

Arctic Marine Sciences

Arctic and Aquatic Research Division

Fisheries and Oceans Canada

Contacts:

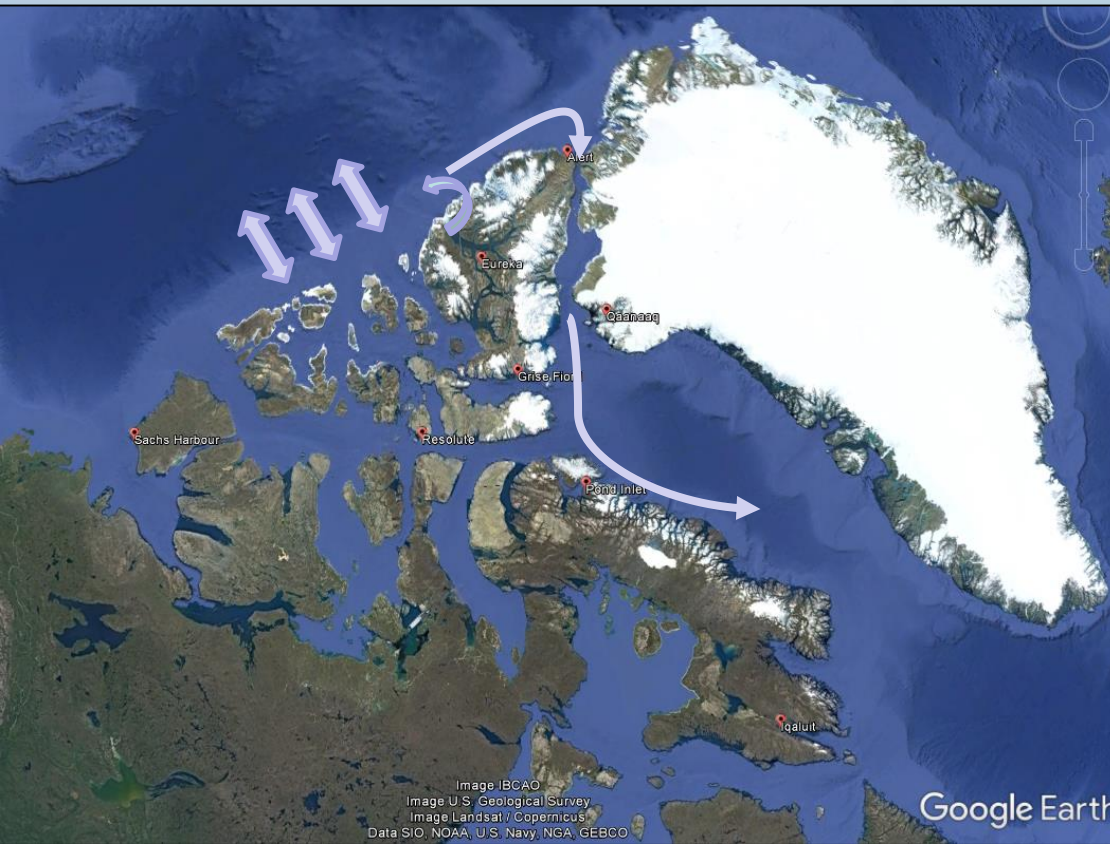
- Lianne Postma, A/Division Manager, Arctic and Aquatic Research, Fisheries and Oceans Canada (DFO-Winnipeg)
- Jason Stow, Section Head, Ecosystem Impacts Section, AARD, DFO – Winnipeg
- New DFO Arctic Region – became operational in 2020

Major Projects

- Multi-disciplinary Arctic Program (MAP) – Last Ice, Lead: Christine Michel
- Knowledge and Ecosystem Based Approach to Baffin Bay (KEBABB), Lead: Christine Michel
- Eastern Arctic Multi-Species Survey, Lead: Kevin Hedges
- Canadian Beaufort Sea – Marine Ecosystem Assessment, Lead: Andrea Niemi



MAP – Last Ice



- Unique Arctic ecosystem & least studied region of the Arctic
- Window into the future: Multi-year Ice (MYI) & First-Year Ice (FYI)
- Downstream impacts & interconnections



Objective: Characterize the multi-year ice High Arctic ecosystem

How does multi-year sea ice influence the structure and functioning of the LIA and Arctic marine ecosystems?

.... How is it changing?



MAP – Last Ice

2019 Field Campaign (April/May):

- >300 ice cores collected
- 2- month time-series of chemical, biological and physical data in sea ice and water column
- Unique biodiversity in MYI



@ Pierre Couperl



@ Pierre Couperl

Pitch: 2.2

11.05.2018

14:37:59

Roll: 5.4

Heading: 16.3

Depth: 3.6

Pitch: 19.2

11.05.2018

Roll: -18.3

Heading: 83.4

15:14:19

Depth: 6.5





COVID-19 update

- Cancellation of the MAP- Last Ice 2020 field campaign will impact scientific deliverables in support of Tuvaijuittuq. Therefore, postponement to 2021 emerges as a possibility.
- The 2020 MAP-Last Ice spring field season was planned around three key scientific foci, complementing earlier field campaigns and supporting ecosystem knowledge for Tuvaijuittuq:
 - spatial characterization and ecosystem knowledge of the diverse sea ice habitats found in the region;
 - long-term monitoring of sea ice and ocean conditions, with the deployment of automated instrumentation (sea ice tethered mooring) that would also provide spatial coverage as the mooring drifts with the ice;
 - enhancement of the fish and benthic program, with increased under-ice fishing efforts and a structured AUV (autonomous underwater vehicle) program to explore benthic habitats.



KEBABB

Knowledge and Ecosystem Based Approach to Baffin Bay

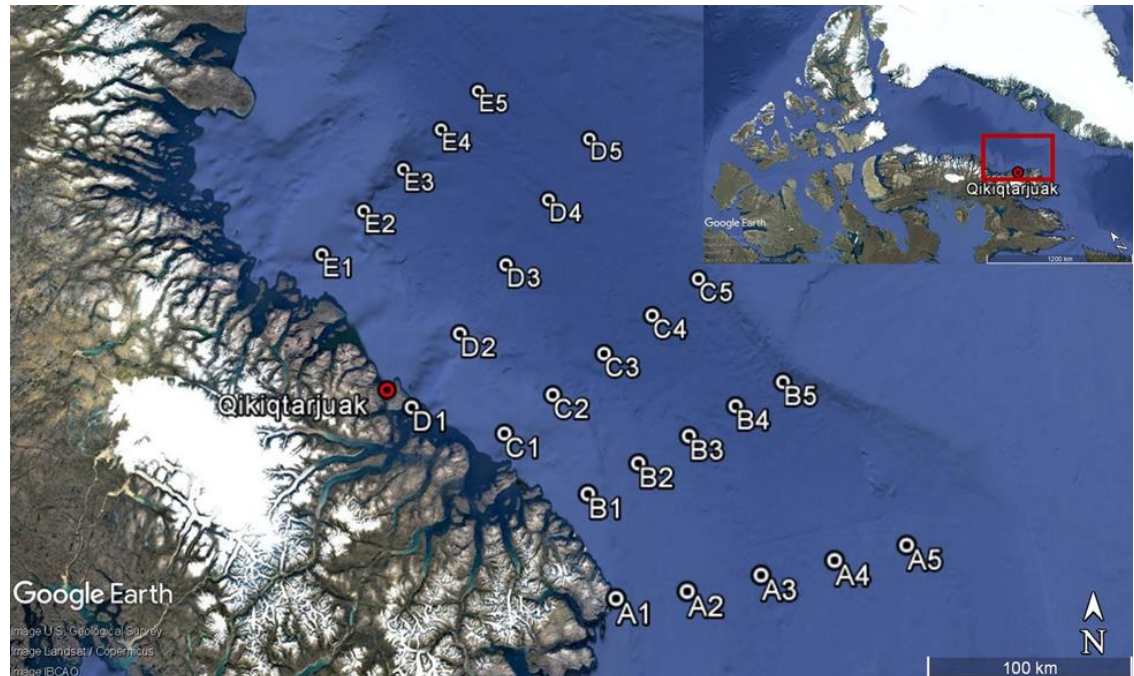
> Characterizing the variability and trends
in physical, chemical and biological
oceanographic conditions and their
influence on fisheries resources in western
Baffin Bay



Year 1, August 22 – 31, 2019

5 transects, 25 stations

- Physical and chemical oceanic conditions
- Abundance and diversity of primary producers
- Abundance and composition of zooplankton
- Benthic ecology and biogeochemistry
- Ecosystem health and interactions





COVID-19 update

- Cancelled for 2020
- Working on the data integration from measurements taken in 2019
- One interesting result – extensive and intense sub-surface chlorophyll a maximum at the shelf break.
- Hopeful that this program will continue in 2021



Eastern Arctic Multi-Species Survey Program

Multiple platforms for inshore and offshore surveys (chartered vessels – funds are secured annually) used to support DFO Results Framework:

- **Fisheries**
 - fisheries sustainably managed
 - Science informs management decisions
 - Improved relationships with and outcomes for Indigenous people
- **Aquatic Ecosystems**
 - Ocean science informs management decisions

Paamiut



Nuliajuk



William Kennedy





New Vessel - TARAJOQ

- Hoping to be in service for surveys in 2021, though likely with reduced survey days
- Collaborative Agreement with GINR (20 years now)
- We are excited about the arrival of this vessel in Canada too!





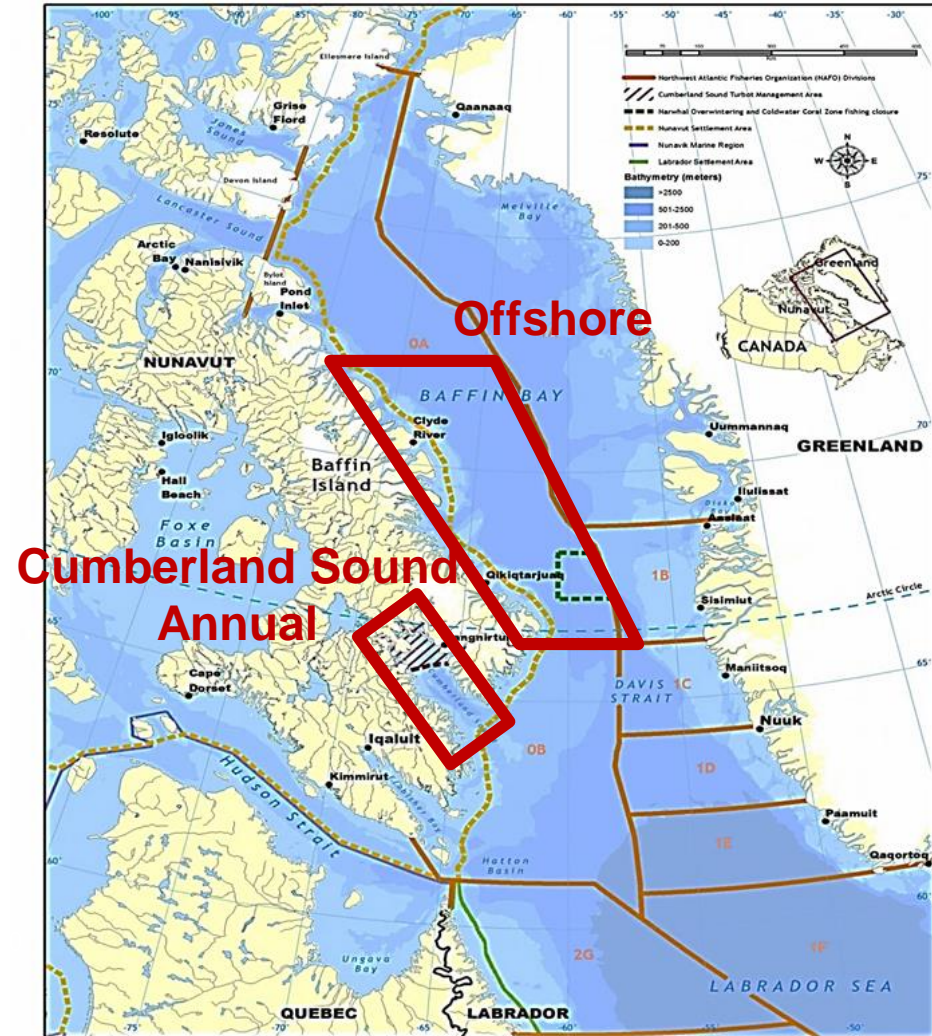
Eastern Arctic Multi-Species Survey Program

Annual offshore survey:

- Bottom trawl
- Greenland Halibut stock assessment
- Biodiversity monitoring
- Ecological research
- Species ecology
- Habitat use
- Movement patterns
- Trophic structure
- Community structure

Annual Cumberland Sound survey

- Longline Greenland Halibut fishery
- Stock assessment
- Ecological research

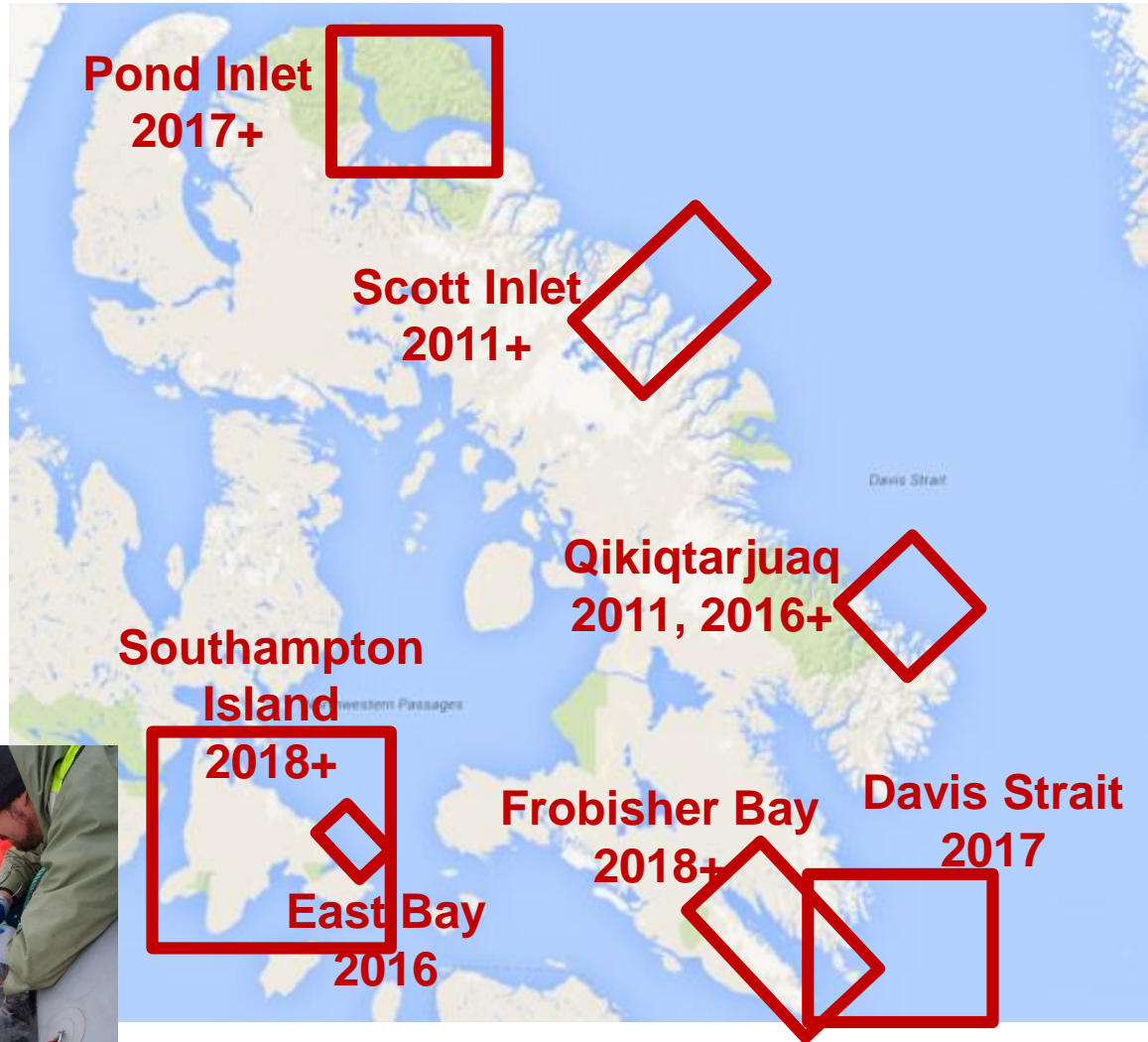
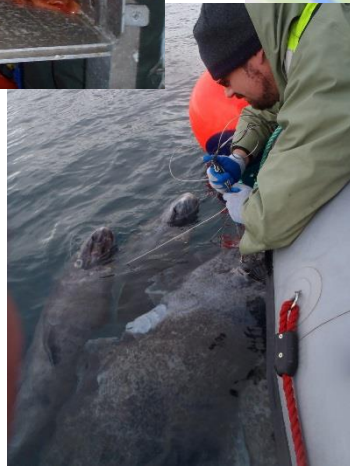




Eastern Arctic Multi-Species Survey Program

Inshore surveys

- Development of community-based fisheries
- Biodiversity baseline surveys
- Ecological research

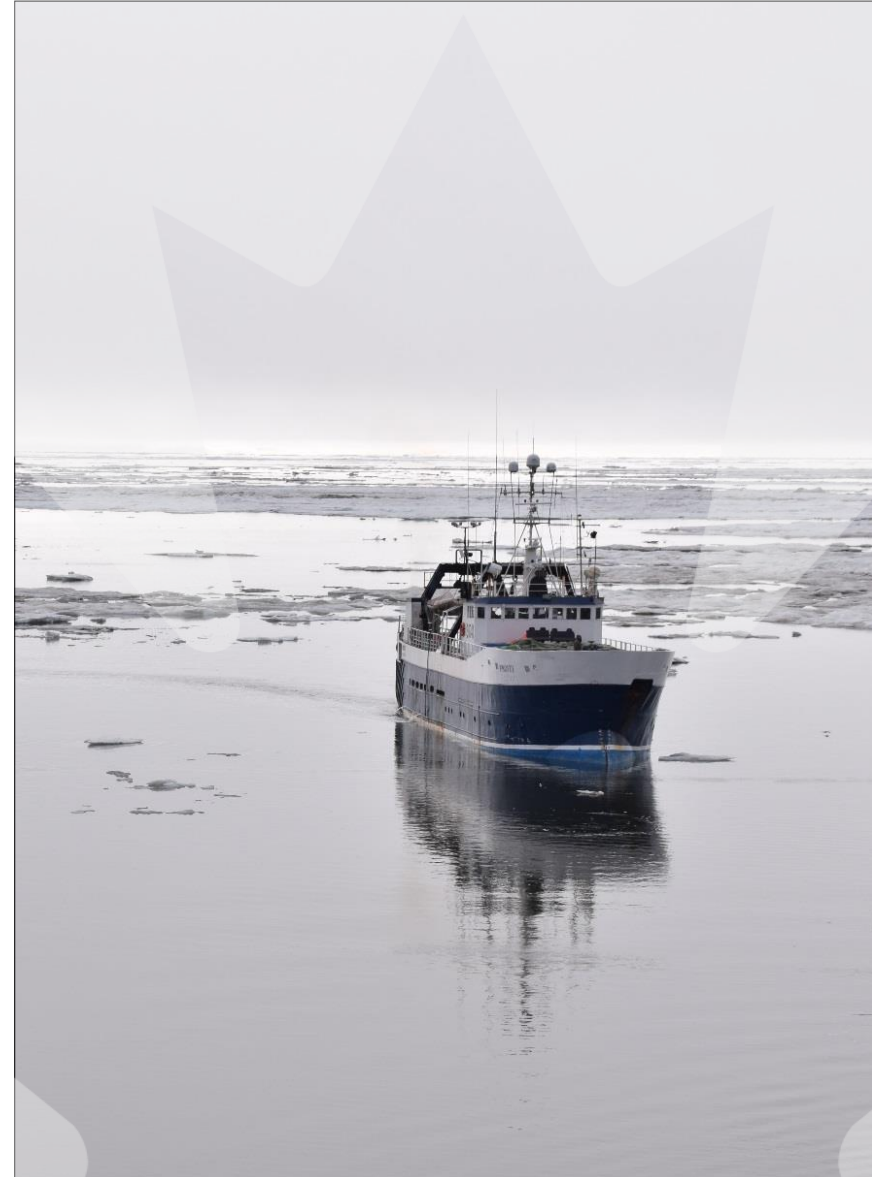




CBS-MEA

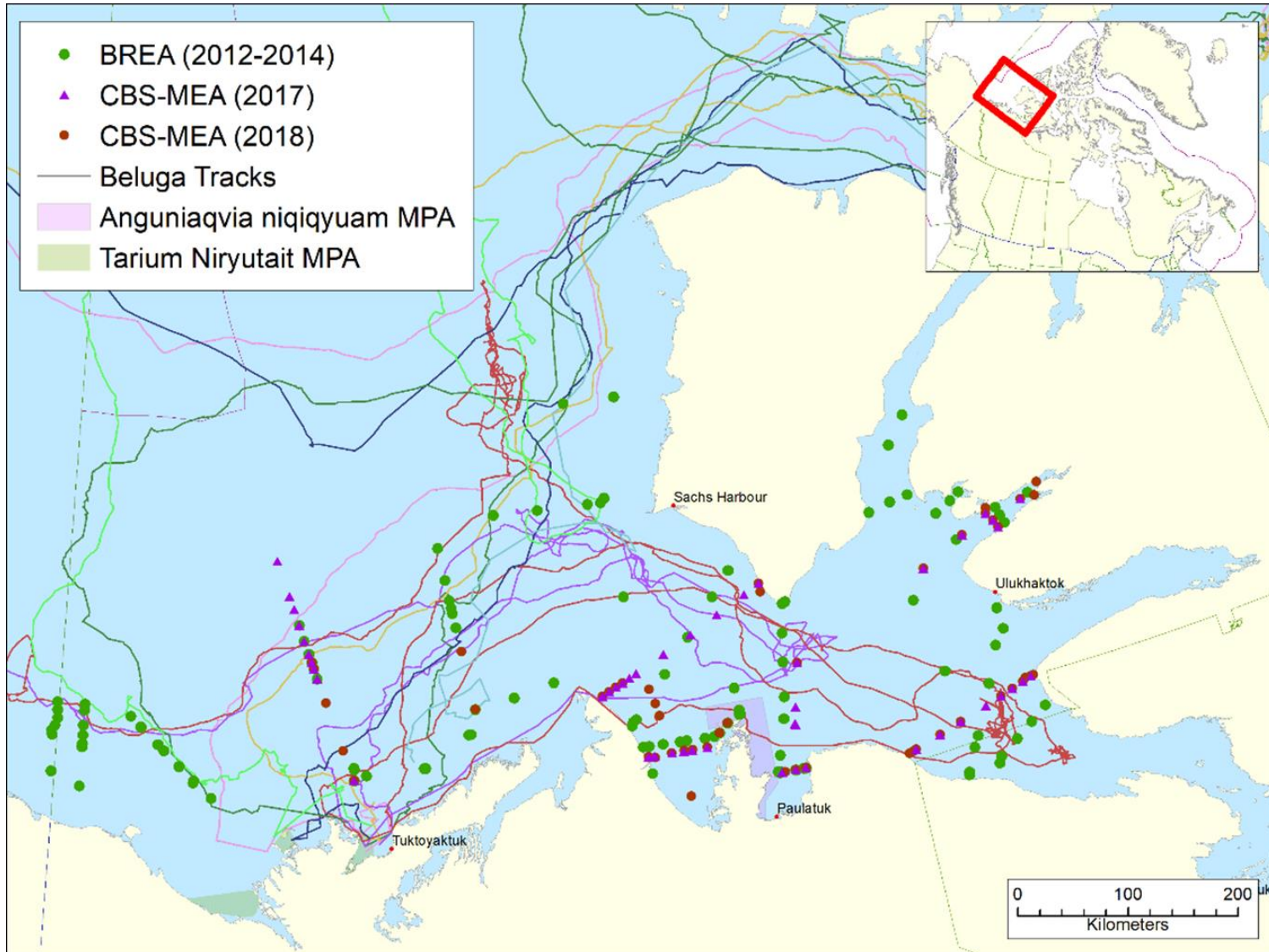
Canadian Beaufort Sea-Marine Ecosystem Assessment (CBS-MEA)

- Open water, 2012-2014, 2017-2019
 - CTD, bottle sampling, acidification studies
 - Zooplankton, box core, trawling
 - 1 year surface drifters
 - Moorings – 2017, 2018
-
- Main objective is to examine all data for variability and trends
 - data available through DFO Open Data portal





Survey Coverage





COVID-19 Update

- Program cancelled for 2020
- Focussing on laboratory work and data analysis
- Beaufort Sea moorings retrieved through the JOIS (Joint Ocean Ice Study; Canadian Polar Shelf – Beaufort and Chukchi Sea; CCGs Sir Wilfrid Laurier)
- 10 to 20 submerged moorings
- Humfrey Melling – DFO



New programs in development

- Ecosystem overview and science need analysis:
 - Sarvarjuaq (Pikialasorsuaq - Northwater Polynya)
 - Southampton Island
 - Tuvaijuittuq (Last Ice Area)
- Lancaster Sound National Marine Conservation Area