

# BRIDGING KNOWLEDGE SYSTEMS

## to Monitor Beluga Whale Health & Habitat Use in the Beaufort Sea

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### INTRODUCTION

Temporal changes have been observed in beluga whales *Delphinapterus leucas* from the eastern Beaufort Sea stock. These changes may be linked to larger scale changes in the marine ecosystem.<sup>1,2</sup>

Previous scientific studies in the Inuvialuit Settlement Region (ISR) provided important information about beluga habitat use, including:

- Distribution and abundance<sup>3,4</sup>
- Association with sea ice and bathymetry<sup>5</sup>
- Timing of arrival and activity in Kugmallit Bay<sup>6</sup>
- Relationship between habitat use and mercury exposure<sup>7,8</sup>

Studies in the ISR of potential impacts of environmental change on beluga health included:

- Growth rate and blubber thickness<sup>9</sup>
- Contaminant levels and trends<sup>10,11</sup>
- Potential toxicity of contaminant exposure<sup>12-14</sup>
- Parasite presence/abundance e.g. *Toxoplasma gondii*
- Presence of antibodies e.g. *Brucella* spp.
- Pathology e.g. lesions

There are currently knowledge gaps about how environmental change may impact beluga whales in the Beaufort Sea.

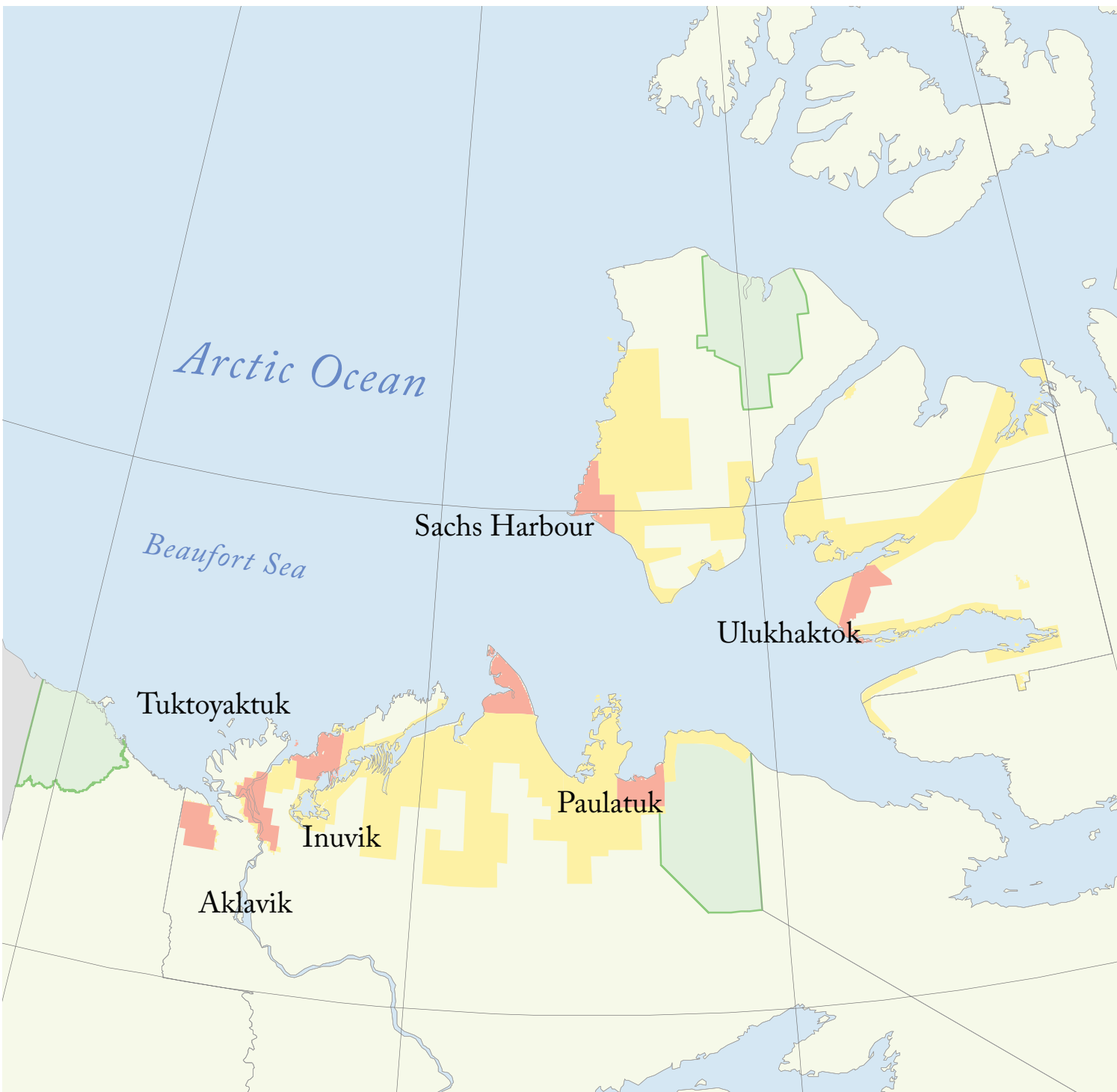
The Inuvialuit Final Agreement (IFA) states that “the relevant knowledge and experience of both the Inuvialuit and the scientific communities should be employed in order to achieve conservation”.<sup>15</sup>



*Knowledge held by the Inuvialuit provides a valuable perspective on beluga whales in a changing environment.*

### OBJECTIVES

To identify how local observations and Traditional Ecological Knowledge (TEK) can be recorded to support beluga whale monitoring in the ISR.



Map of the Inuvialuit Settlement Region (ISR)

### METHODS

	2013	2014	2015
Participants at community meetings (n)	79	81*	28
Observation forms completed (n)	13	84	119
Harvester questionnaires completed (n)	28	33	33
Participation rate for questionnaire (%)	78	87	79
Interview participants (n)	na	27	19
Total minutes of interviews	na	322	155

### Community participation in recording local observations and TEK

**Table 1**

Overview of community participation in meetings, sharing observations, interviews and focus groups in Inuvik, Paulatuk and Tuktoyaktuk between 2013 and 2015.

### Methods to document & record TEK



Identifying observations made by the Inuvialuit during beluga harvesting activities, June 2013, Tuktoyaktuk, NT. Photo credit: Megan Kimikana

Develop survey tools and questions to identify observations made about harvested and migrating whales

Open community meetings were held in Paulatuk, Inuvik and Tuktoyaktuk in June 2013 to identify observations made about harvested and migrating whales. This information was used to develop and pilot semi-structured questionnaires and survey forms for July 2013.



Lisa Loseto recording Lawrence Angusak's observations about a harvested whale at East Whitefish in July 2014. Photo credit: Kayla Hansen-Craik

Record health-related observations about harvested whales

Beluga hunters provided health observations about harvested whales at East Whitefish, Hendrickson Island and Darnley Bay. In 2015, John Noksana Sr. (from Tuktoyaktuk) assisted with recording health observations on Hendrickson Island. Interviews provided additional observations about harvested belugas made during beluga preparation.



Beluga whales travelling in Kugmallit Bay, July 2010. Photo credit: Marie Noel

Document beluga sightings and habitat use to record how belugas use the coastal environment

Community members shared their knowledge about how belugas use the coastal environment through participatory mapping. Shore-based and boat-based observations of beluga whales were recorded by community members in 2013-2015.

### RESULTS

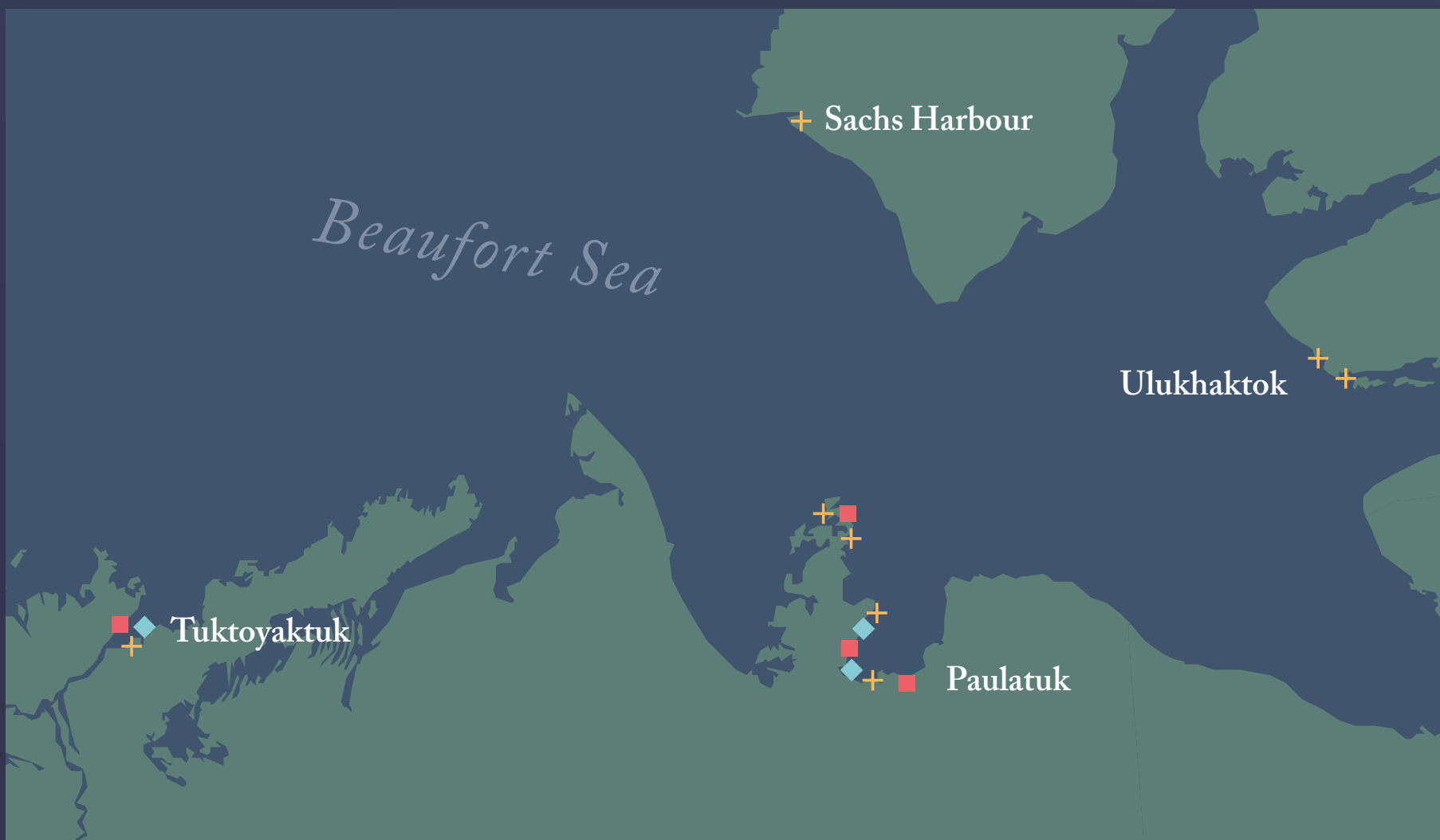
## What can local observations and TEK tell us about harvested whales?

- Whale behaviour
- Condition or quality of skin/muktuk, blubber and muscle
- Abnormalities of liver, lung and heart
- Past observations about unhealthy/sick whales
- Whether beluga meat and/or muktuk is good to eat



*Delphinapterus leucas*

## What can local observations and TEK tell us about beluga habitat use?



Beluga harvest sites from 2013 to 2015 as shared by hunters in the ISR.

- Expected location and timing of migration
- Expected location of calving and feeding areas
- Observed feeding or association with fish
- Observed composition of whale groups
- Association between beluga whales and environmental factors e.g. tide, water temperature, salinity
- Association between beluga whales and other species
- Changes in habitat use over time

### DISCUSSION

## How could local observations and TEK be included in future beluga monitoring?



Anthony Pokiak, Verna Pokiak, Molly Nogasak, Kayla Nuyavak, Sonja Ostertag, John Noksana Sr., Jimmy Carpenter, Fred Wolki, Rex Noksana and John Tedjuk participate in a focus group in June 2015 in Tuktoyaktuk. Photo credit: Carie Hoover

- Characteristics of harvested whales could be recorded by whale monitors in partnership with hunters.
- Observations about abnormalities in meat or muktuk could be documented and shared by harvesters and their families.
- Surveys could provide general information about beluga presence/absence and habitat use.
- Focus groups and interviews with key TEK holders would provide greater depth and context about potential changes in beluga health and habitat use.
- Inuvialuit knowledge and observations could enhance our understanding of contaminant dynamics in beluga and how they could affect beluga health.

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