TARIUM NIRYUTAIT MPA 2016 ANNUAL REVIEW

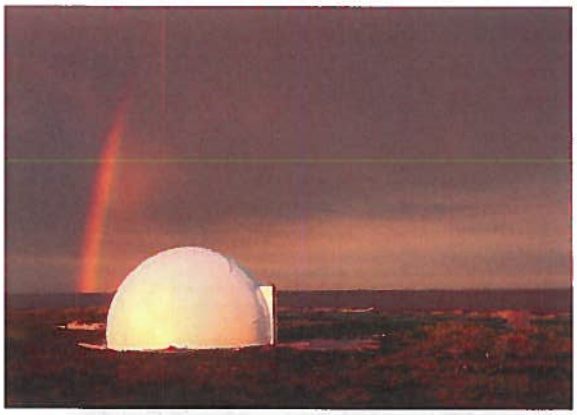
January 2017

The Tarium Niryutait Marine Protected Area (TNMPA), is the Arctic's first MPA (Fig. 1) and provides an important summer habitat for one of the world's largest populations of beluga.

The TNMPA was established to monitor and sustain the Beaufort Sea beluga populations and their supporting ecosystems, while preserving Inuvialuit cultural and spiritual connections to the land.

TNMPA Conservation Objective
conserve and protect beluga whales and other marine species, their habitats, and their supporting ecosystem.

Monitoring of the TNMPA is based on analyzing a set of indicators (ecological, social, economic, and governance) by Fisheries Joint Management Committee (FJMC) and Fisheries and Oceans Canada (DFO)



Beluga monitoring dome at Hendrickson Island. Photo Credit: Shannon McPhee.

Figure 1. *The TNMPA consists of three sub-regions covering approximately 1800 km^2: Niaqunnaq, Okeevik, and Kittigaryuit*

Inside this issue:

Special points of interest:

- Beluga Regional Advisory Process (RAP) in Inuvik, NT January 2017.
- WAMPA Steering Committee elects new Chair John Day
- Arctic coastal water temperatures were some of the warmest in Canada

2016 TNMPA Projects

Below are some of the current and on-going DFO related research and monitoring activities that occurred in the TNMPA.

Research:

- Beluga habitat use of Kugmallit Bay defined by vocalization and Kugmallit Bay Weather and Oceanographic habitat characterization; led by DFO
- Coastal Erosion and Deposition Research—Tuktoyaktuk; led by Natural Resources Canada (NRCan)
- Health Assessment of the Beaufort Sea Beluga Whale in the ISR; partnership between DFO, FJMC, University of Manitoba, Canadian Wildlife Health Cooperative, Faculte de medicine vetinaire, Universite de Montreal, University of Saskatchewan
- Beluga Diet and Oxygen capacity/diving physiology; led by DFO and Emily Choy (University of Manitoba)

Monitoring:

- Coastal fish and beluga food web, energy and habitat characterisation (using stable isotope and fatty acids) at Shingle Point under Arctic Coastal Ecosystem Studies (ACES); led by DFO (Table 1)
- Coastal harvest monitoring of Dolly Varden ; led by DFO (Table 1)
- Community-based beluga harvest monitoring ; led by the FJMC in partnership with HTCs, and DFO (Table 3)
- Beluga knowledge co-production and the 'Beluga App'; led by DFO
- Traditional Ecological Knowledge (TEK) collection of Shingle Point fishes (Fig. 2) and TNMPA beluga led by Jasmine Brewster and Sonja Ostertag
- ISR Indicator inventory and assessment for the Marine Ecosystem: led by Carie Hoover (DFO, and the University of Manitoba)

Summer Tourism:

- River tours to Tuktoyaktuk with visits to camps by Tundra Tours

2016 Shingle Point team

Hendrickson Island 2016. Photo Credit Emilie Couture

WAMPA Update

The Western Arctic Marine Protected Areas (WAMPA) was created to coordinate management of the TNMPA

The WAMPA steering committee consists of members from FJMC, DFO and one community representative for each MPA

Arctic Coastal Ecosystem Study (ACES) & Dolly Varden Char Monitoring Program (Shingle Point)

Fish Data

Table 1. *Species of fish captured at Shingle Point , YK as part of the ACES and Dolly Varden Char monitoring programs .*

Common Name	Traditional Name	Habitat
Arctic Cisco	Herring	Anadromous
Arctic Flounder	Flatfish	Freshwater/marine/ brackish
Broad Whitefish	Whitefish	Anadromous
Dolly Varden Char	Char,Trout	Anadromous
Fourhorn Sculpin	Devil fish	marine
Least Cisco	Herring	Anadromous
Saffron Cod	Tom cod	Brackish
Starry Flounder	Flatfish	Freshwater/marine/ brackish

28 tags were returned through the Dolly Varden Program

Shingle Point Traditional Knowledge report available now

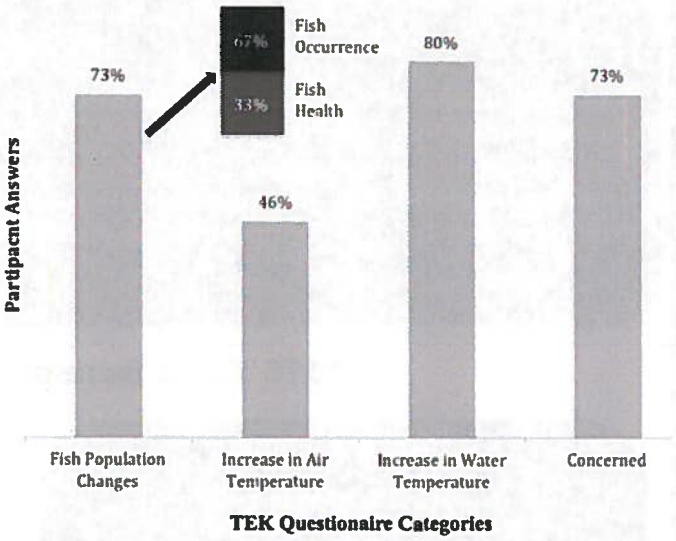


Figure 2. *Results (%) of participants answers to the TEK questionnaire from Shingle Point, YT for the 2015 study. Details on results can be found at http://publications.gc.ca/collections/collection_2016/mpo-dfo/Fs97-6-3174-eng.pdf*

Figure 3. *Number of salmon captured in regions within the TNMPA*

Arctic Salmon

Karen Dunmall

Over 400 salmon were provided to the Arctic Salmon project from across the Canadian Arctic in 2016. This includes close to 50 that were harvested in or near the TNMPA. These fish will be processed at DFO in Winnipeg shortly, and samples taken for additional analyses.

Health Assessment of the Beaufort Sea Beluga Whale in the Inuvialuit Settlement Region (Hendrickson Island)

Emilie L. Couture, Rozenn Le Net and Stéphane Lair, Canadian Wildlife Health Cooperative, *Faculté de médecine vétérinaire, Université de* Montréal

Emily Jenkins, and Rajnish Sharma, Western College of Veterinary Medicine, University of Saskatchewan,

Shannon McPhee and Lisa Loseto, Central and Arctic Region, Freshwater Institute, Fisheries and Oceans Canada

Project Objective

Changes in the Arctic ecosystem can affect the health of Beaufort Sea beluga which are important indicators of ecosystem health. The purpose of this two year program was to perform a baseline health assessment of beluga harvested. These observations will be compared with findings from the St. Lawrence Estuary beluga, which should serve as a baseline against future changes, and help us understand what the issues are with the endangered southern population.

2016 Field Season (July 6th-July 20th)

Project Summary:

- Overall the beluga appeared to be in very good health and body condition.
- There are few weights recorded for beluga sampled from the Beaufort Sea population. Additionally, these whales fall out of the curve for SLE whales (Figure 4)
- This highlights that we cannot compare the populations, suggesting we need to develop our own condition curve with weight.

2016 science team weighing a beluga of ~1500kg. Photo credit Jasmine Brewster

Table 2. *Two whales were weighed successfully. An adjustment of weighing technique allowed to perform the weighing in under 20 minutes.*

Beluga Sex	Weight (Kg)
male	1058
male	1147

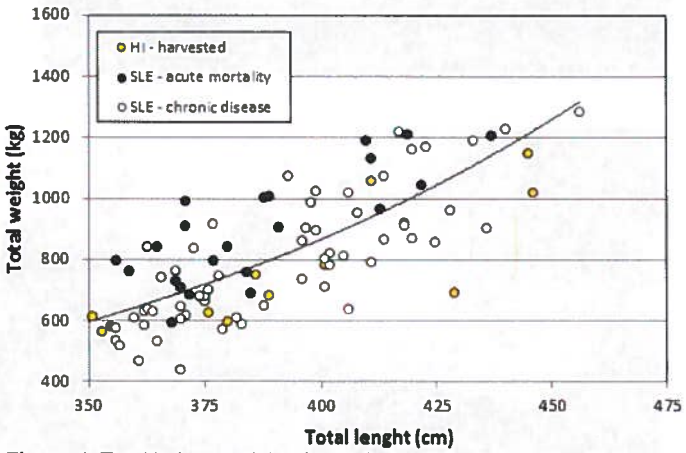


Figure 4. *Total beluga weights from whales collected at Hendrickson Island (HI) and St. Lawrence Estuary (SLE) populations*

Lets Get Weighing!

Currently, data is lacking on beluga weights from the Beaufort Sea population (Fig. 4). Weight informs on important biological data such as body condition and growth in a population, and is important in monitoring the Beaufort Sea beluga

2016 Harvest Data

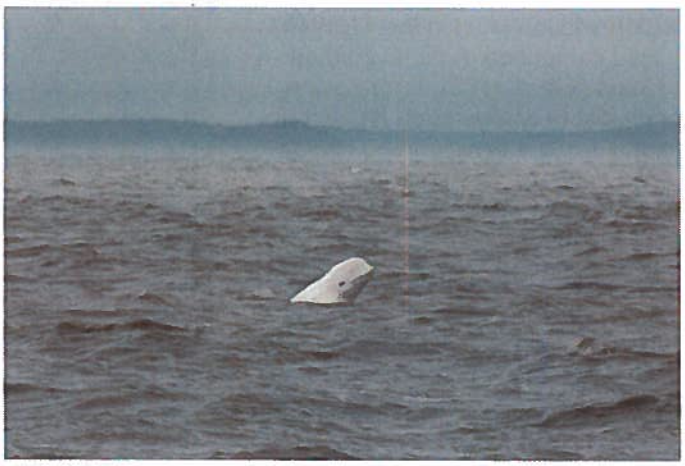
Beluga Data

Table 3 *Beluga harvest numbers collected through FJMC beluga monitoring program in each of the TNMPA areas. Each of these whales was sampled by a community monitor.*

Location	Beluga Harvested
Hendrickson Island	14
Tuktoyaktuk Harbour	4
East Whitefish	17
Kendall Island	6
Aklavik	2
Total	***43***

Harvest data from the FJMC. Contact for questions : fjmc-rb@jointsec.nt.ca

2016 science team sampling beluga. Photo credit Jasmine Brewster



Little "spy hopping" by a Beaufort beluga. Photo credit Emilie Couture

Break-up Summary

Table 4. *Date of break-up of the land fast ice bridge across Mackenzie Bay and Kugmallit Bay. Ice break-up dates can inform on when beluga arrive in the TNMPA*

TNMPA Region	Break-up Date
Mackenzie Bay	June 7th
Kugmallit Bay	June 15th

2016 Hendrickson Island Team

Large Vessel Traffic

2016 vessel travel in the TNMPA was comprised of the Canadian Coast Guard, NTCL barges, and participants of Operation Nunakput; including Conservation and Protection and Royal Canadian Mounted Police. This data was captured and made possible by the Automatic Identification System (AIS).

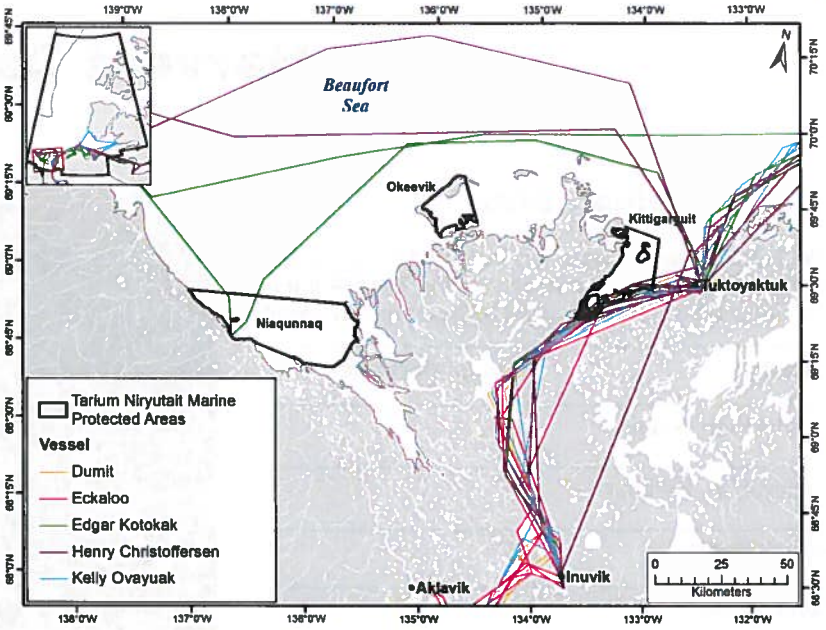


Figure 5. *Map of large vessel routes with the TNMPA in 2016*

Working Together

Table 5. *This year, management and community based monitoring in the TNMPA employed approximately*

Positon	Shingle Point	Hendrickson Island	East Whitefish
TEK Holder	-	John Noksana Sr.	-
Youth	Jesse Pascal	Lionel Kikiak	Andrew Gordan Jr., Jesse Pascal, Edwin Amos
Monitor	Jordan McLeod, Dennis Arey	Jonas Lucas, Rex Noksana, John Noksana	Linly Day
Contractor's (e.g., boat drivers, cook, etc.)	North-Write Airways	James Keevik, James Pokiak, Jimmy Kalinek	Jimmy Kalinek, Rosa Day

East Whitefish 2016. Photo Credit: Corrine Bullock

Surveillance and Compliance

Two open water patrols by DFO Conservation and Protection officers (C&P) in Kittigaruit and one in Niaqunnaq were done this year.

C&P work in the TNMPA in 2016:

- participate in FJMC Community Tour
- Aerial Surveillance flight of TNMPA onboard Transport Canada Aerial Surveillance plane
- Shingle Point Vessel Patrol
- Attempted Vessel Patrol to Hendrickson Island (Beluga & MPA), unable to reach Hendrickson due to weather
- Logistical Support to DFO Science
- Respond to occurrences as required

Monitoring Beluga Habitat Use, Oceanographic Parameters and Coastal Environmental Conditions in the TN MPA: Joint initiative with DFO, NRCan and FJMC

Lisa Loseto, Central and Arctic Region, Freshwater Institute, Fisheries and Oceans

Dustin Whalen, Geological Survey of Canada, Natural Resources Canada,

Purpose of Project

Install passive sensors to document beluga presence and environmental conditions and change throughout the summer season June-August. This research provides more detailed look at the environmental parameters (wind, waves, salinity and temperature) that may drive beluga whale movement and migration patterns within the TN MPA, specifically Kugmallit Bay.

Instruments

- Up to 5 seabed moorings were installed ~ 5 km apart. Instruments included a CTD, wave/pressure sensor, ADCP, PH sensor, sediment trap and a hydrophone
- A cable observatory was installed at one of the stations. This allowed for live broadcasts of these critical weather and oceanographic conditions.
- Live broadcast allowed for sharable scientific data, and provide real time weather conditions for safe travel

Data could be viewed through a publically accessible webpage. (http://dataservices.campbellsci.ca/nrcan/index.php). On average webpage was view 5 times a day

Working Together

DFO (Lisa Loseto, Shannon Mcphee) and NRCan (Dustin Whalen) staff worked in collaboration with :

- Jessi Pascal- Fisheries Joint Management Committee
- Andrew Gordon Jr– Aurore Research Centre
- Edwin Amos – Aurora Research Centre
- Brent Jewer – Gwich'n Great Slave Helicopters

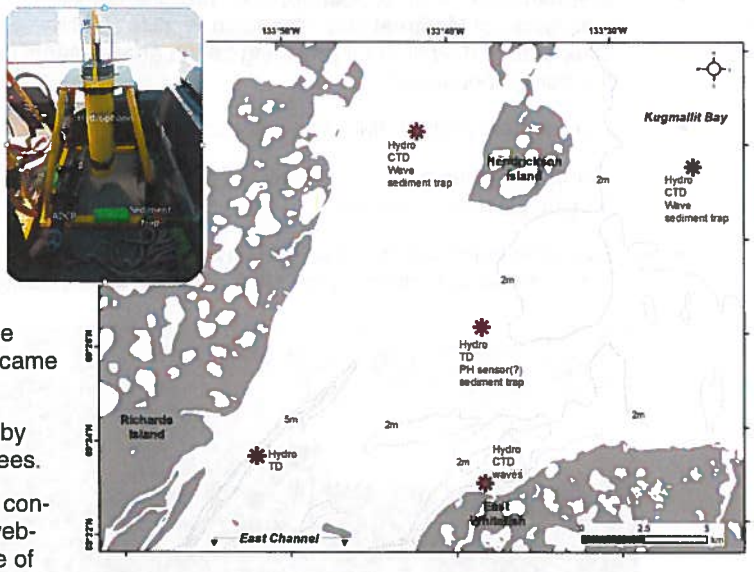


Figure 6 *Map of study area showing location of moorings as they were deployed in June 2016*

Highlights

Four significant storms occurred during the season that brought offshore winds into the bay. During these periods of prolonged NW winds, waters in the bay became colder and saltier.

An unprecedented July storm increased water levels by 1.2 m and decreased water temperatures by 14 degrees.

In addition the real-time broadcasts of environmental conditions sparked public interest in mid July when the website revealed that the waters of the TN MPA were one of the warmest in the country (22 degrees), as reported in News North.

On the Horizon

- Community based monitoring will continue in 2017.
- The same indicators from 2016 will be used in 2017 in an effort to see trends over time.
- The Beluga RAP will focus on sharing information on beluga is planned for January 2017. Many of the research projects occurring in the TNMPA will be featured.
- Connie Blakeston, Bethany Schroeder, Shannon McPhee, Jasmine Brewster and Corrine Bullock will be touring the ISR communities and Kitikmeot region in Winter 2017 for MPA Network planning.

2016 Hendrickson beluga vertebrae Photo Credit: Emilie Couture

BEAUFORT SEA PARTNERSHIP

We're on the Web!

Beaufortseapartnership.ca

Thank You

DFO Oceans would like to thank the following:

- Contributors from DFO Science who provide great ecological data
- DFO C&P for supporting the MPA
- Contributors from NRCan for providing excellent ice break up data in real time
- Stephan e Lair, Emilie Couture, and Rozenne LetNet (University of Montreal and Canadian Wildlife Health Cooperative (CWHC)) for providing health assessments on the beluga population
- Our partners at the FJMC who work so hard on the TNMPA
- Community members from Inuvik, Tuktoyaktuk, and Aklavik for biological data collection
- Everyone in the communities of Aklavik, Inuvik, and Tuktoyaktuk for supporting the MPA and making it a reality

Shingle Point . Photo credit Jasmine Brewster

Anguniaqvia niqiqyuam MPA

The newest Western Arctic marine protected area was designated November 16th 2016. The boundary encompasses *Darnley Bay and the Cape Parry Migratory bird Sanctuary*

State of the MPA Report

We are currently preparing a Assessment of the TNMPA from 2010-2016. The report will be available in 2018

Questions?

Contact: Jasmine Brewster
MPA Biologist, Oceans Management/DFO
Phone: 867-777-7516
Fax: 867-777-7501
E-mail: jasmine.brewster@dfo-mpo.gc.ca