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## New insights into seasonal foraging ranges and migrations of minke whales from the Salish Sea and coastal British Columbia.

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<https://cedar.wvu.edu/ssec/2014ssec/Day2/69>

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**Speaker**

Jared R. Towers, Christie McMillan, Mark Malleson, Jackie Hildering, John K. B. Ford, and Graeme M. Ellis

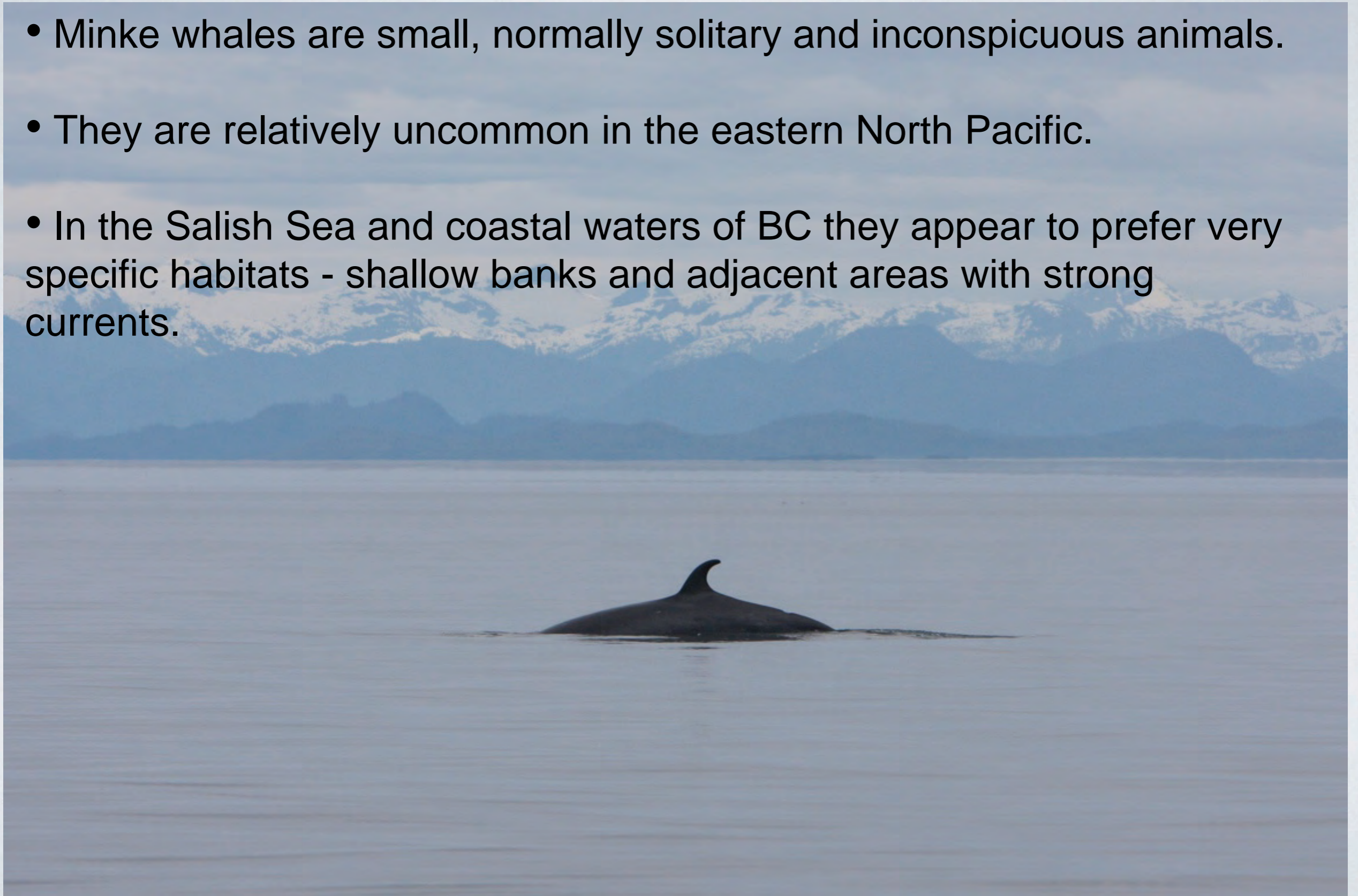
# New insights into seasonal foraging ranges and migrations of minke whales from the Salish Sea and coastal British Columbia



Jared Towers, Christie McMillan, Mark Malleson, Jackie Hildering, John Ford, Graeme Ellis

# Background

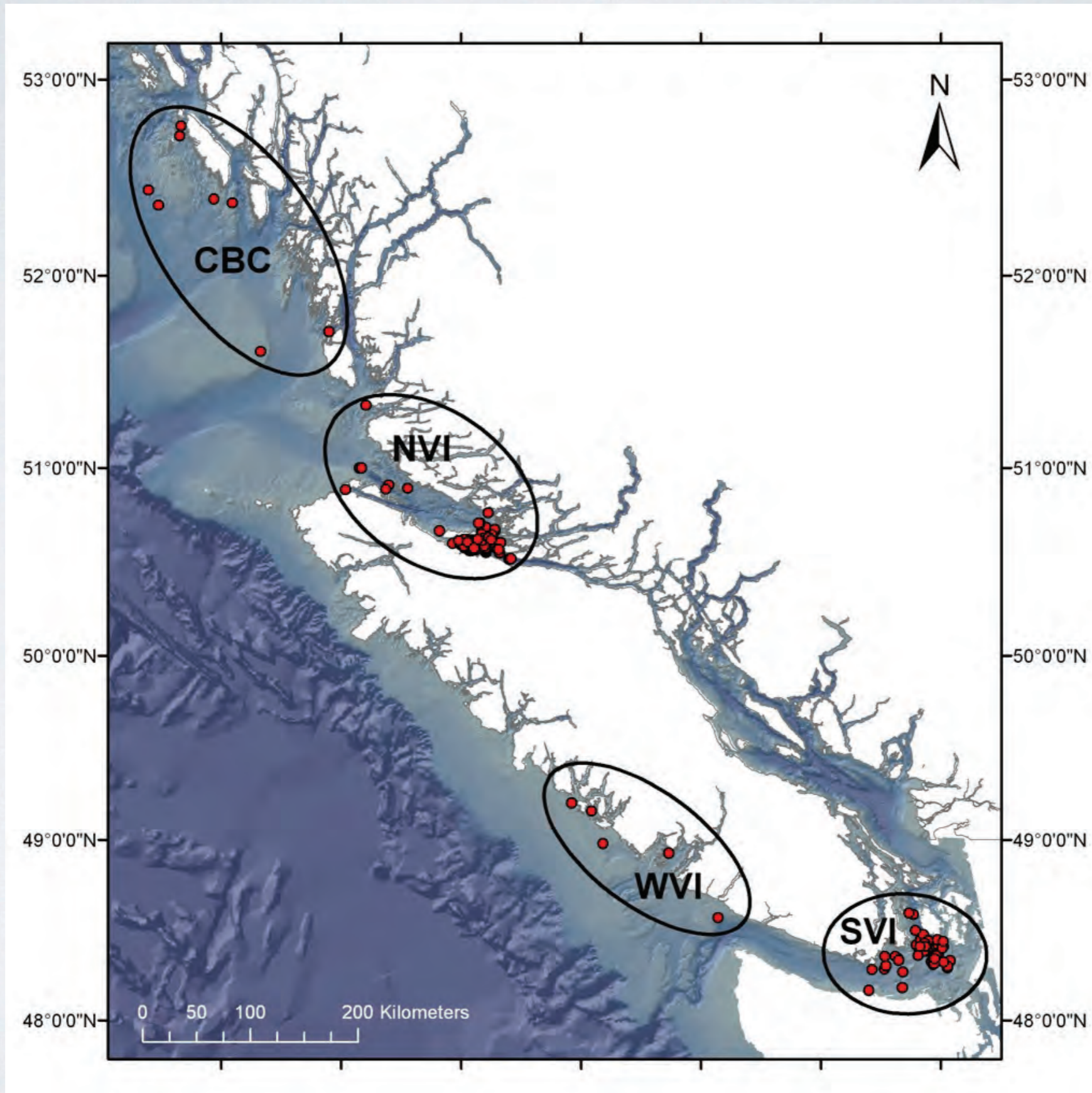
- Minke whales are small, normally solitary and inconspicuous animals.
- They are relatively uncommon in the eastern North Pacific.
- In the Salish Sea and coastal waters of BC they appear to prefer very specific habitats - shallow banks and adjacent areas with strong currents.



# Photo-identification



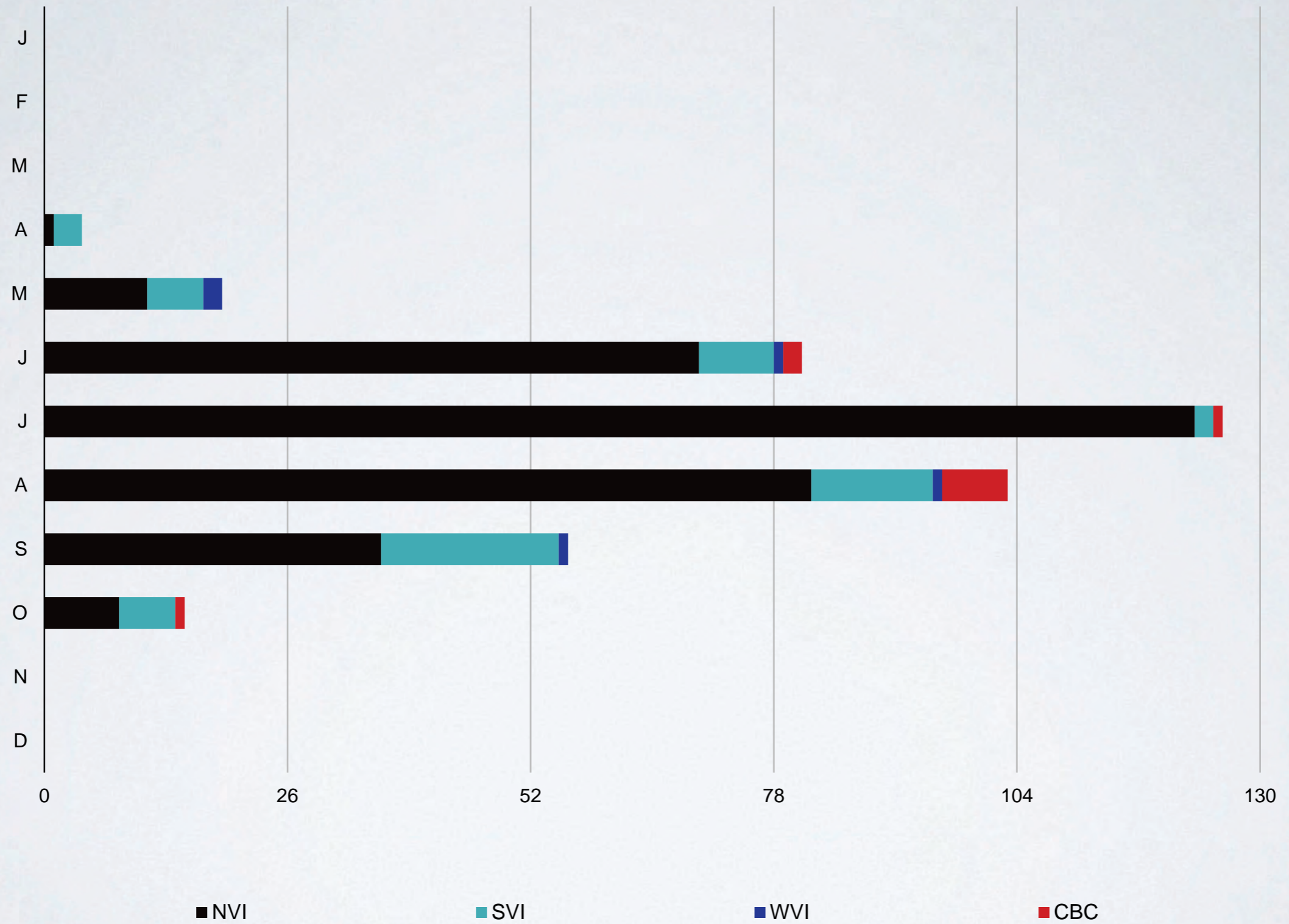
# Encounters and Areas



# Foraging Areas



# Encounters by Month and Area





# Encounters and Whales by Area

	NVI	SVI	WVI	CBC
Encounters	331	58	5	11
Whales	15	21	4	9



# Previous Research

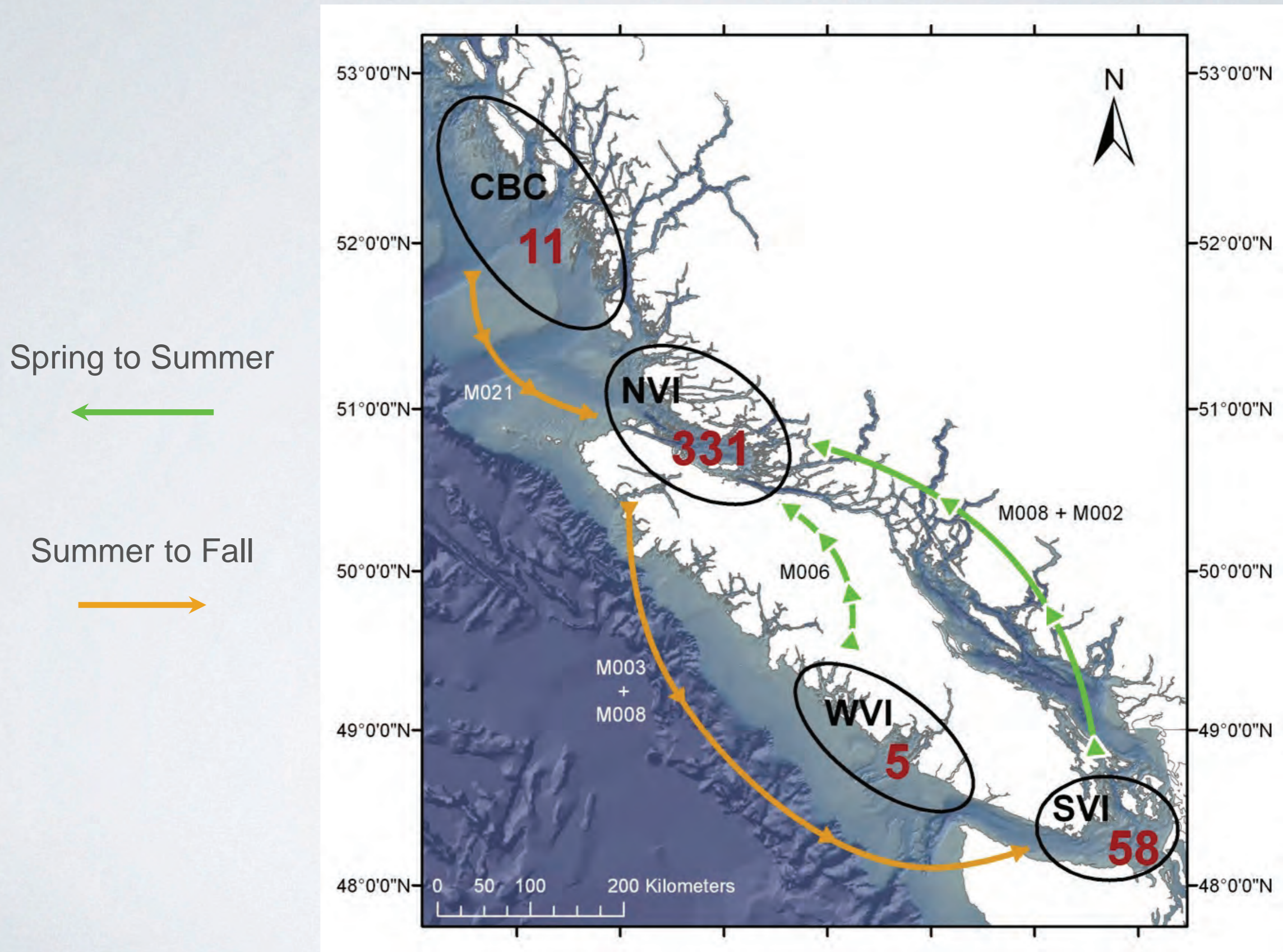
- Research conducted in the 1980's revealed that minke whales off northern and southern Vancouver Island showed small-scale fidelity to specific foraging areas within and between years.

Dorsey, Stern, Hoelzel, Jacobsen (1990). Rep. Int. Whal. Commn. (Special Issue 12).

- It is generally thought that minke whales in the eastern North Pacific are migratory but minkes whales in the Salish Sea and coastal waters of BC have been referred to as a resident and behaviourally distinct from migratory animals.



# Intra-annual Movements between Areas



Towers, McMillan, Malleson, Hildering, Ford, Ellis. (in press) J. Cetacean Res. Manage.

# Ecological Markers

- Ecological markers can be described as indicators of interactions between species that provide information about the habitats used by individuals.
- Examples in cetaceans can include swordfish beaks found embedded in the blubber, diatom coatings or barnacles on the skin and body scars from bites of cookiecutter sharks.



# Cookiecutter Shark Scars



# Cookiecutter Shark Scars

	Minkes	w/ new scars	%
2005	4	4	100%
2006	8	7	88%
2007	1	1	100%
2008	11	10	91%
2009	15	14	93%
2010	14	13	93%
2011	18	17	94%
2012	15	12	80%

Towers, McMillan, Malleson, Hildering, Ford, Ellis. (in press) J. Cetacean Res. Manage.

- Between 2005-2012, an average of 91% of minke whales identified each year were photographed with scars from bites of cookiecutter sharks that had occurred since the previous year.

# Cookiecutter Shark Distribution

1990 Nakano and Tabuchi: *Isistius* Occurrence in North Pacific Japan J. Ichthyol.

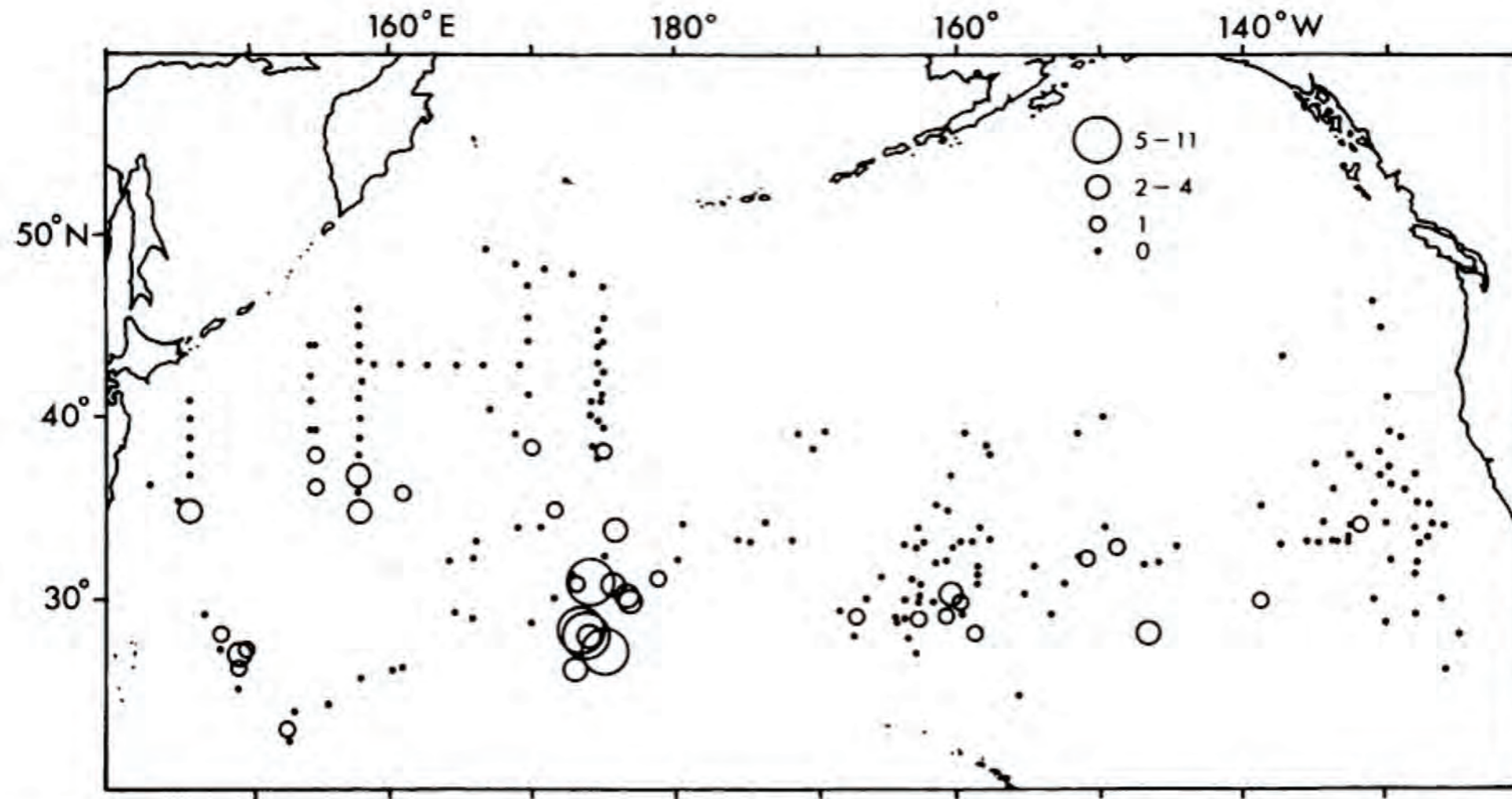


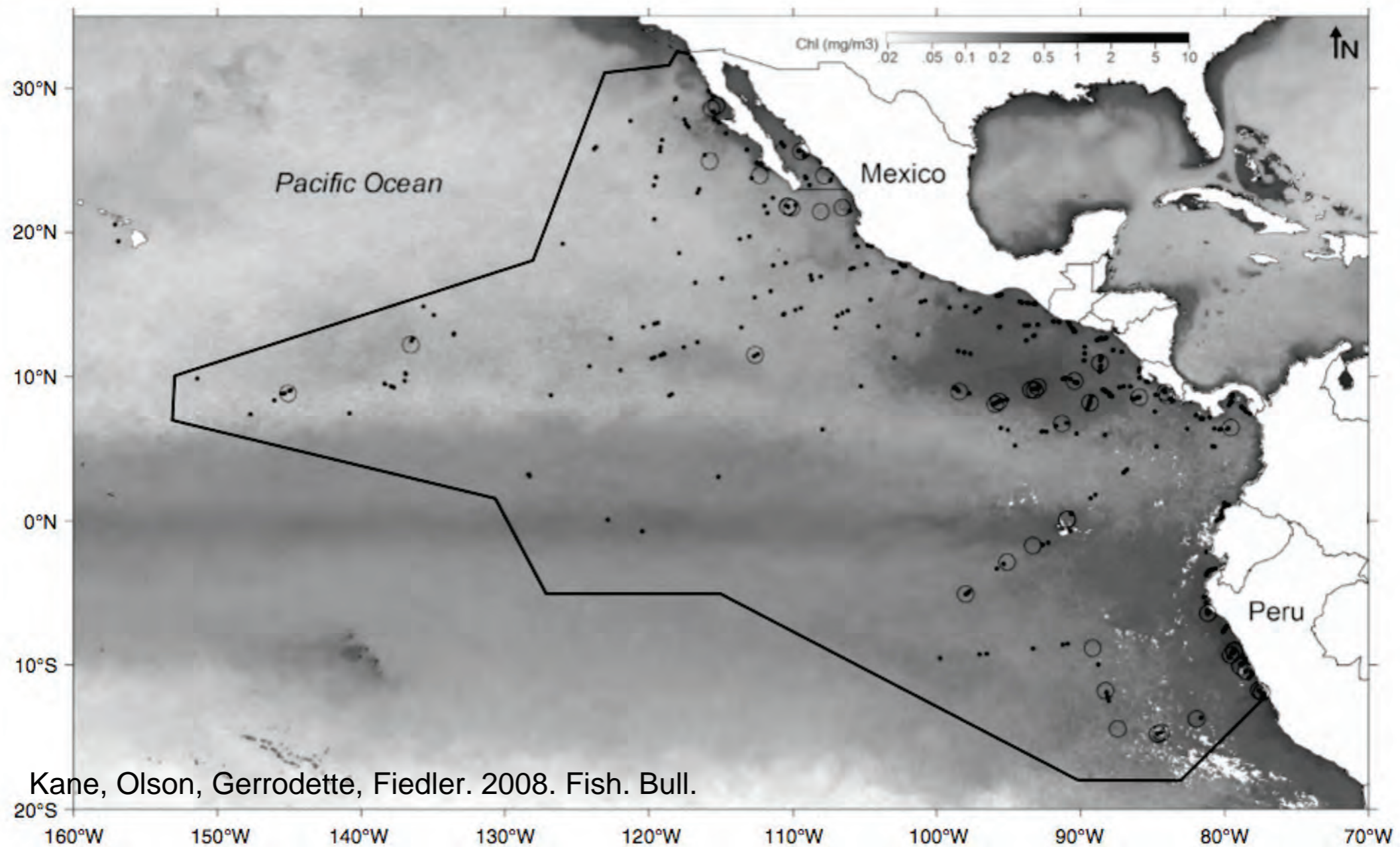
Fig. 1. Stations where the drift gill net was operated by the R/V Shinyo-maru, Hokusei-maru and Kanki-maru No. 58 during the year 1980-85. Black spots indicate the research stations and circles indicate stations where specimens of *Isistius brasiliensis* were captured. The numbers on the upper right represent those of specimens captured in each station.

*Xenobalanus globicipitis*





# *Xenobalanus* occurrence in the ETP



**Figure 1**

*Xenobalanus* presence or absence for 445 cetacean sightings in the eastern tropical Pacific Ocean (ETP) in 2003 as determined from analysis of identification photographs. Dots (●) indicate cetacean sightings with no *Xenobalanus* observed; circles (○) indicate sightings with one or more barnacles observed; the solid line indicates the border of the ETP study area. Presence or absence is overlaid on a background of graded shading representing the volume of chlorophyll-*a* (mg/m<sup>3</sup>) averaged from September to November 2003.

# Ecological Markers on Other Cetaceans



March 20 

# Ecological Markers on Other Cetaceans



May 19

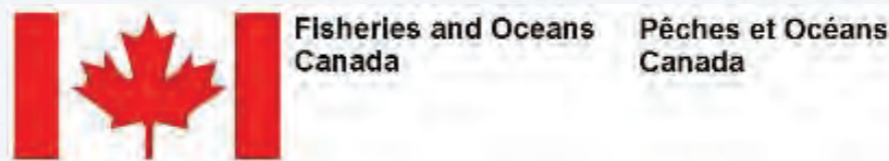
# Conclusions

- Ecological markers on minke whales in the Salish Sea are some of the first evidence that these whales make long distance migrations to warm waters each winter.
- At least some of the resident minke whales from the Salish Sea visit foraging areas that are hundreds of miles apart while migrating.
- Advancements in digital technology have made it easier to photo-identify whales and share data.
- Growth in the commercial whale-watching industry has provided opportunities for promotion of citizen science.



# Thank You

Photographic contributions to this study have been made by: Leah Thorpe, Wayne Garton and Carmen Pendleton of Stubbs Island Whale Watching, Rod Palm and Peter Schulze of the Strawberry Isle Marine Research Society, Lance Barrett-Lennard and Caitlin Birdsall of the Vancouver Aquarium, Angela Smith of Ocean Rose Coastal Adventures, James Pilkington and Eva Stredulinsky of Fisheries and Oceans Canada, Dave and Maureen Towers of Seasmoke Whale Watching, Jim Borrowman of Orcella Expeditions, Susan MacKay of Whales and Dolphins BC, Marie Fournier of the Robson Bight Warden Program, Paul and Helena Spong of Orcalab, Heidi Krajewsky of the MERS Marine Education and Research Society and Brian Gisborne of Juan De Fuca Express Water Taxi. Special thanks to the MERS Marine Education and Research Society, Prince of Whales Whale Watching and the Department of Fisheries and Oceans Canada.



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#: 101071  
Species: HW  
Date: MAR 29/13  
Location: WHITE PINE COVE  
Comments: (external wounds)  
Observer:

May 19