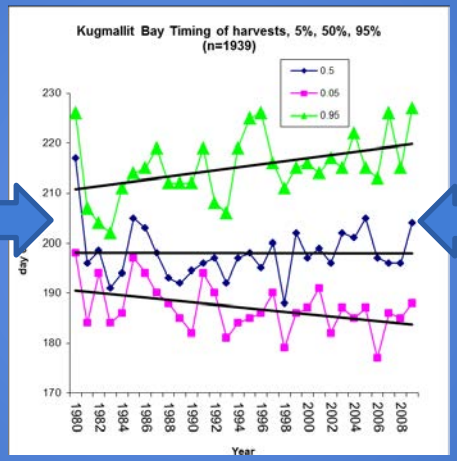
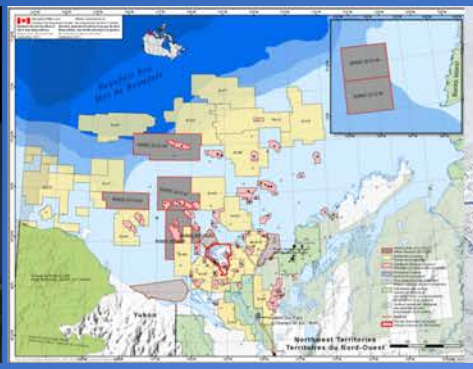
Regional Coastal Monitoring in the Inuvialuit Settlement Region: Ecosystem Indicators



Frank Pokiak, Chair IGC
Vic Gillman, Chair FJMC

Lisa Loseto (DFO), Jennie Knopp (JS), Kristin Hynes (FJMC), James Malone (FJMC), Tracey Loewen (UofM), Jim Johnson (DFO), Jim Reist (DFO)

Preparing for Change

How do we prepare for the changes the region will be faced with in the near future?

How can communities be involved in the research that provides advise for development activities?

Long term ecosystem monitoring partnered with communities and scientists...

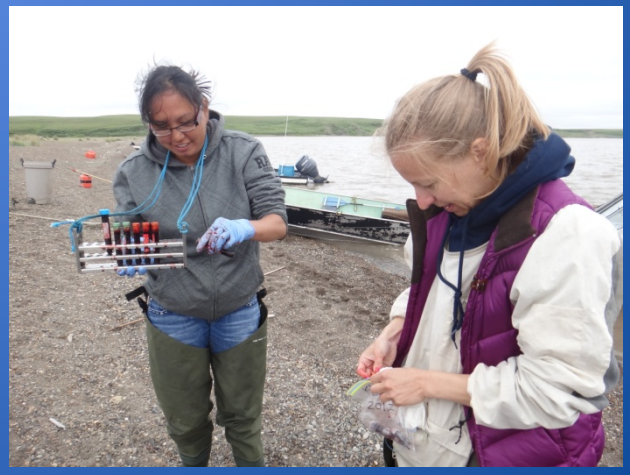
ISR-Wide CBMP

Jennie Knopp, Program Coordinator

- For all important species of wildlife: terrestrial, avian, freshwater and marine
- Increasing community capacity through training and local monitors
- Improving the way data is collected
- Investigating current and changing environmental conditions and impacts in ISR
- Improving our knowledge-base with an emphasis on TEK
- Collecting long-term data sets where possible and ensuring collected data is maintained in a standardized and useable format
- **Working with all ISR communities to ensure their monitoring needs are met**
- **Synthesize all CBM in the ISR**

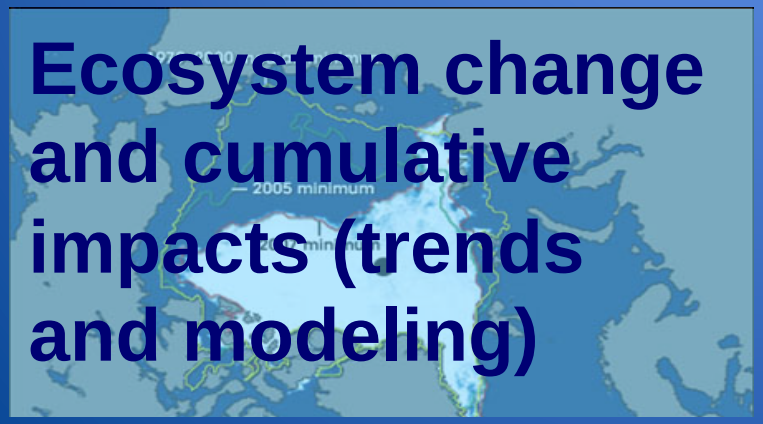
ISR Coastal Monitoring Program

- Links to the goals of the ISR-CBMP
- Partnership with DFO, FJMC and ISR communities (HTC's)
- Use indicators to help improve our understanding of the coastal ecosystem
  - Coastal fish
  - Beluga
  - Supporting physical env't
- Field programs in each ISR community supported by DFO and FJMC,
- BREA supporting the cost of the lab analysis



Objectives: Regional Coastal Monitoring

Goal: Characterize the ecosystem connectivity and better inform managers/decision makers on ecosystem responses to changes or stressors such as climate change or development related activities



Regional Project Layout

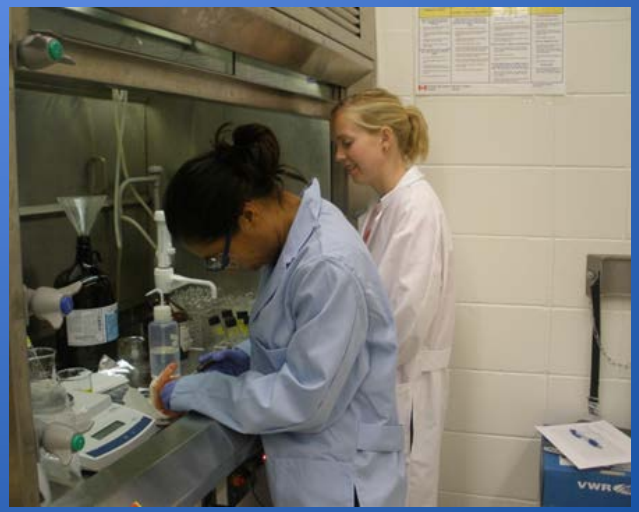
Community	Monitoring Site	VEC
Aklavik	Shingle Point	Fish, Oceanography, Inverts beluga
Inuvik	Kendall Island, (EWF)	Beluga, Fish
Paulatuk	West Darnley Bay	Fish, Beluga, inverts, crab/shrimp
Tuktoyaktuk	Hendrickson Island	Beluga, acoustic environment
Sachs Harbour	Coastal area	Fish: all cod, sculpin, Beluga
Ulukhaktok	Coastal area	Fish: all cod, sculpin, Beluga (Seal)

Linking Coastal and Offshore Programs

Project Funding and Partners

Funders	Project component	Secured for 2013/14
FJMC	Field component	Yes
DFO	Field and Staff	Yes
BREA	Indicator Lab Analysis	Yes
NCP	Contaminants (beluga)	Pending
CIMP	Synthesis/Framework	Pending

BREA Funds Supported
Dietary Indicator Analysis
Analysis of up to 1000 fish from all sites
Analysis of up to 100 beluga from all sites



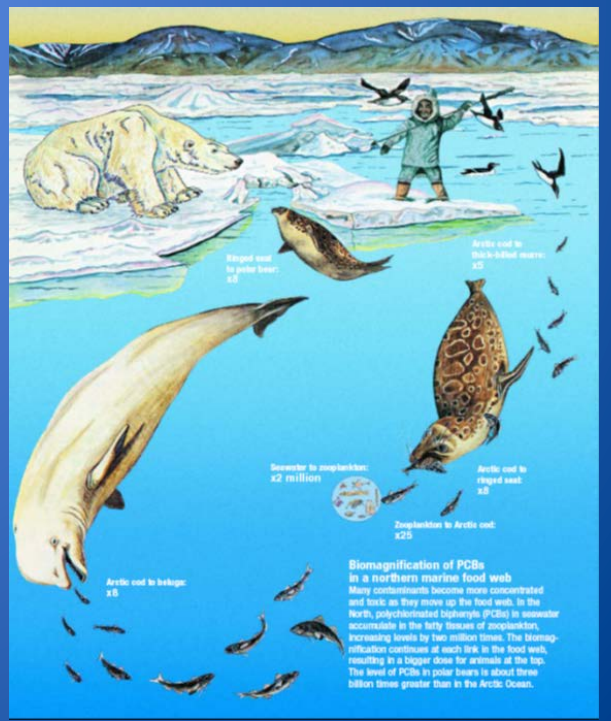
Addressing BREA Purpose and Priorities

- Contributes to BREA Purpose 1&3:
  - the project collects **regional information** that can assist project assessments;
  - and it **engages communities** and their priorities as it is developed with communities, community monitors, **capacity building for long term monitoring**

- Contributes to BREA Priorities:
  - the project feeds into '**Baseline fish information**' – emphasis on all coastal fish, not only subsistence (i.e. flounders, saffron cod, devil fish as well as whitefish etc). Key focus to link with the offshore trawler program (using diet indicators)

Priorities outside of BREA

- Program addresses DFO, FJMC, IGC priorities
  - Ecosystem Monitoring
  - Monitoring for and by the community
  - Capacity building/training
  - Developing baseline of ecosystem status
  - Testing indicators for long term monitoring
  - Defining ecosystem structure
  - Understanding ecosystem linkages between coast and offshore ecosystems



Concept: Hendrickson Island Beluga Program

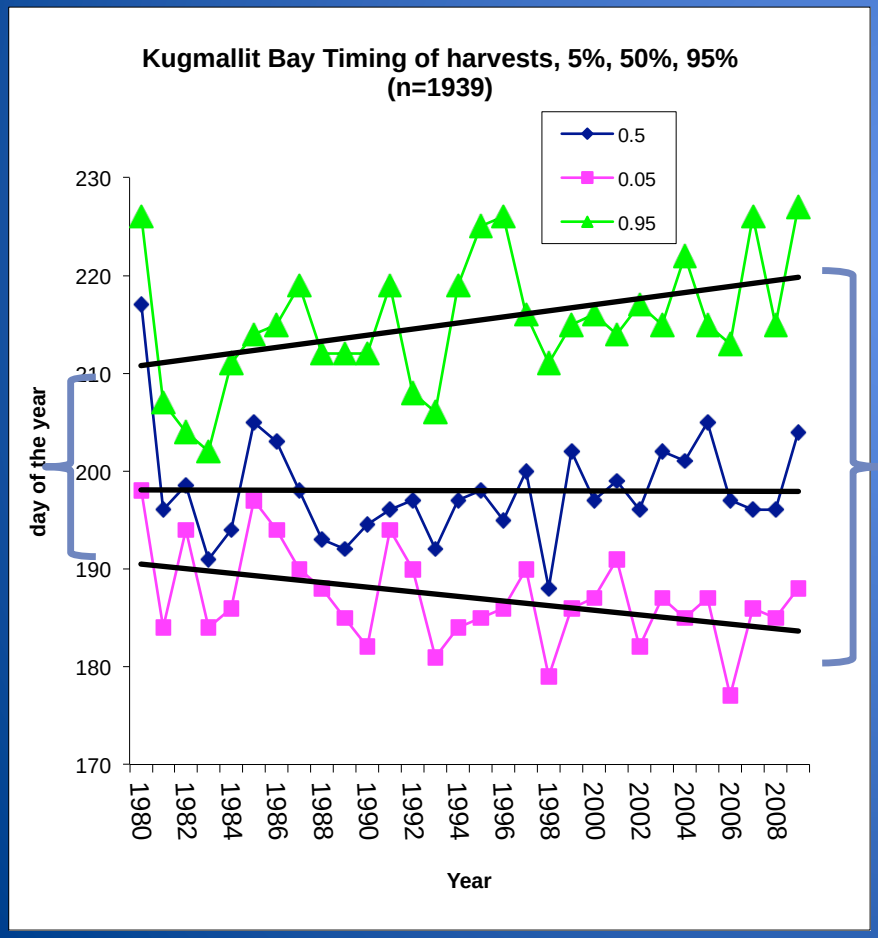
- Long term monitoring
- Strong partnership between community and scientists
- Many aspects outside of monitoring: youth programs, shared knowledge transfer, conference participants, project development, shared communication
- Solid foundation supported further program growth



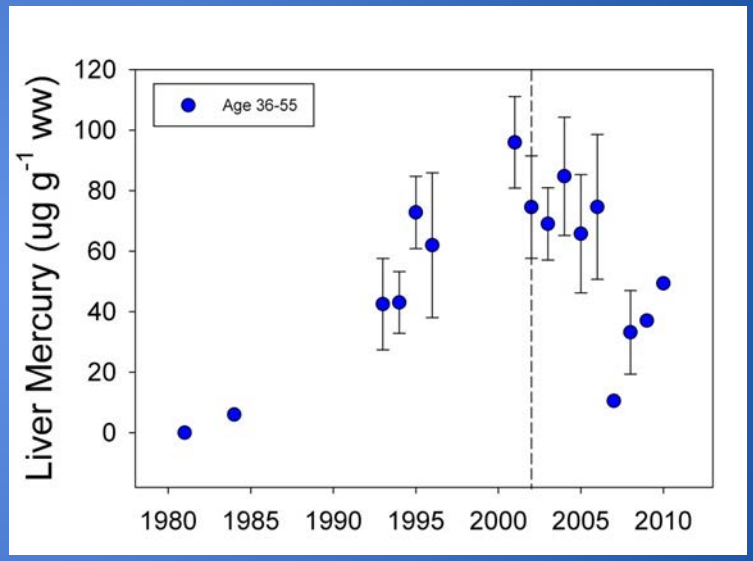



Long term monitoring of Ecosystem Indicators

Baltic and North Sea



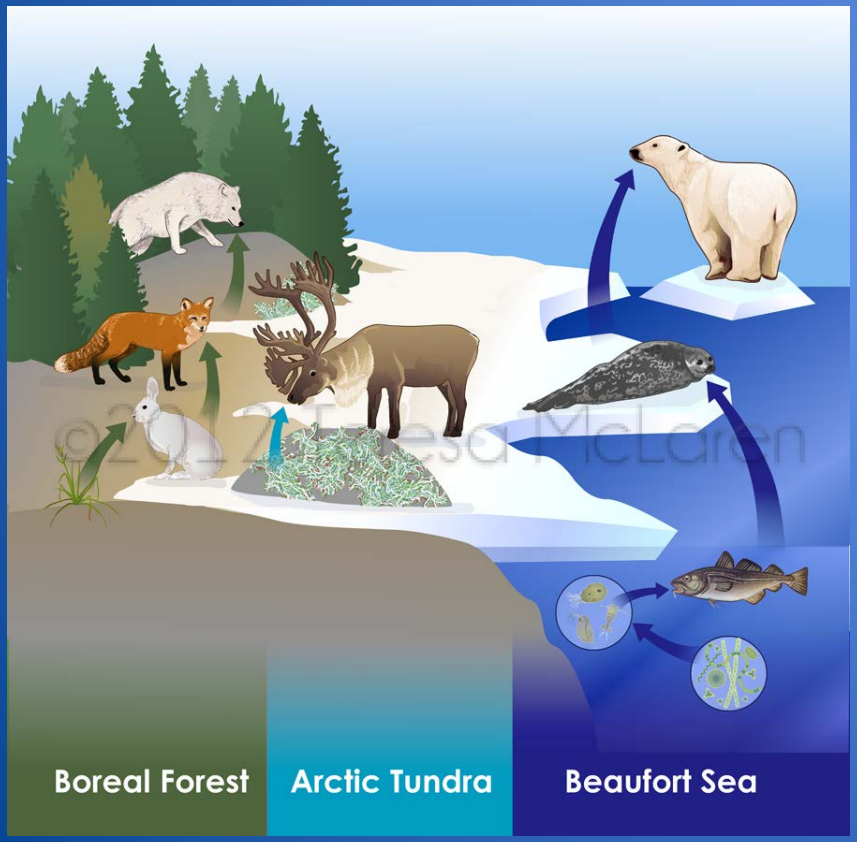
Hendrickson Island



How did their diet change?
How did their prey change?
How did the ecosystem change?

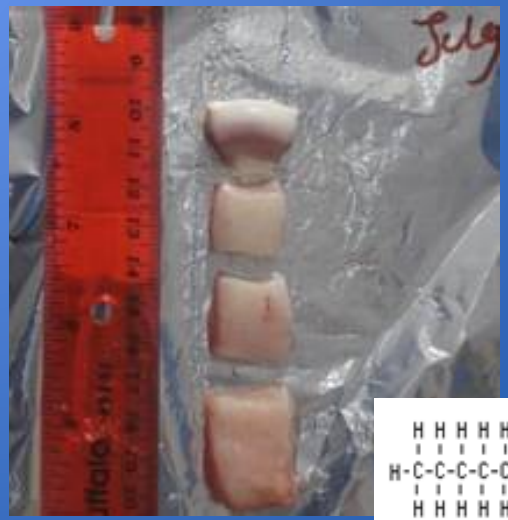
Indicators Funded under BREA: Diet Biomarkers

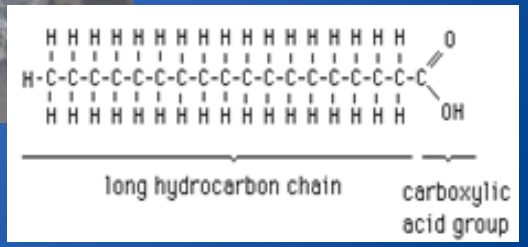
Stable Isotopes
(Nitrogen, Carbon, Sulfur)



Fatty Acids (70 fatty acids)

- Memory Card of what you last ate (link predator/prey)
- Unique features: EPA/DHA





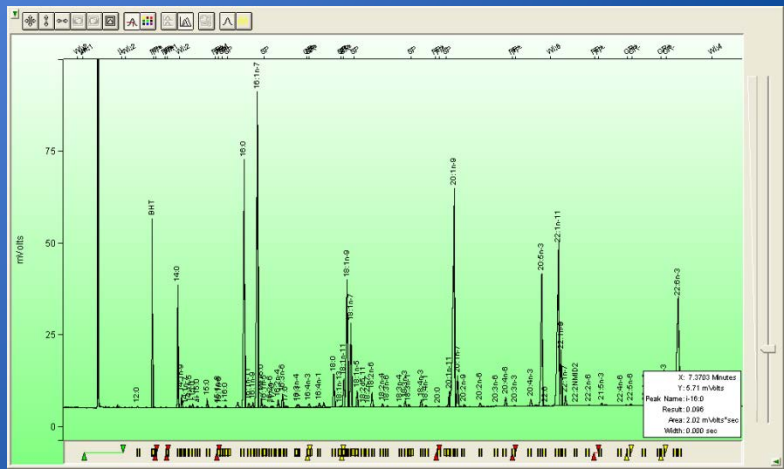
Status of Analysis

Stable Isotopes

- Processed 830 fish (20 species) – 3 months
- Prepared a 1000 fish, 40 inverts and 100 beluga tissues – 2 months
- Total 950 sent to the laboratory for analyses, preparing last 400 for submission
- Waiting for data …

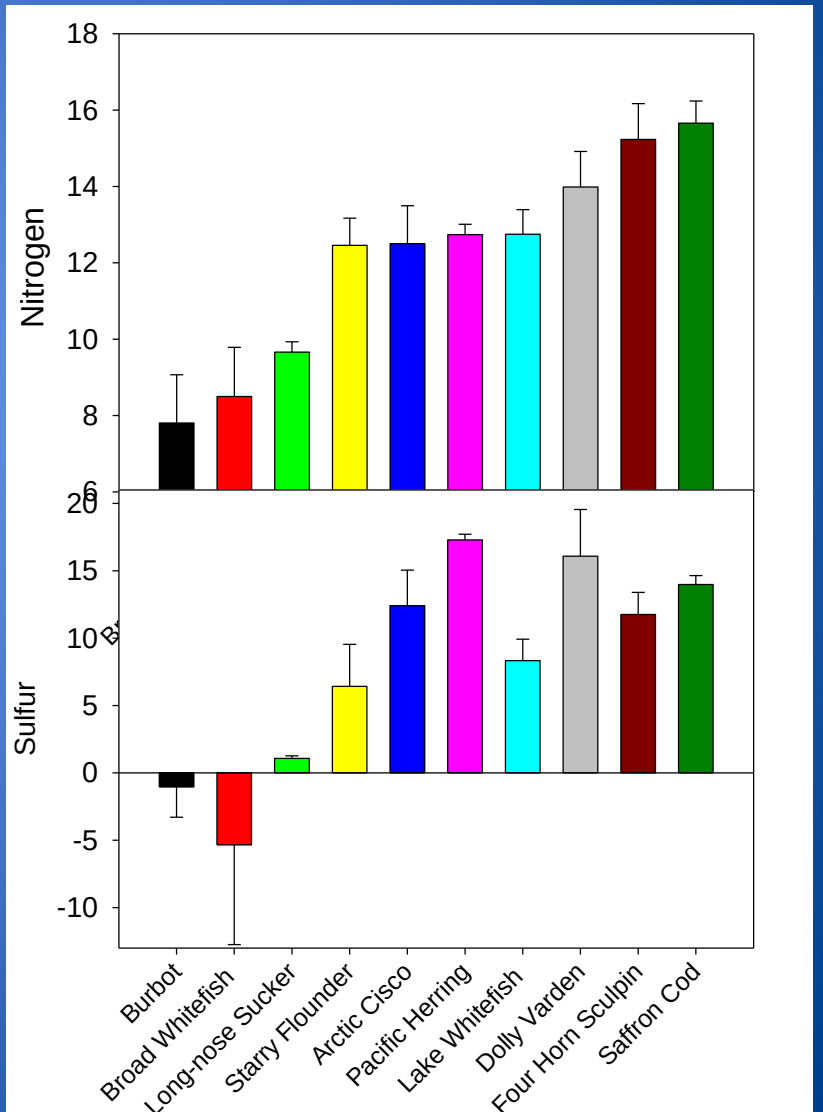
Fatty Acids

- Fish are being extracted at the DFO in Winnipeg (lengthy extraction)
- All 50 beluga samples extracted (3 blubber layers).
- Beluga data being integrated for analyses



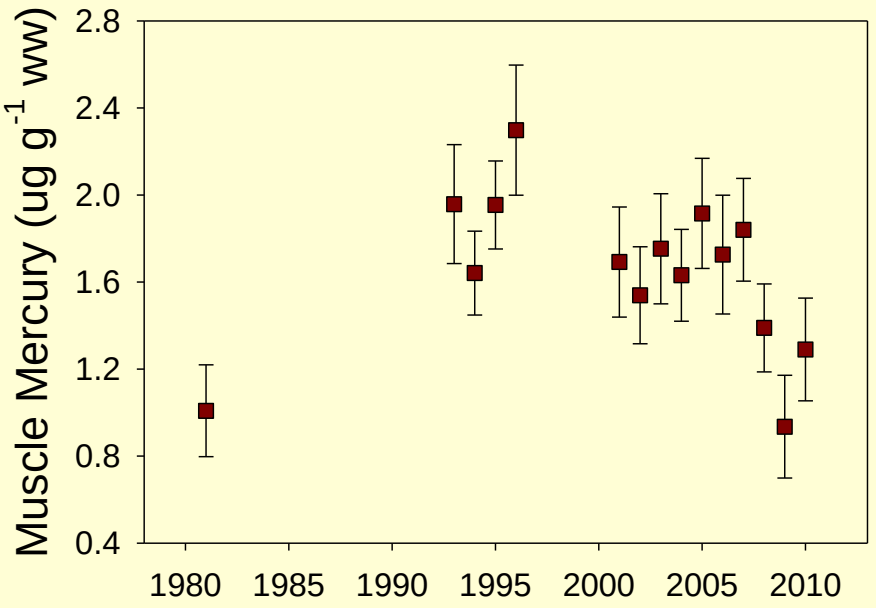
Shingle Pt: Arctic Coastal Ecosystem Program (ACES)

- 6 weeks, science crew, 2 monitors (Dennis Arey, Jordan Mcloed)
- 18 Fish species
- 6 Invertebrate
- Environmental and Oceanographic variables

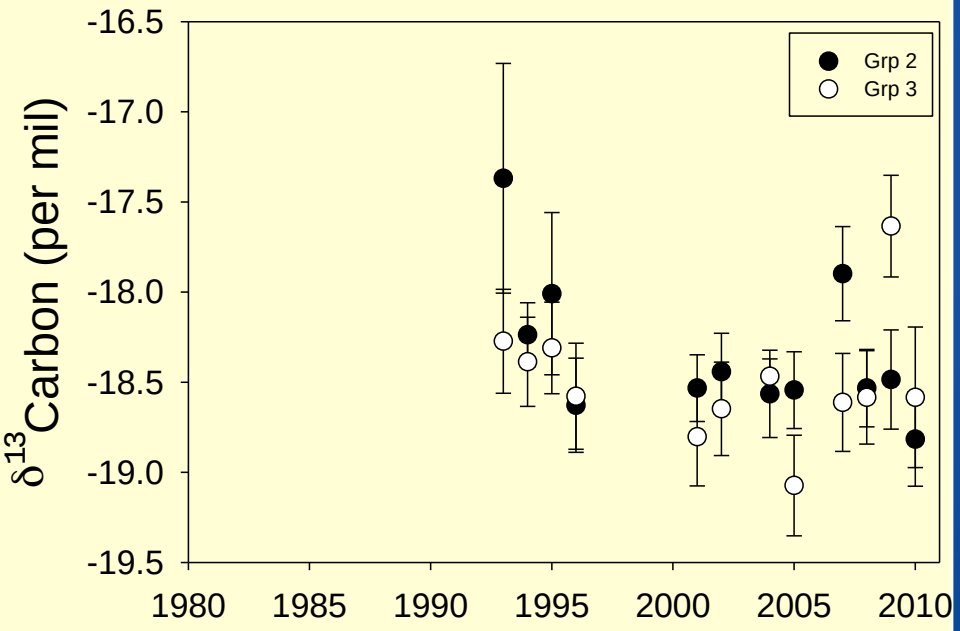


Hendrickson Island Beluga Study

Muscle Mercury in belugas



Carbon values in belugas

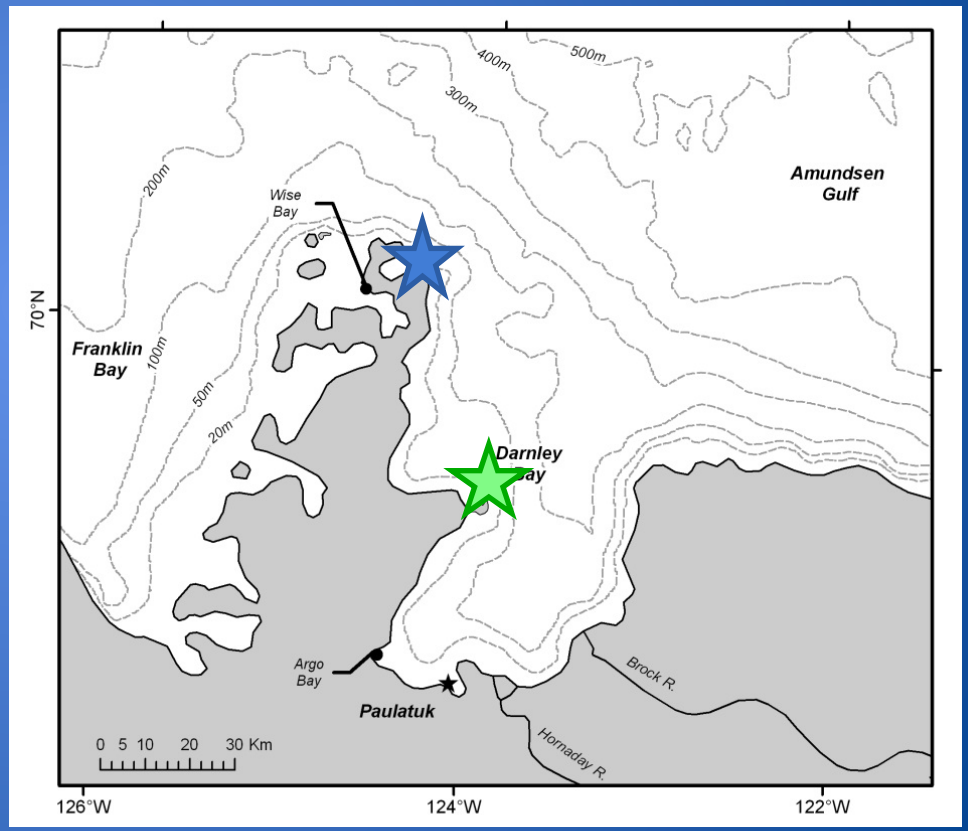


Kendall Island Program

- 3 week program, set up similar to Hendrickson
- Training: monitor J. Day, Youth K. Tingmiak
- Beluga: low sample 16 in 2011 25 whales landed
- First Year sampling fish
- Fish- 50 fish, 5 species
- Compare to Shingle Pt
- Traditional Knowledge study (K. Snow/S.O'Hara)

Paulatuk: West Darnley Bay

- Beluga Monitoring
  - NCP support for monitor and youth (B. Lennie)
  - 2012: new approach with stationed monitor and mobile monitor
- Marine Fish Survey
  - Pilot baseline to develop further monitoring and CBM
  - Link to BREA
  - Link to Beluga diet
- Invertebrate Project
  - Crab and Shrimp traps



Darnley Bay Fish Survey

Gear Types: a variety of fishing gears, gillnets, trapnets, beach seines and crab and shrimp pots, to capture a wide variety of fish and invertebrates.

Between July 19th and 27th approx. 645 fish, representing 13 species were collected. 20% of the fish were dead sampled to provide detailed biological information and tissues for further lab analysis.

Project Crew included two fisheries biologists from Winnipeg plus two Paulatuk residents, Mykle Wolki, an experienced hunter fisher, and Bessie Lennie-Ruben, a recent high school graduate.

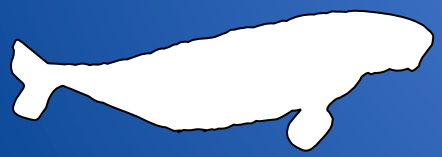
The 3 most abundant fish species were saffron cod, starry flounder and Greenland cod.

Paulatuk: Beluga Monitoring

- Newer site, differences observed in 2005 relative to Hendrickson
- Different size, diet, contaminants

- This year the hunt occurred later, end July, beginning of August
- Whales were larger
- Biomarkers…

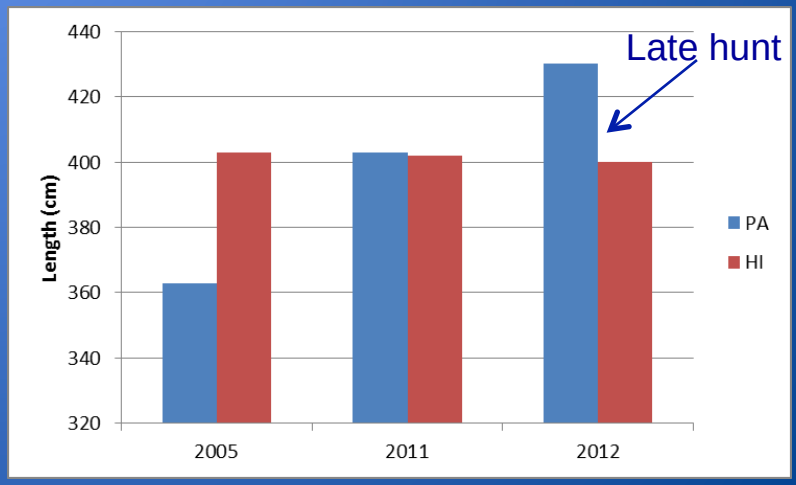
Hendrickson



13 ft 30yrs old

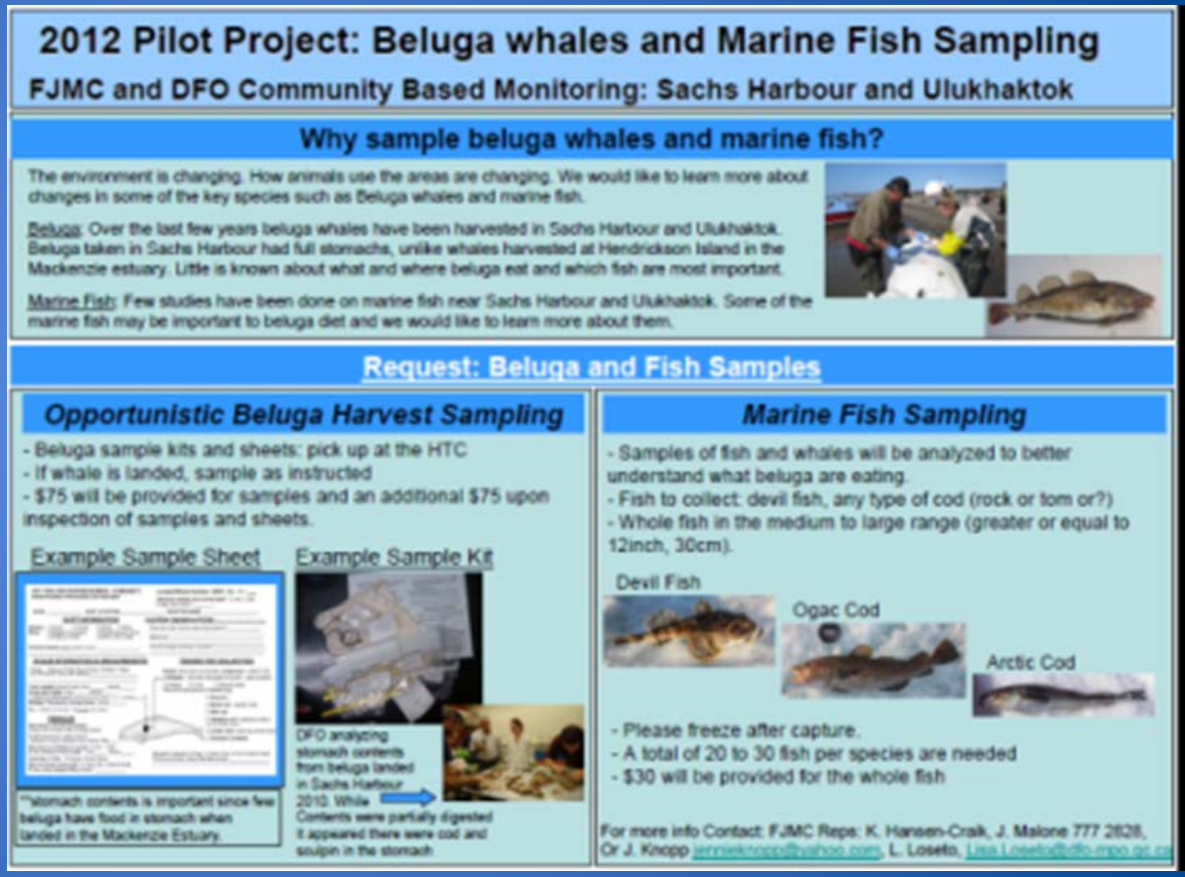
Paulatuk

12 ft 18yrs old



Sachs Harbour/Ulukhaktok

- 2008, 2010, 2011 beluga hunts
- 2011- Cod collection
- 2012- broader fish collection (all cod & sculpin)
  - 80 grcd, 30 sculpin Ulu
  - 59 grcd sachs



2012 Pilot Project: Beluga whales and Marine Fish Sampling

FJMC and DFO Community Based Monitoring: Sachs Harbour and Ulukhaktok

Why sample beluga whales and marine fish?

The environment is changing. How animals use the areas are changing. We would like to learn more about changes in some of the key species such as Beluga whales and marine fish.

Beluga: Over the last few years beluga whales have been harvested in Sachs Harbour and Ulukhaktok. Beluga taken in Sachs Harbour had full stomachs, unlike whales harvested at Hendrickson Island in the Mackenzie estuary. Little is known about what and where beluga eat and which fish are most important.

Marine Fish: Few studies have been done on marine fish near Sachs Harbour and Ulukhaktok. Some of the marine fish may be important to beluga diet and we would like to learn more about them.

Request: Beluga and Fish Samples

Opportunistic Beluga Harvest Sampling

- Beluga sample kits and sheets: pick up at the HTC
- If whale is landed, sample as instructed
- $75 will be provided for samples and an additional $75 upon inspection of samples and sheets.

Example Sample Sheet

Example Sample Kit

DFO analyzing stomach contents from beluga landed in Sachs Harbour 2010. While Contents were partially digested it appeared there were cod and sculpin in the stomach

**stomach contents is important since few beluga have food in stomach when landed in the Mackenzie Estuary.

Marine Fish Sampling

- Samples of fish and whales will be analyzed to better understand what beluga are eating.
- Fish to collect: devil fish, any type of cod (rock or tom or?)
- Whole fish in the medium to large range (greater or equal to 12inch, 30cm).

Devil Fish

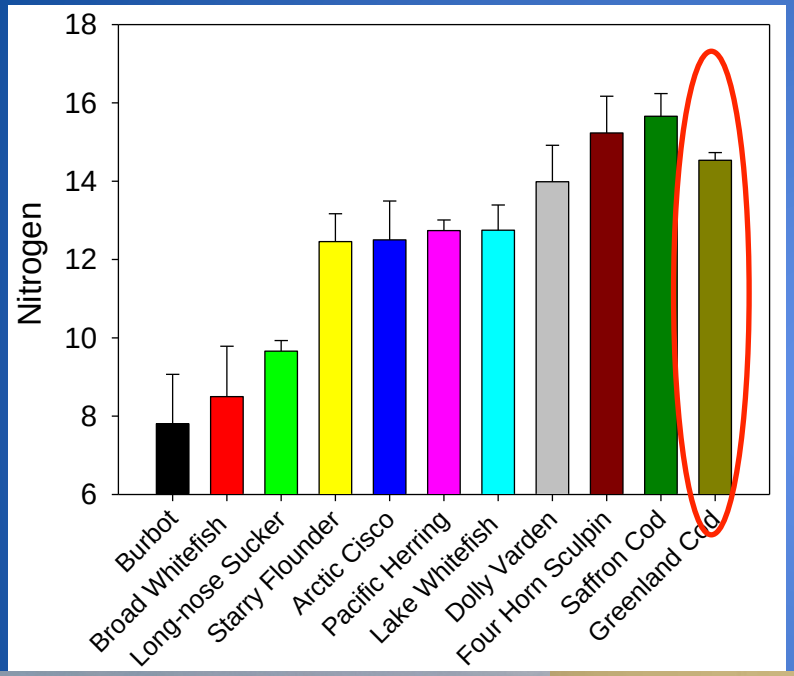
Ogac Cod

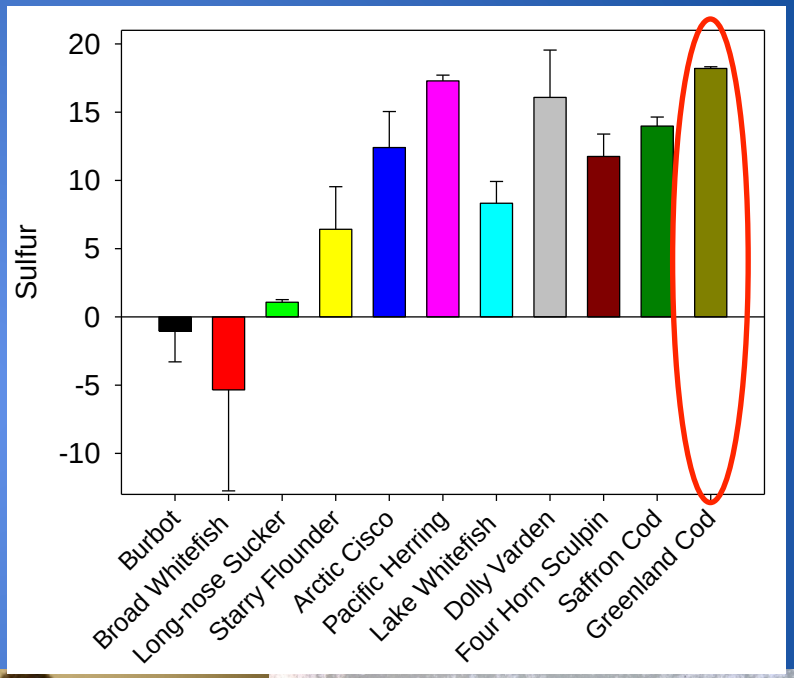
Arctic Cod

- Please freeze after capture.
- A total of 20 to 30 fish per species are needed
- $30 will be provided for the whole fish

For more info Contact: FJMC Reps: K. Hansen-Craik, J. Malone 777 2828, Or J. Knopp jennyknopp@yahoo.com, L. Loseto, Lisa.Loseto@dfo-mpo.gc.ca

Sachs Harbour, Ulukhaktok and Marine Observations





Linking Coastal and Offshore Programs

What's Next…

- Lab work on food web indicators (SI, FA)
- Indicator analysis
- Compare among sites
- Linking coastal with offshore
- Framework for regional monitoring
- Linking with LEK/TEK and community perspectives
- Plan for 2013

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Paulatuk HTC
Tuktoyaktuk HTC
Sachs Harbour HTC
Ulukhaktok HTC

Fisheries and Oceans Canada

Indian and Northern Affairs Canada

FJMC