

# How do prey react to killer whales?



Fisheries and Oceans Canada  
Pêches et Océans Canada



Reinhart NR<sup>1</sup> & Ferguson SH<sup>1,2</sup>

<sup>1</sup>Department of Biological Sciences, University of Manitoba, 501 University Crescent, Winnipeg, MB

<sup>2</sup>Fisheries and Oceans Canada, 501 University Crescent, Winnipeg, MB



## Introduction

As apex predators, killer whales shape ecological communities through top-down consumption<sup>1</sup>. Yet they also disrupt prey behaviour through intimidation that may have consequences for prey population fitness and survival<sup>2</sup>. The **objective** of this project is to quantify narwhal and bowhead whale anti-predatory behaviours in response to killer whale presence and in relation to environmental characteristics in the eastern Canadian Arctic (Fig 1a & b).

## Proposed Methods

- 1 killer whale, 3 bowhead whales & 7 narwhal tracked in 2009.
- 3 **killer whales** & 9 **bowhead whales** tracked in 2013 (subset of data shown in Fig 1b).
  - Calculate prey turning angles & movement speeds.
  - Environmental variables: sea-ice concentration, bathymetry, distance to coast, distance to ice & shoreline type.

Aug 28  
Gulf of Boothia

Aug 28

Aug 30

Aug 30

Fig 1b. 3 killer whales & 1 bowhead whale overlap on Aug-29-2013 at ~ 12:00

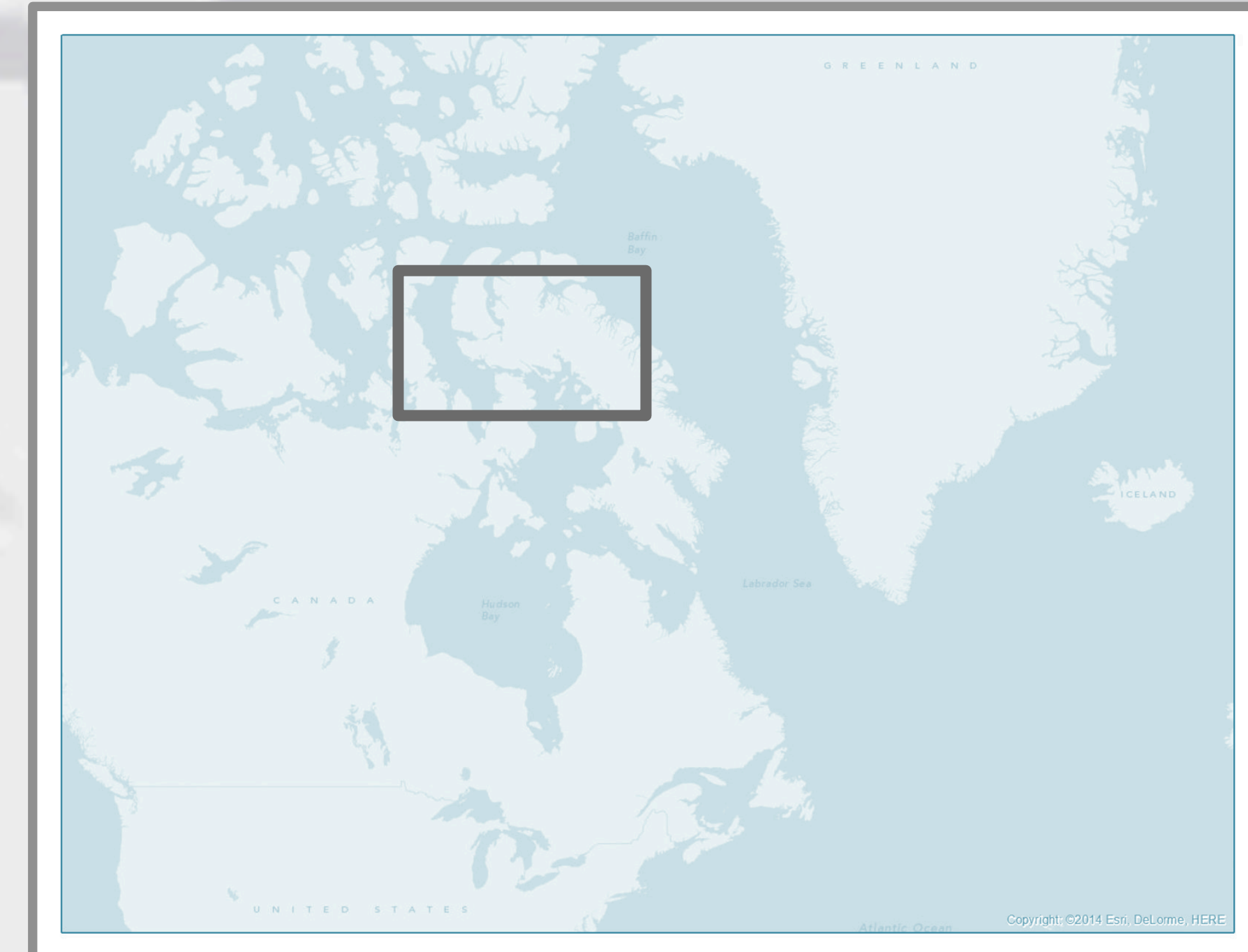


Fig 1a. Western North Atlantic and eastern Canadian Arctic.

## Network Importance

- Expand our understanding of species interactions in the Arctic by including the top marine predator (OTN Framework Question 2).
- Quantify the cumulative effects of killer whales in the eastern Canadian Arctic (consumption & intimidation) to inform management of Arctic marine mammal stocks that are important natural resources for Inuit subsistence hunting.

## Acknowledgements

Cory Matthews, Stephen Petersen Bernard LeBlanc, Jack Orr, Charlie Inuarak, Enookie Inuarak, Michael Inuarak, Pond Inlet Hunters and Trappers Organization (HTO), Arctic Bay HTO, Pangnirtung HTO. Funding provided by: University of Manitoba, Nunavut Government Monitoring Plan, Ocean Tracking Network, Nunavut Wildlife Management Board, Department of Fisheries and Oceans (Emerging Fisheries & Nunavut Implementation Fund), WWF Canada, Oceans North, Polar Continental Shelf Program & ArcticNet. Killer whale image - Gretchen Freund.

## References

<sup>1</sup> Estes et al., 2001. Ecological role of predators. *Encyc Biodiv*, 4:857-878.

<sup>2</sup> Preisser et al., 2005. Scared to death? The effects of intimidation and consumption in predator-prey interactions. *Ecol* 86(2):501-509.