



Canadian Beaufort Sea Marine Ecosystem Assessment (CBS-MEA)

Ship-based and mooring trophic studies on DBO8

Christie Morrison

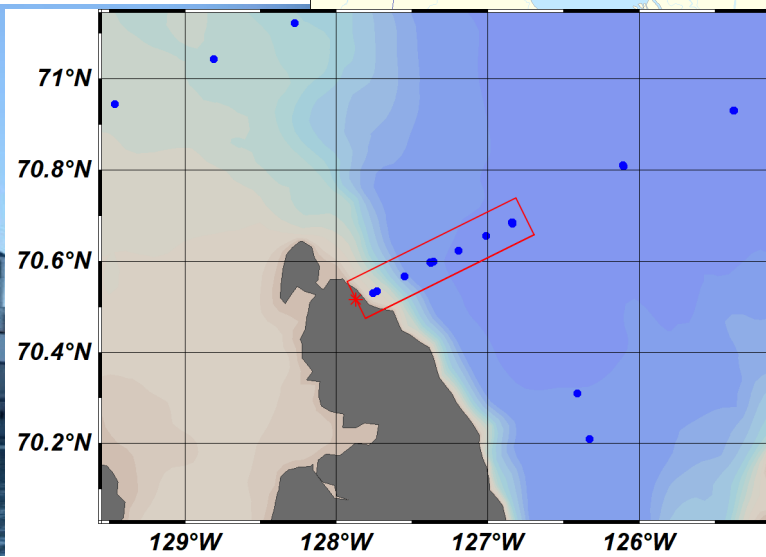
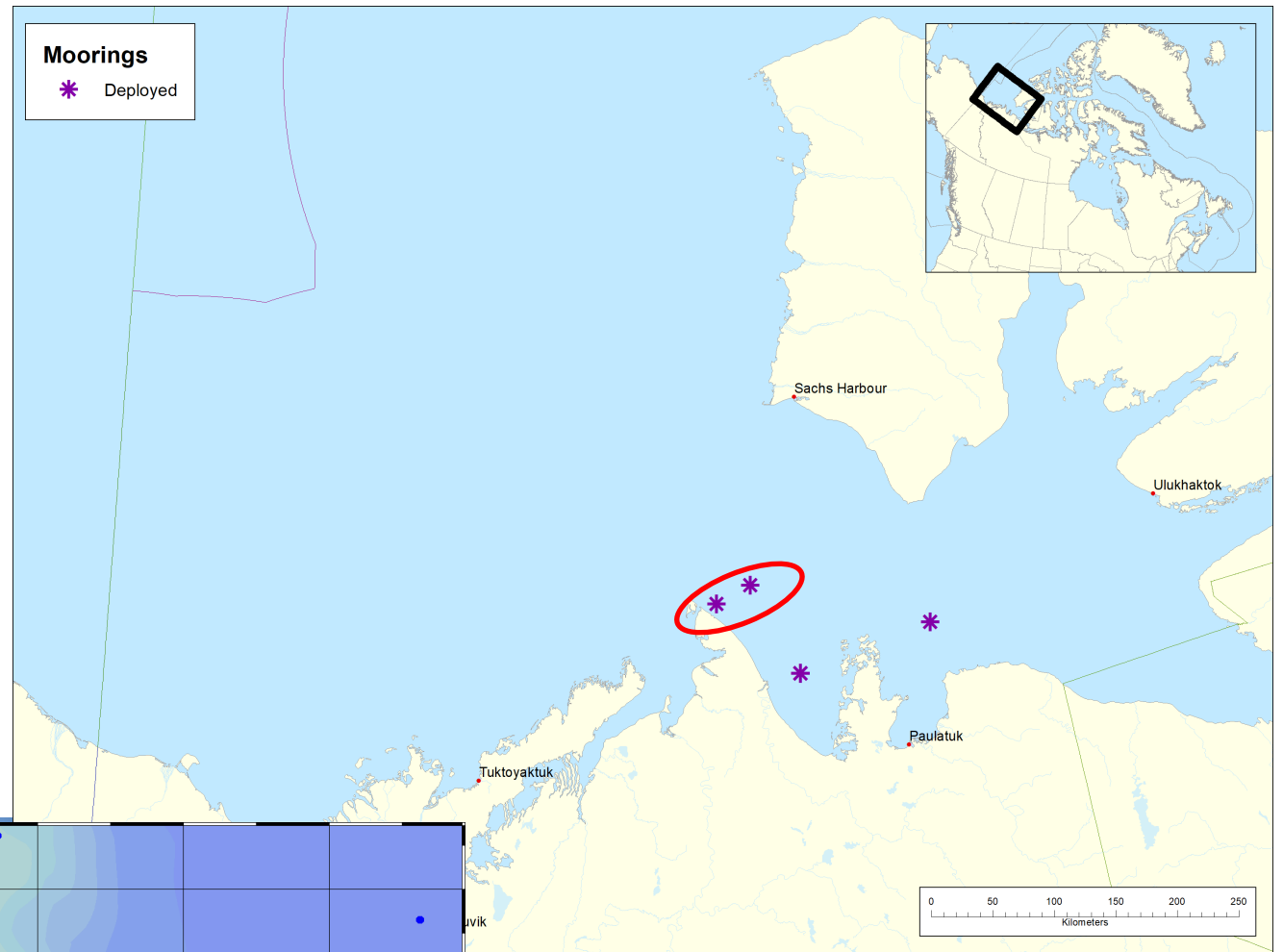
Andrea Niemi, Andrew Majewski, Bill Williams,
Jane Eert, Christine Michel, Monika Pućko,
Valérie Cypihot, Phil Archambault





Program overview

- BREA-MFP (2012 - 2014)
 - Address information gaps for deep-water fish communities relevant to offshore oil and gas exploration and development
- CBS-MEA (2017-)
 - Comprehensive research and monitoring approach for the offshore to advance the understanding of relationships between oceanographic drivers and ecosystem responses.



Comprehensive sampling program

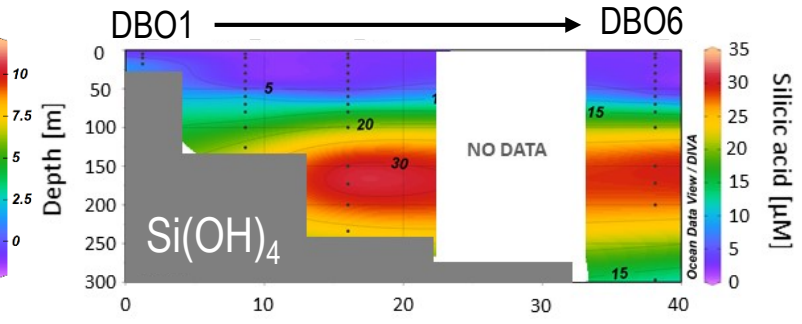
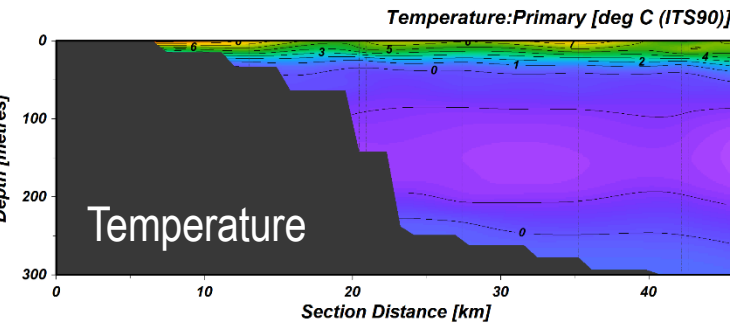
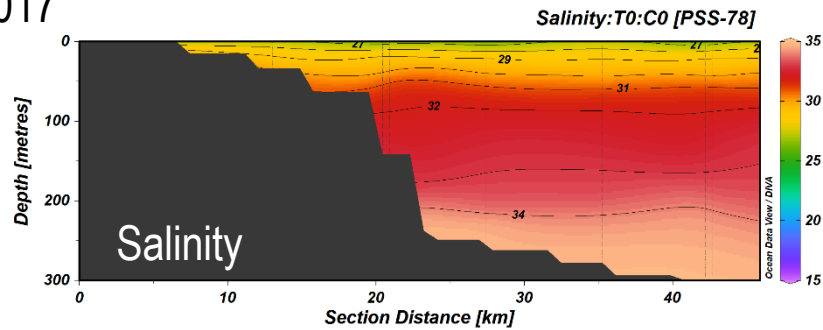
- Oceanography
- Primary productivity
- Zooplankton
- Epifauna
- Infauna
- Sediments
- Fishes
- Hydroacoustics



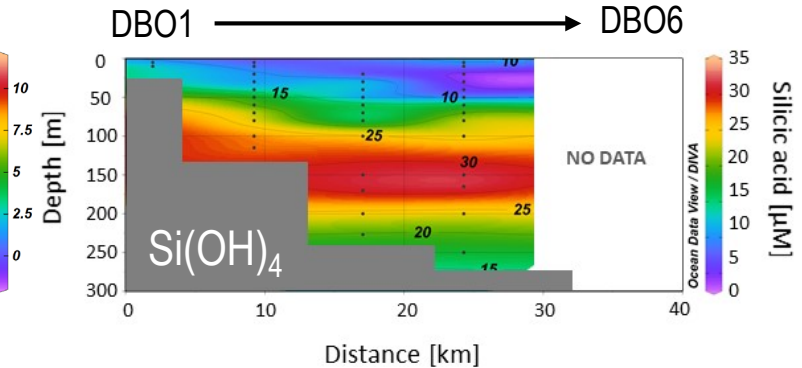
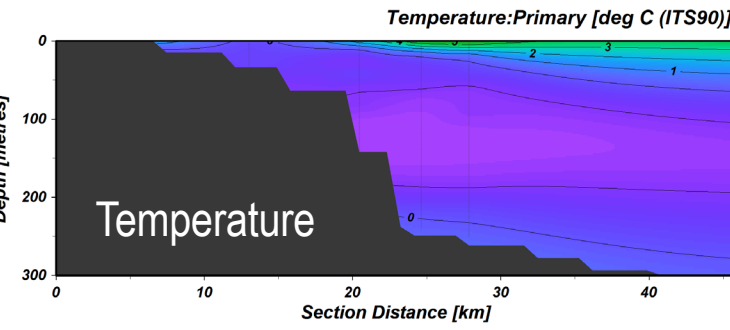
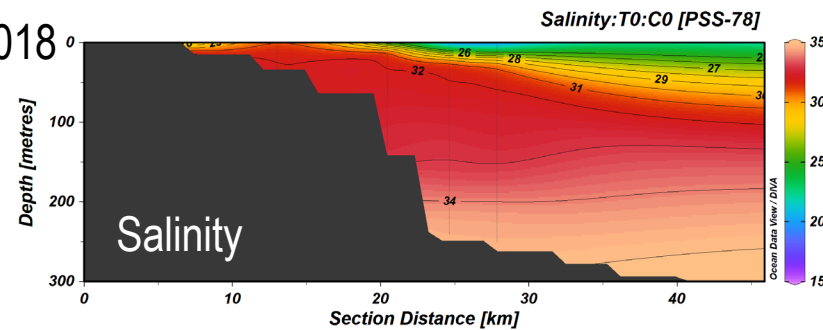
Oceanography & Primary Productivity

- Pacific layer indicated by temperature, salinity, and nutrients
 - Upwelling important for extending productive period in this area
- Strong nutrient depletion in surface layers (post bloom conditions)

2017



2018





Oceanography & Primary Productivity

2018

- Influenced by presence of sea ice
- Upwelling signature

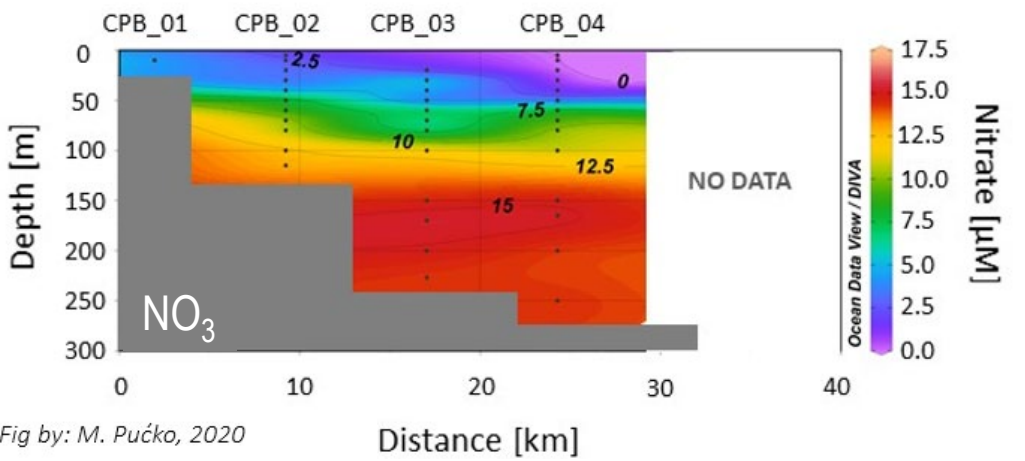
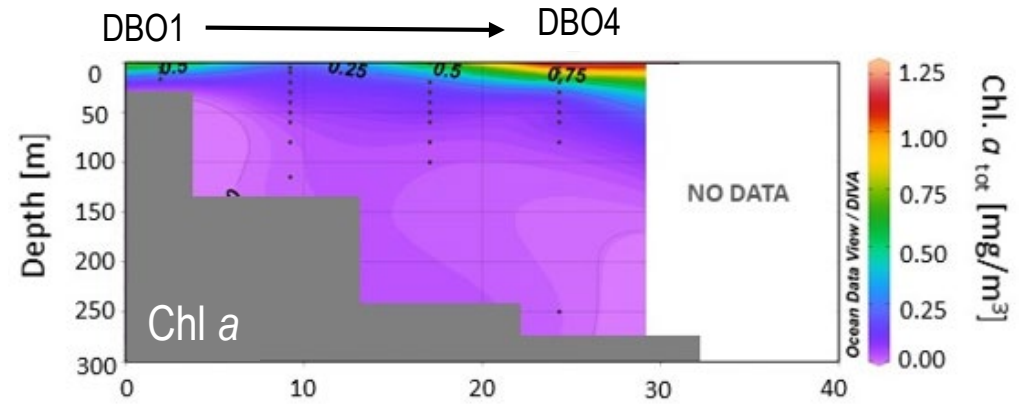
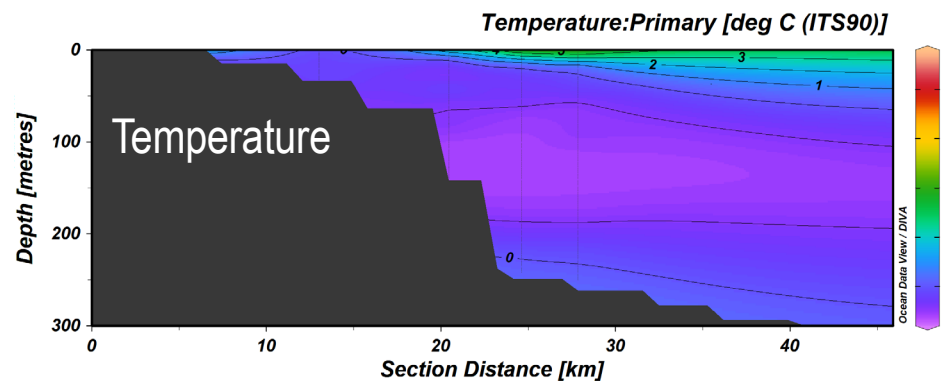
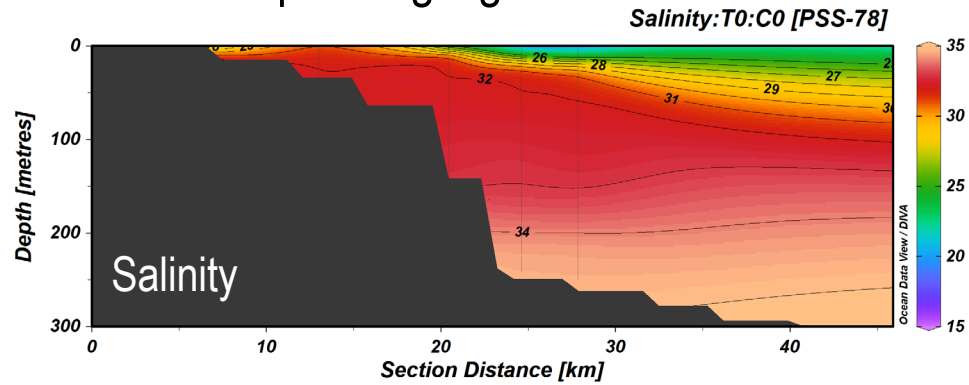
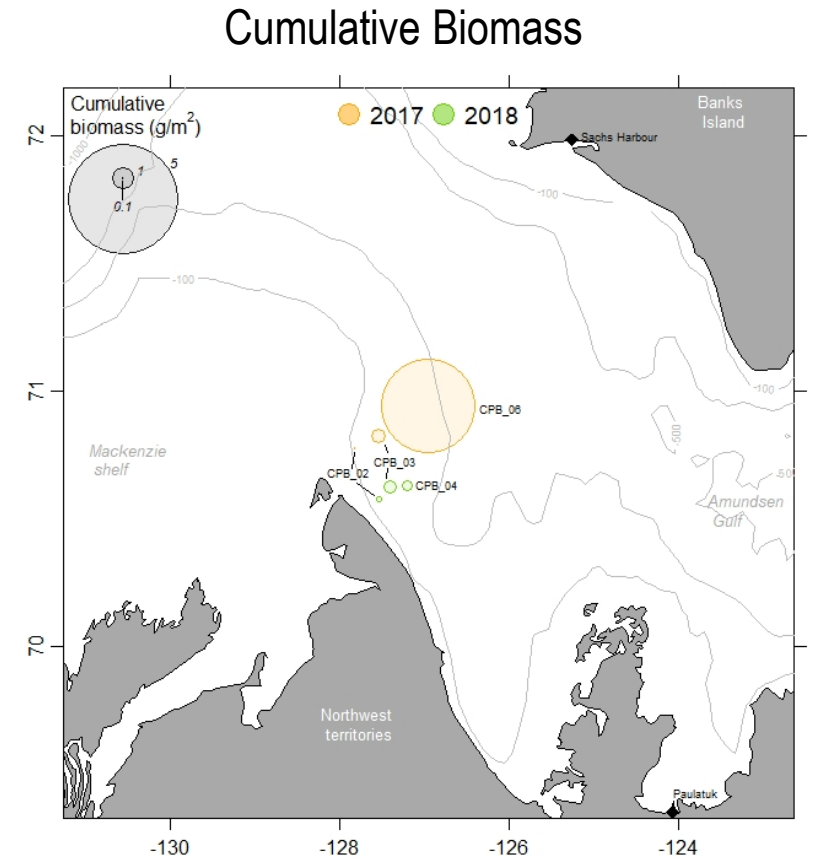
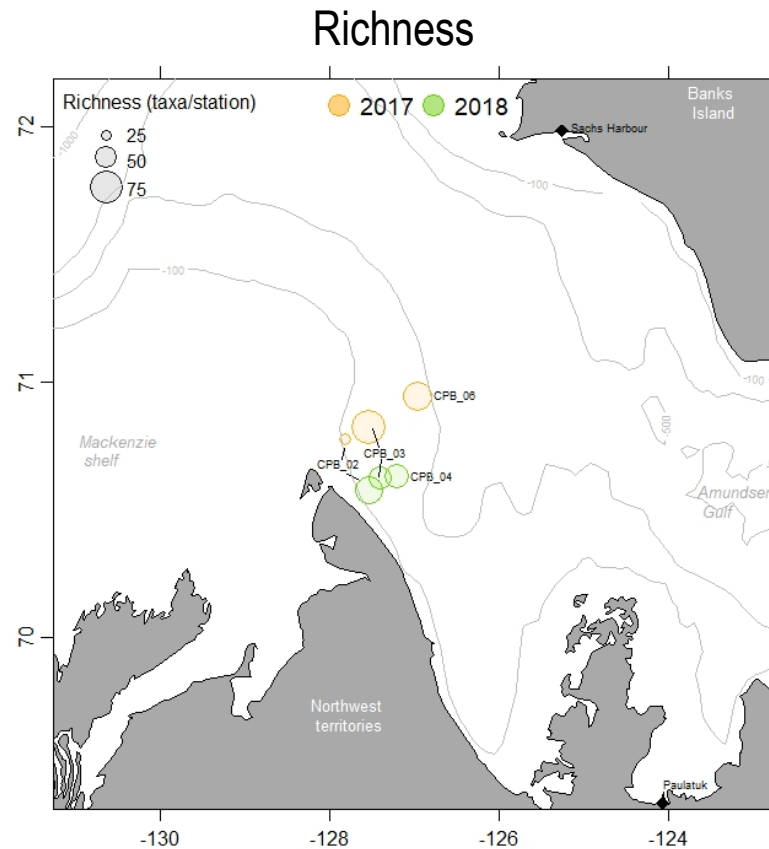


Fig by: M. Pučko, 2020



Epifauna

- Sampled with 2mm mesh benthic beam trawl
- Richness variation relatively low in region
 - 78 taxa DBO8_03 (2017)
 - 28 taxa DBO8_02 (2017)
- Cumulative biomass
 - Low at shallow station DBO8_02
 - Highest at DBO8_06 (2017)

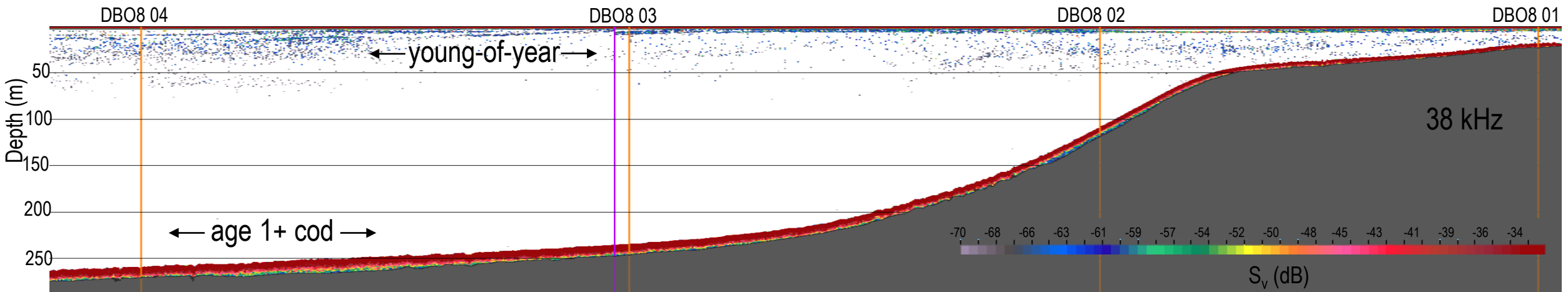
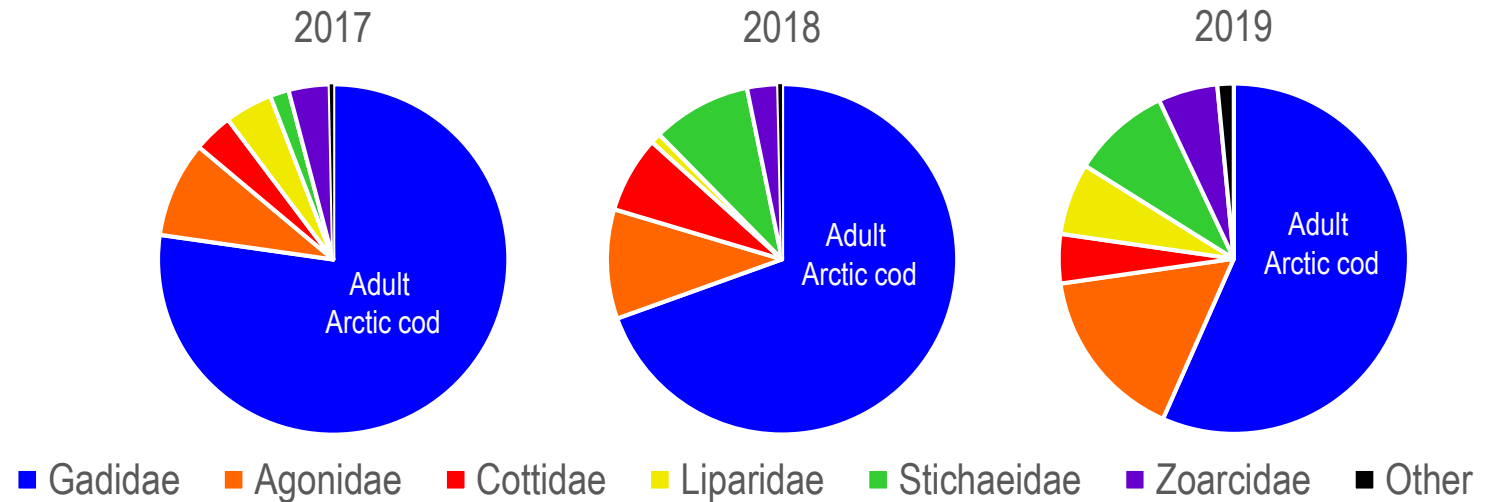




Fishes & Hydroacoustics

- Bottom trawling at stations
- Echovalidation of acoustic signals
 - Simrad EK80 (38, 120, 200 kHz)
- > 85% Arctic cod (*Boreogadus saida*) in water column catches

Bottom trawl catches





Moorings

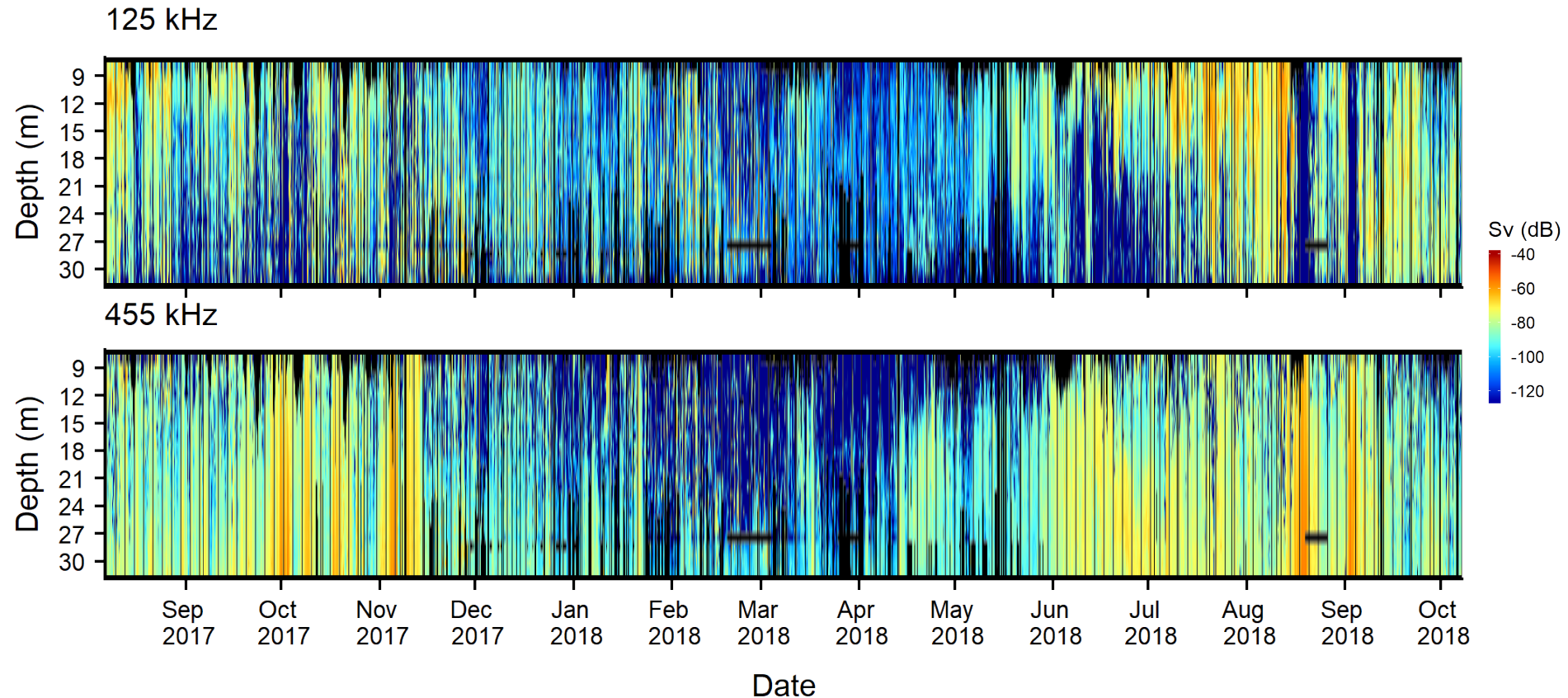
Acoustic Zooplankton Fish Profiler (AZFP)

- 50 m (station 02) and 300 m (station 08)
- Four frequencies
 - 38, 125, 200, 455 kHz
- Assess patterns of biological movement

Moorings

- Four frequency AZFP
- CTD
- Hydrophone
- VEMCO receivers

50 m AZFP





2020 Field Plans

- CBS-MEA field season (August – September)
- Mooring turn around, *CCGS Sir Wilfred Laurier*

Program Linkages

Arctic Fish Program
(CCGS Amundsen)

Marine Mammal &
Fishes Community
Monitoring Programs

Beaufort Moorings
(IOS/Amundsen
Science)

Marine Mammal &
Fish Tracking
Programs



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Program PIs

Andrea Niemi: Co-lead & Zooplankton (DFO Central and Arctic [C&A])

Andy Majewski: Co-lead & Fishes (DFO C&A)

Bill Williams: Oceanography (DFO Pacific)

Christine Michel: Primary Productivity & Marine Chemistry (DFO C&A)

Maxime Geoffroy: Hydroacoustics (Memorial University)

Ashley Ehrman: Food web tracers (DFO C&A)

Phil Archambault: Benthos (Laval University)



	Physical	Chem / Biol	Sediments	Fish	Epifauna	Infauna	Zooplankton	Ichthyoplankton	Phytoplankton / Protists
Water column									
Temperature	X								
Conductivity	X								
Pressure	X								
Dissolved Oxygen	X								
Fluorescence	X								
Transmissivity	X								
Turbidity	X								
PAR	X								
Altimetry	X								
Salinity		X							
δ ¹⁸ O		X							
DIC/Alkalinity		X							
DOC		X							
Acoustics				X			X		
Benthic									
Granulometry			X						
Chlorophyll			X						
Basic Biology									
Taxonomy				X	X	X	X	X	X
Abundance				X	X	X	X	X	X
Biomass				X	X	X	X	X	X
Distribution				X	X	X	X	X	X
Sex / Maturity				X					