# ECHO Program

## Monitoring underwater noise to understand the effects of vessel traffic on whales

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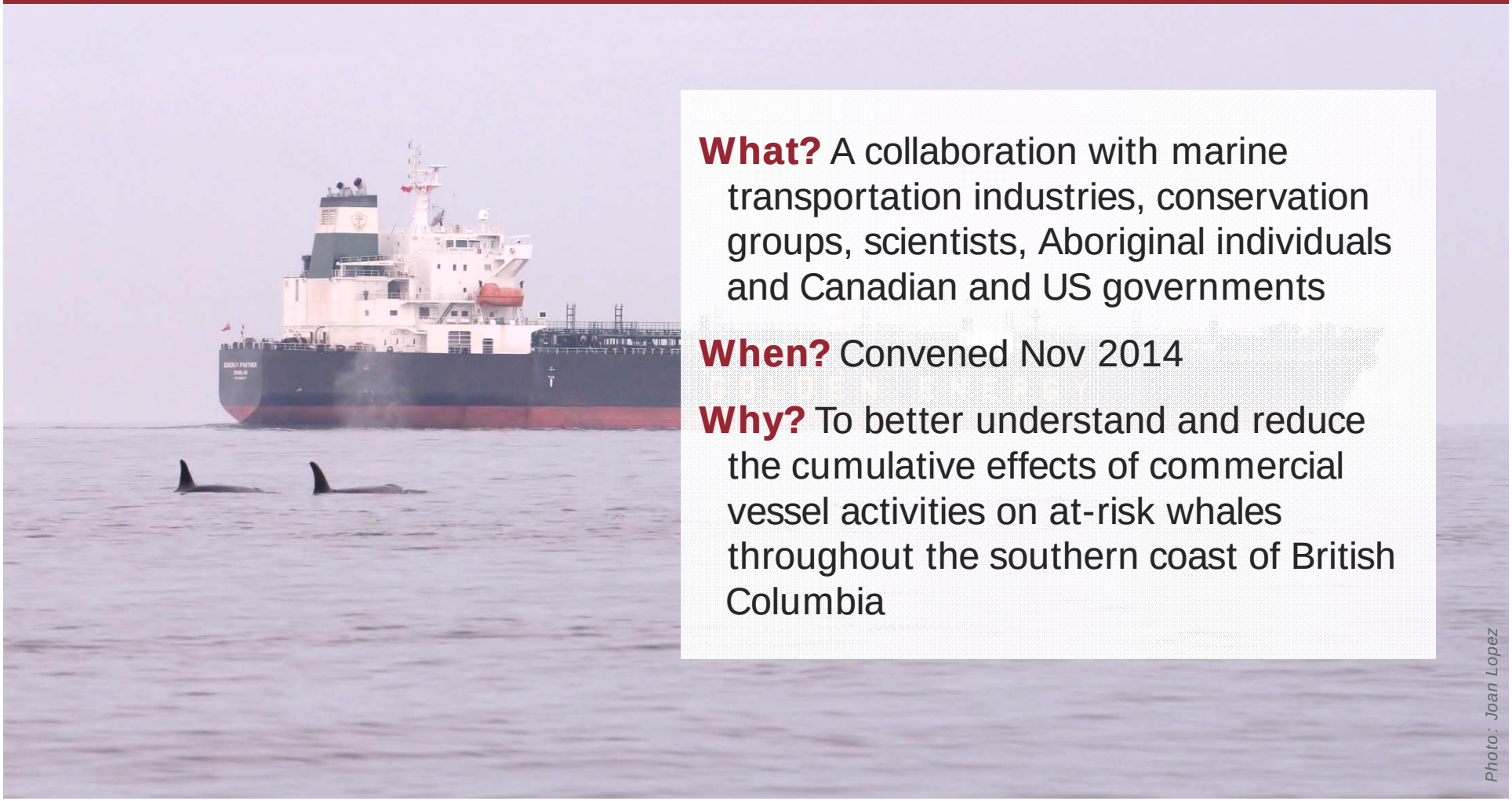
Project Manager
Vancouver Fraser Port Authority

*March 21, 2019*

# Enhancing Cetacean Habitat and Observation program



**What?** A collaboration with marine transportation industries, conservation groups, scientists, Aboriginal individuals and Canadian and US governments

**When?** Convened Nov 2014

**Why?** To better understand and reduce the cumulative effects of commercial vessel activities on at-risk whales throughout the southern coast of British Columbia

Photo: Joan Lopez

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# Whales in our waters

## Many at-risk marine mammals species off the coast of British Columbia


**Harbour Porpoise**
(Special Concern)


**Humpback**
(Threatened)


**Fin**
(Threatened)


**Sei**
(Endangered)


**Blue**
(Endangered)


**North Pacific Right whale**
(Endangered)


**Biggs (transient) killer whale**
(Threatened)


**Resident killer whale**
(Endangered)

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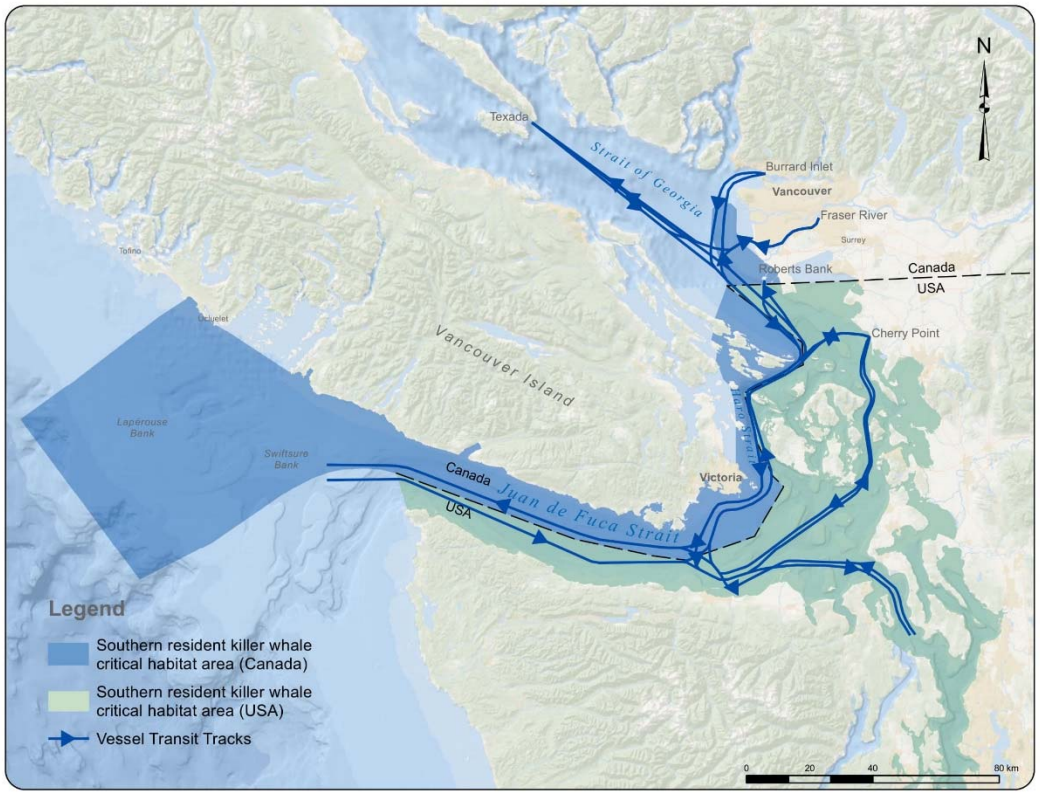
*Based on Canadian Species at Risk Act.*

# Vessels and southern resident killer whale interactions




VFPA PLAN G2018-100-02

- 74 individual whales remaining in population
- Critical habitat, shipping lanes and ferry routes overlap
- Predicted growth in both population and vessel movements
- *Canada Marine Act* mandate

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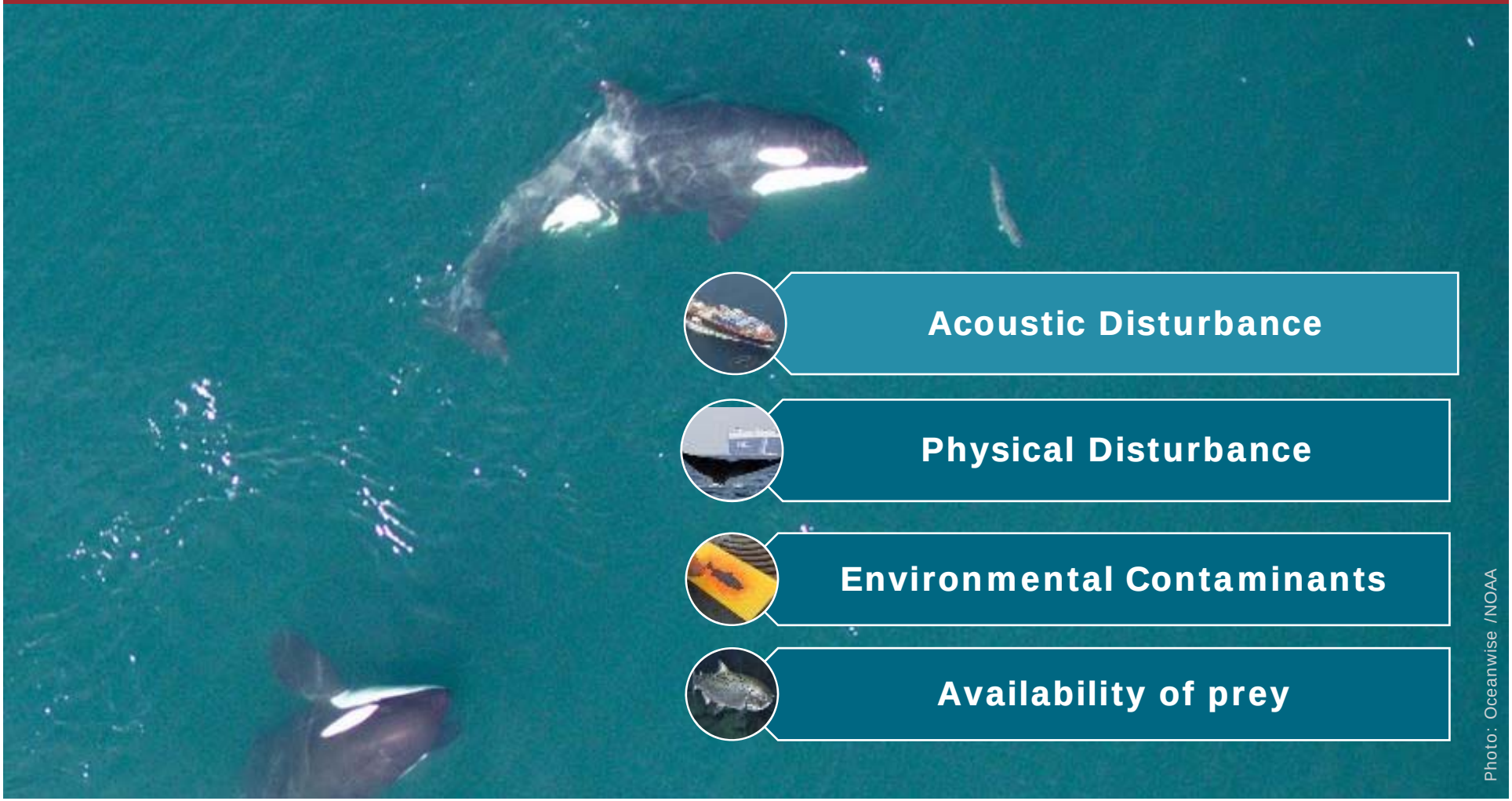
# Known threats to marine mammals



- Acoustic Disturbance
- Physical Disturbance
- Environmental Contaminants
- Availability of prey

Photo: Oceanwise /NOAA

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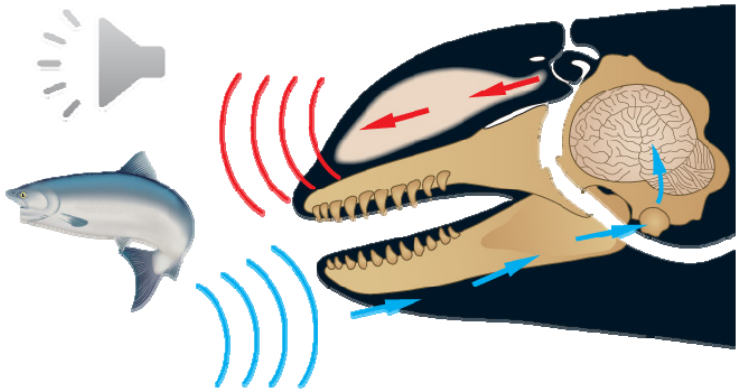
# Whales and acoustic disturbance

- Whales use sound to find food, communicate and navigate
- Vessel noise can disrupt their ability to communicate, socialize, rest and their ability to hear returning echolocation clicks when feeding



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*Sound clip: Northern resident killer whale echolocation and click masking from passing commercial vessel. Credit: Orcalab*

# Underwater noise monitoring projects

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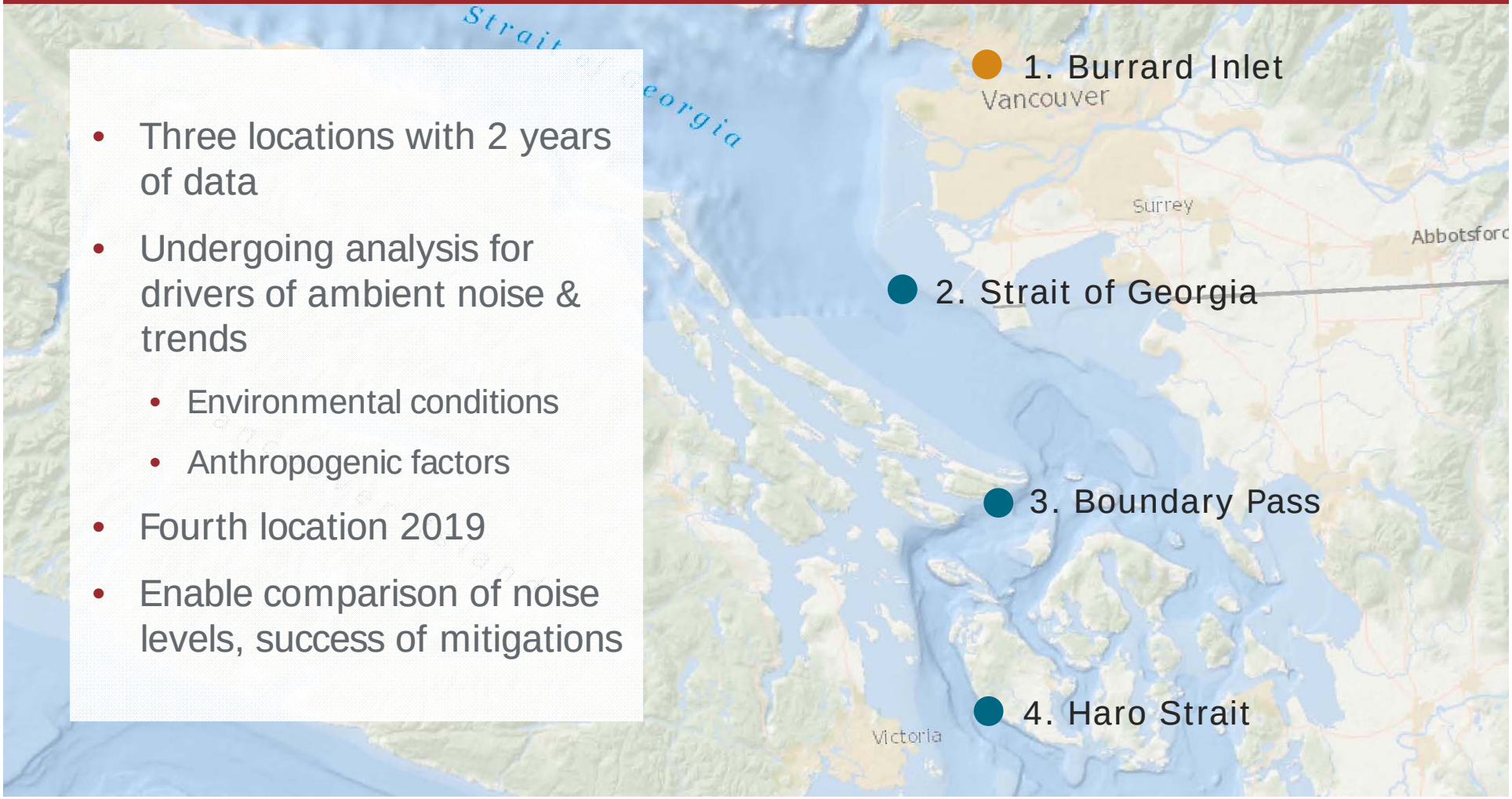
# Monitoring underwater noise in the region

- Three locations with 2 years of data
- Undergoing analysis for drivers of ambient noise & trends
  - Environmental conditions
  - Anthropogenic factors
- Fourth location 2019
- Enable comparison of noise levels, success of mitigations

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# 1. Burrard Inlet

## Underwater noise monitoring project

- Five longer-term hydrophones
- Monitoring ambient noise and marine mammals
- Short-term, mobile monitoring of port-specific sources




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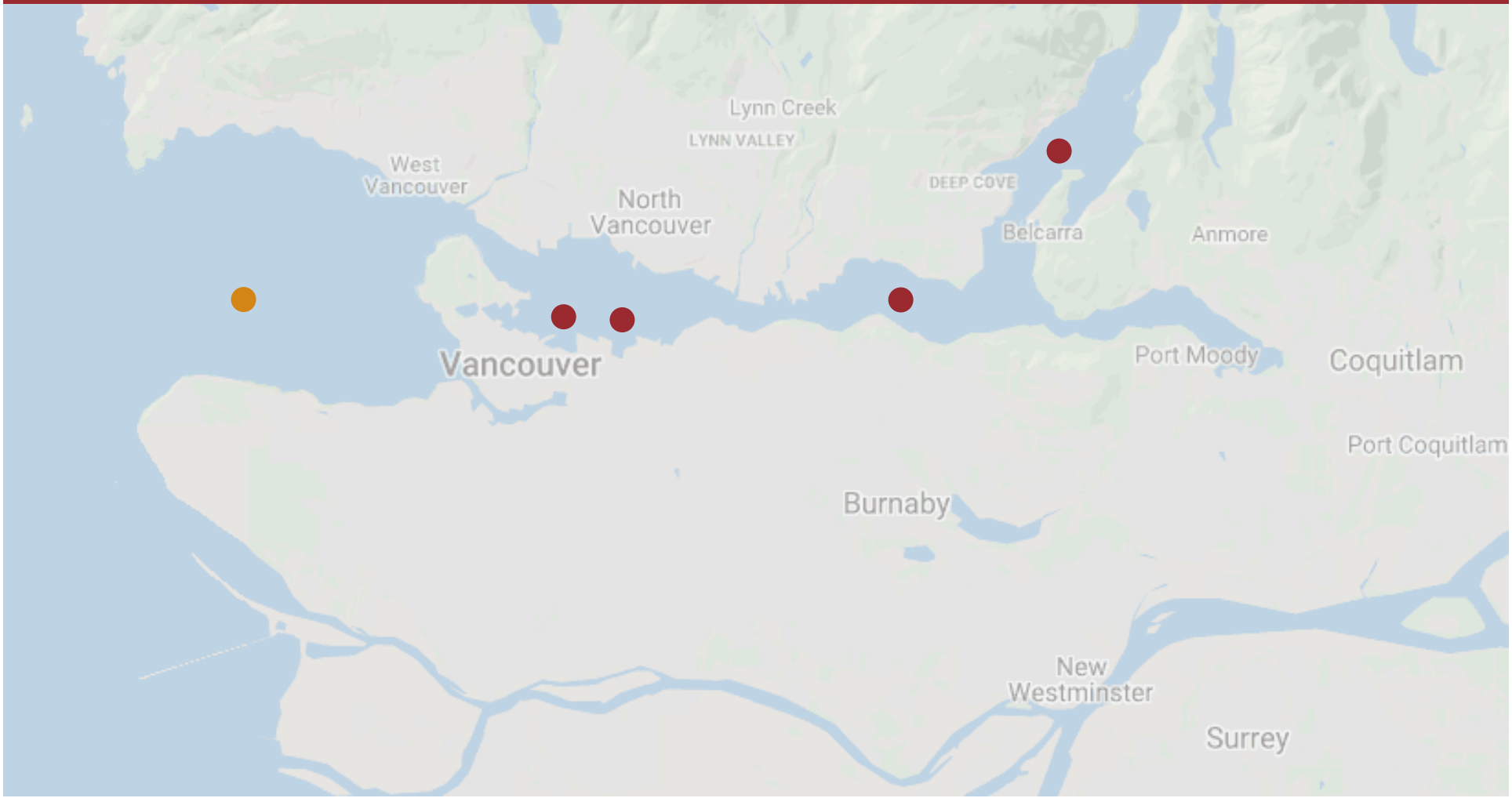
Transport Canada

# 1. Burrard Inlet

## Underwater noise monitoring project

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# 2. Strait of Georgia

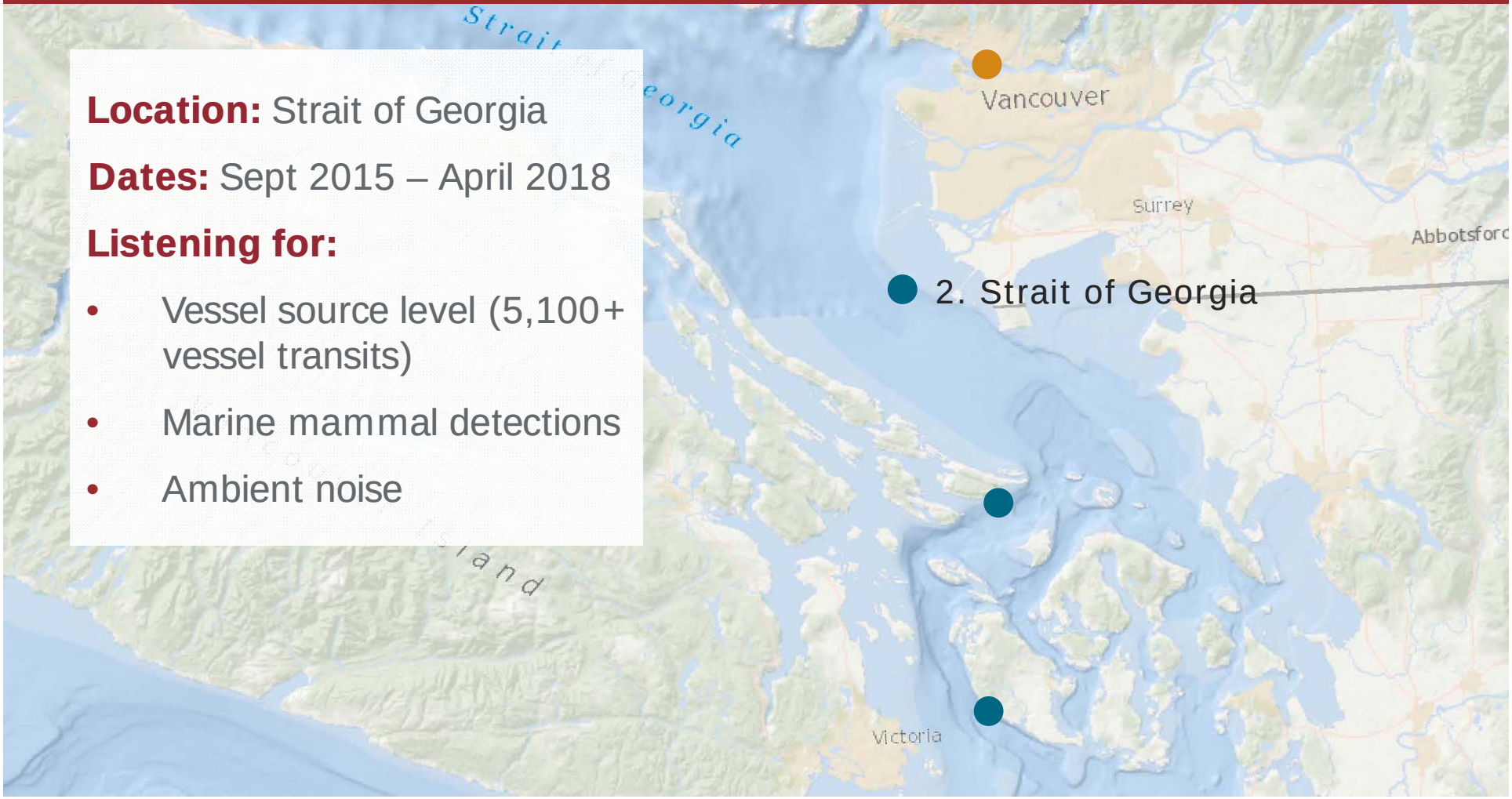
## Underwater listening station

**Location:** Strait of Georgia

**Dates:** Sept 2015 – April 2018

**Listening for:**

- Vessel source level (5,100+ vessel transits)
- Marine mammal detections
- Ambient noise

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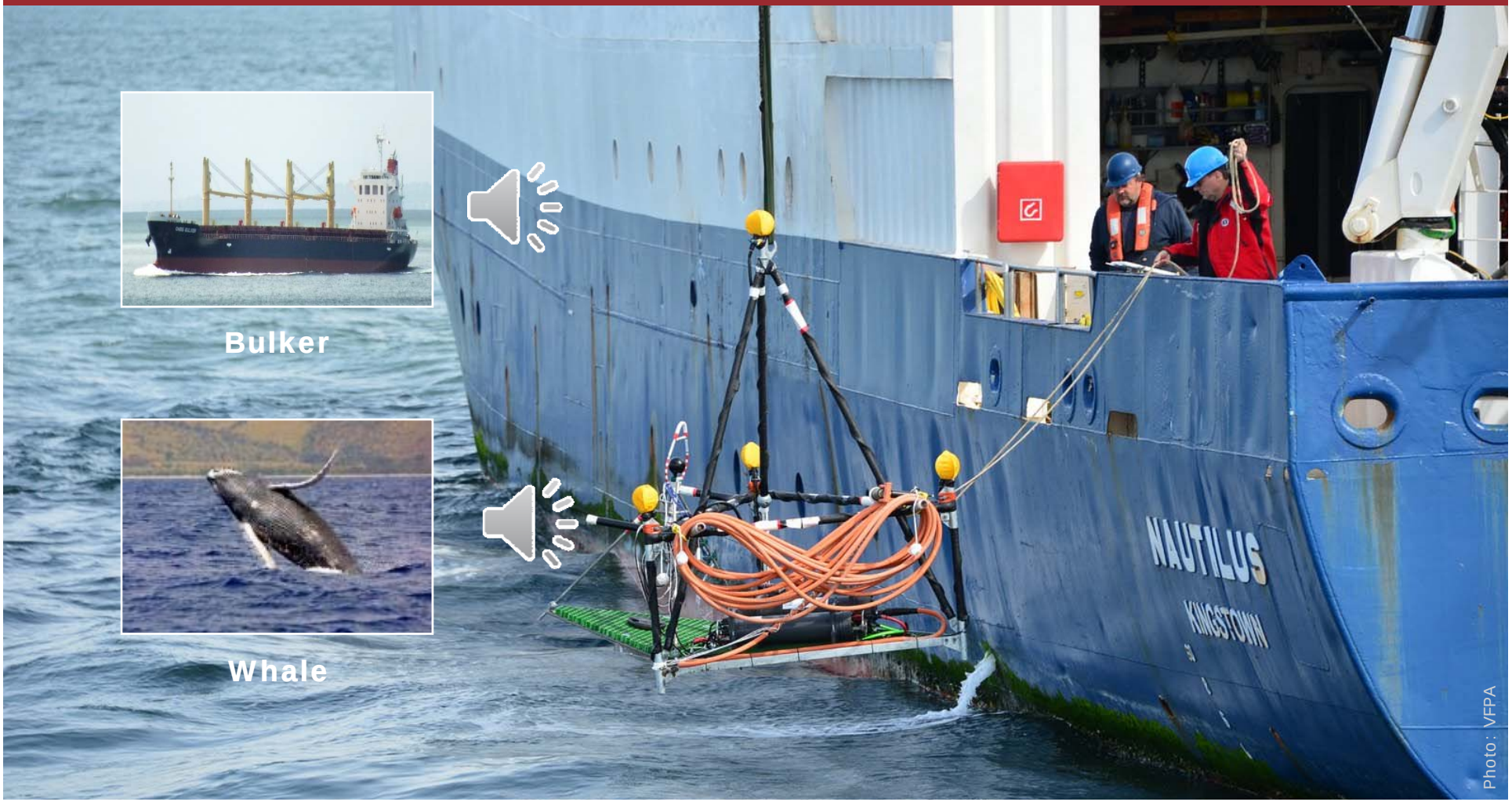
# 2. Strait of Georgia

## Underwater listening station

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JASCO RESEARCH

OCEAN NETWORKS CANADA

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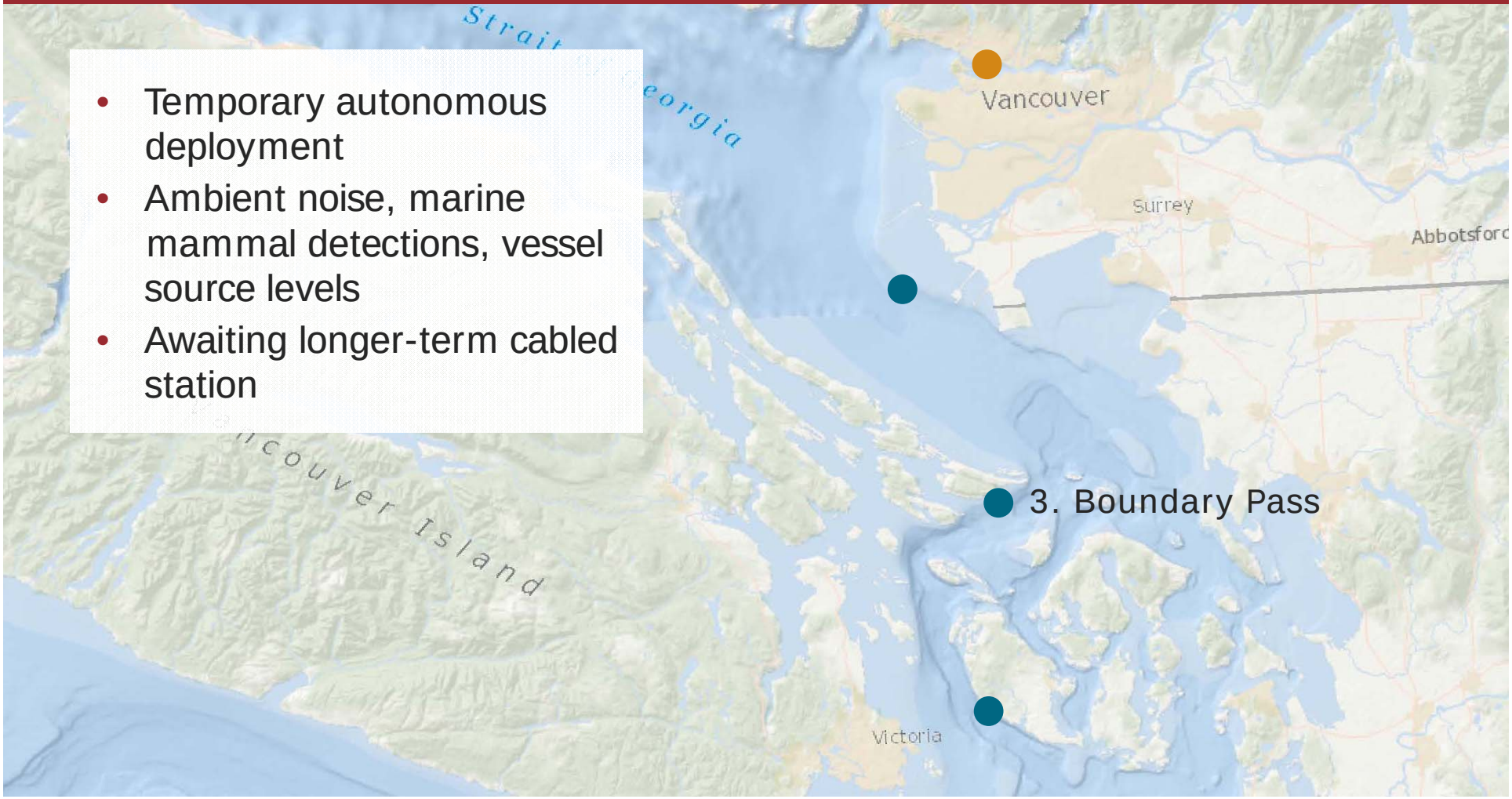
# 3. Boundary Pass

## Underwater listening station

- Temporary autonomous deployment
- Ambient noise, marine mammal detections, vessel source levels
- Awaiting longer-term cabled station

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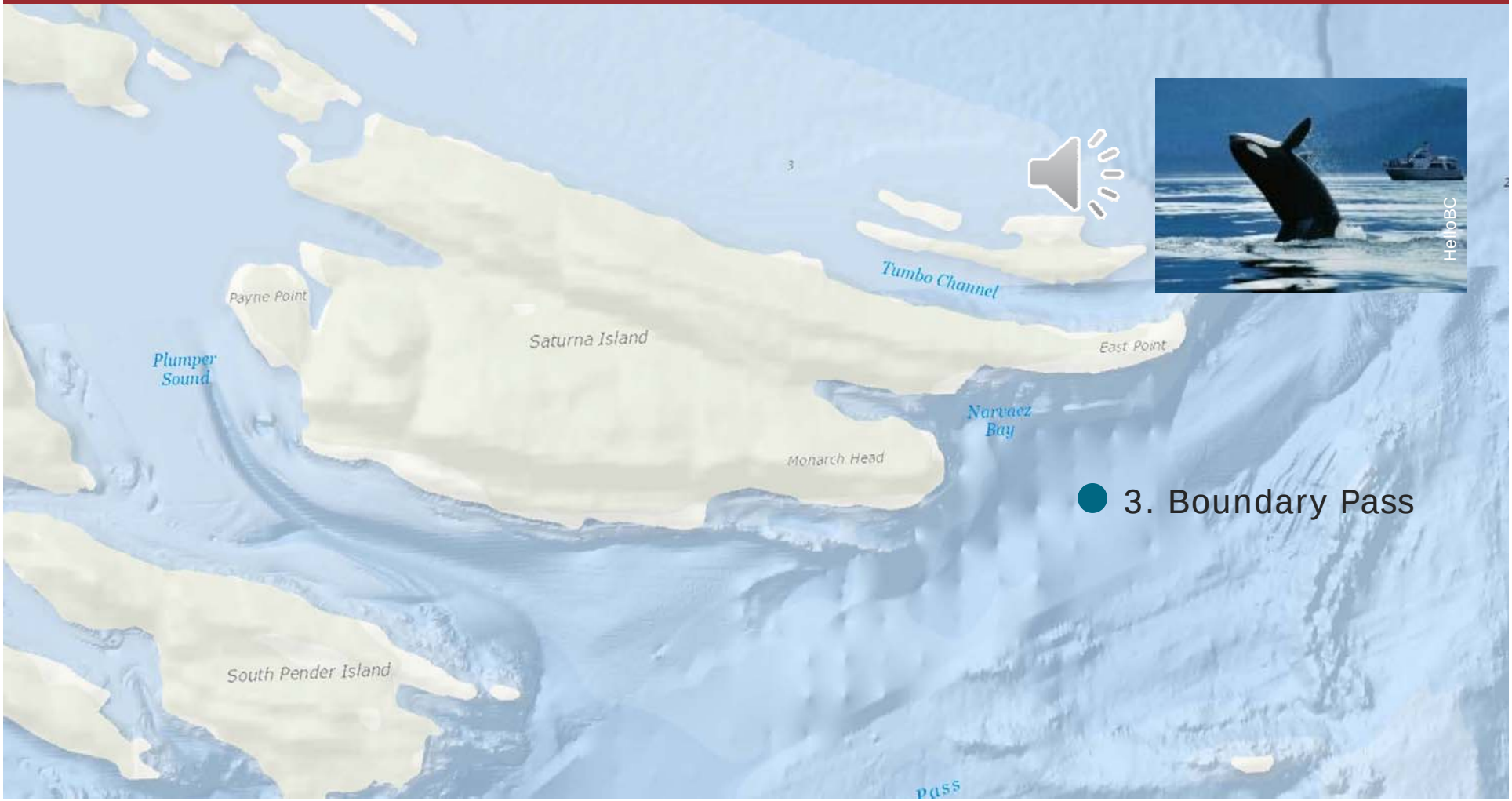
# 3. Boundary Pass

## Underwater listening station

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# 4. Haro Strait

## Voluntary vessel slowdown

- Important foraging area for southern resident killer whales (SRKW)
- Selected site for voluntary vessel slowdown in 2017 and 2018


Photo: ECHO




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Image: Hydrophone deployment in Haro Strait, 2017

# 4. Haro Strait

## Voluntary vessel slowdown

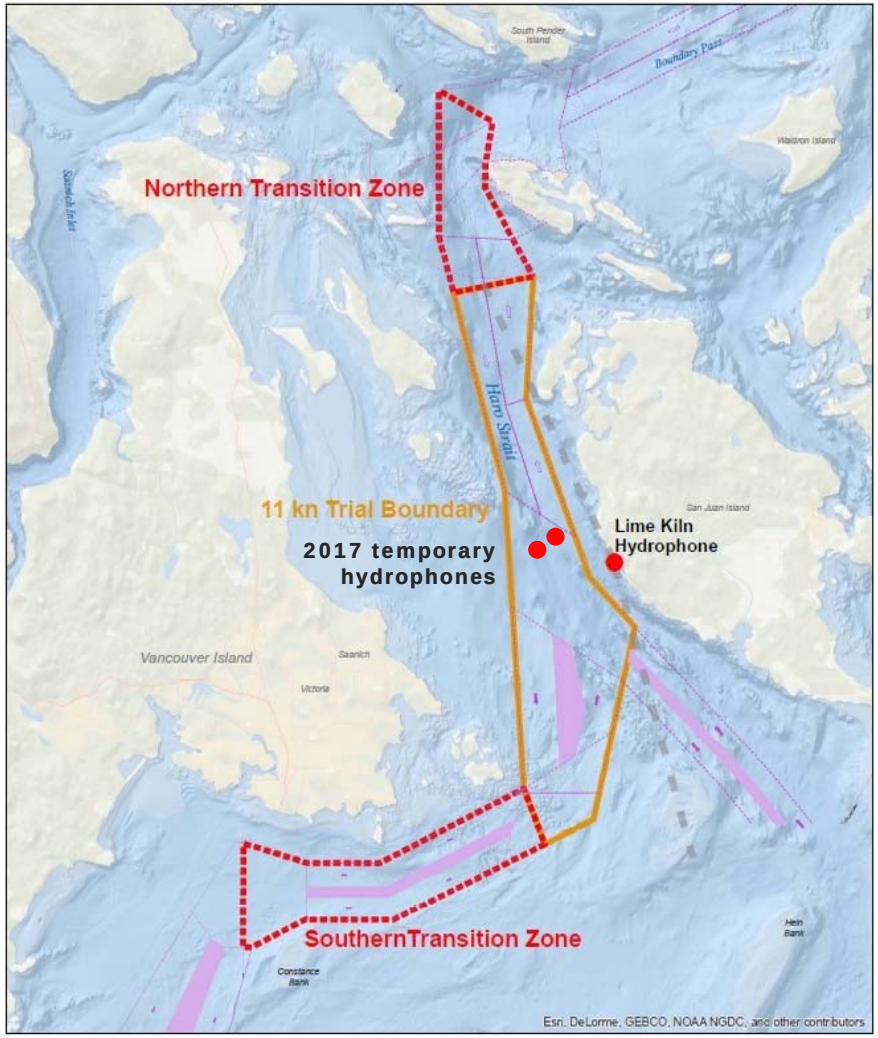
**When:** Summers of 2017 (61 days) and 2018 (111 days)

**Where:** ~16 nautical miles through critical whale foraging habitat in Haro Strait

**Who:** Over 50+ organizations

**Monitoring:**

- Participation and vessel speeds
- Vessel source levels
- Ambient noise
- Marine mammal detections

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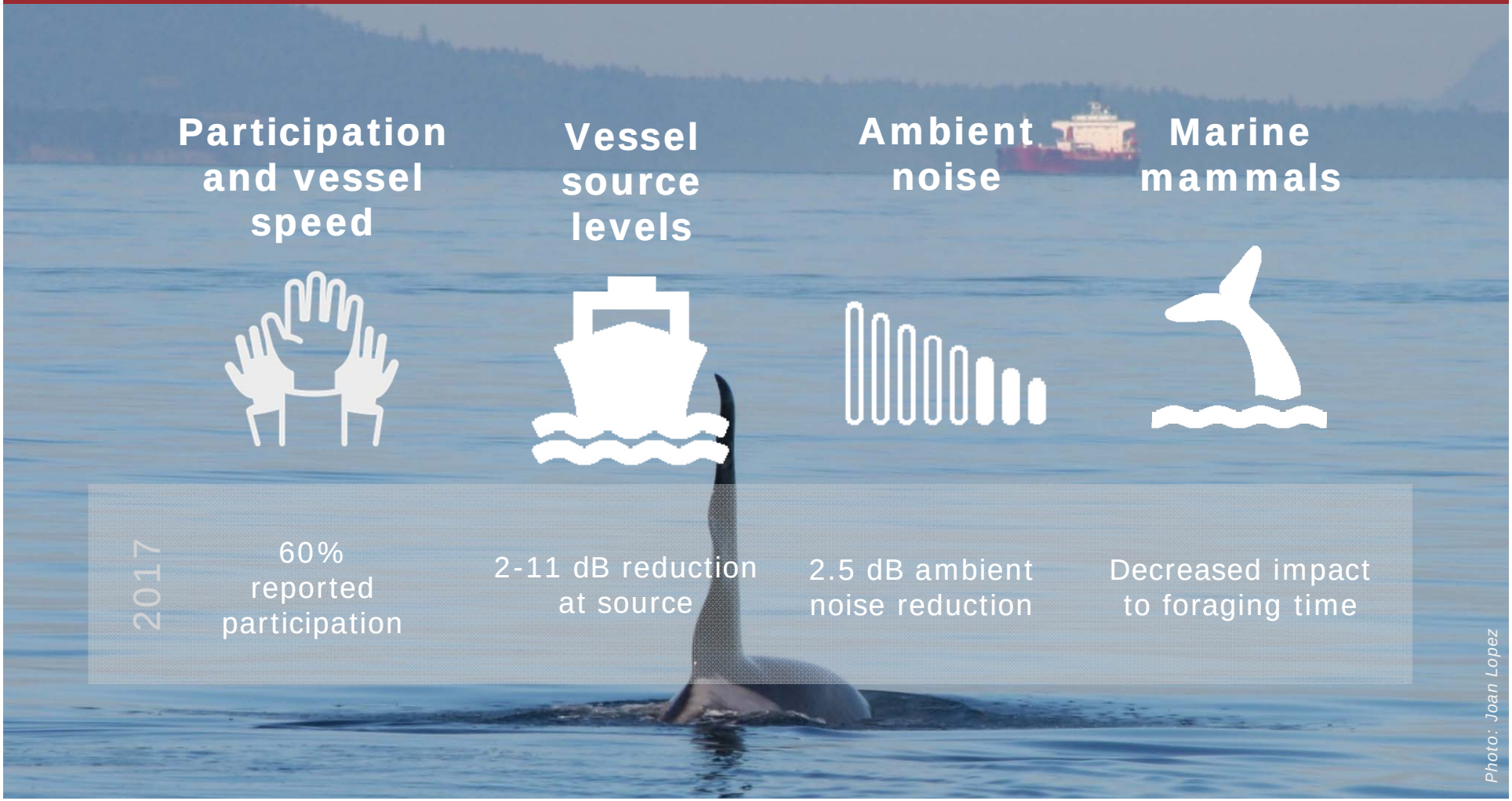
# 4. Haro Strait

## 2017 vessel slowdown results

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*Note: a 3 dB reduction is roughly equivalent to a 50% reduction in sound intensity. Source: JASCO Applied Sciences*

# Whale monitoring project

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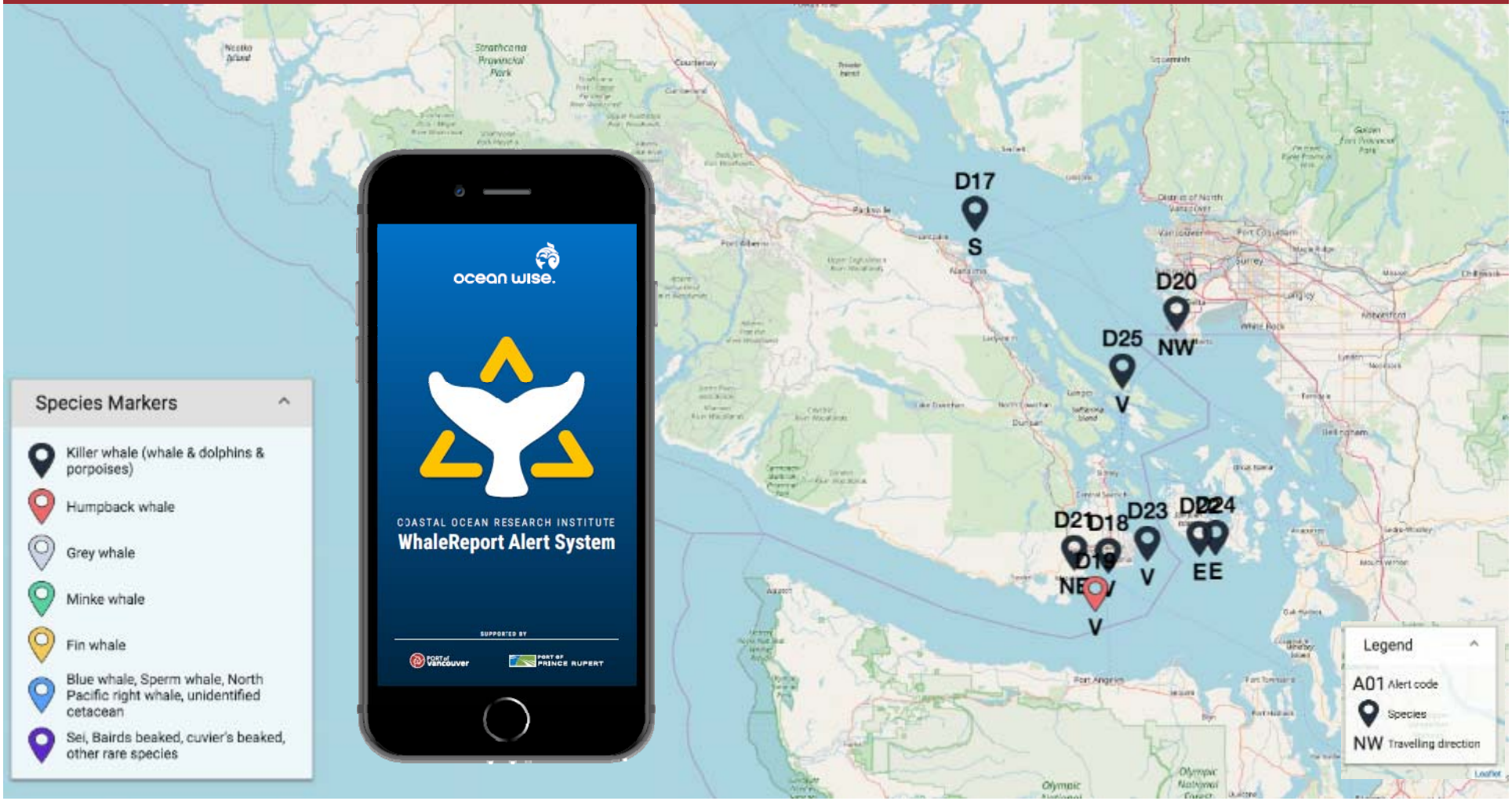
# WhaleReport Alert System (WRAS)




*Project lead by:* ocean wise.

*Supported by:* PORT of vancouver

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LINKING A WORLD OF OPPORTUNITY

# Global applications

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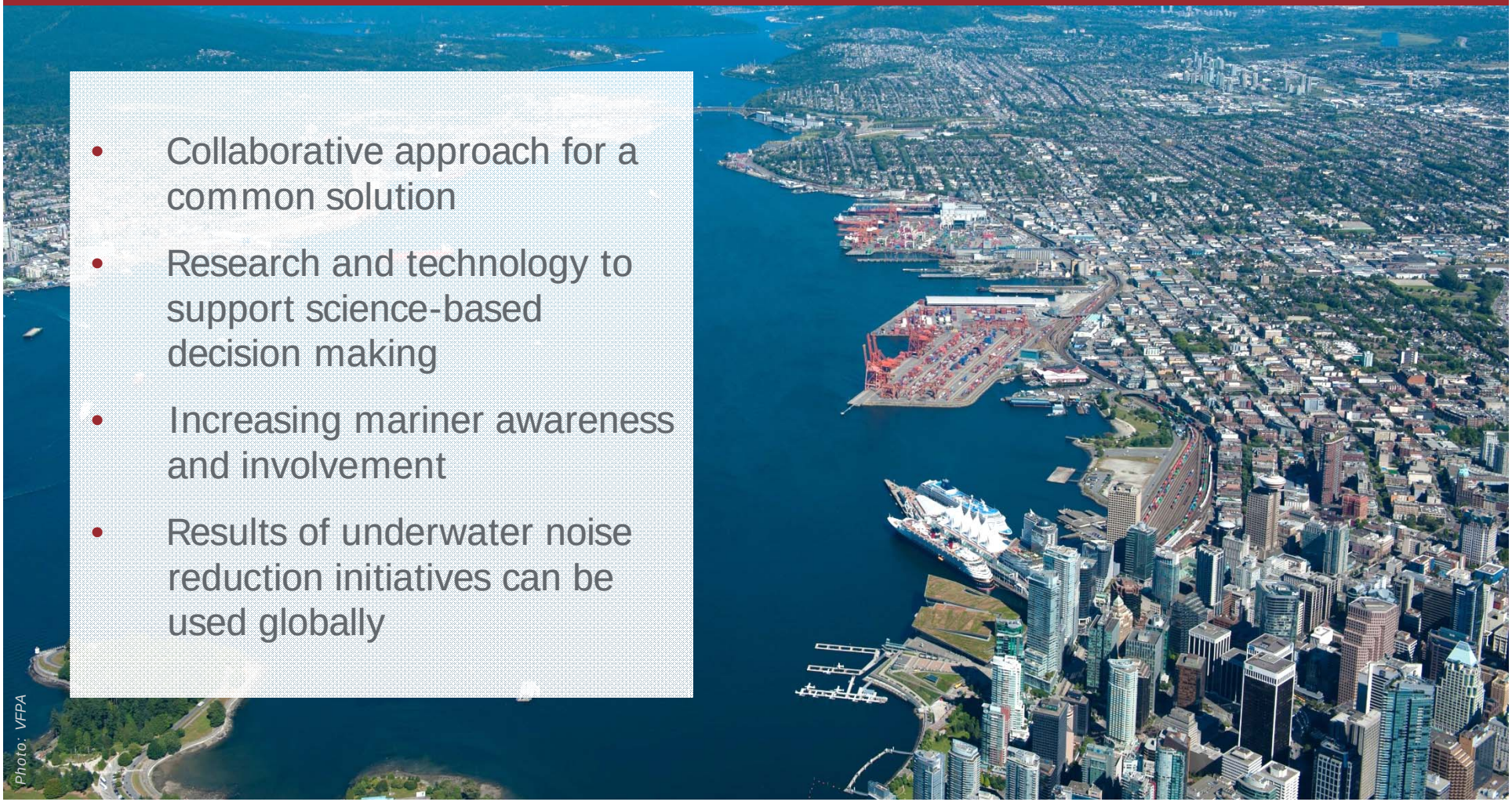
# Global applications



- Collaborative approach for a common solution
- Research and technology to support science-based decision making
- Increasing mariner awareness and involvement
- Results of underwater noise reduction initiatives can be used globally

Photo: VFPA

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# Thank you for listening!

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Photo: Joan Lopez

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