

Marine Mammals

Cold-Region Estuaries Workshop



Steven Ferguson

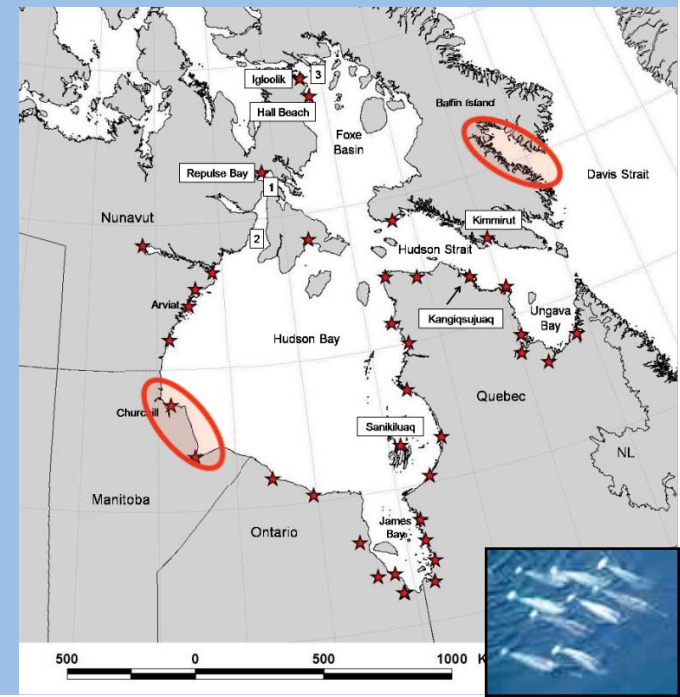


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Fisheries and Oceans
Canada



Churchill and Cumberland Sound estuary research



Theme 1: Why beluga use estuaries in summer?



Hypotheses:

- Calving
- Predation
- Food

Research projects:

- killer whale predation
- food habits
- reproduction

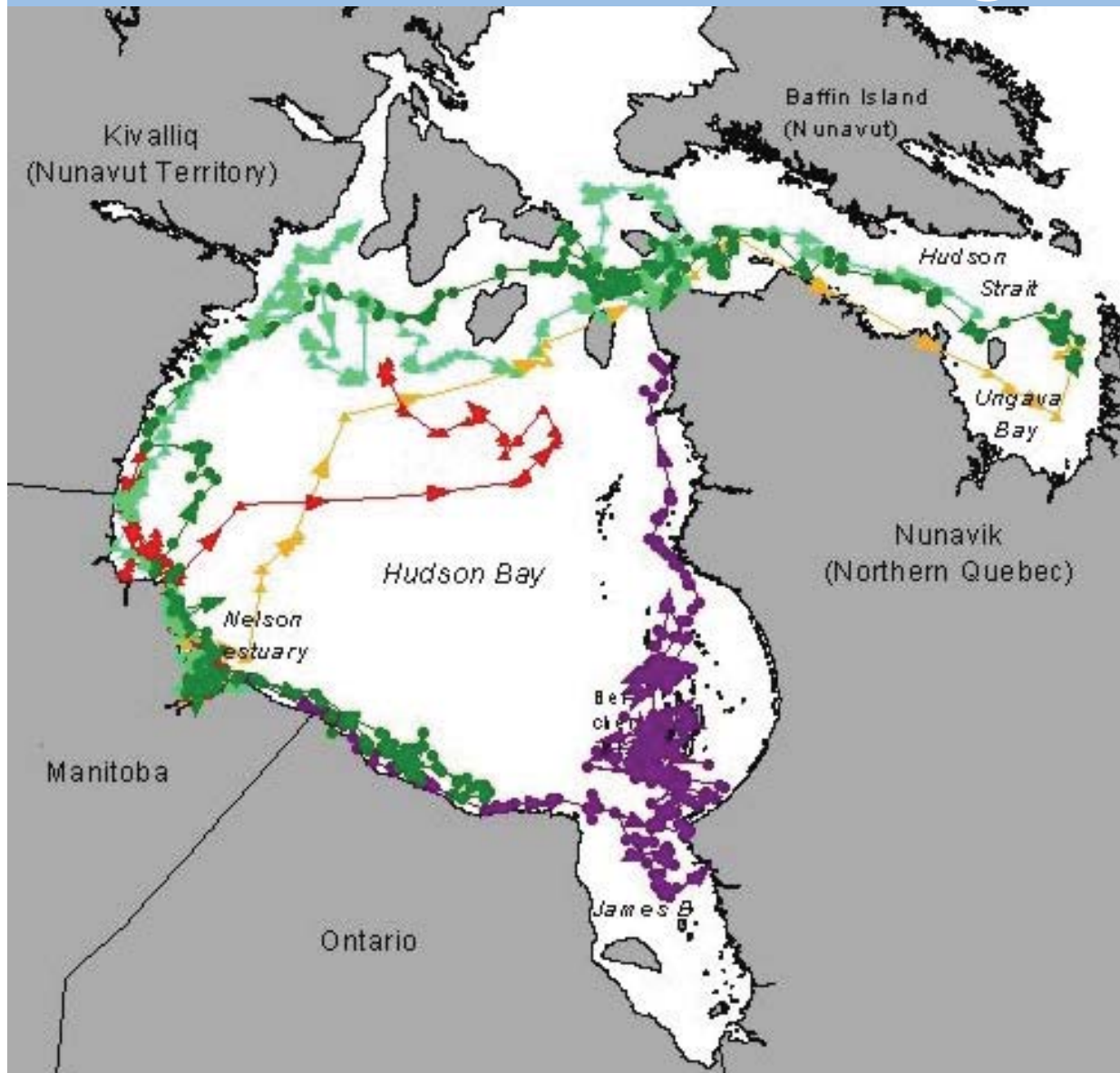


Research-Education-Ecotourism:

- Tagging beluga whales (Oceans North)
- food web knowledge
- Ocean Tracking Network (acoustic curtain and tags)



Satellite tracking of beluga



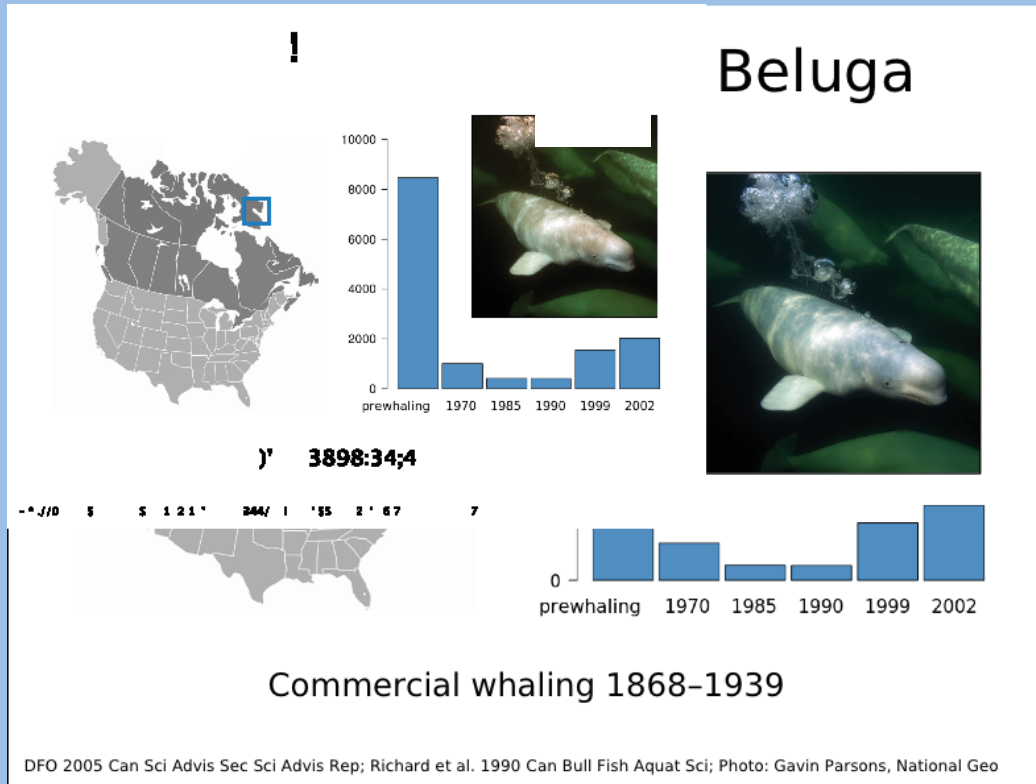
Community-based monitoring



- Food
- Reproduction
- Mortality
- Disease
- Contaminants
- Stress



Species at Risk



Commercial whaling 1868-1939

Theme 2: Marine Ecosystem Shift From polar bears to killer whales?

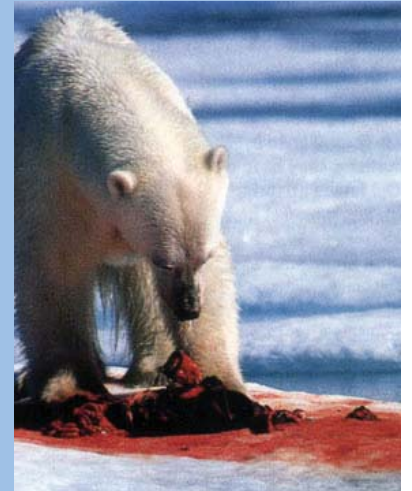


Components:

- Polar bears
- Arctic fox
- Ringed, bearded, harbour, harp seals
- Killer whales

Research projects:

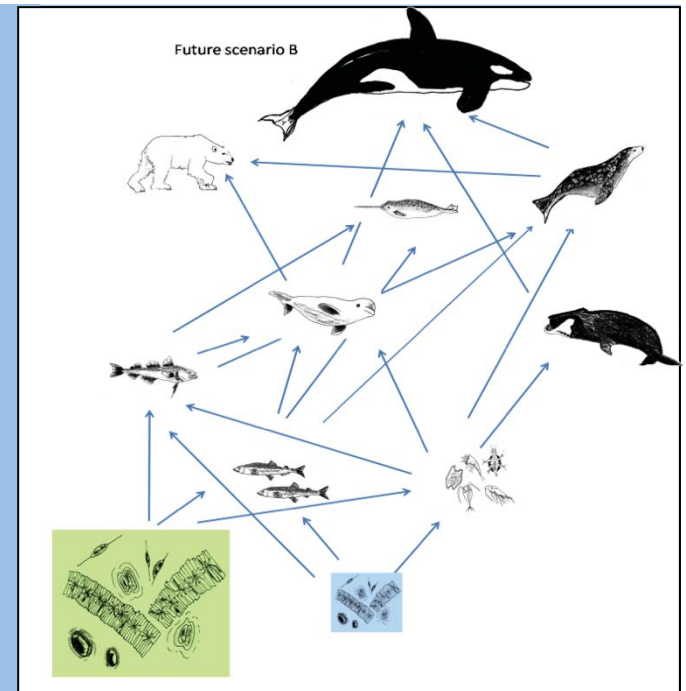
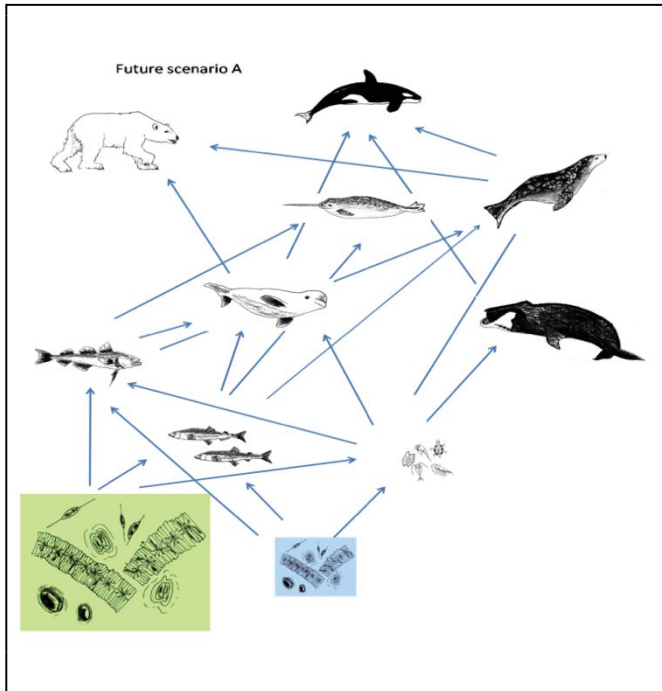
- Wapusk Parks Canada
- ArcticNet GWAMM
- Ocean Tracking Network



Research-Education-Ecotourism:

- Aerial digital photography above ice
- Snowmobile track surveys
- Small boat surveys
- Ocean scans of whales

What happens when the sea ice is gone?



- Ecosystem Change of 50% reduction in ice algae
- Future warming scenario
 - 30% marine mammals
 - 25% fish
 - 40% zooplankton
 - 20% benthos
 - +15% increase in pelagic primary production

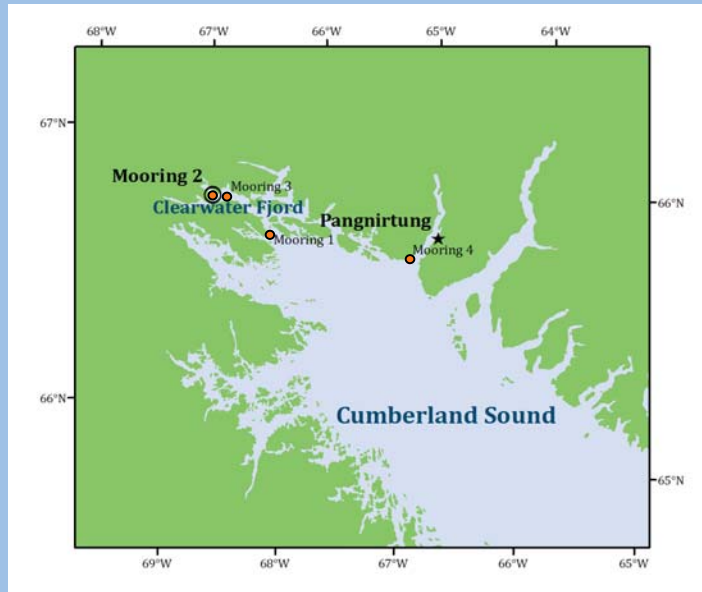
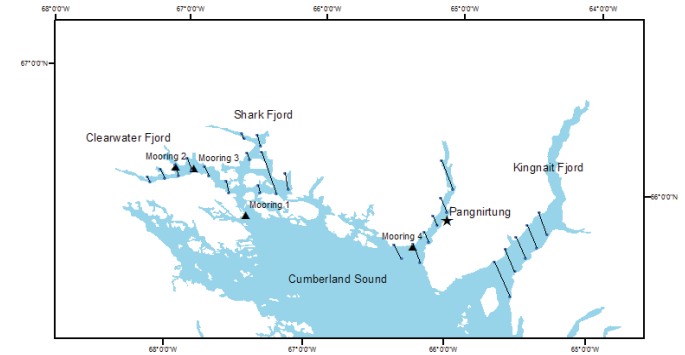


What will a new Arctic look like?

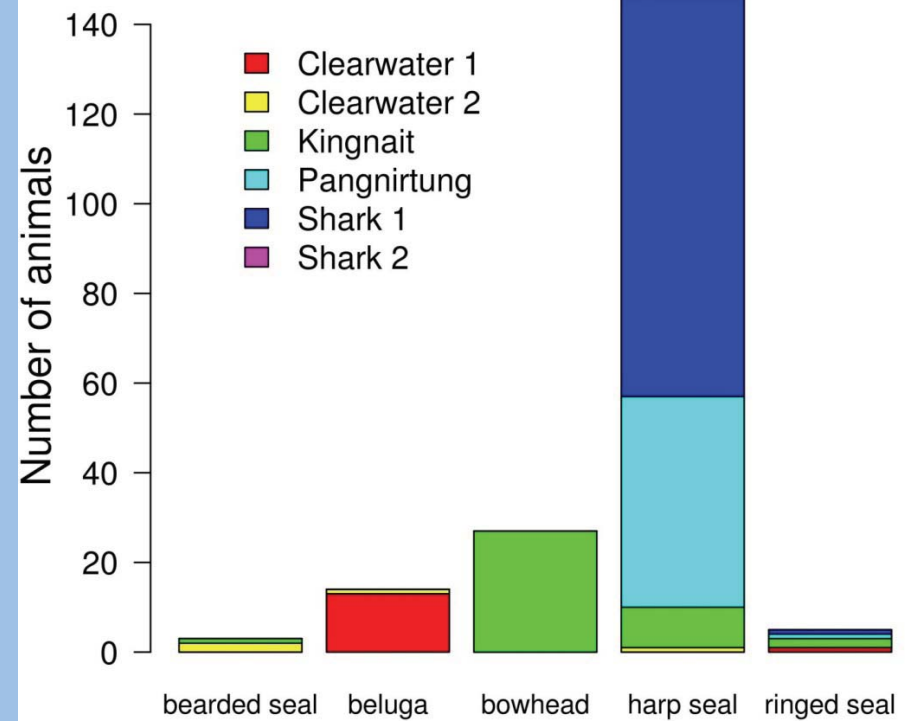


- Beluga
- Bowhead
- Narwhal

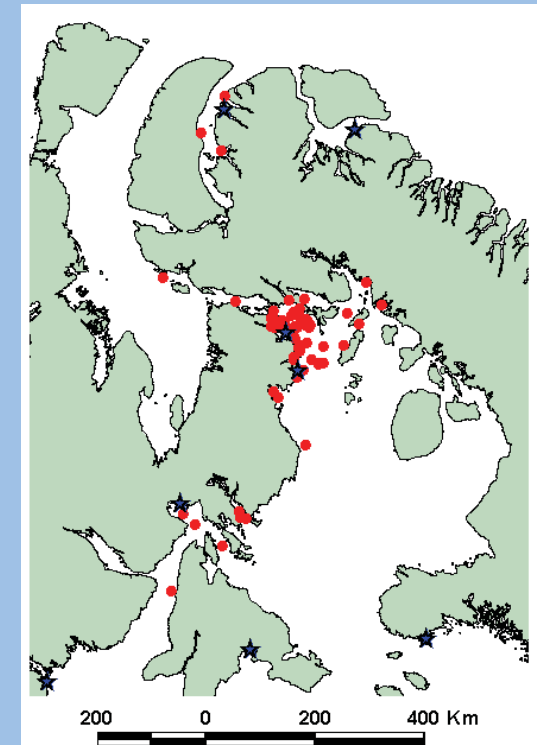
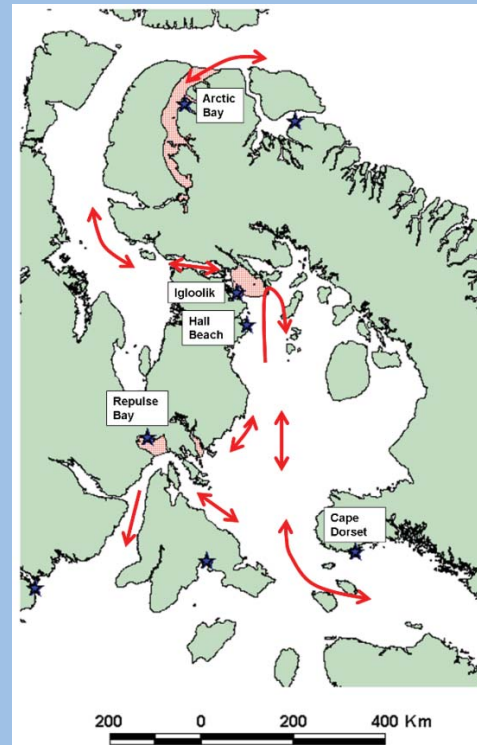
Surveys for marine mammal and birds



Fiord survey



Can Inuit knowledge help?



Theme 3: Noise

Aquatic communication/bioacoustics



Components:

- Killer whales
- Beluga
- Bearded seals
- Ringed seals
- (narwhal and bowhead)

Research projects:

- Ocean Tracking Network
- ArcticNet
- Hydrokinetics

Research-Education-Ecotourism:

- acoustic vocalization recorders
- echolocation recorders
- ship noise
- ecotourism





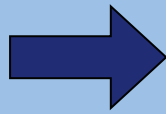
Passive Acoustic Monitoring

Deployments 2006 - present:

- Seal River and Nelson River
- Repulse Bay, Nunavut
- Rankin Inlet
- Pond Inlet
- Pangnirtung Cumberland Sound
- Arctic Bay



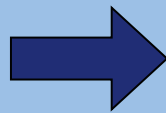
Bioacoustic of belugas



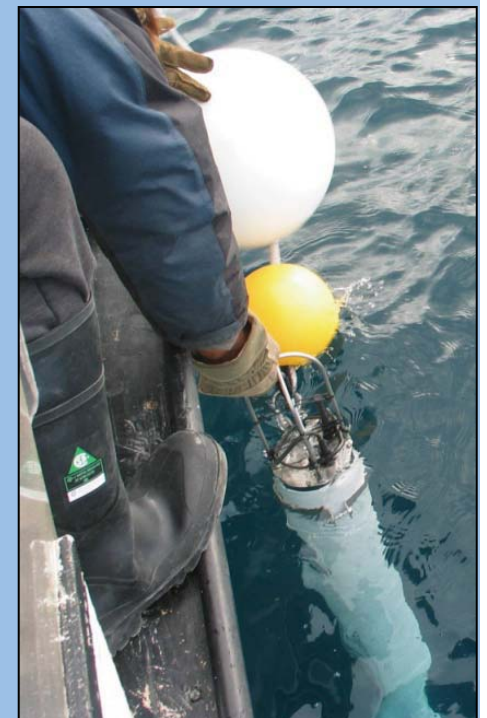
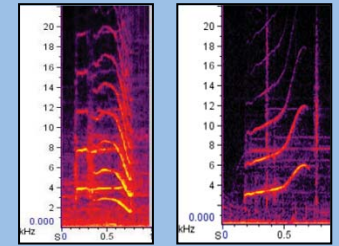
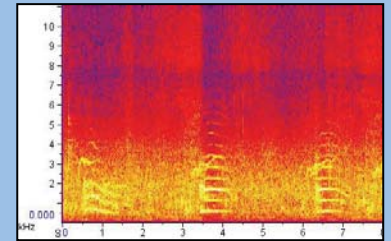
CPOD: detects

1. beluga regular clicks (associated to echolocation)

2. beluga *buzzes* (potential feeding events)

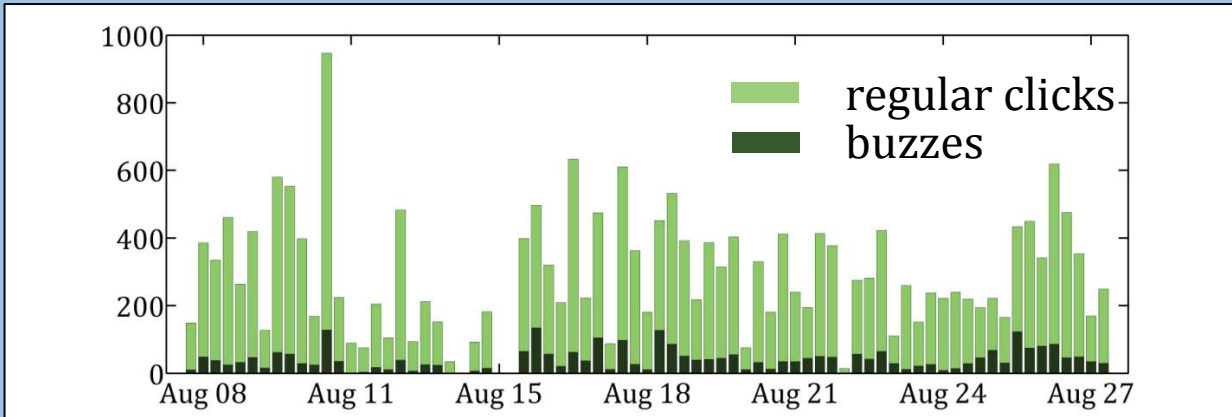


AURAL: Records whistles

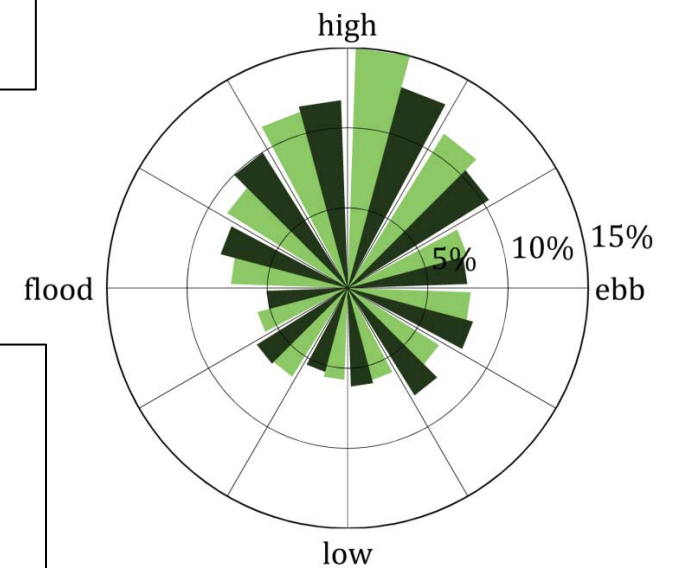
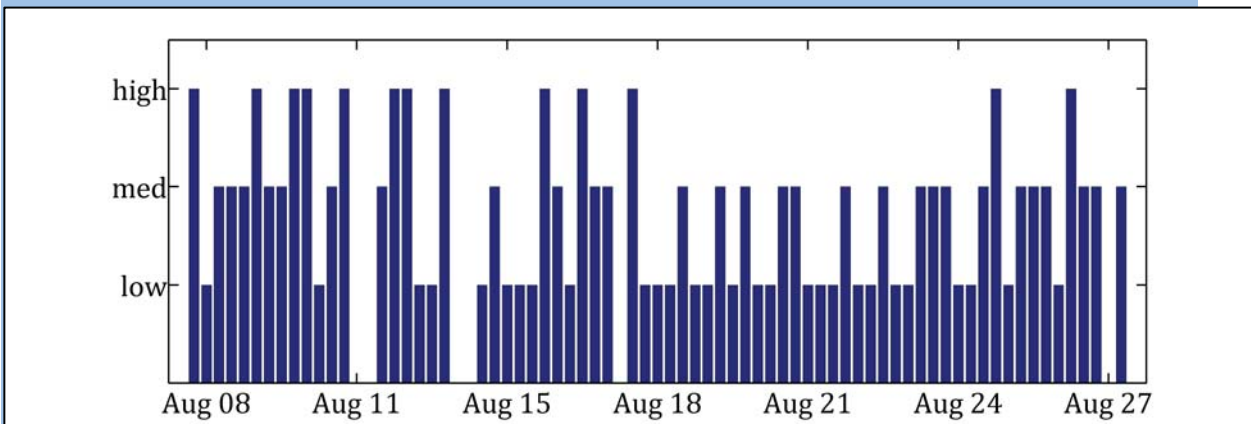


Feeding behaviour of belugas

Clicks detected by CPOD



Whistles recorded on AURAL



Questions?



Changes in ringed seals of Hudson Bay

	1990s	2000s
Percent pups	low	increased
Pregnancy rate	low	increased
Median age	high	decreased
Age at maturity/first parturition	high	decreased
Growth/length	low	increased

