.
- Canon DSLR controlled by a Python script.
- Writing data to external HDD.
- Automatic restart to combat power outages.
- Enclosed in a weather proof box.
- Burst of three photos every minute during daylight hours.
Early Findings...POS

No. of Days with Image Data

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Coupling of the Camera and Hydrophone Data

![Graph showing ambient noise level and recording consistency over time. The graph displays peaks and troughs in ambient noise and spikes in detections, with a particular focus on the 6th Sep 2017 data.]
Coupling of the Camera and Hydrophone Data
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Coupling of the Camera and Hydrophone Data
Future Work and Research Goals

• Coupling the hydrophone, camera and AIS data
• Addition of video, night vision and infrared sensors
• AIS speed assessment
• Development of vessel auto-detection software
Automatic Identification Software
Many thanks again to all our amazing collaborators

Thank You for listening!

Any Questions?