



# atlas

UNDERSTANDING DEEP ATLANTIC ECOSYSTEMS



## Davis Strait Case Study Area 10

WP6 Plenary ATLAS GA 2017

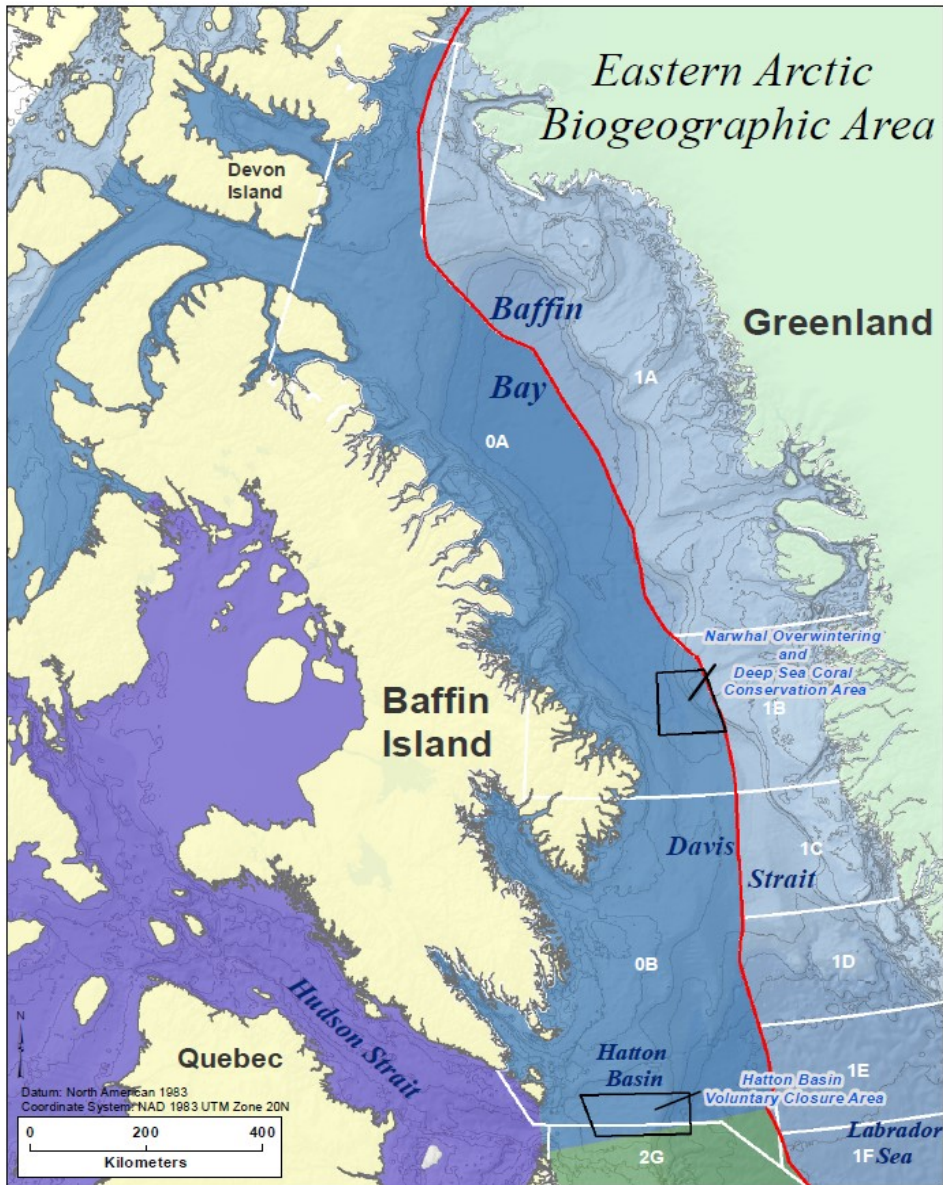
Ellen Kenchington, Canadian DFO



## MESMA Framework

- 1) setting the context
- 2) collation of existing information and mapping
- 3) setting of targets
- 4) risk analysis and state assessment
- 5) assessment of findings against operational objectives
- 6) evaluation of the effectiveness of management measures and
- 7) adaptation of the current management regime based on the outcome of the assessments

## Action 1a.1: Identifying and mapping of existing management and sector plans



### **Governance:**

Canada, Greenland,  
NAFO

### **NAFO Fishing Area:**

Fishing management plans for NAFO Divisions in this area for shrimp and groundfish (Greenland Halibut) with fixed and mobile gears

## Northern Shrimp and Greenland Halibut Fisheries: Fully Assessed (NAFO)

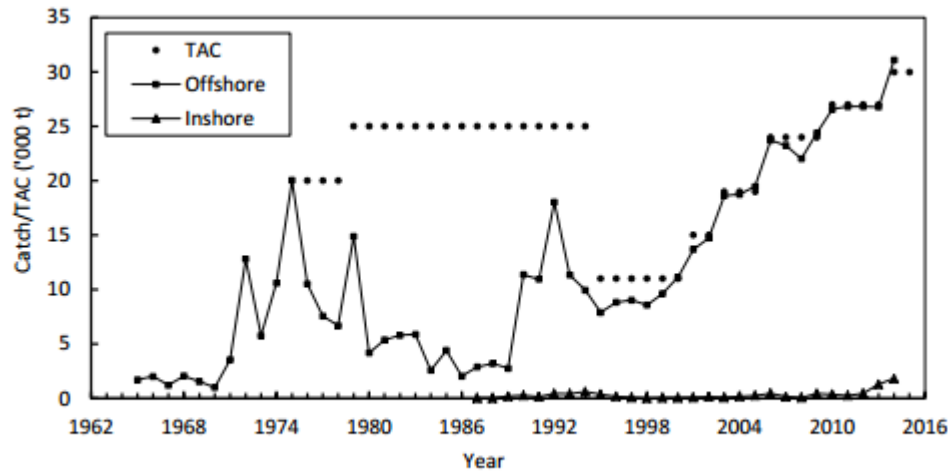


**Table 4. Landings and landed values for Greenland Halibut in Divisions 0A and 0B.**

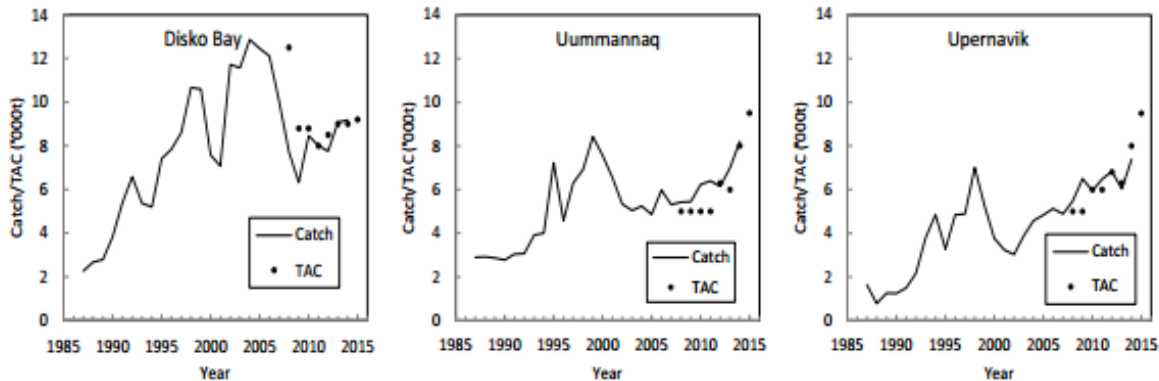
Variables	2005	2006	2007	2008	2009	2010	2011
<b>Division 0A</b>							
Landings (t)	4,125	6,634	6,173	4,964	6,496	6,394	6,262
Landed Values (\$000)	\$20,010	\$28,859	\$26,369	\$20,467	\$24,343	\$26,663	\$31,586
<b>Division 0B</b>							
Landings (t)	5,856	5,522	5,331	5,424	5,547	6,989	6,985
C&A	1,230	1,208	1,227	1,930	2,178	3,107	3,097
N&L	4,028	4,061	3,751	3,368	3,369	3,882	3,888
Maritimes	598	253	353	126	0	0	0
Landed Values (\$000)	\$21,259	\$19,794	\$17,718	\$15,869	\$24,541	\$36,691	\$41,146
C&A	\$6,356	\$5,570	\$5,551	\$8,413	\$8,585	\$13,706	\$15,622
N&L	\$12,769	\$13,381	\$11,408	\$7,272	\$15,956	\$22,986	\$25,524
Maritimes	\$2,134	\$842	\$759	\$184	--	--	--
<b>Divisions 0A + 0B</b>							
Landings (t)	9,981	12,156	11,504	10,388	12,043	13,383	13,247
Landed Values (\$000)	\$41,269	\$48,653	\$44,087	\$36,337	\$48,884	\$63,355	\$72,732

Source: Landings from Canadian Atlantic Quota Report and Landed Values from DFO staff calculations and data from DFO regional offices.

# Fishery statistics for Greenland Halibut (*Reinhardtius hippoglossoides*)



Greenland halibut (turbot) in the Davis Strait region Subareas 0 + 1 (excluding 1A inshore)

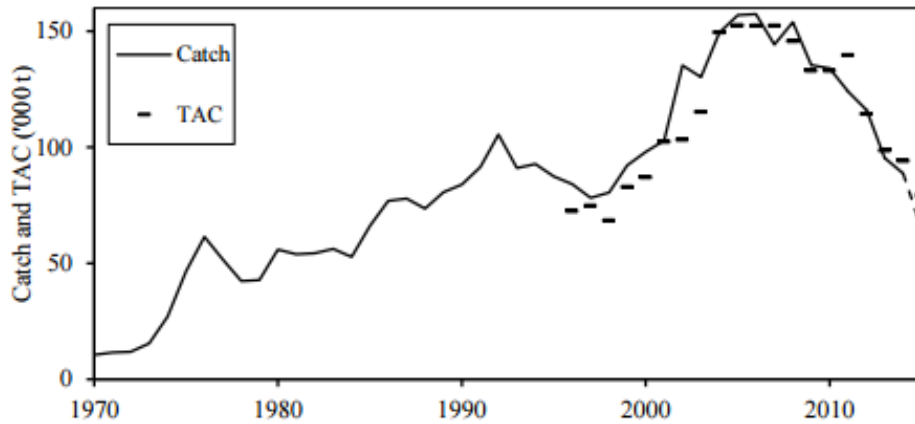


Greenland halibut (turbot) in the Davis Strait region Div. 1A – Disko Bay, Uummannaq and Upernavik

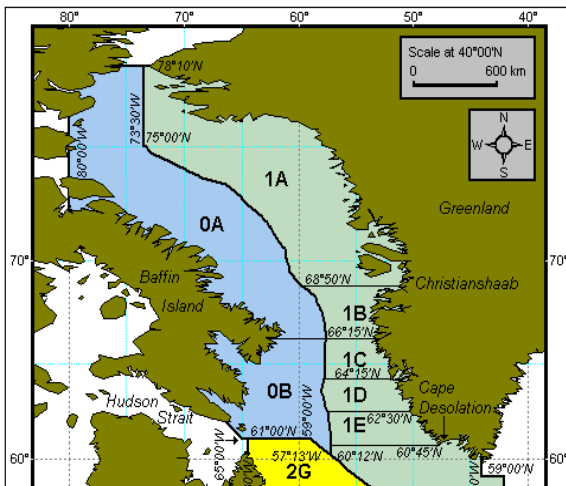


# Fishery statistics for Northern Shrimp (*Pandalus borealis*)

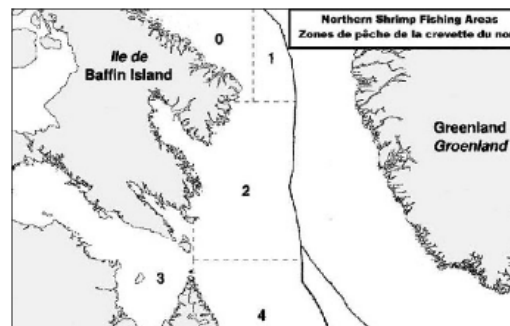
Northern shrimp (prawn) in Subarea 1 and Canadian SFA1: enacted TACs and total catches (2015 predicted for the year).



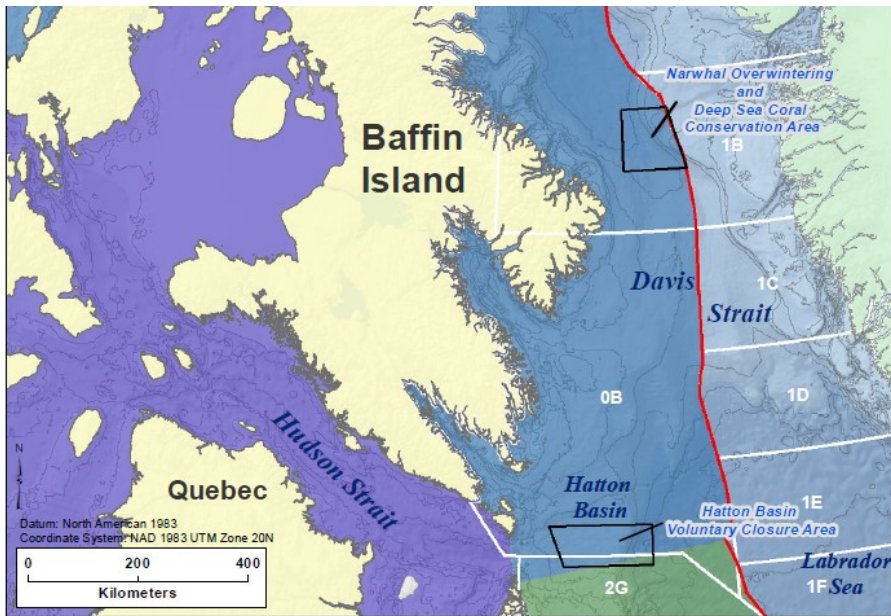
NAFO Fishing Areas



Canadian Shrimp Fishing Areas

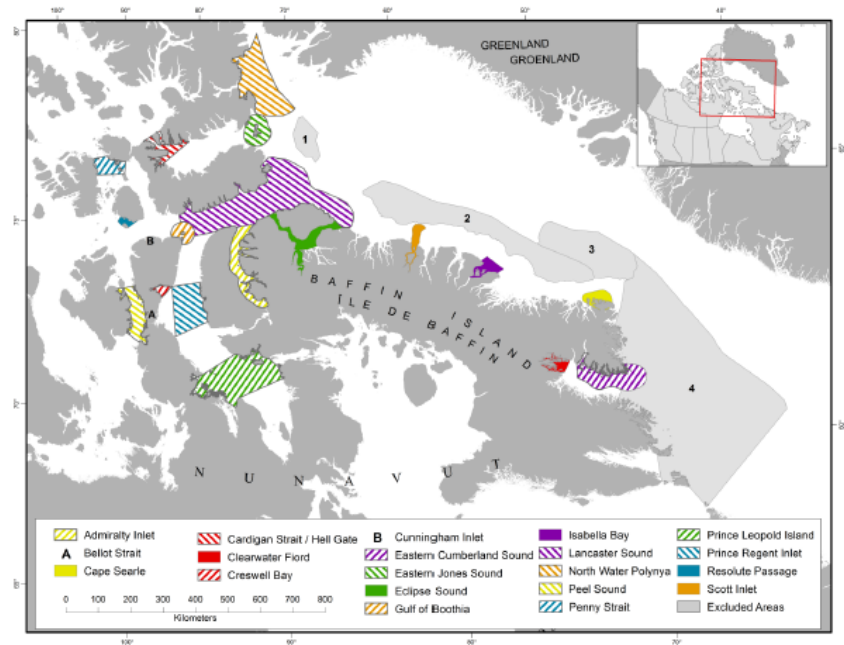


## Action 1a.2: Identifying and mapping of planned spatial management initiatives



**One Area Closed to Fishing with Federal Authority:** Narwhal Overwintering and Deep Sea Coral Conservation Area (area being re-evaluated)

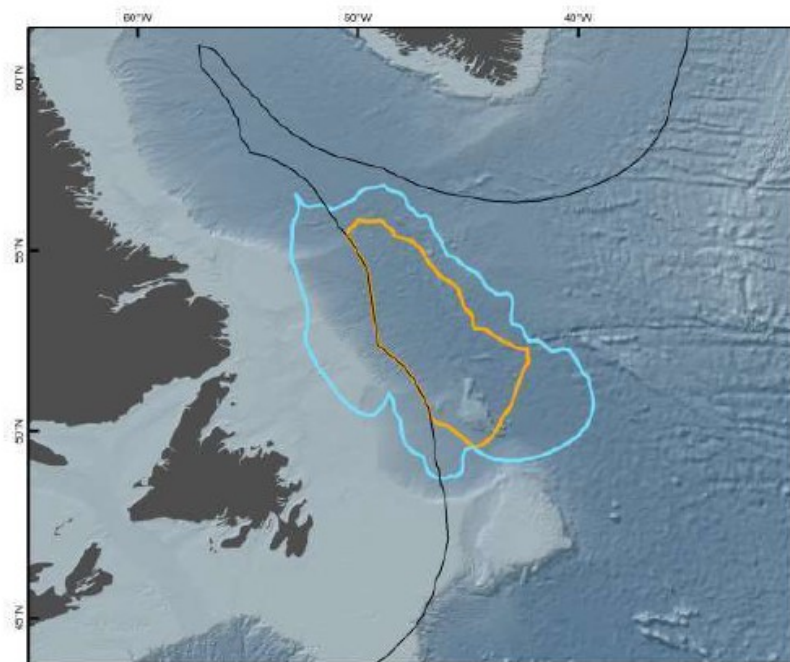
**Industry Avoidance Area:** Hatton Basin Voluntary Closure Area



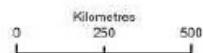
**Canadian EBSA areas identified (process evolving with Aichi deadline approaching):**  
Information from Greenland?

## Action 1a.2: Identifying and mapping of planned spatial management initiatives

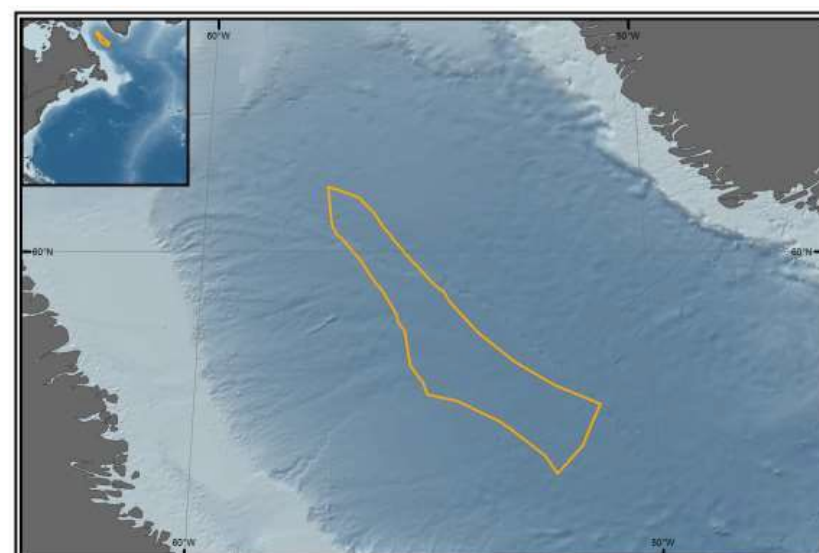
### Seabird Foraging Zone in the Southern Labrador Sea



- Area meeting EBSA criteria
- Union of seabird use areas
- 200 nm boundary



### Labrador Sea Deep Convection Area



#### Labrador Sea Deep Convection Area

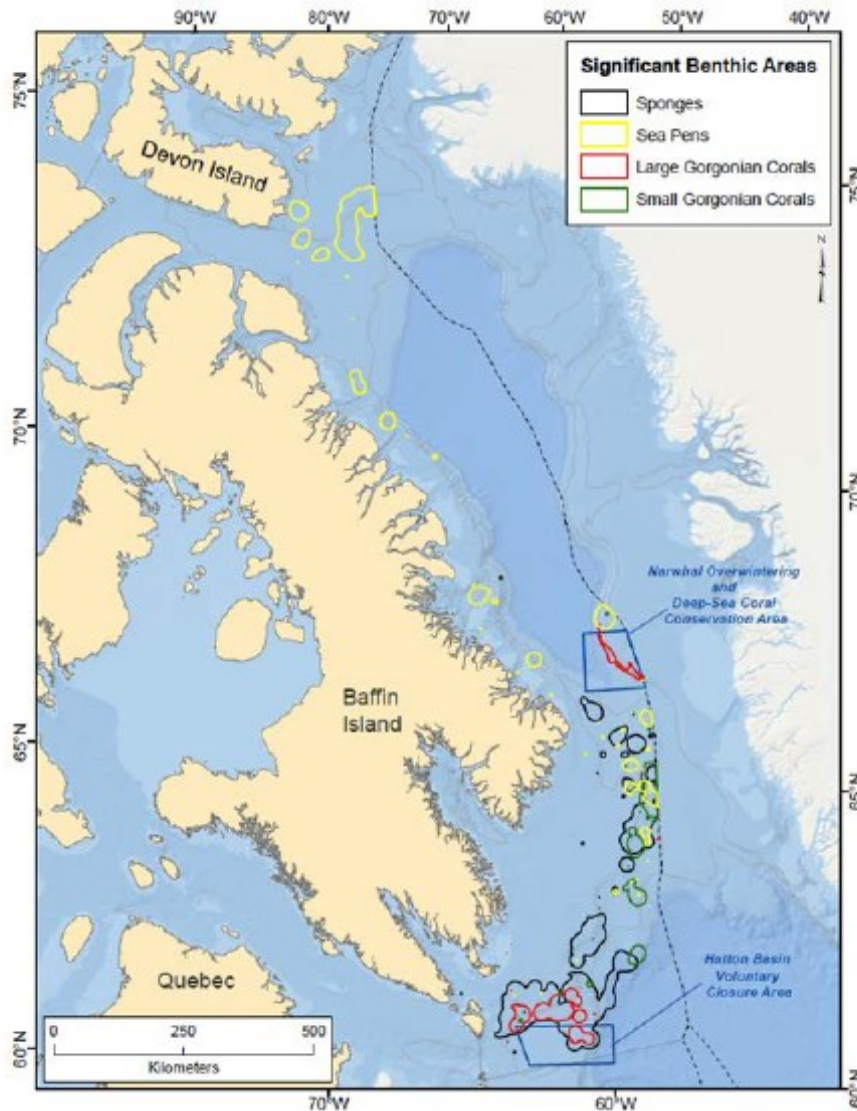
Area: 42874 km<sup>2</sup>

Northwest Atlantic Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas (EBSAs)  
24 March - 28 March 2014 in Montreal, Canada

Marine Geospatial Ecology Lab, Duke University (2014)



## Action 1a.2: Identifying and mapping of planned spatial management initiatives

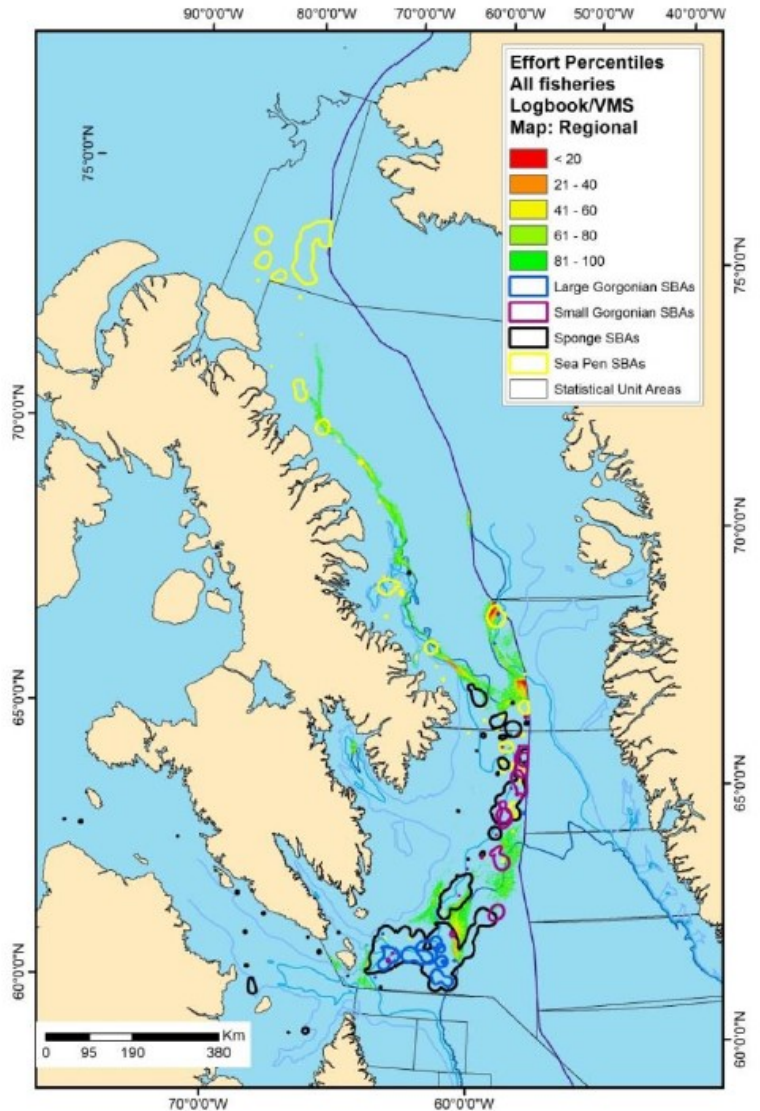


### Significant Benthic Areas (SBAs):

Large and small gorgonian corals; sea pens; sponges

Similar to VME

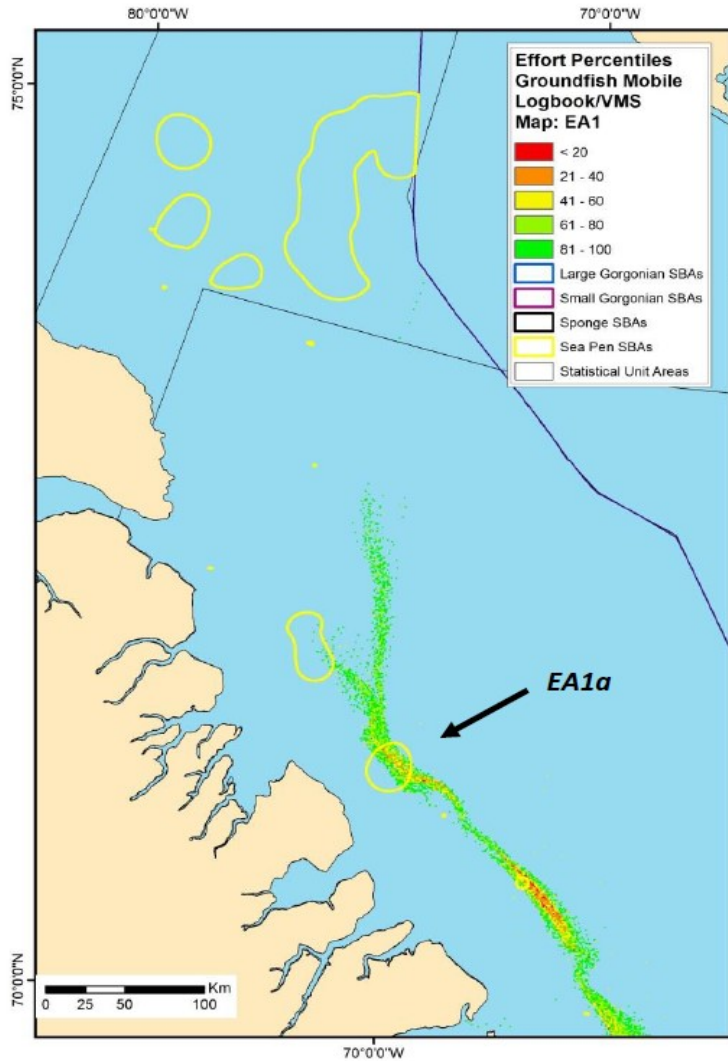
## Action 1a.2: Identifying and mapping of planned spatial management initiatives



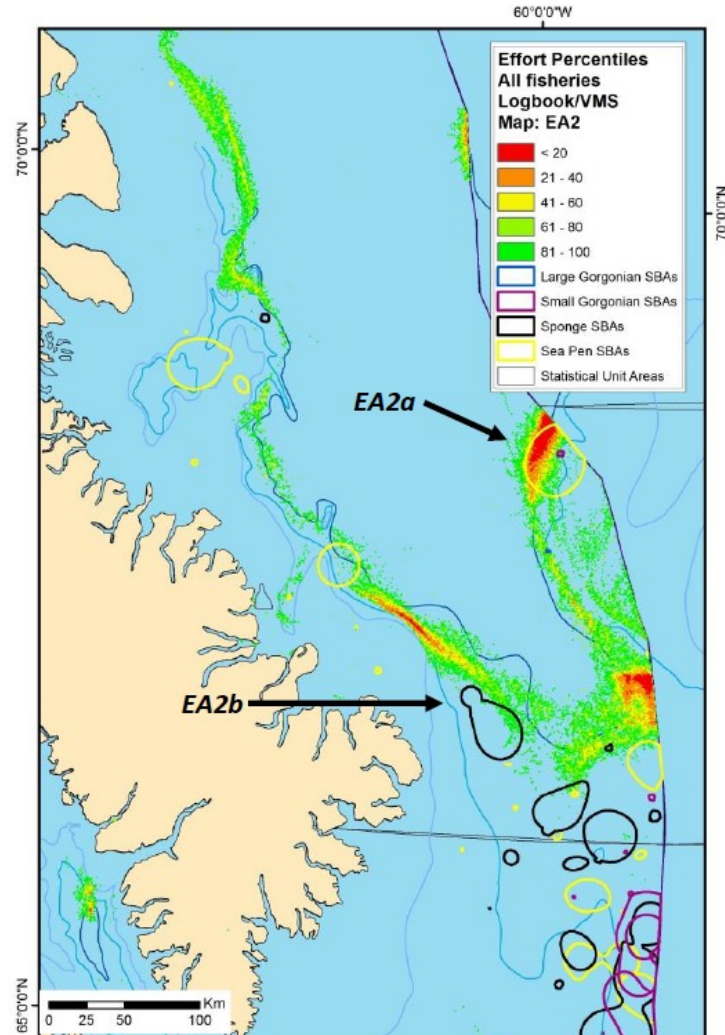
### Sensitive Benthic Areas (SeBAs):

Areas where significant concentrations of large and small gorgonian corals, sea pens or sponges overlap with fishing activity.

## Action 1a.3: Describing the patterns of activities

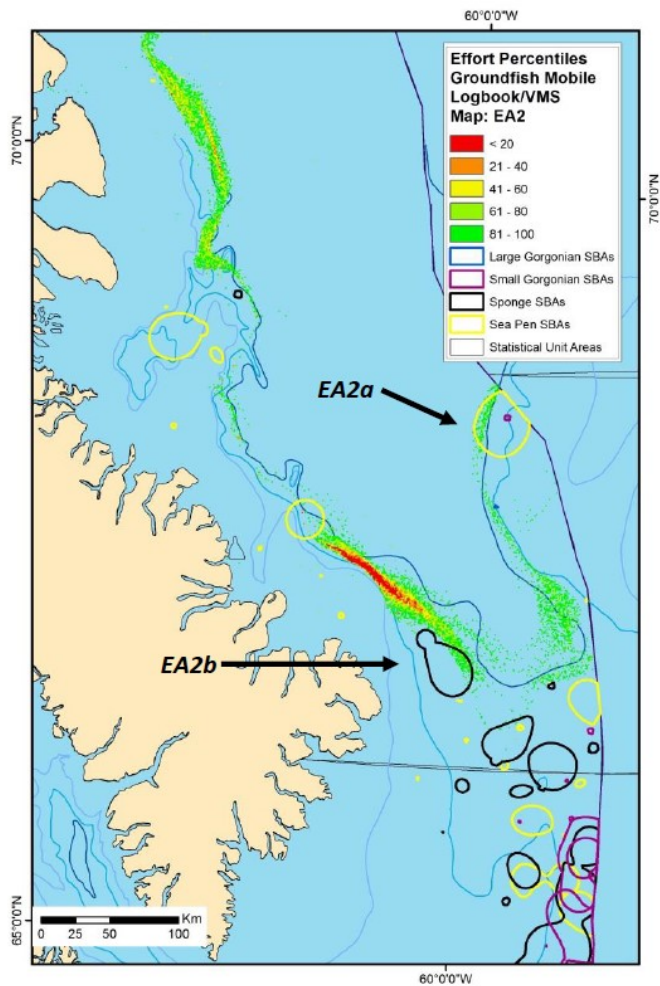


Mobile Groundfish

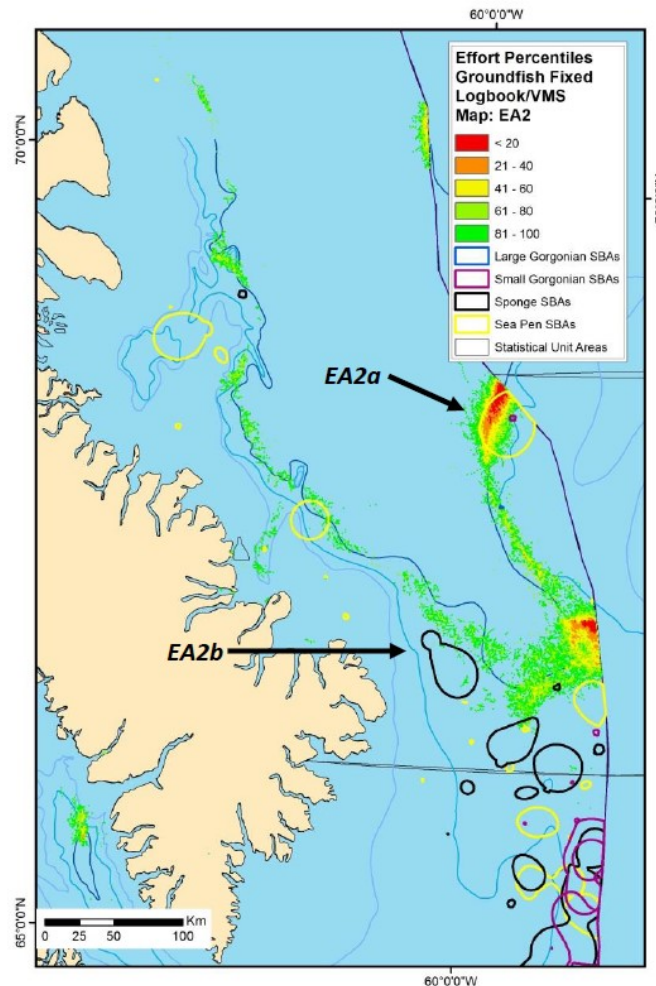


Mobile and Fixed Gear Groundfish

## Action 1a.3: Describing the patterns of activities

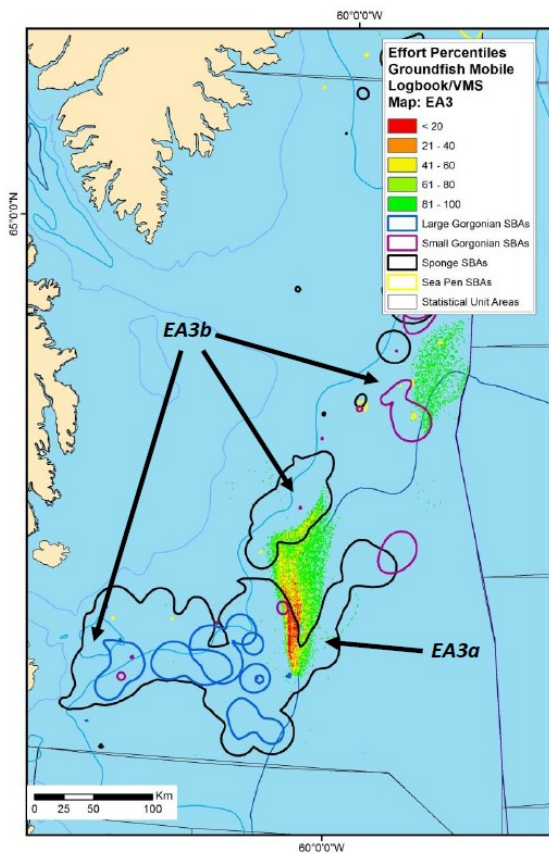


Mobile Groundfish

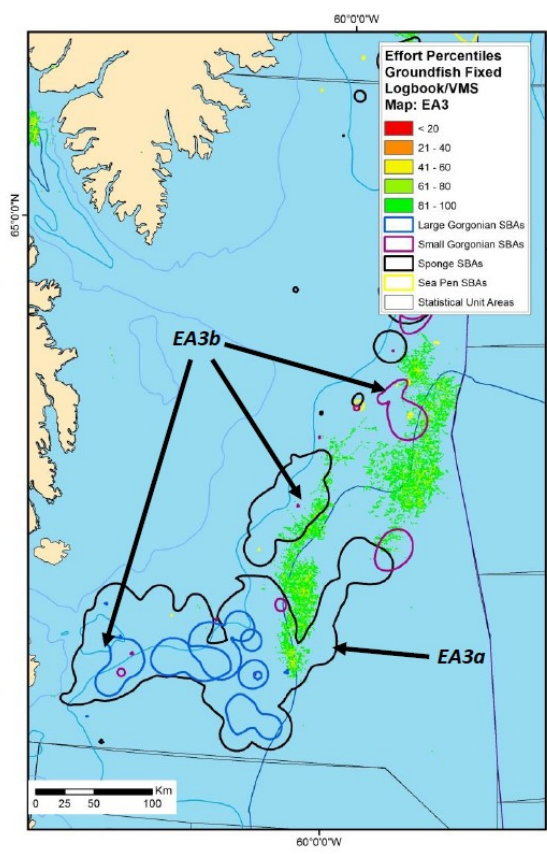


Fixed Gear Groundfish

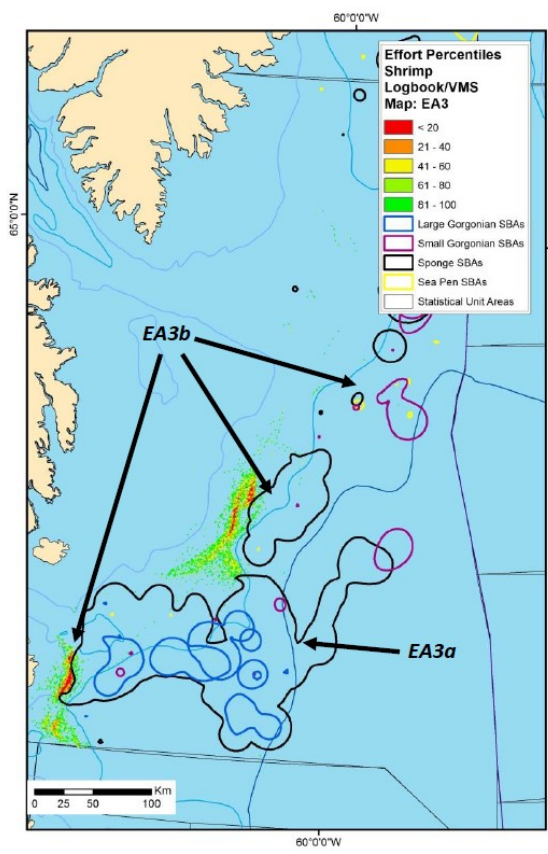
## Action 1a.3: Describing the patterns of activities



Mobile Groundfish



Fixed Gear Groundfish

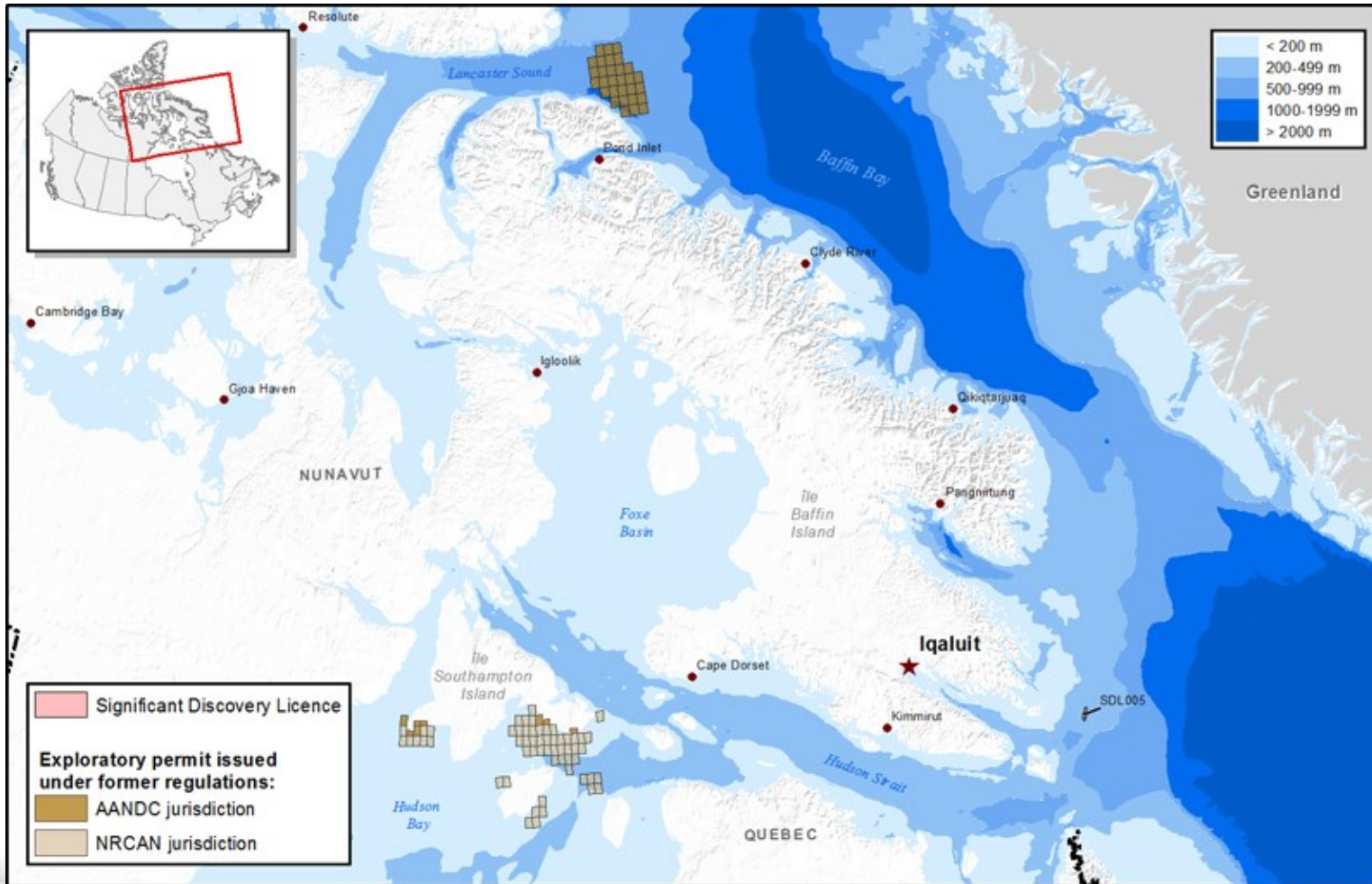


Shrimp

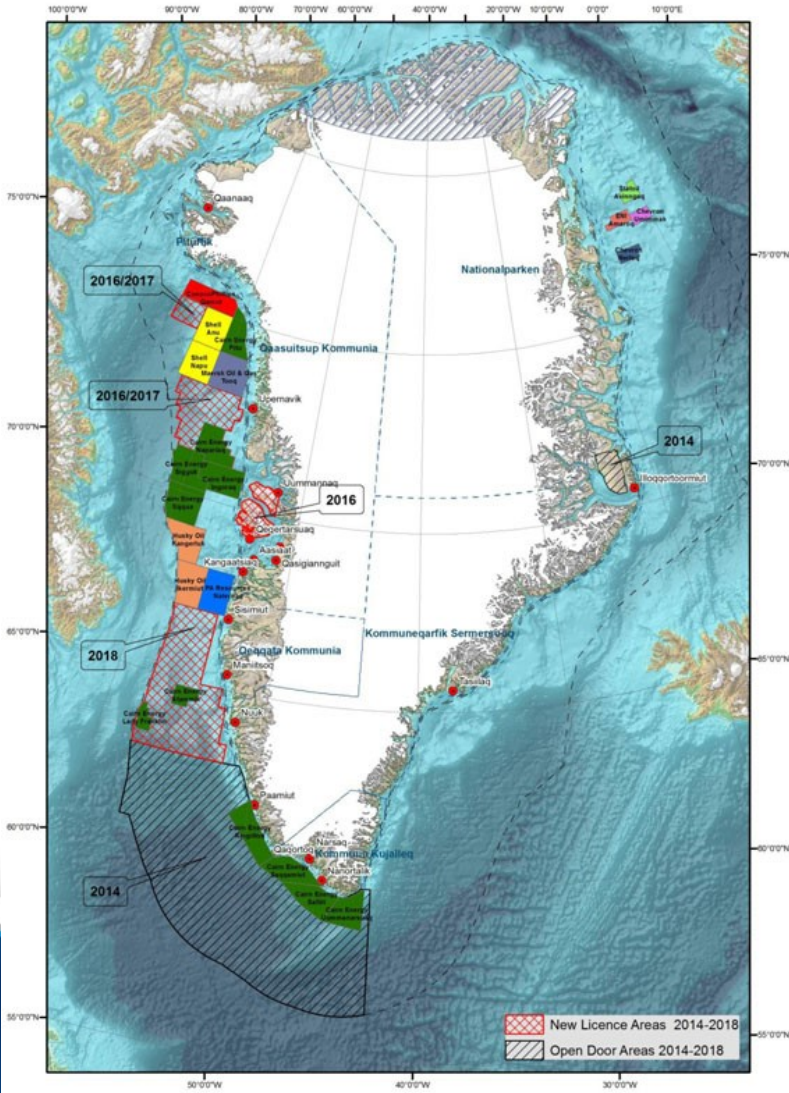
# Eastern Arctic

Eastern Arctic		Fraction of the fisheries class footprint that overlaps with the SBA (%)				Fraction of the SBA that overlaps with the fisheries class footprint (%)			
Fisheries class	Fraction of the effort with logbook positional data (%)	Large Gorgonlans	Seapen	Small Gorgonlans	Sponge	Large Gorgonlans	Seapen	Small Gorgonlans	Sponge
Groundfish Fixed	99.39	0	6.5	1.9	7.2	0	5.7	4.2	2.8
Groundfish Mobile	100.0	0	4.1	1.0	12.3	0	3.6	2.3	4.8
Shrimp	100.0	0.2	1.2	0.0	5.9	0.2	0.3	0	0.7
All fisheries	99.67	0	4.9	1.3	8.2	0.2	8.6	5.9	6.4

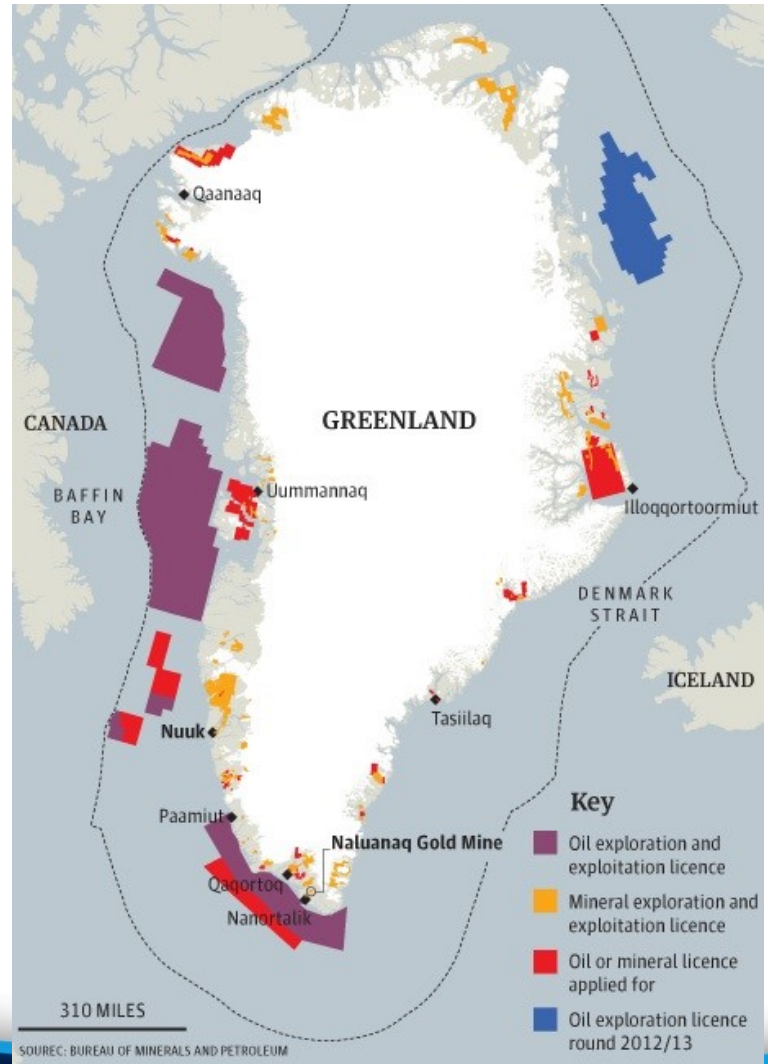
# Oil and Gas Leases



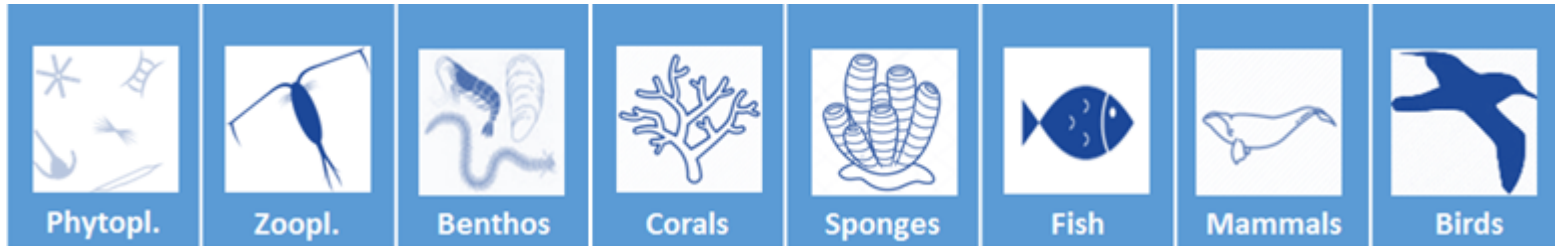
# Oil and Gas Leases



# Oil and Gas and Mineral Leases





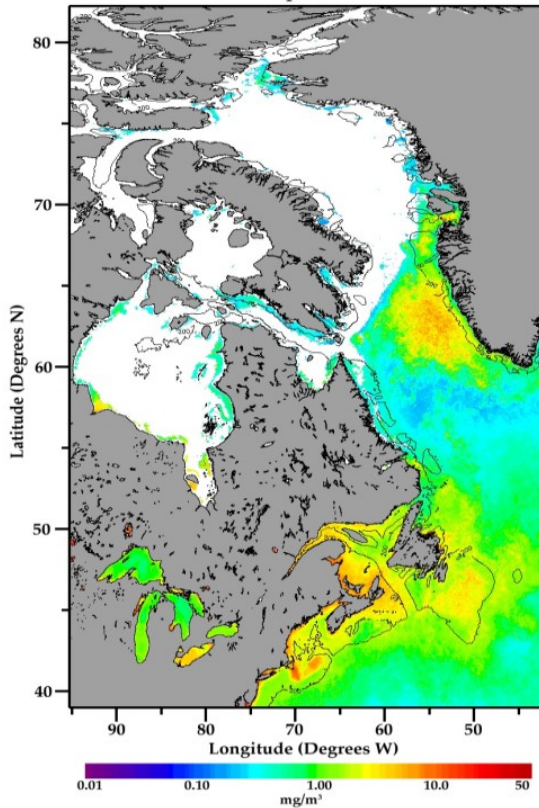


Data on Various Ecosystem Components

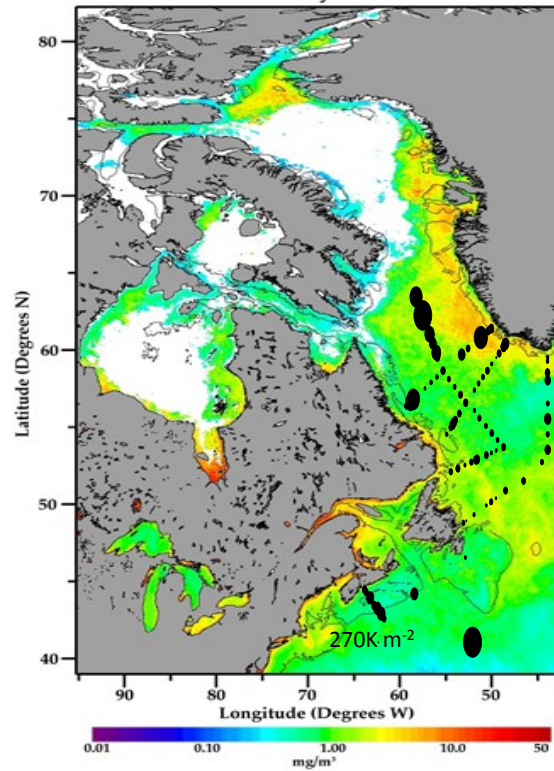
# SeaWiFS Chlorophyll-a Climatology (1999-2010) for April, May and June



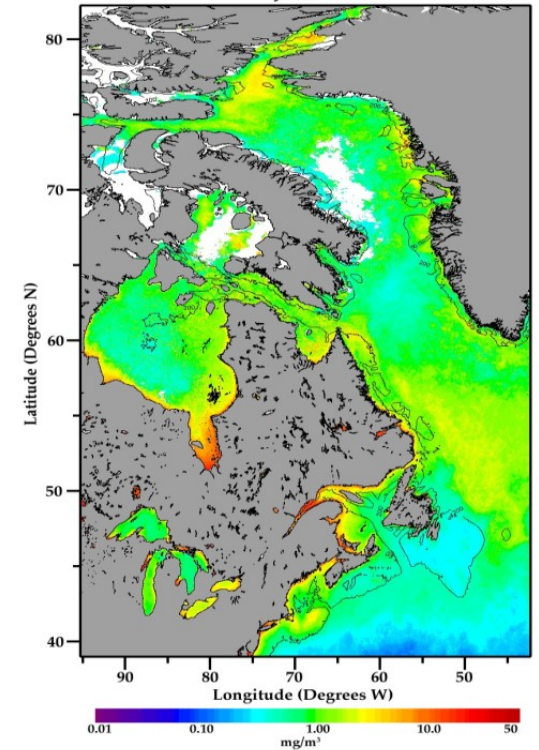
SeaWiFS (4km) Chlorophyll-a Climatology (1999-2010)  
April



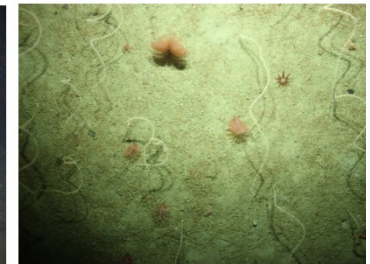
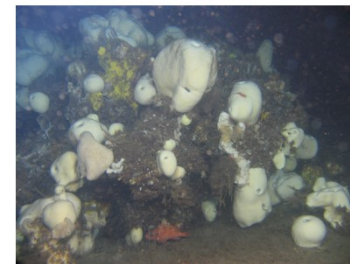
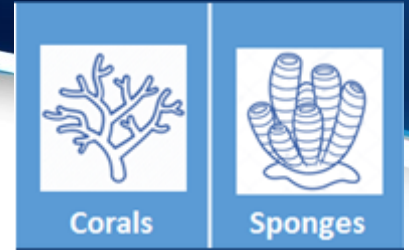
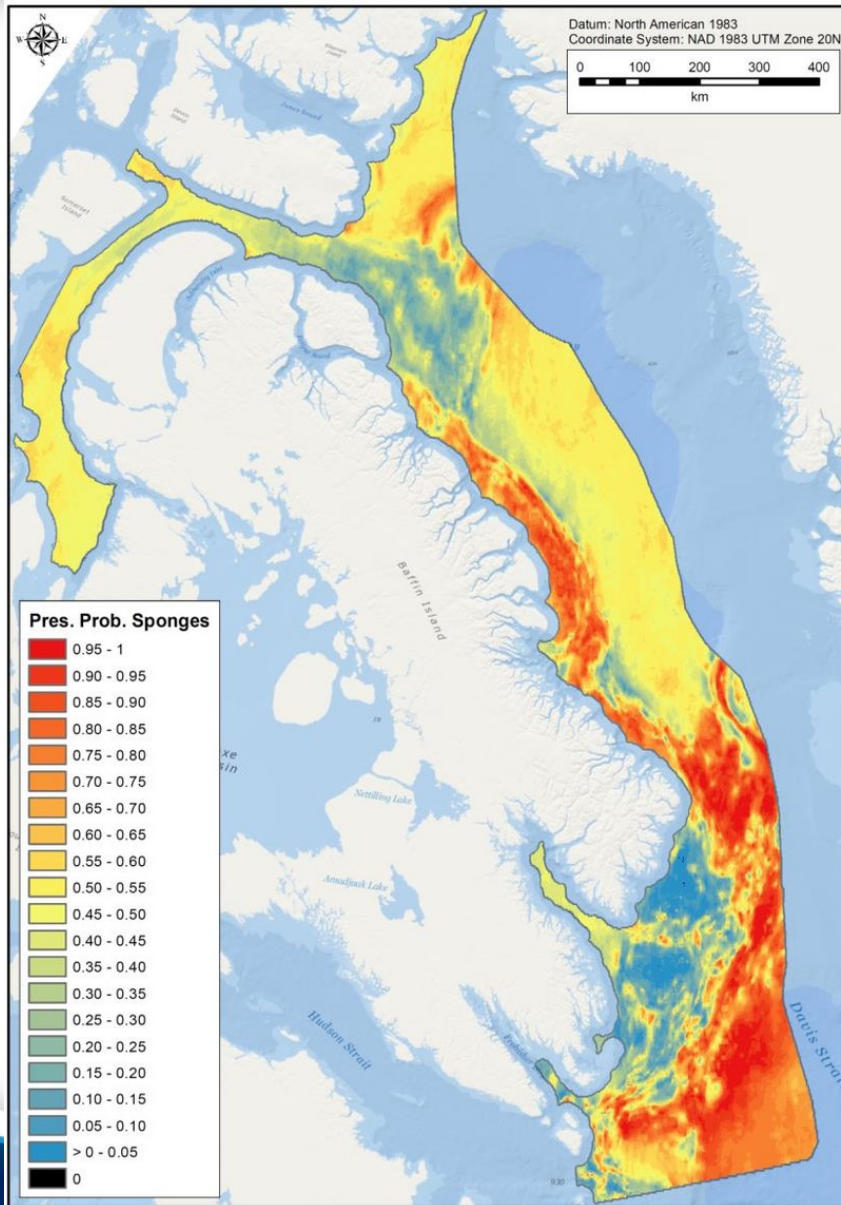
SeaWiFS (4km) Chlorophyll-a Climatology (1999-2010)  
May



SeaWiFS (4km) Chlorophyll-a Climatology (1999-2010)  
June



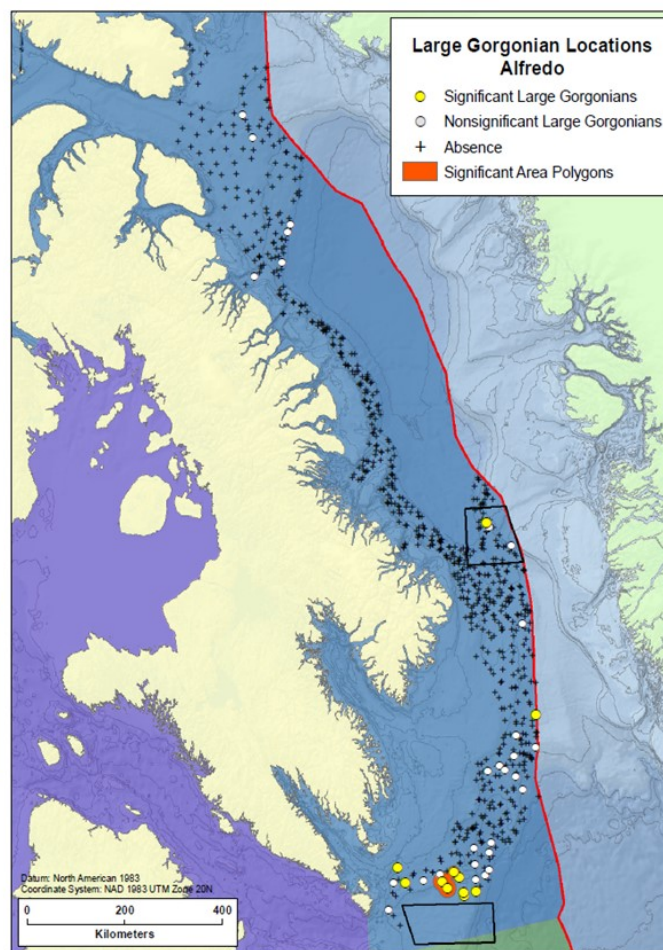
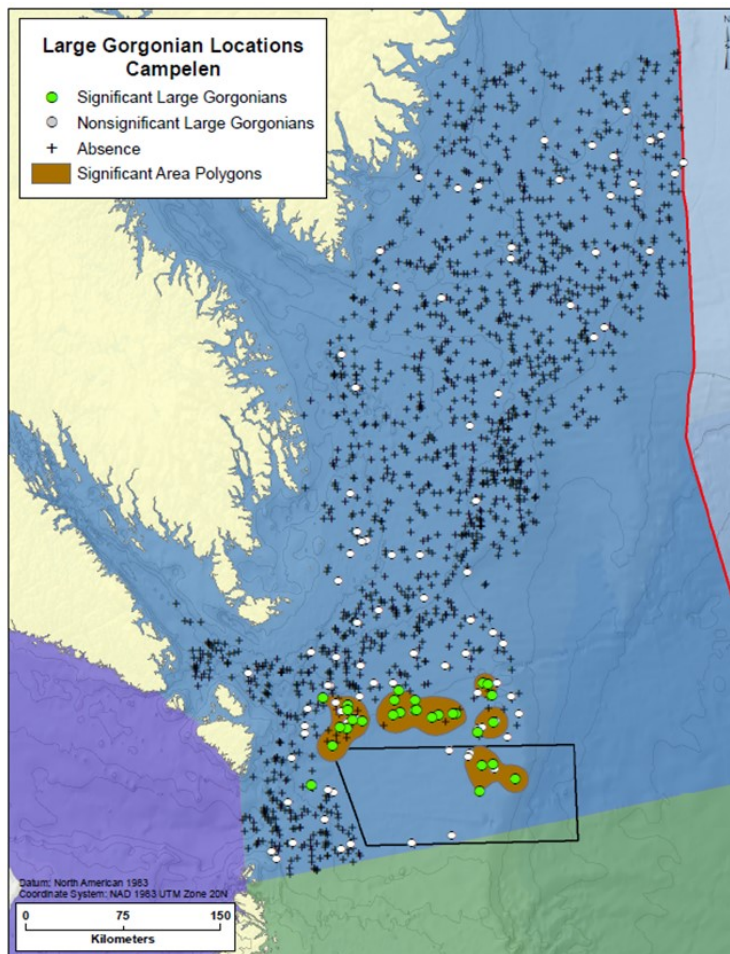
- the May image shows the abundance of *C. finmarchicus* in May-June, 1997



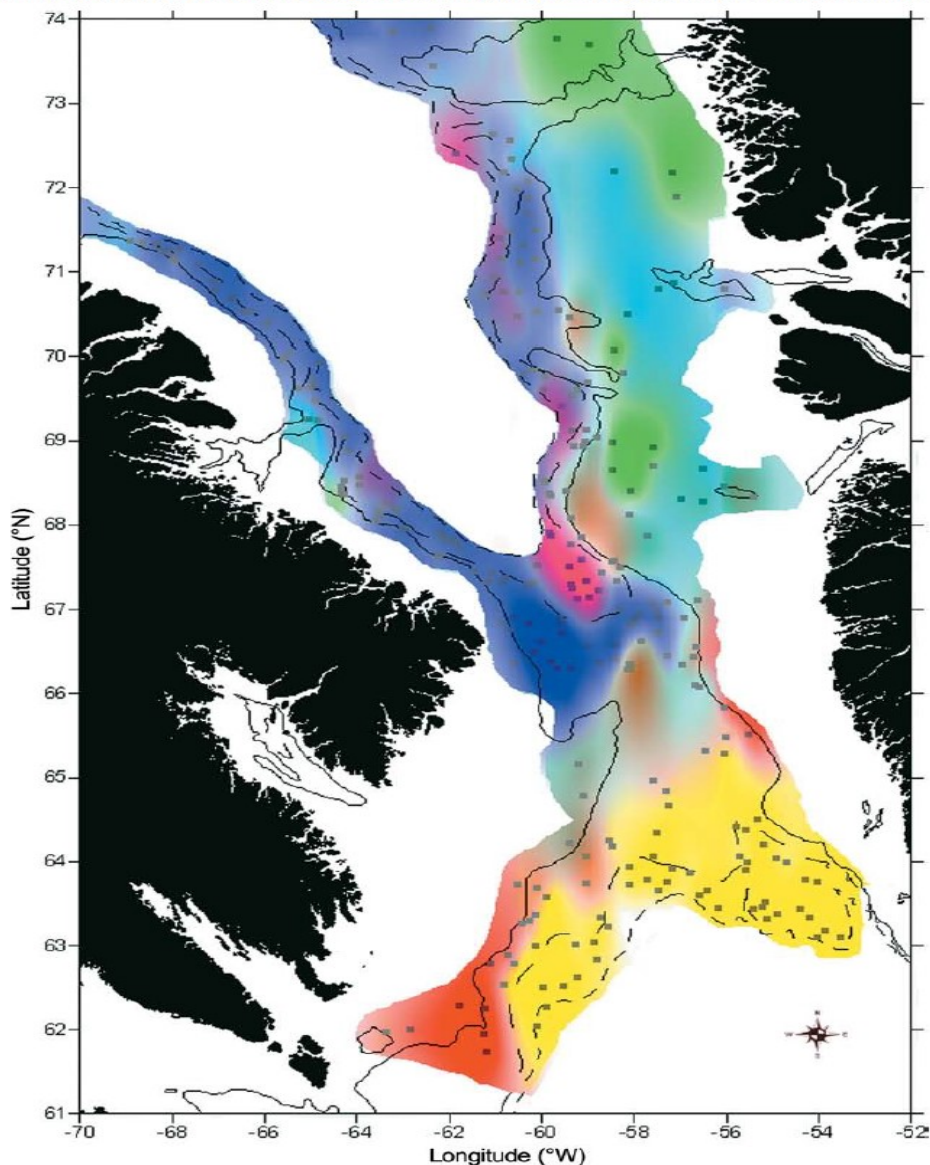
SDM (random forest): regionally based; presence/absence and biomass models; validated with Observer and UW image data



Benthos



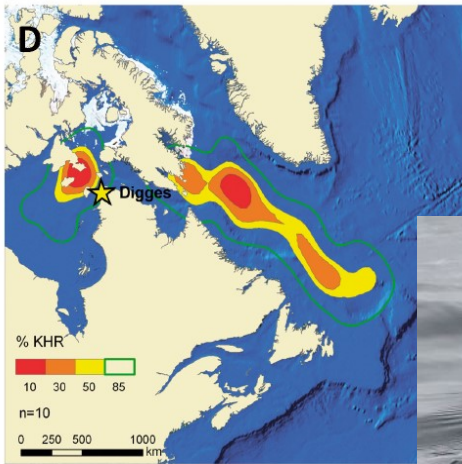
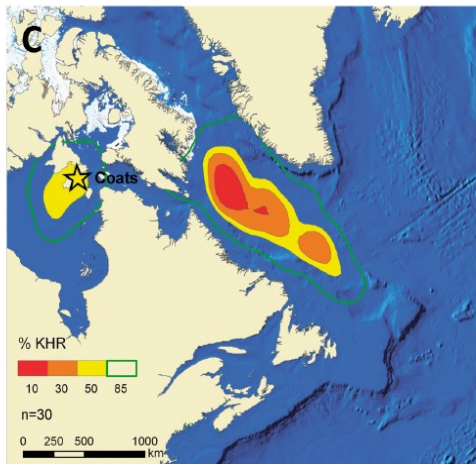
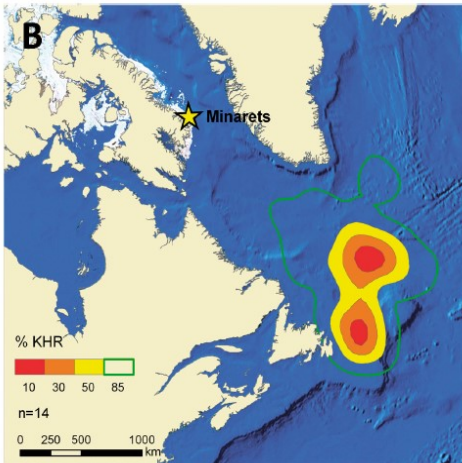
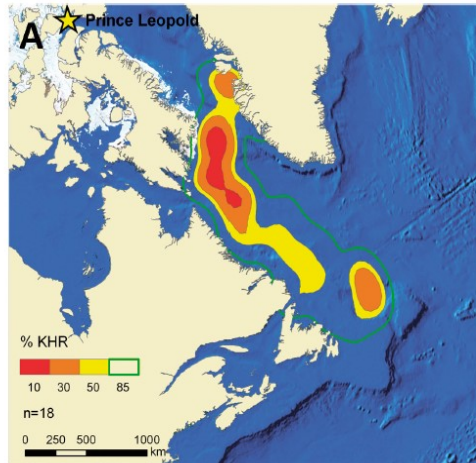
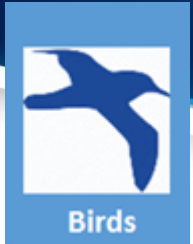
RV Catch data for other invertebrates



## The spatial distribution of fish assemblages (colour coded)

Jørgensen OA, Hvingel C, Møller PR, Treble MA (2005) Identification and mapping of bottom fish assemblages in Davis Strait and southern Baffin Bay. *Can. J. Fish. Aquat. Sci.* 62: 1833–1852.

# Winter Distribution of Thick Billed Murres Relative to Breeding Colonies





Toothed whales including Narwhal - overwinter in the Davis Strait region, along the slopes, near the ice-edge.



Beluga - on the West Greenland Shelf (WGS)



Humpback - in Disko Bay and on the WGS



Baleen whales including Bowhead - transit through Davis Strait between the High Arctic (summer) and Hudson Strait (winter).



Fin whale –transit through Davis Strait between Baffin Bay and southerly regions (even the Azores) in late fall.



Arctic ice-associated seals



Ringed - present year-round, mainly coastal. Benthic, epontic, pelagic feeders.

Bearded – as above



Sub-arctic ice-associated seals including

Harp – mainly present in winter. Opportunistic feeders.



Hooded – as above



Seals with no ice-association

Harbour – coastal, from the Arctic to Florida.

# Thank You!



**Presenter details:**  
*Name, details go here...*

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