

Table S1. Marine mammal observations for all species recorded during Fisheries and Oceans Canada bottom trawl surveys in Baffin Bay and Davis Strait. Only years where marine mammals were observed were included (i.e. 1999, 2004, 2006, 2008, 2010-2014, and 2017). Observations where species were unidentifiable were not included.

Year	Month	Species	Total Observed
1999	10	Northern Bottlenose Whale	3
2004	10	Northern Bottlenose Whale	23
2006	10	Humpback Whale	2
2006	10	Killer Whale	1
2006	10	Atlantic White-Sided Dolphin	3
2006	11	Northern Bottlenose Whale	8
2008	10	Harp Seal	3
2008	10	Northern Bottlenose Whale	44
2008	11	Harp Seal	1
2008	11	Bowhead Whale	3
2010	10	Northern Bottlenose Whale	8
2010	11	Northern Bottlenose Whale	16
2010	11	Sperm Whale	4
2011	9	Northern Bottlenose Whale	3
2011	9	Sperm Whale	2
2011	10	Humpback Whale	2
2012	9	Northern Bottlenose Whale	4
2012	10	Northern Bottlenose Whale	39
2012	10	Killer Whale	12
2012	10	Harp Seal	1
2013	10	Northern Bottlenose Whale	4
2013	10	Killer Whale	2
2014	9	Northern Bottlenose Whale	7
2014	10	Northern Bottlenose Whale	56
2014	10	Sperm Whale	6
2014	10	Dolphin spp	12
2014	10	Pilot Whale	5
2017	10	Northern Bottlenose Whale	72
2017	11	Northern Bottlenose Whale	5

Table S2. Results of two-sample t-tests comparing AUC values of multiple habitat suitability model runs with and without a bias file restricting the spatial selection for background points. Model runs performed for each species and at three levels of background points (i.e. 100, 500, or 1000)

Run details		t	df	p-value
Species	Number of background points			
Sperm Whale	100	-0.47	16	0.65
Sperm Whale	500	2.06	16	0.06
Sperm Whale	1000	0.29	16	0.78
Northern Bottlenose Whale	100	-0.60	18	0.56
Northern Bottlenose Whale	500	-0.92	18	0.37
Northern Bottlenose Whale	1000	-0.99	18	0.34

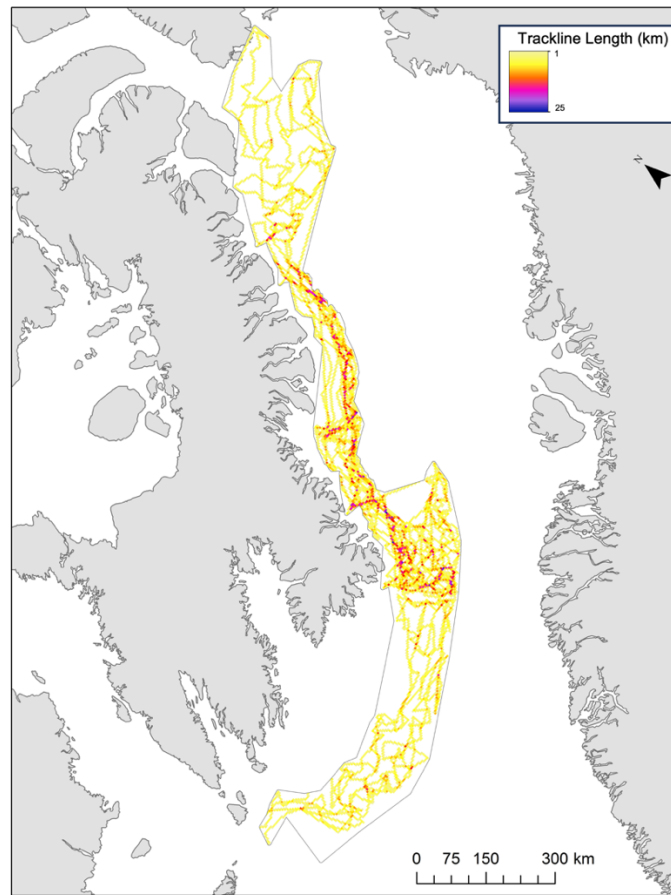


Figure S1. Multi-year tracklines of bottom trawl surveys mapped across a 4 km grid. The study boundary (black outline) was defined by the outline of the tracklines within NAFO 0A and 0B. Spatial survey effort was computed by summing the total length of all tracklines per grid cell. The trawl survey transited across the middle of the study area more than the south or north ends during times of whale observations (i.e. 2004 to 2017)

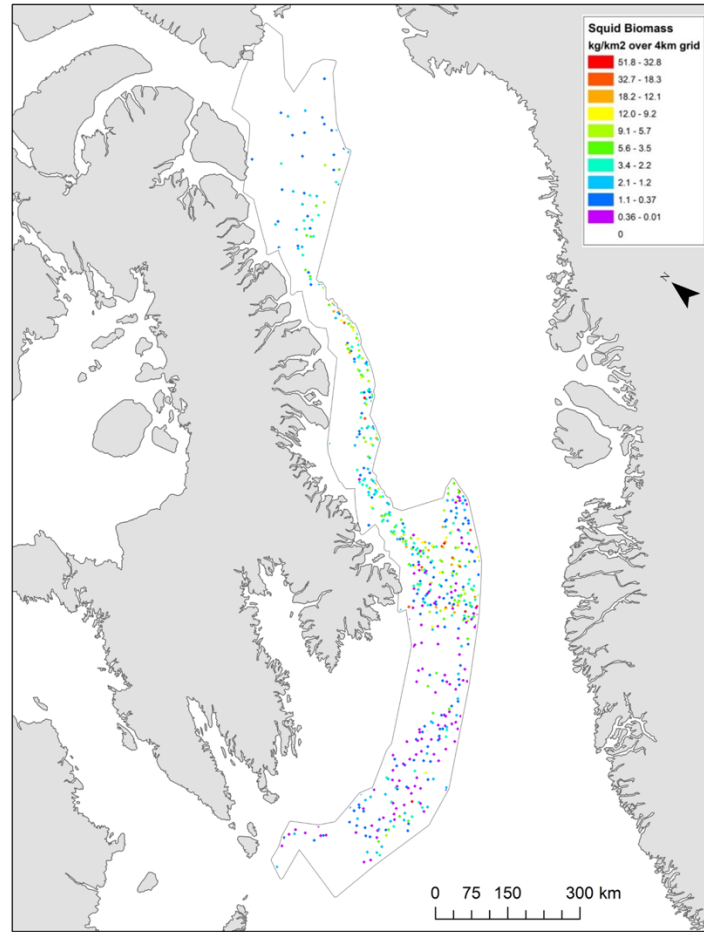


Figure S2. Squid biomass ( $\text{kg} / \text{km}^2$ ) across a 4 km grid. Values were obtained from the Fisheries and Oceans Canada bottom trawl survey and assigned based on the start latitude and longitude of the corresponding trawl set. The average biomass was taken where multiple values were present in the same grid cell.

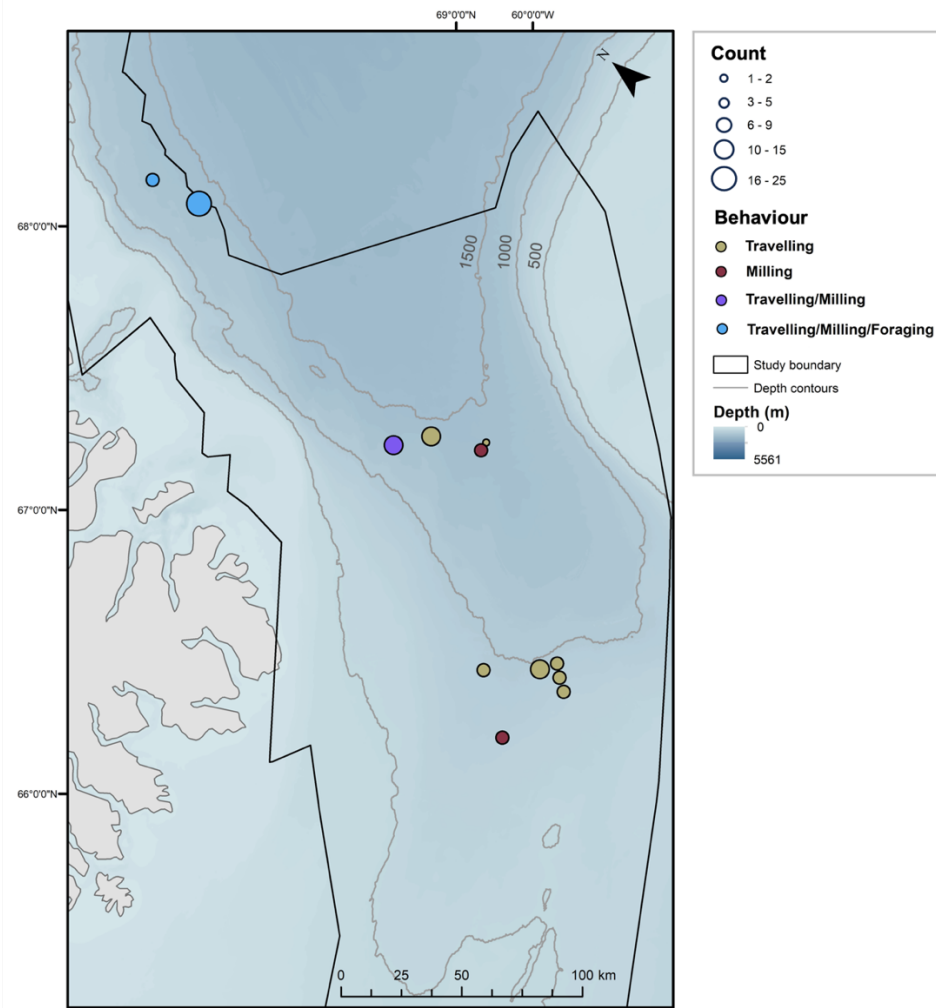


Figure S3. Recorded behaviours of northern bottlenose whales opportunistically observed in 2017 during bottom trawl surveys.

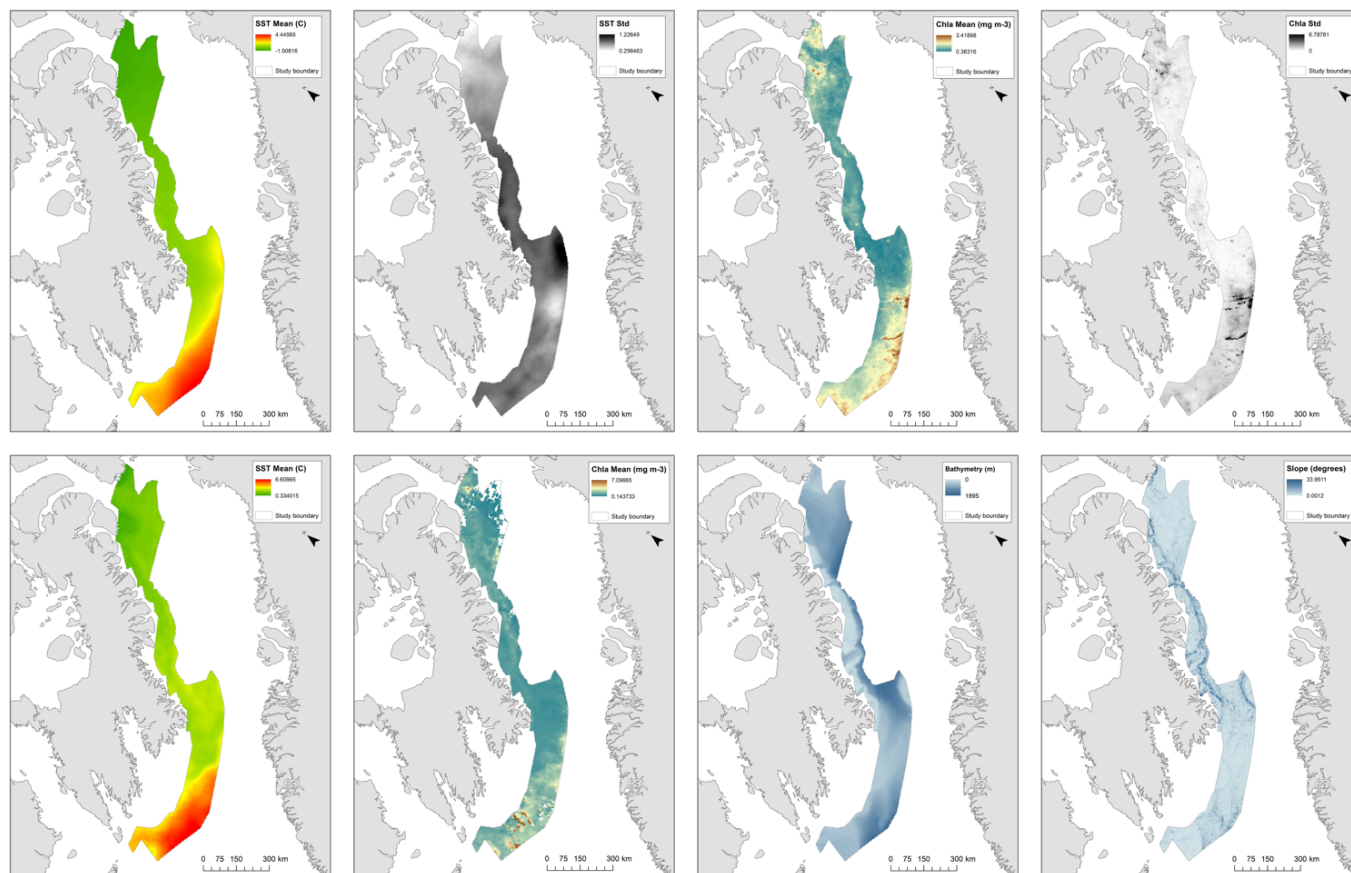


Figure S4. Distribution of environmental predictors across the study area: A) sea surface temperature monthly mean, B) sea surface temperature standard deviation, C) surface chlorophyll-a mean, D) surface chlorophyll-a standard deviation, E) sea surface temperature September 2021, F) surface chlorophyll-a September 2021, G) bathymetry, H) slope. Sea surface temperature and chlorophyll-a data available from <https://polarwatch.noaa.gov/catalog>. Bathymetry (and derived slope) data available from <https://www.gebco.net>