

## Marine Mammals Distribution and Numbers in Modern Oceanographic Conditions in the Barents Sea

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As it is known that in the Barents Sea hit content of sea surface layers beginning from 2000 to present can be defined as high and anomaly high level particularly in last 7 years. This caused of marine mammals great changes distribution, numbers and species structure here. In carrying out of research increasing of marine mammals numbers and regions meeting who inhabit in the Barents Sea all year around was brought. Increasing of time presence for animals who observe here periodically was recorded here also. Under that in our opinion climate change greatly influence to marine mammals distribution, numbers and species structure in the Barents Sea, and it can influence also to fish stocks as top predators. This reason in the paper will be presented results which in annual joint Russian-Norwegian ecosystem survey in the Barents Sea about marine mammals distribution, numbers and species structure by specialist from PINRO and Institute of Marine Research from Bergen (IMR) accordingly were got.

### Introduction

The Barents Sea hit content can be defined as high and anomaly high level during last 7 years. This caused of marine mammals considerable changes in distribution, numbers and species structure. In carrying out different research increasing among marine mammals numbers and regions meeting who inhabit in the Barents Sea all year around was recorded. Increasing of time presence for animals who observe here periodically was recorded here also. Under that in our opinion change of marine mammals distribution, number and species structure can greatly influence to the Barents Sea fish stocks. This reason it is need to take into account modern oceanographic conditions in the Barents Sea as very important factor for marine mammals this area.

### Materials and Methods

PINRO uses for marine mammals observations research vessels, other commercial fisheries vessels, special equipped two engines research aircrafts Antonov-26 (An-26) named "Arktika or L-410, coastal and small boats surveys usually. All observations for marine mammals from research and commercial vessels, from research aircraft are carried out as opportunistic surveys, and coastal, small boats surveys can be considered as dedicated. The first place among opportunistic surveys belongs to annual Russian-Norwegian ecosystem surveys. Onboard the Russian research and commercial vessels observations of marine mammals carry out by one observer covering a full sector of 180° from the bridge roof about 7-10 m above the sea surface. Observers make observations along transects between trawl and oceanographic stations only. All species record continuously along transects. For more correct of marine mammals identification use binocular. Onboard "Arktika" and L-410 observations for marine mammals carry out from both sides of aircraft by two observers from each side through special blubbers windows, so named "blisters". The swath observation from each side is equal research aircraft flight altitude, for both sides it is double altitude. All information put on onboard computer system in real time and positions. During coastal and small boats surveys all observations are as transect. Here use binocular and GPS. All observer activity is limited by weather conditions. When the weather conditions are not sufficiently good for observation (poor visibility, hard

precipitations, dark time, fogs, waves with Beaufort scale more than 4) its effort stop. For aircraft observations have one more limitation which is caused by clouds altitude. Aircraft observations don't carry out when it is less than 150 meters.

## Results and Discussion

Marine mammals numbers and distributions recorded during last annual Russian-Norwegian ecosystem survey (3 vessels from IMR and 1 from PINRO) carried out in August-September 2013 are presented as an example below. In total 1485 individuals of 12 identified species of marine mammals were observed. As in previous years, the most often observed species was white-beaked dolphin (about 55% of all registrations). Groups of white-beaked dolphins were registered in the southern Atlantic water masses and up to 81°N by Franz Josef Land. Compared to earlier years (e.g., 2003 – 2007), the dolphin distribution have shifted northwards, with fewer observations in Atlantic water masses and more observations north of the polar front. The toothed whales were also represented by killer whales, harbour porpoises and sperm whales. The sperm whales were observed in association with the Bear Island Trough, but also in the shallower south central Barents Sea. Small groups of harbour porpoises were observed in the southern and the eastern parts up to 73°N. Killer whales were observed north in the south west and south of Storfjorden, in the Svalbard archipelago. Among the baleen whales, minke whales, humpback whales and fin whales were most frequently observed (about 38% of all observations). As in 2012, the number of minke whale observations was low, whereas the number of humpback whales observed was relatively high. These whales were predominantly observed in dense concentrations on the banks east of the Spitsbergen Archipelago, while fewer individuals were observed in the central and the south-eastern parts of the Barents Sea compared to previous years. Six blue whales were observed along the northern shelf break and in the Hinlopen straight. Few seals were observed during the ecosystem survey. Harp seals were recorded around the Spitsbergen Archipelago, and along the northern shelf break at 81°N. Walrus were single animals observed at 80°N, north of west Spitsbergen and between Spitsbergen and Franz Joseph Land. Also the bearded seals were observed along the northern shelf break.

**Marine mammals numbers observed during annual Russian-Norwegian ecosystem survey in 2013**

Order/ suborder	Name of species	Johan Hjort	Helmer Hansen	GO Sars	Vilnus (PINRO)	Total	%
Cetacea/ Baleen whales	Blue whale	-	6	-	-	6	0.40
	Fin whale	65	26	19	17	127	8.56
	Humpback whale	275	6	2	40	323	21.78
	Minke whale	74	9	5	33	121	8.16
	Unidentified whale		2			2	0.13
Cetacea/ Toothed whales	Sperm whale	1		5	1	7	0.47
	Killer whale	6		6	1	13	0.88
	Harbour porpoise				31	31	2.09
	White-beaked dolphin	241	112	291	170	814	54.89
	Dolphin spp.					0	0.00
	White whale					0	0.00
Pinnipedia	Harp seal	26	4		6	36	2.44
	Ringed seal					0	0.00
	Bearded seal		1			1	0.07
	Walrus	1			1	2	0.13
	Hooded seal					0	0.00
<b>Total sum</b>		<b>689</b>	<b>166</b>	<b>328</b>	<b>300</b>	<b>1483</b>	<b>100</b>

