



SEABIRDS AND MARINE MAMMALS IN SOUTHEAST GREENLAND II

Results from a survey between Scoresby Sound and Tasiilaq
in July and August 2016

Scientific Report from DCE – Danish Centre for Environment and Energy

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Data sheet

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Abstract:	This report describes the results of the second part of the survey of breeding colonial seabirds and marine mammals in Southeast Greenland. The survey covered the coasts between Scoresby Sound and Tasiilaq. Generally, the assembly of breeding seabirds was poor, just as in the area surveyed during the first part of the project in 2014. Again in 2016 the most widespread and numerous species were glaucous gull and black guillemot. However, there is an important and relatively rich area at the coast between Cape Brewster and the Manby Peninsula, with several colonies of kittiwake, a large thick-billed murre colony, little auks at several sites and many other breeding seabird species including common eider, Arctic tern, Arctic skua and lesser black-backed gull. This area is clearly influenced by the polynya in the mouth of Scoresby Sound. Another area with more seabirds is the mouth of Kangerlussuaq and the coast from here south to Patulajaviit, where there are colonies of common eiders and Arctic terns. South of the Cape Brewster-Manby Peninsula area only one kittiwake colony was found and no colonies of other auk species besides black guillemots.
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Summary

This report presents the results of a ship-based survey of breeding seabirds and marine mammals in Southeast Greenland in the area between Scoresby Sound and Tasiilaq undertaken in late July 2016. This was the second and final part of a survey planned to cover the entire outer coast of Southeast Greenland and was funded by the Danish Environmental Protection Agency ('DANCEA') and The Environment Agency for Mineral Resources Activities in Greenland. The results of the first part of the survey were presented in a previous report (Boertmann & Rosing Asvid 2014).

In total, 116 breeding colonies of seabirds were visited, and 92 of these were new to the Greenland Seabird Colony Register. Just as found along the coasts surveyed during the first leg of the survey in 2014, the seabird fauna was generally poor; the most frequent species recorded being black guillemot and glaucous gull. However, the area between Cape Brewster and the Manby Peninsula was rich in both number and diversity. The reason for this is that this area is influenced by the polynya in the mouth of Scoresby Sound. Another relatively bird rich area was from the mouth of Kangerlussuaq and the archipelagos south to Patulajaviit, where there are several colonies of common eiders and Arctic terns.

In the Cape Brewster area, a small kittiwake colony was found nearby the two well-known colonies, but on the entire coast between the Manby Peninsula and Tasiilaq only one new colony was found. Breeding lesser black-backed gulls were found at several sites, the largest colony with 35 pairs. In contrast and unexpectedly, breeding great black-backed gulls were few in numbers.

Non-breeding and moulting grey-lag geese ($n = 5$) were recorded at two sites near the Manby Peninsula. Together with the observation of another moulting grey-lag goose in 2014, this may indicate that grey-lag geese regularly perform moult migration from Iceland to Greenland.

Great skuas ($n = 4$) were observed in the area north of the Manby Peninsula; the species was also observed during aerial surveys in 2008 and 2009 in the same area, and there is thus reason to believe that it breeds here.

Among the marine mammals, coastal seals (harbour and grey) were focus species (cf. the report from the 2014 part of the survey). Sightings of harbour seal along the coasts surveyed 2016 have occasionally been reported, but in our survey neither harbour nor grey seals were observed.

Polar bears were recorded in high numbers along the Blossville Coast ($n = 50$), all on land or in fjords with glacier ice and among them several females with cubs ($n = 10$). Despite the complete lack of sea ice, all looked healthy and fit.

A concentration of hooded seal was observed in an area with dense glacier ice off the coast south of Kangerlussuaq. This area was the only longer stretch outside the fjords where the ice conditions prevented sailing close to land. It was therefore passed 5-10 km from the coast where high abundances of harp seals of all ages were found.

It can be concluded that apart from the Cape Brewster area (influenced by the polynya in Scoresby Sound), the fauna of breeding seabirds is generally poor, exhibiting few species, low numbers and dispersed colonies. However, the density of colonies of black guillemot on the Blosseville Coast is very high.



Travelling along the Blosseville Coast is like jumping from cape to cape; here Cape Ravn in the foreground followed by Cape Stephensen, Cape Rink, Cape Normann and Cape Garde. Photo: David Boertmann.

Sammenfatning

Denne rapport beskriver resultaterne af et skibsbaseret togt, der havde til formål at kortlægge ynglekolonier for havfugle og forekomsten af havpattedyr (med fokus på kystsæler) i Sydøstgrønland langs kysten mellem Scoresby Sund og Tasiilaq. Der var tale om den anden og afsluttende del af et to-årigt projekt, der skulle dække hele den sydøstgrønlandske yderkyst. Første del blev gennemført i 2014. Hele projektet blev finansieret af den danske miljøstyrelse ('DANCEA') og af den grønlandske miljøstyrelse for råstofområdet. De indsamlede data skal indgå i regulering af eventuel fremtidig olieefterforskning og ved kortlægning af områder der er følsomme overfor oliespild, ligesom de kan bruges som en 'base-line' hvis effekter af klimaændringerne skal vurderes.

I alt blev 116 havfuglekolonier besøgt og optalt, og af disse var 92 nye i forhold til det tidligere kendskab til området. Området var generelt fattigt på ynglende havfugle, med tejst og gråmåge som de mest talrige og udbredte arter. Tejst var dog særdeles talrig langs Blossville Kyst. En væsentlig undtagelse fra dette indtryk, var dog kysten mellem Kap Brewster og Manby Halvø. Her har polynyet i munden af Scoresby Sund indflydelse, og her er et meget rigere fugleliv, både i forhold til antal arter og i antal. Et andet lidt mere rigt område (dog ikke tilnærmelsesvist så rigt som Kap Brewster-området) var munden af Kangerlussuaq og skærgårdene herfra mod syd til Patulajaviit, hvor der var ederfugle og havterner.

Der blev fundet to nye kolonier med ynglende rider, den ene en lille aflægger af en af de velkendte kolonier, den anden en hidtil ukendt, som den eneste på hele strækningen fra Manby Halvø til Tasiilaq. Sildemåger blev fundet ynglende flere steder, med en koloni på 35 par som den største. Svartbag var derimod forbløffende fåtallig. Fældende grågæs blev set to steder (i alt fem) ved Manby Halvø, og sammen med observationen af en tilsvarende fældende grågås i 2014 syd for Tasiilaq, antyder de et regelmæssigt fældningstræk fra Island.

I alt fire storkjover blev observeret i området nord for Manby Halvø. Arten er set her flere gange tidligere (under de flybårne optællinger i 2008 og 2009) og må antages at yngle i området.

Blandt havpattedyrene var det særligt kystsælerne (spættet og grå), der var i fokus, jvf. rapporten fra den første del af undersøgelsen i 2014. Der foreligger enkelte gamle observationer af spættet sæl på den kyststrækning der blev undersøgt i 2016, men ingen blev set, ligesom der ikke blev observeret gråsæl.

Der blev observeret et større antal ($n = 50$) isbjørne på Blossville Kyst, heriblandt mange hunner med unger ($n = 10$). Alle opholdt sig på land eller i fjorde med tæt gletsjeris på vandet, da havis var fraværende under hele turen. I et område med tæt gletsjeris ud for yderkysten syd for Kangerlussuaq sås en koncentration af klapmydser. Dette område var det eneste længere stræk (ca. 100 km) langs yderkysten, hvor isforholdene umuliggjorde sejlads tæt på land, og her 5-10 km fra kysten var der også mange svømmende grønlands-sæler i alle aldre.

Det kan konkluderes (ligesom i 2014), at bortset fra strækningen mellem Kap Brewster og Manby Halvø er fuglelivet langs den undersøgte kyst relativt fattigt med få arter og med spredt liggende kolonier.

Eqikkaaneq

Tunup kujasinnerusortaani Ittoqqortoormiit Tasiilallu akornani sinerissami timmissat ineqarfiinik miluumasunillu imarmiunik (annermik puisinik sineriammiunik) nalunaarsuiluni umiarsuakkut angalanermit paasisat nalunaarusiami matumani allaatigineqarput. Misissuineq tassaavoq suliniutip ukiunik marlunnik sivilissusillup immikkoortuisa aappaat naggataallu, tassanilu tunup kujasinnerusortaani sineriappasissut misissuiffigineqartussaapput. Immikkortoq siulleq 2014-imi naammassineqarpoq. Suliaq tamarmi danskit avatangiisinik aqutsisoqarfiannit ('DANCEA') kiisalu Kalaallit Nunaanni aatsitassalerivimmi avatangiisinut aqutsisoqarfimmit aningaasalersorneqarpoq.

Timmissat ineqarfiit katillugit 116 tikinneqarput kisitsivigineqarlutillu, taakkunanngalu 92-it siusinnerusuklut ilisimasanut sanilliullugit nutaajupput. Sineriak tamanna ataatsimut isigalugu timmissanik imarmiunik soqarluannilaq, taavalu serfat naajaanaallu amerlanersaallutillu siammasinnerpaajupput. Serfalli Blossevillep Sineriaani amerlalluinnarput. Kisiannili Kap Brewsterip aammalu Manby Halvøp akornanni sineriak taakkunasut inngilaq. Tassani Ittoqqortoormiit Kangerlussuata paani aakkarnersuaqarfik sunniuteqarpoq, tamaani timmiarneqarneroqaaq, tassa amerlassusii assigiinngitsukkuutaallu amerlaqalutik. Alla timmiaqarluartoq (kisiannili Kap Brewsterit eqqaatut peqartiginngitsaq) tassaavoq Kangerlussuup paava kujammullu qeqertaqarfik ikkarloqarfillu Patulajaviit tungaannoortoq, tamanilu miteqarluarlunilu imeqqutaalaqarluarpoq.

Taateraaf erniorfii marluk nassaarineqarput, aappaa ilisimaneqareersup sanilequtaraa, aappaalu maannamut ilisimaneqarsimanngilaq, taavalu Manby Halvømiit Tasiilamut taama ittuni kisiartaalluni. Naajarujsuit erniorfii arlallit nassaarineqarput, annersaallu aappariinnit 35-init najorneqarpoq. Naajaruilli uissuuminartumik ikittuinnaapput. Manby Halvømi nerlerit isasut piffinni marlunni takuneqarput (katillugit 5), taavalu Tasiilap kujataani 2014-imi nerlernut isasunut naammattoorneqartunut ilanngukkaani malunnarpoq Islandimiit isajartortarnerat nalinginnaasimasooq.

Katillugit isunngarujussuit sisamat Manby Halvøp avannaani takuneqarput. Timmissat taakku siusinnerusuklut arlaleriarlutik tamaani takuneqartarput (2008 aamma 2009-imi timmisartumiit kisitsinermi), tamanilu erniortarsimanissaat naatsorsuutigisariaqarpoq.

Miluumasut imarmiut akornanni pingaartumik puisit sineriammiut (qasigissat sigguttuullu) sammineqarput, takuuk 2014-imi misissuinerup immikkoortuisa aappaannit nalunaarusiaq). Sinerissami 2016-imi misissuiffigineqartumi qasigissanik ataasiakkaanik takusoqartarsimavoq, tamatumuunalu takusoqarsimanngilaq aammalu puisinik sigguttuunik takusoqarsimanani.

Blosseville Kystip sineriaani nanorpaalusuarunik (n=50) takusoqarpoq, soorlu arnavissanik piaqqisartunik (n=10). Tamarmik nunami kangerlunniluuniit immamut qanittumik sermitalimmi ippat,

angalanerummi nalaani tamarmi imaq sikuusimanngilq. Kangerlussuup kujammut paarpasissuani kassortuumi natsersuaqarluarpoq. Piffik taannatuaq sinerissami annertuumi (100 km missaaniittumi) sikut pissutigalugit angallammik nunaliarfissaanngilaq, tamaanilu 5-10 km-imik avasitsigisumi immamiittunik tamalaanik utoqqaassusilinnik aataarpassuaqarpoq.

2014-imisulli oqaatigisariaqarpoq Kap Brewsterip Manby Halvøllu akornat eqqaasanngikkaanni sineriak timmiaqarluannngimmat assigiinngitsullu ikittuinnaammata aammalu erniorfiit siammasimmata.



Glaucous gull kindergarten. Photo: David Boertmann.

Preface

In 2014, the Danish Environmental Protection Agency and the Greenland Environment Agency for Mineral Resource Activities funded a survey of breeding seabirds and marine mammals (with focus on coastal seals) in Southeast Greenland to be carried out over two summers. The purpose was to gather background data for future regulation of primarily petroleum exploration activities but also to establish a base-line for future monitoring of climate change impacts along this arctic coast. The first leg – covering the southern part of the coast from Cape Farewell to Tasiilaq – was surveyed in July 2014 (Boertmann & Rosing Asvid 2014). The second leg of the survey – covering the area between Tasiilaq and Scoresbysund – should have been carried out in 2015, but had to be postponed, due to lack of a suitable boat. In 2016, a boat was available and the second and final leg of the survey was carried out in July and August 2016.



A remarkable seabird cliff (68514) – a stack with glaucous gulls on the flat top and Iceland gulls on the sides. Photo: David Boertmann.

1 Introduction

Information on seabirds breeding along the coast between Tasiilaq and Scoresby Sound is very limited and most of the available reports are more than 40 years old (e.g. Helms 1926, Degerbøl & Møhl-Hansen 1935, Hørring 1939, Ray 1973, Meltofte 1976). A more recent boat survey in 2004 included the northern part of Blossville Coast (Gilg 2005) and two aerial surveys conducted in 2008 and 2009 covered also the northern part of the Blossville Coast (Boertmann et al. 2009, Boertmann & Nielsen 2010). The only survey covering the entire coastline is an aerial survey focusing on common eiders undertaken in June 2008 by Merkel et al. (2010). In fact, ours is the first thorough and systematic boat-based survey of breeding seabirds along the entire Southeast Greenland coast.

DCE – National Centre for Environment and Energy and Greenland Institute of Natural Resources (GINR) keep a database over seabird breeding colonies in Greenland – the Greenland Seabird Colony Register – (GM & OC 1992, Boertmann et al. 2010, Bakken et al. 2006). This contains information on approximately 2700 colony sites and in total 12,500 records. Of these records, only 150 were from Southeast Greenland before the surveys in 2014 and 2016.

The information on the occurrence of marine mammals presented by previous sources is more detailed than the previous bird data. For instance the catch of the hunters in Tasiilaq, the former settlement Kangerlussuaq and at Scoresbysund is well described (Born 1983, Glahder 1992, 1995, Sandell & Sandell 1991, Sandell et al. 2001, Rosing-Asvid 2002). But the information is generally relatively old and, moreover, restricted to the inhabited sites.

Gunnbjørn Fjeld, the highest mountain in Greenland, 3693 m asl. Photo David Boertmann.



2 Methods

The scientific crew included David Boertmann (DCE/AU) and Aqqalu Rosing-Asvid (GINR). The boats were operated by Sigurður ('Siggi') Petursson and Anders Sanimiunaq, and Michael Lindskov Jacobsen also joined the survey.

Two vessels were used as observation platforms. A 45 feet motorboat (cruising speed 5-7 knots) and a 17 feet speed boat (cruising speed 25 knots) (Figure 1).

Figure 1. The two observation platforms. Above: the dinghy used for fast surveys into fjords and close to the coast; below: the 'Vega'. Photos: David Boertmann.



Coasts were searched for seabird breeding colonies by binoculars when steaming, and as many as possible of the previously known sites were visited. Coastlines potentially hosting coastal seals (harbour seals and grey seals) were scanned, whereas the search for other marine mammals was done opportunistically when sailing. Main focus was directed at the outer coasts where a potential oil spill from future activities could end up.

The entire route was recorded on GPS (Figure 2). Along the route all coasts were searched (except when fog prevented our view of the coasts and glacier ice prevented access). All observations were recorded with time of the day and later assigned a geographical position from the GPS log with the time record (all time records in UTC) as link. Steep cliffs were searched from the boat. Most islands were also surveyed from the boat, but at some places we went ashore, for instance on Ndr. Aputiteq.



Figure 2. The daily routes sailed. Anchor symbols show night stops and red asterisks the sites where beach litter was sampled. On 29 and 30 July fog prevented observation and on 28 July glacier ice on the sea forced us to sail too far from the coast to survey for breeding birds. Green = land below 200 m asl, ochre = land above 200 m asl, white = inland ice and glaciers. These signatures are used in the following maps.

The birds in the colonies were counted as Apparently Occupied Nests (AON), if possible (e.g. kittiwakes, gulls and cormorants that build obvious nests) and terns and black guillemots as individuals present. Common eiders were recorded as females with chicks on the water near colonies, and nests (with eggs or hatched) were counted, although not systematically, on the visited islands. However, we did not go ashore on apparent eider islands not to disturb brooding females.

Cape Brewster holds the largest seabird breeding colony in the surveyed region, and as it is monitored regularly by GINR (Falk & Kampp 1997), we did not survey the seabirds breeding there.

Five-numbered figures (e.g. 61501) all refer to the code numbers in the Greenland seabird colony register.

Age of birds is indicated as cy = calendar year or juv. = juvenile, imm. = immature and ad. = adult.

At three sites (Figure 2), beach litter was monitored as a part of new marine litter project to be reported in another report (Strand in prep.). Beach litter was collected systematically on 100 m long beaches and recorded using a standard method (Strand et al. 2016). This project is supported by the Danish Environment Agency (mst-112-270).

Finally, two of the famous hot springs on the Blosseville Coast were visited; Rømer Fjord on 22 July and Knightton Bay on 23 July, and several sites with former human activity and/or settlements were visited, including the former US Air Base at Ikateq between Sermiligaaq and Kuummiit.

2.1 Weather conditions

The weather during the survey was generally favourable with sunny and calm days. Only on 22 July did we have to wait for six and a half hours in shelter, before the swell had calmed down, allowing us to pass by an exposed point. Fog inhibited observations on 29 July and the first half of the survey on 30 July.

2.2 Ice conditions

No sea ice was encountered during the entire route (Figure 3). This was in sharp contrast to recordings from previous expeditions along the same coasts conducted in July and August when sea ice was abundant and presented a major obstacle to sailing (Mikkelsen 1933, Andersen 1981). However, we encountered glacier in the fjords with calving glaciers and off some of the glaciers calving into the open sea, particularly on 28 July between Deception Island and Nuugaalik and from Nuugaalik to Cape Warming, forcing us sail too far from the coast to survey for seabird colonies.

Figure 3. The ice conditions on 26 July 2016. Note the complete absence of sea ice. Upper map shows the region between Cape Brewster and Kangerlussuaq and the lower map the region between Kangerlussuaq and Tasiilaq (images from NASA Worldview web site).



3 Results

3.1 Seabirds

Northern fulmar *Fulmarus glacialis*

Breeding northern fulmar only occurred on Cape Brewster where a few birds sitting on the cliffs were observed. Flying fulmars were, however, commonly observed throughout the survey.

Great cormorant *Phalacrocorax carbo*

Great cormorant only breeds in the Tasiilaq-area, and a small colony with three nests was located in Sermilik Fjord on 31 July.

Common eider *Somateria mollissima*

Breeding eiders were encountered along the northern part of the Blosseville Coast between Dunholme and Rømer Fjord, near Søkongen Island, at Kangerlussuaq and at a few sites between here and Tasiilaq (Figure 4). The breeding islands were not visited in order not to disturb brooding females, but generally the colonies appeared to be small (< 10 nests). Only on the small islands and the low peninsula just northwest of the former hunting village Kangerlussuaq (68556) numerous nests were seen (> 100). At Smalsund near Sermiligaq, three apparently successfully hatched nests of solitary breeding common eiders were found (cf. Merkel et al. 2010).

Non-breeding birds (primarily males) were numerous on the northern Blosseville Coast as well as in smaller numbers along the survey route further south (Figure 4).

The distribution of breeding colonies is in correspondence with the results of the aerial survey in 2008 (Merkel et al. 2010), but the number of non-breeding birds was much lower in 2016.

Arctic skua *Stercorarius parasiticus*

Breeding or possible breeding pairs of Arctic skuas were found on Dunholme (69502) and on the islands on the north side of the Manby Peninsula (69506). Two single birds and a small flock (n = 5) were observed further south along the Blosseville Coast.

Long-tailed skua *Stercorarius longicaudus*

Non-breeding long-tailed skuas were observed on 28 July in the same area as the non-breeding Arctic terns; in total 6 birds (4 adults and 2 immatures).

Apparently, long-tailed skuas and Arctic terns follow each other and exploit the same feeding grounds during the autumn migration (Boertmann 2011, Gilg et al. 2013).

Great Skua *Stercorarius skua*

Four great skuas (1, 1, 2) were observed in the waters near Dunholme and the Manby Peninsula. This is remarkable, as the species was also observed here during the aerial surveys in both 2008 and 2009 (Boertmann et al. 2009, Boertmann & Nielsen 2010). The species has not yet been proved as a breeder in Greenland, and these repeated observations indicate breeding.

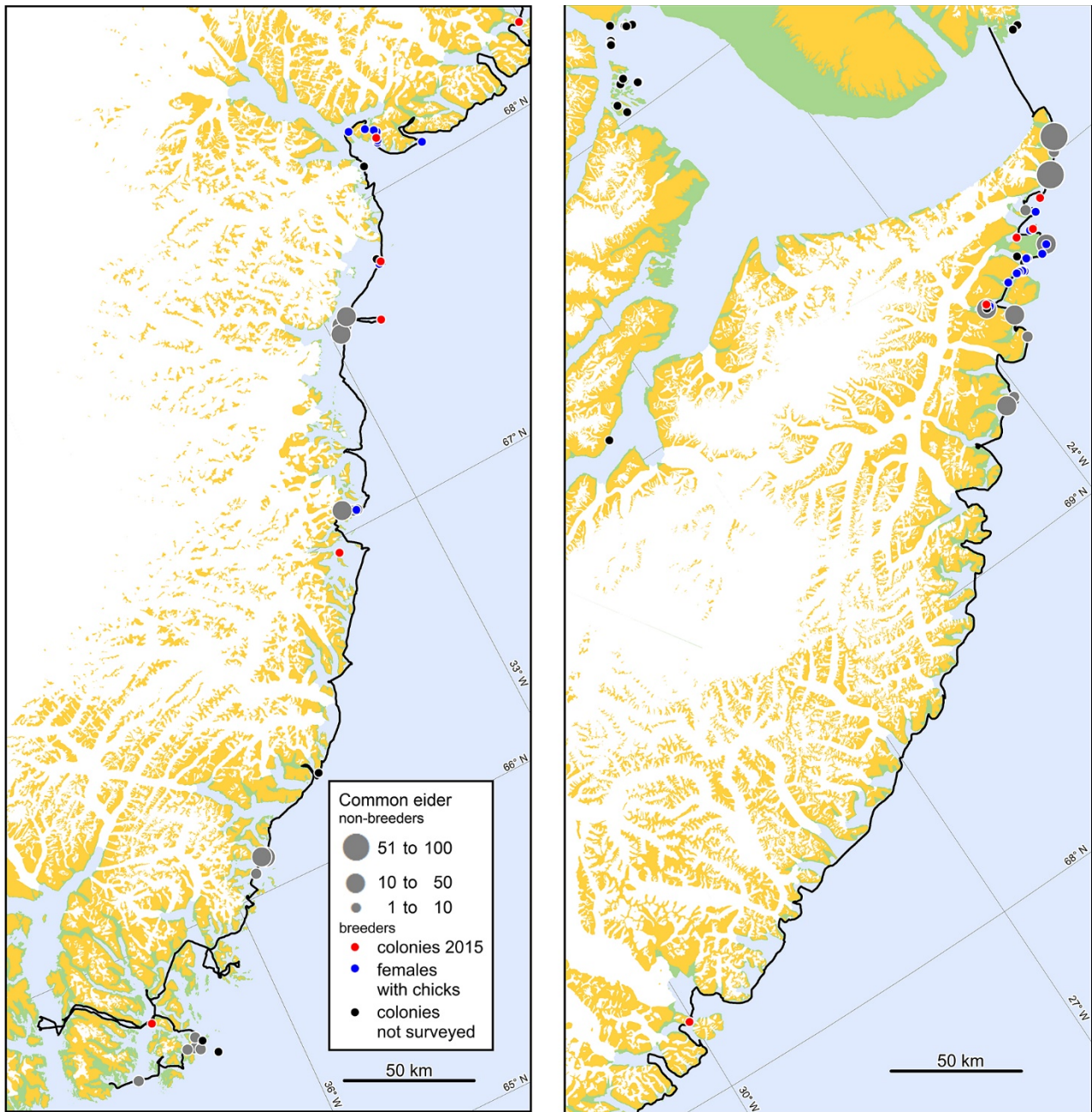


Figure 4. Distribution of breeding and non-breeding common eiders along the coasts surveyed in 2016. Ten colonies were recorded, but not counted, 84 females with chicks and in total 2896 non-breeding birds were observed (of these 2097 males and 480 females).

Lesser black-backed gull *Larus fuscus*

In total, eleven small colonies or single pairs of lesser black-backed gull breeding among other colonial seabirds were observed (Figure 5). The largest colony was 35 pairs on an island in Ammassalik Fjord south of Kuummiit. Besides these, four probably breeding solitary pairs were recorded.

Several single birds and small flocks (up to 6) were observed on the northern Blosseville Coast on 21 July and in the area near Tasiilaq on 30 and 31 July and 1 August.

The species seems still to expand its range in Greenland. In 2008 and 2009, breeding pairs were found only at two sites (Dunholme and east of Kulusuk) and several (possibly including breeders) birds were observed in the Tasiilaq area (Merkel et al. 2010, Boertmann et al. 2009, Boertmann & Nielsen 2010).

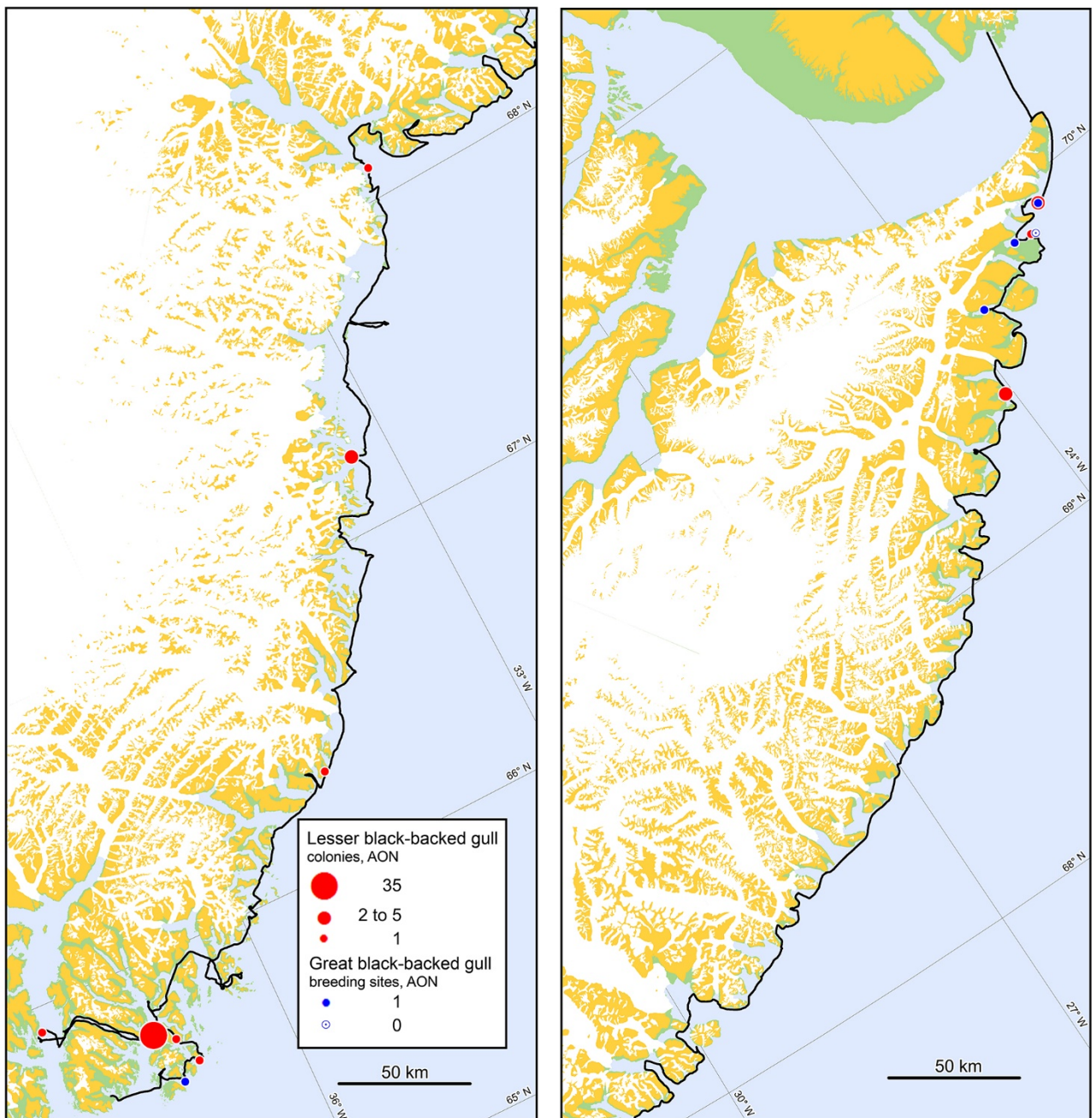


Figure 5. Distribution of lesser black-backed gull colonies (and single pairs breeding in colonies of other seabird species) and all breeding pairs of great black-backed gulls recorded in July/August 2016. N = 11 lesser black-backed gull colonies and n = 4 great black-backed gull breeding sites. A previously known breeding site for great black-backed gull was visited, but no birds were seen. A few pairs of lesser black-backed gulls presumably breeding solitarily were also recorded and not shown here.

Herring gull *Larus argentatus*

A single immature herring gull was observed among a large flock of roosting gulls on Fugleholmene east of Kuummiit on 31 July.

Great black-backed gull *Larus marinus*

Unexpectedly few great black-backed gulls were observed, and breeding was only recorded at four sites (Figure 5). Non-breeding adult birds were observed on three occasions, a 2nd cy bird on 23 July and two flocks of immatures (n = 7 and 5) near Kuummiit on 31 July.

According to the literature (Helms 1926, Salomonsen 1967), the great black-backed gull is a scarce breeder in the Tasiilaq area. This corresponds with our

observation of only one breeding pair here in 2016 (none in 2014); and in 2008 Merkel et al. (2010) only recorded non-breeding birds.

Iceland gull *Larus glaucoides*

In total, 17 colonies of Iceland gull were located (Figure 6). Of these, 13 were new, and the northernmost was located on 69° 28' N (69509). The number of AONs in the colonies was small ranging between 2 and 55.

Salomonsen (1950, 1967) reported breeding pairs in East Greenland as far north as Kangerlussuaq. However, we and Merkel et al. (2010) found colonies much further north – the northernmost being 69509 (see above). As these coasts have not been surveyed before, any general conclusions cannot be drawn from this.

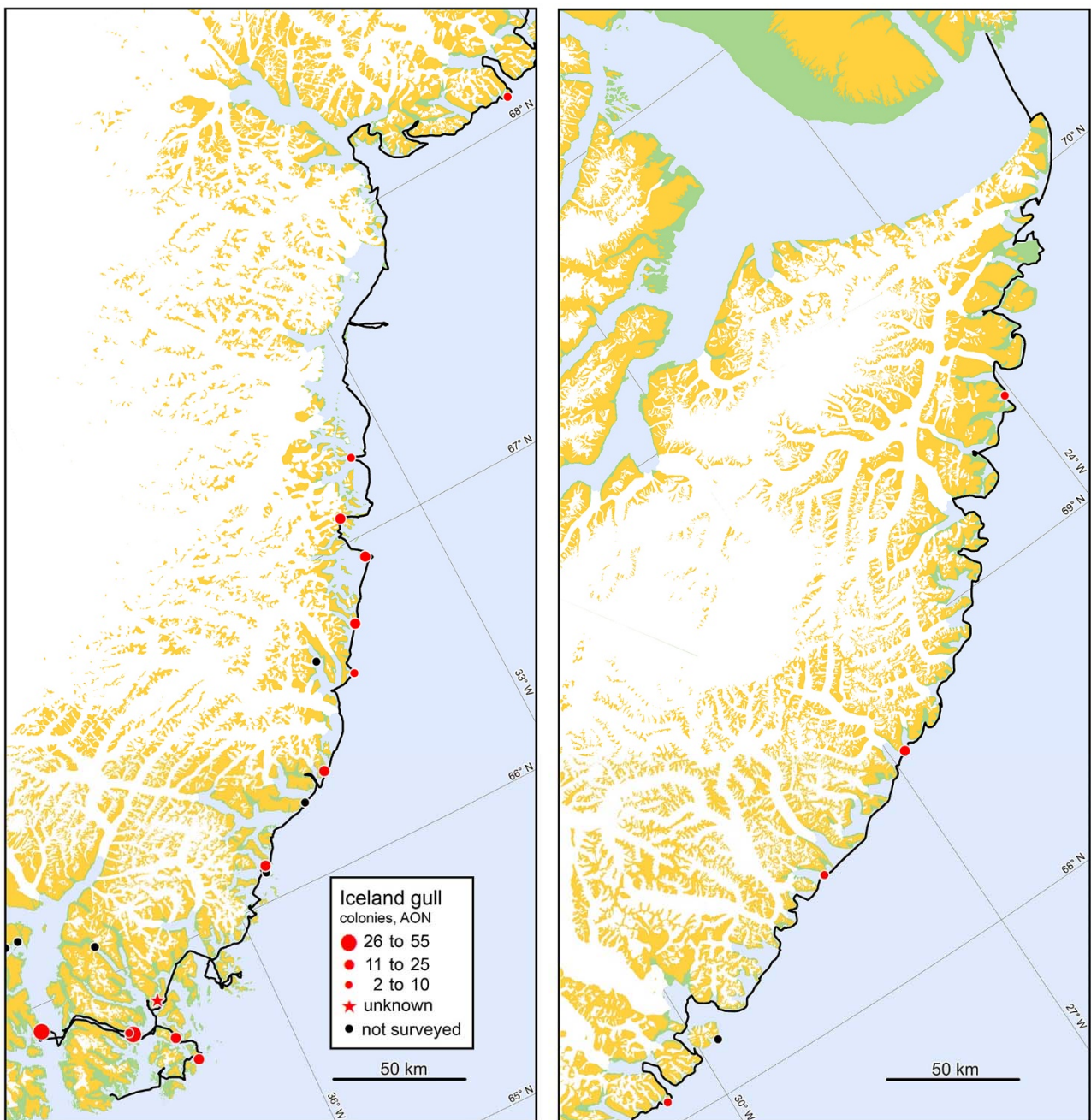


Figure 6. Distribution of Iceland gull colonies along the coasts surveyed in July/August 2016. N = 16. We were informed of an additional colony near Kuummiit (asterisk), and a few colonies on the coast were not visited.

Glaucous gull *Larus hyperboreus*

Glaucous gull was the most widespread gull, with a total of 48 colonies (Figure 7). Beside the colonies, solitary breeding pairs were occasionally observed. All colonies were small with maximum 15 pairs.

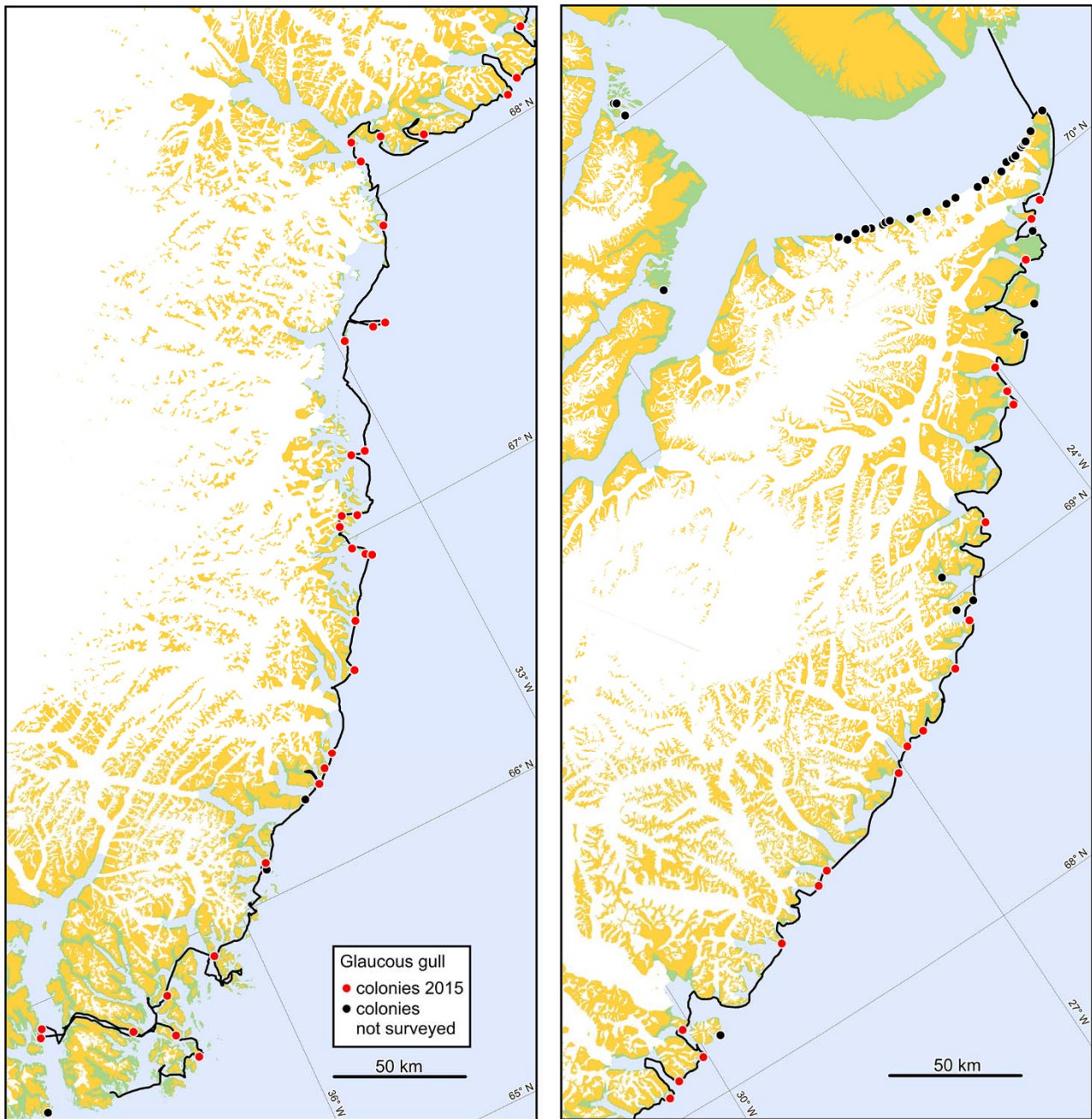


Figure 7. Distribution of glaucous gull colonies (and single pairs breeding in colonies of other seabird species) along the coasts surveyed in July/August 2016. N = 47. The number of breeding pairs in the colonies ranged from 1 to 15. Pairs breeding solitarily are not shown.

Kittiwake *Rissa tridactyla*

Only four kittiwake colonies were recorded, two of these being new – 66515 and 69506 (Figure 8). The two well-known colonies at Steward Island (69503) and Dunholme (69502) held 227 and 56 AONs, respectively (Figure 9). The number recorded at Steward Island is the highest ever counted here (the previous maximum of 120 occurring in 2004 (Gilg 2005)), while the number at Dunholme was much lower compared to 2004 when 184 AONs were recorded

(Gilg 2005). However, in 2008 the Dunholme colony only held 57 AONs (Boertmann et al. 2009). The new colony at 69506 only had three nests and may be an offshoot from the nearby colony on Steward Island. In July 2015, kittiwakes were observed here, and several ledges were stained white, but no real nests were spotted (O. Gilg, pers. comm.). The other new colony at Kangerterapip Karra (66515) held 70 AONs.

Besides the surveyed colonies, kittiwakes also breed on Cape Brewster. The most recent survey in 2010 recorded approx. 700 AONs here.

Non-breeding kittiwakes – mainly 3rd cy birds – were frequently observed along the survey route, the largest flocks counting up to 1,000 individuals in the Ammassalik Fjord area.

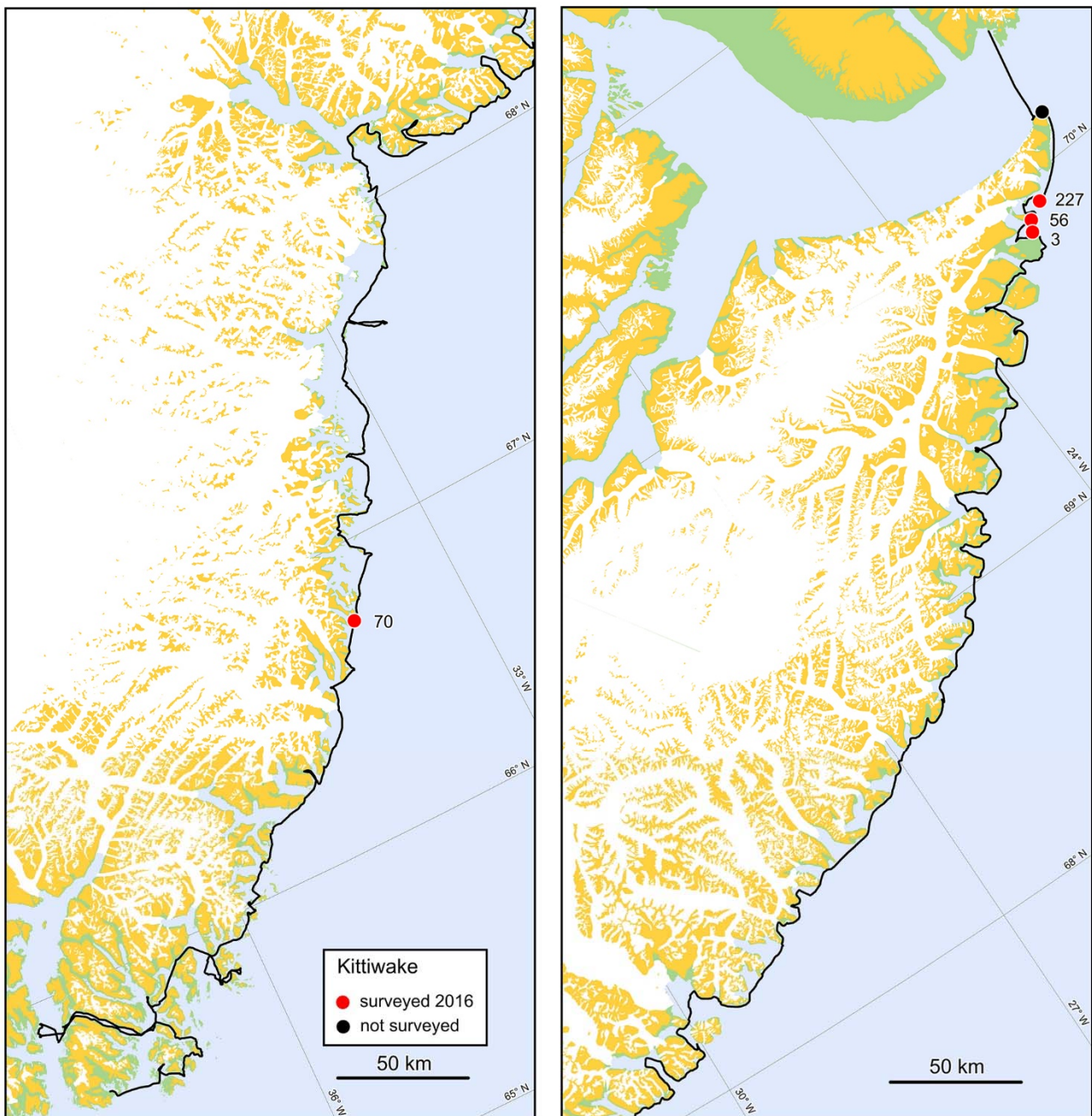


Figure 8. Distribution of kittiwake breeding colonies along the surveyed coasts in July/August 2016. Only four colonies were counted and a fifth (on Cape Brewster) was not surveyed. Figures at the colony symbol indicate number of AONs.



Figure 9. Most of the kittiwake colony on Dunholme (69502). Photo: David Boertmann.

Ivory gull *Pagophila eburnea*

No breeding sites of ivory gull were found. However, a number of resting gulls on a steep cliff side, most likely ivory gulls (Figure 10) were observed on long distance (not accessible due to dense glacier ice on the sea). Ivory gulls were rather numerous in three areas where glacier ice was dense on the sea (Figure 10). In total, 66 ivory gulls were observed, all adults.

The recorded gulls probably breed in the colonies located on nunataks far inland (Figure 10). No ivory gulls were seen at the coast east of the southernmost located colony (66504); however, visibility here was low due to dense fog. There was dense glacier ice on the sea off the two Steenstrup Glaciers (just south of the 66504 colony) and conditions for ivory gulls looked favourable. The aerial survey in June 2008 did not locate this colony, but an ivory gull was observed in the fjord just east of the colony (Merkel et al. 2010).

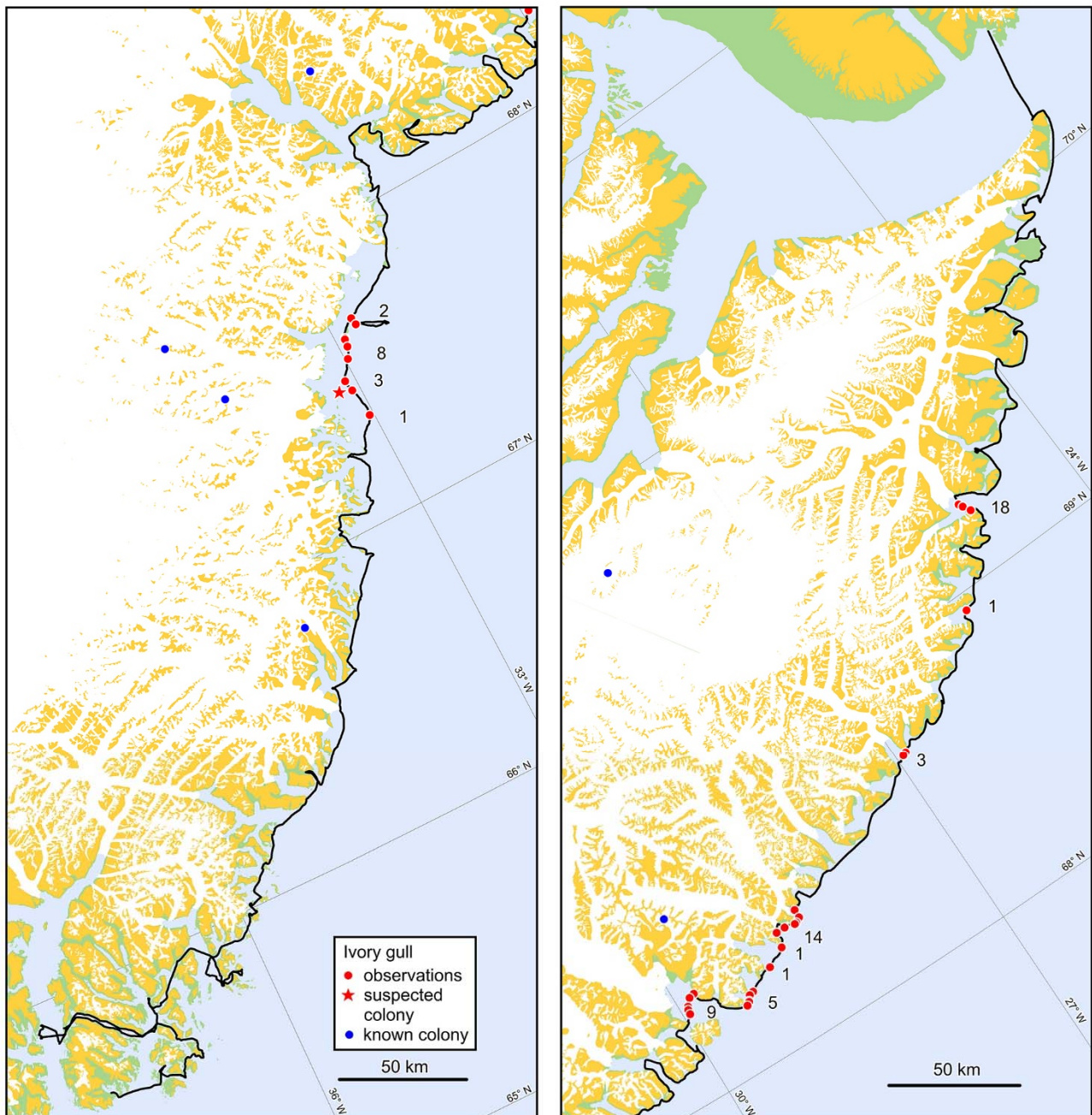


Figure 10. Observations of ivory gulls. Dots indicate observations of ivory gulls and figures the number of birds. A total of 66 birds were observed. Most were single, but at two polar bear kills and at an anchor place (27 July) where we fed the gulls several birds were seen. Asterisks indicate a potential breeding site; observations were made, however, too far away to determine with certainty whether the gulls present were ivory gulls. Shown are also the positions of known breeding colonies.

Arctic tern *Sterna paradisaea*

Seven colony sites with Arctic terns were visited (Figure 11). Six of these were occupied, the colony on Patulajaviit (67504) being large including more than 1,500 individuals in the air above the colony. The other colonies were small, holding 12 to 85 birds. Two sites were unoccupied, and of these colony 65531 in Sermilik Fjord east of Tiniteqilaaq was new to the register. According to Anders Sanimiunaq (pers com.), it was occupied in 2015.

A concentration of non-breeding birds was observed on 28 July when 240 individuals were counted in eight flocks resting on ice floes between Deception Island and Nuugaalik. A single 2nd cy bird was among them, all the other birds being adults.

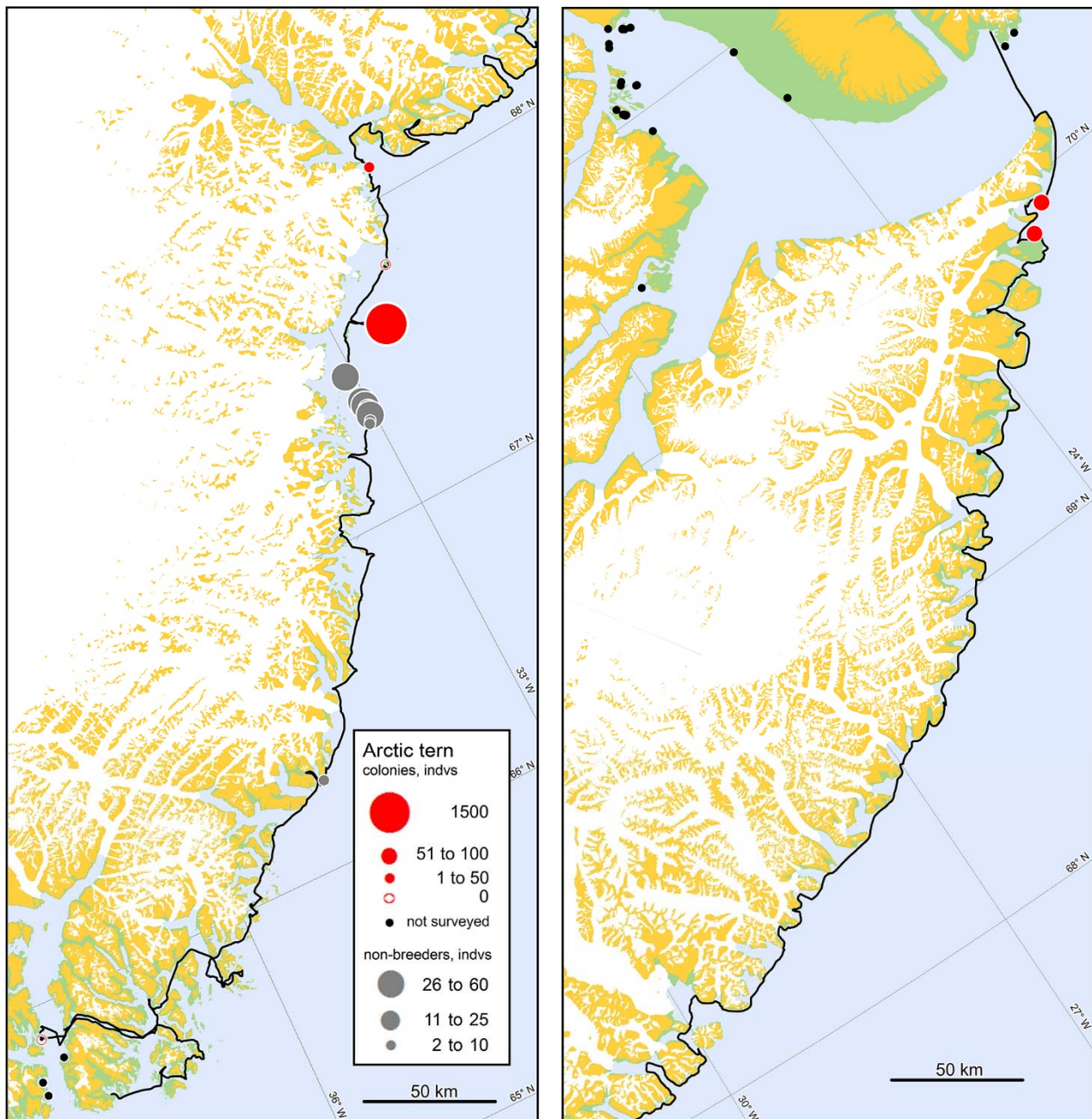


Figure 11. Distribution of Arctic terns along the coasts surveyed in July/August 2016. In total, four occupied colonies and two previously known, but unoccupied in 2016, colonies were visited. Also shown are previously known and not visited colonies. In total, 237 (in 9 flocks) non-breeding Arctic terns were observed.

Thick-billed murre *Uria lomvia*

There is only one colony of thick-billed murre in the surveyed region, on Cape Brewster. Numerous birds were seen here, but as the colony is included in the survey programme of GINR counting of the birds was omitted, and poor light conditions prevented a photo survey. During the most recent survey in 2010, 4,800 individuals were counted (GINR unpublished).

Black guillemot *Cephus grylle*

Black guillemot is the most numerous and widespread seabird in the surveyed region (Figure 12). In total, 93 breeding colonies were recorded, but there are many more as the birds breed along most of the exposed coastline of the Blossville Coast where the colonies are difficult to detect. Along large

parts of the coast, black guillemots were observed on the water, but definite proof of their breeding on the adjacent cliffs could not be obtained.

Breeding densities were highest on the Blossville Coast; south of Tuttilik the density of both birds and colonies was markedly lower. Fog and glacier ice prevented thorough inspection of the coast between Kangerlussuaq and Tuttilik.

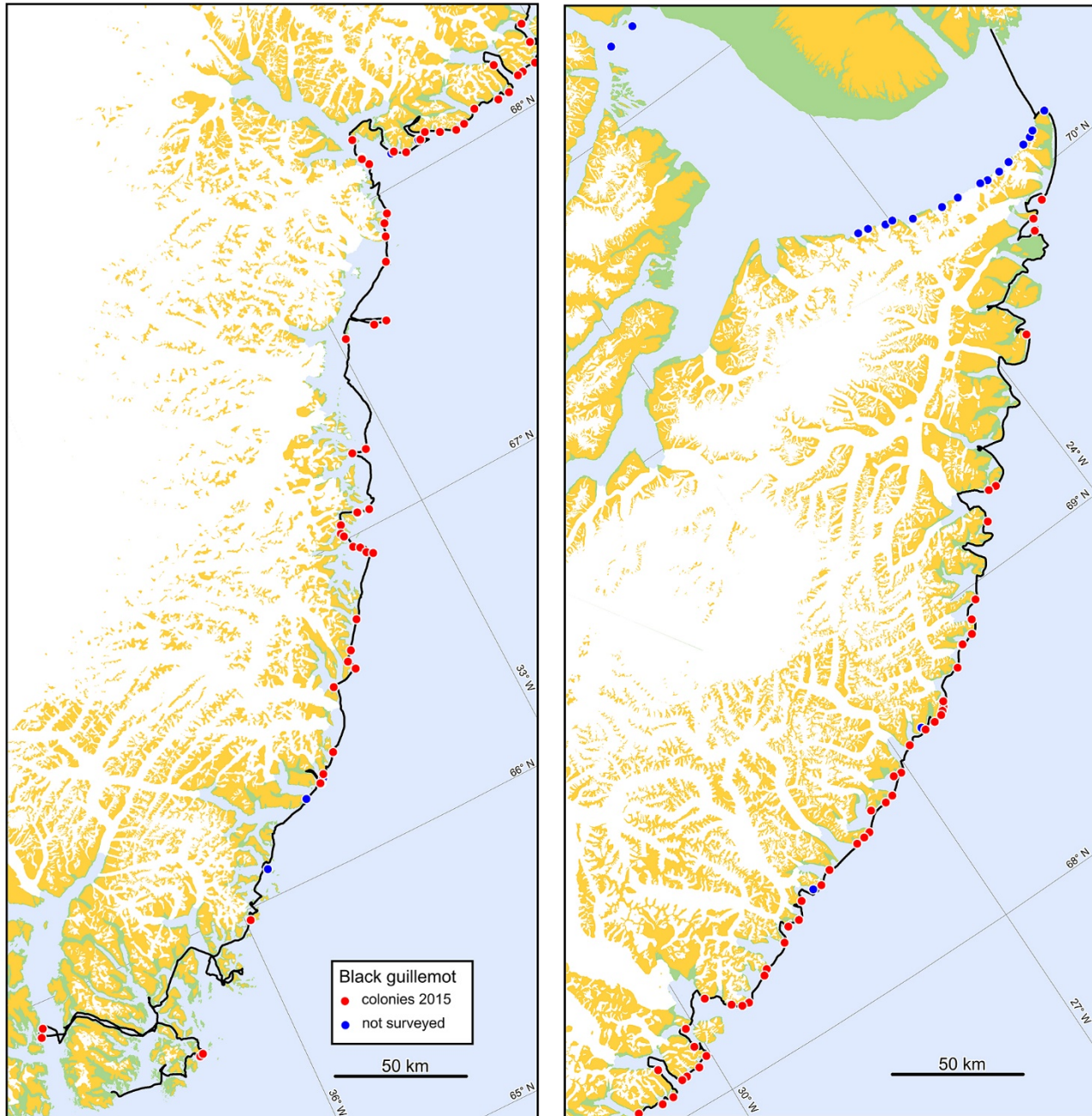


Figure 12. Distribution of black guillemot colonies along the coasts surveyed in July/August 2016. N = 93. The number of birds recorded at the sites ranged from 2 to 210. Also shown are previously known colonies not surveyed in 2016.

Little auk *Alle alle*

Little auk was only recorded on 21 July when thousands of birds were present in the mouth of Scoresby Sound and along the survey route south to Dunholme. Especially south of Cape Brewster, little auks were foraging (full gular pouch) in relatively shallow, 20-110 m deep, water. Little auk breeds in relatively small numbers on Cape Brewster, but were not surveyed. The species was not observed at Cape Dalton where Gilg (2005) suspected it to breed.

3.2 Other birds

Red-throated diver *Gavia stellata*

Red-throated diver was relatively numerous between Cape Brewster and Kangerlussuaq where 16 birds were recorded at 10 sites, always adults feeding in fjords and bays. No red-throated divers were recorded south of Kangerlussuaq, but two breeding pairs were seen in the lakes on Kulusuk Island.

Great northern diver *Gavia immer*

Two great northern divers were recorded in the waters on the south side of Cape Dalton and two solitary birds were seen in the Ammassalik Fjord area.

Grey-lag goose *Anser anser*

Two small flocks (n= 2 and 3) of moulting birds observed in the Manby Peninsula area. Both in coastal habitats (Figure 13).

Together with the moulting bird seen in the Qeertaartivit archipelago in 2014, these observations indicate a regular moult migration of grey-lag geese from Iceland to Southeast Greenland.



Figure 13. A grey-lag goose in wing moult and unable to fly. Manby Peninsula 21 July 2016. Photo: David Boertmann.

Barnacle goose *Branta leucopsis*

Breeding barnacle geese (pairs with chicks) were seen at Turner Sound on 21 July (4 broods + 10 moulting birds), in Henry Land on 22 July (4 broods + 3 moulting birds) and near the hot spring in Knightton Bay on 23 July (2 broods + 15 moulting birds). A single non-breeding bird was observed on Cape Dalton on 23 July.

King eider *Somateria spectabilis*

Only two males king eiders seen, one in Rømer Fjord (22 July) and one in Knightton Bay on 23 July. The latter site is known as a moulting locality (Boertmann et al. 2009, Boertmann & Nielsen 2010), but we did not venture into the fjord where most of the birds usually stay.

Red-breasted merganser *Mergus serrator*

A female red-breasted merganser passed by at Steward Island on 21 July and two small flocks (n = 3 and 2) were seen near the former village at Kangerlussuaq on 27 July.

Land birds and waders

Ptarmigan (*Lagopus mutus*) was observed only at the Ikateq Air Base where a female with two chicks were seen.

A few shorebirds on migration from the high Arctic were seen here and there staging on the coasts: knot (*Calidris canutus*), turnstones (*Arenaria interpres*) and ringed plovers (*Charadrius hiaticulus*).

Breeding ringed plovers were recorded at Henry Land, Knightton Bay and the Ikateq Air Base and breeding dunlins (*Calidris alpina*) were found in Henry Land.

Of the passerines, ravens (*Corvus corax*) were observed at many sites, for instance where polar bears had left remains of kills and in the settlements. Wheatear (*Oenanthe oenanthe*) – mainly fledged juveniles – were only seen in the villages in the Tasiilaq area and Lapland bunting only at the Ikateq Air Base where a pair had newly fledged juveniles.

Snow bunting (*Plectrophenax nivalis*) was observed at most sites where we ventured into land.

3.3 Marine mammals

The focus of the marine mammal part of the survey was to search for the two coastal seal species – harbour seal and grey seal (cf. the report from the 2014 part of the survey). However, no observations of these were made, and other seal species were not surveyed systematically as the survey focus was directed at the coasts.

Ringed seal *Pusa hispida*

Ringed seal were seen in small numbers, especially in the fjords with glacier ice. The highest concentration of more than 200 seals was recorded on the remaining fast ice in Saalo Sund at Nuugaalik. Moulting had finished when we conducted our survey, and ringed seals were therefore mainly in the water and less easy to detect.

Harp seal *Pagophila groenlandica*

Individuals and flocks (in Greenland termed as 'amissut') of harp seal were seen daily during the entire survey. The highest number was encountered when glacier ice forced the boat to sail offshore. Harp seals had also finished their moult before the survey.

Hooded seal *Cystophora cristata*

Most hooded seals had finished their moult when the survey was initiated, why only few were expected to rest on ice floes. However, a concentration of young (n = 15) and adults (n = 19) in moult were seen on ice floes and glacier ice between Kangerlussuaq and Cape Hegemann (Figures 14, 15). Also a few young-of-the-year were observed on the Blossesville Coast.

Figure 14. Distribution of hooded seals along the surveyed coasts in July/August 2016. A total number of 38 seals were observed (19 adults and 19 bluebacks (1st year and 2nd year individuals), almost all on ice floes.



Figure 15. Hooded seal 1st cy ('blueback') on the ice south of Deception Island on 28 July 2016. Photo: David Boertmann.



Bearded seal *Erignathus barbatus*

Most bearded seals would still be molting (and thus rest on ice floes) during the survey period and therefore easy to detect. However, only six observations of eight seals in total is a low number and must be ascribed to the absence of sea ice. Most ($n = 6$) of the seals were resting on ice floes.

Humpback whale *Megaptera novaeangliae*

Two observations of humpback whale were made: three in Sermiligaaq Fjord on 31 July and a single individual near Kulusuk on 1 August.

Fin whale *Balaenoptera physalis*

In total, six fin whales were observed in Ammassalik Fjord on 30 July.

Narwhal *Monodon monoceros*

A narwhal pod was observed in Barclay Bay on 23 July and another in Kruuse Fjord south of Nuugaalik on 28 July.

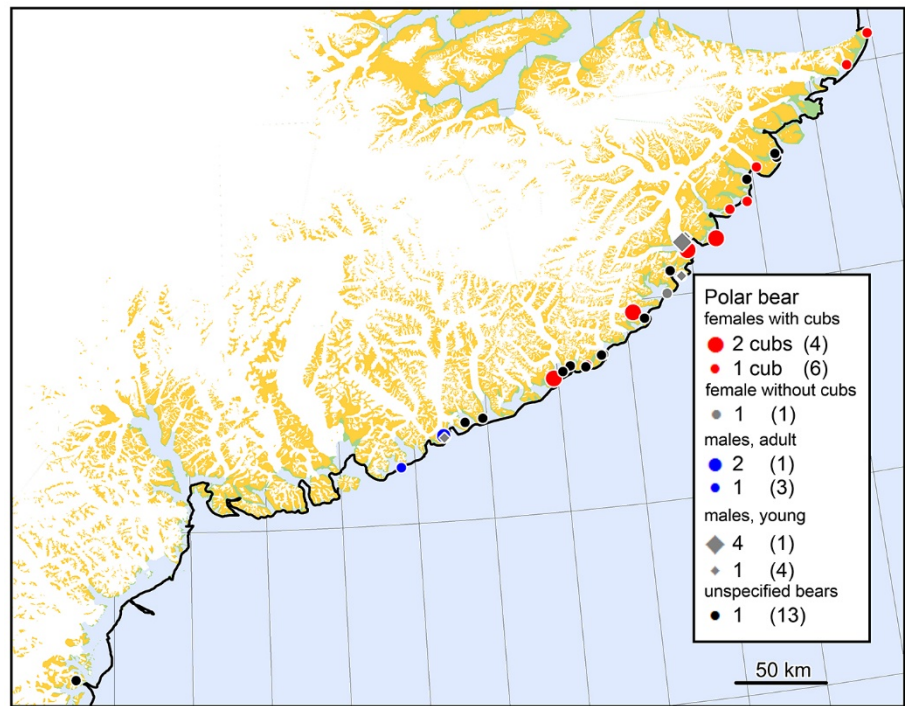
Polar bear *Ursus maritimus*

In total, 29 encounters of in all 49 bears were registered during the survey (Figure 16). Most polar bears were observed from 22 to 25 July on the central Blossville Coast. Moreover, the boat crew recorded two bears on their way northwards to Scoresbysund on 18 July (Figure 16). On 14 of the encounters the bears were staying high up on mountain sides, usually on herb slopes. On one occasion, three bears (a single adult and a female with a cub) were spotted on a high altitude herb slopes from the anchor site when we arrived in the evening and were still there when we left the next morning.

Ten females had one ($n = 6$) or two ($n = 4$) cubs. The remaining observations included five adult males, one adult female, eight probably younger males and 13 unsexed adult bears.

On one occasion in Barclay Bay, five bears – apparently all males – were gathered around the remains of a seal on a small iceberg (Figure 17). Another bear in Stephensen Fjord had just finished a meal of a seal on a small ice floe.

Figure 16. Polar bear observations along the coasts surveyed in July/August 2016. Two bears observed by the ship crew two days before initiation of the survey are included. Figures in brackets indicate number of observations; in all, 51 bears were recorded.



All bears looked healthy and at least in average condition according to the polar bear fatness scorecard (Stirling et al. 2008).



Figure 17. Four of five bears assembled at a kill on an iceberg in Barclay Bay 23 July 2016. Ivory gulls were also attracted to the kill. Photo: David Boertmann.

Other mammals

Muskox *Ovibos moschatus*

No live muskoxen were observed, but the remains of a slaughtered muskox were found on the beach at the hot spring in Rømer Fjord on 21 July, and in the valley in the head of the fjord on east Henry Land footprints (several), droppings and shed wool were found on 22 July.

3.4 Local knowledge

Anders Sanimiunaq and local inhabitants interviewed in Sermiligaaq and Kuummiit provided us with information on breeding seabirds. All reported limited diversity in their regions of observation (mainly the Tasiilaq and Kangerlussuaq areas), the species of breeding seabirds recorded being common eiders, black guillemots, Arctic terns and gulls. Species such as razorbill (*Alca torda*), Atlantic puffin (*Fratercula arctica*) and thick-billed murre were not known to breed in the region between Tasiilaq and Kangerlussuaq.

Regarding common eiders, the general impression was that the population between Tasiilaq and Kangerlussuaq had decreased considerably during recent decades. Several small islands formerly hosting eider colonies were seen, and several islands east of Tasiilaq and Kulusuk (not visited by us) formerly populated by eiders were reported to be without breeding eiders today.

Anders Sanimiunaq also told us that he observed great cormorant for the first time about ten years ago.

3.5 The hot springs

In Rømer Fjord, two groups of hot springs are described in the literature (Halliday et al. 1974, Kliim-Nielsen & Pedersen 1974, Feilberg 1985, Gilg 2005). We visited the most well-known site on the south coast where the hot water emerges from several sites distributed along the coast. The most spectacular site is shaped like a low chimney (Figure 18) below which a pool has been created. The vegetation here is not as lush as at the springs in Knightton Fjord, but species such as *Pinguicula vulgaris*, *Rhodiola rosea*, *Thalictrum alpinum* and *Triglochin palustris* were recorded there. According to the literature, another hot spring is located on the north side of the fjord, just opposite to the site we visited. We were able to discern some intensively green and lush areas on the steep mountain there, but did not go there.

Figure 18. The chimney-shaped hot spring at Rømer Fjord on 22 July 2016. Many more hot water outlets are found between this site and the shoreline. Photo: David Boertmann.



In Knightton Fjord, two hot springs are found (Halliday et al. 1974, Kliim-Nielsen & Pedersen 1974, Feilberg 1985, Gilg 2005), a well-known site at the river and another site north of this (Figure 19, the latter being mentioned but not visited by Halliday et al. (1974) (mentioned in Mikkelsen 1933). Especially at the first-mentioned site, the vegetation was extremely lush with large stands of, for instance, *Rhodiola rosea*, *Potentilla crantzii* and *Alchemilla glomerulans*. Interesting plant species recorded were: *Ophioglossum azoricum* (in Greenland only found here) (Figure 20), *Geum rivale* (in Greenland only found here and at a single site in South Greenland), *Sagina procumbens* (in Greenland only found here), *Platanthera hyperborea* and *Epilobium palustre* (far north of its general distribution range in Greenland). Small diptera of the genus *Scatella* were abundant on red mats of cyanobacteria. The hot water emerges from several sites over an approximately 250 m long hillside (Figure 21).

Figure 19. The position of the two hot spring areas at Knightton Bay. #1 is very lush and has a rich flora. #2 is less known and with a less lush flora.

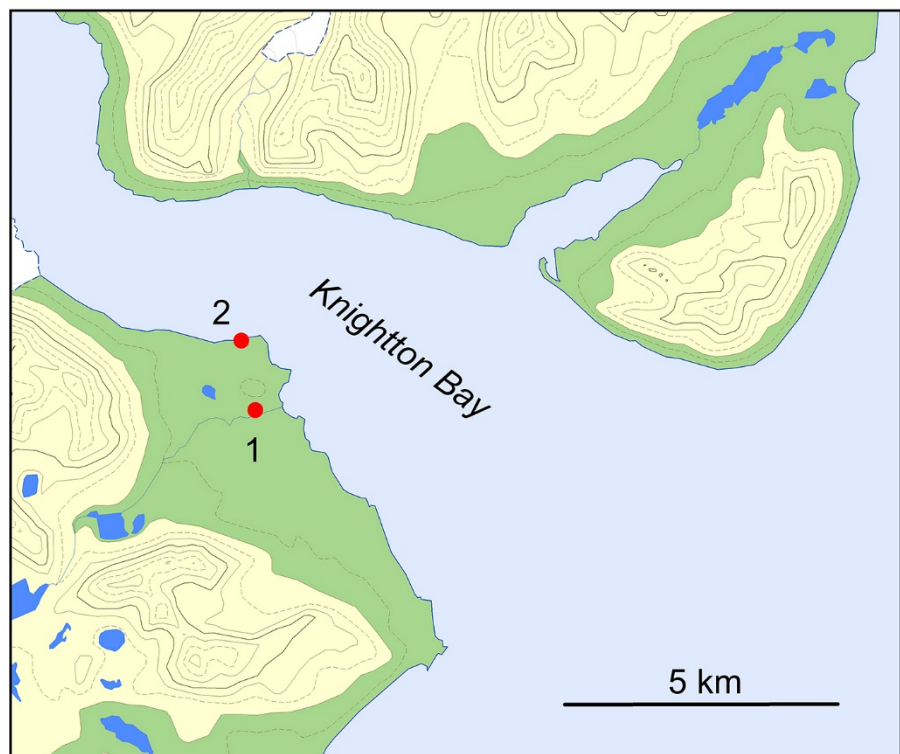


Figure 20. *Botrychium azoricum* and *Sagina procumbens* growing on the warm clay in the hot spring at Knightton Bay, 23 July 2016. Photo: David Boertmann.



At the northern site hot water emerges from several locations from the beach and up the hill side. A pool has been created. The vegetation is not as lush here, but species such as *Alchemilla glomerulans*, *Pinguicula vulgaris*, *Veronica alpina*, *Epilobium latifolium*, *Rhodiola rosea* and *Selaginella selaginoides* were found.

Figure 21. The southern hot spring at Knightton Bay, 23 July 2016. Photo: David Boertmann.



4 Seabird breeding colonies in Southeast Greenland

4.1 The 2016 survey

In total, 116 seabird breeding colonies were observed during our survey in 2016 (Figure 22). Of these, 92 were new to the seabird colony register, and a total of 200 new records were introduced to the register. By far the most widespread and numerous breeding seabirds in the surveyed region were black guillemot and glaucous gull. Iceland gull became more frequent as we travelled towards south. Two areas showed higher density and diversity of breeding seabirds: the coast between Cape Brewster and Manby Peninsula where there were high numbers of breeding common eiders, three kittiwake colonies, Arctic terns, Arctic skuas, lesser and great black-backed gulls, besides the large bird cliff at Cape Brewster with fulmars, thick-billed murrelets, little auks, kittiwakes, glaucous gulls and black guillemots. The other area was at the mouth of Kangerlussuaq and the coast from here and south to the archipelago Patulajaviit where there were common eiders and arctic terns in high numbers. The area at Cape Brewster and Manby Peninsula is influenced by the polynya in the mouth of Scoresby Sound, implying open water in spring and enhanced productivity when seabirds arrive in spring, and therefore excellent feeding opportunities – also for marine mammals. The polynya usually extends south along the coast between Cape Brewster and the Manby Peninsula and Turner Island, where the important seabird breeding colonies Dunholme (69502), Steward Island (69503) and the islands north of the Manby Peninsula (69506, 69012) are located.

4.2 Summary of seabird breeding colonies in Southeast Greenland

The two surveys in 2014 and 2016 covered almost the entire coast between Cape Farewell and Scoresby Sound, in total 1575 km as a crow flies. The inner parts of the long fjords and the coast between Ikeq (north of Eggers Island) and Lindenow Fjord were not surveyed, and some coastlines were inaccessible due to dense glacier ice or not visible due to fog. Nevertheless, a reliable overview of the breeding seabirds was obtained of which a summary is given below. The combined results of the two surveys were 144 new breeding colonies and 387 entries to the Greenland Seabird Colony Register. Before the survey, 99 colony sites were known including 150 entries from the surveyed part of Southeast Greenland.

The updated information on seabird breeding colonies will be an important contribution to future oil spill sensitivity mapping of the coasts of Southeast Greenland, and a baseline of the breeding seabirds of the region is established.

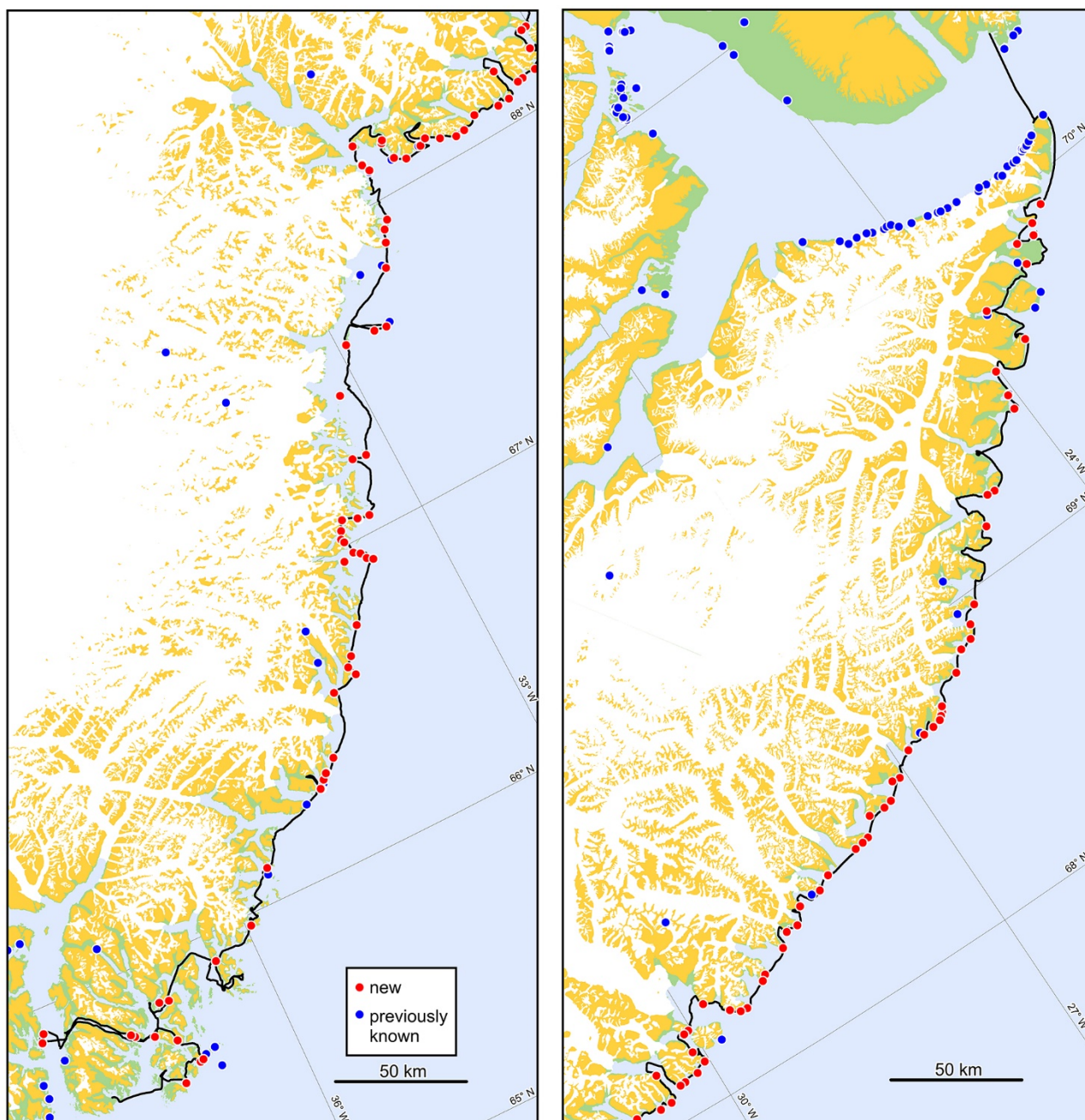


Figure 22. Distribution of seabird breeding colonies in the surveyed region.

4.2.1 The colonial seabirds

Northern fulmar. Only one breeding site was located – the well-known colony at Cape Brewster, which during a survey in 2004 held at least 33 AONs (Gilg 2005).

Great cormorant. The species breeds only in the Tasiilaq area, where four colonies are found in the Sermilik Fjord and the Isortoq areas. Three of these sites were visited in 2014 and 2016. According to local information this population was established within the recent ten or fifteen years.

Common eider. Breeding colonies are concentrated at the northern Blosseville Coast (Dunholme, the Manby Peninsula, Turner Sund), in the Kangerlussuaq-Ndr. Aputiteq area, on the Graah Islands, in the Umiivik area and the Timmiarmiut area. In total, approximately 45 colony sites are known, but many

were found to be unoccupied in both 2014 and 2016. Besides the colonies, solitary pairs nest along many coasts (Merkel et al. 2010).

Arctic skua. In total, eight breeding sites were located, six in the region between Umiivik and Sermilik and two on the northern Blosseville Coast.

Lesser black-backed gull. South of Tasiilaq, two sites with breeding or presumably breeding pairs were located in 2014, and several more were found north of Tasiilaq; in the Amassalik Fjord five colonies were found, including one holding 35 pairs. A few pairs of lesser black-backed gull were observed in colonies of other gulls at six sites between the Amassalik Fjord and Scoresby Sound.

Iceland gull. Colonies were scattered along almost the entire surveyed coastline as far north as 69° 28' N. A total of approximately 50 colonies are now registered in the surveyed region, all small with maximum 55 AONs.

Glaucous gull. Colonies lay scattered along the entire surveyed coastline and a total of approximately 80 colonies are now reported in the surveyed region, all small with maximum 20 AONs.

Great black-backed gull. Solitary pairs and small colonies were observed in the Cape Farewell region, in the Tasiilaq region and in the area between Cape Brewster and the Manby Peninsula. In total, seven breeding sites are known to occur in the surveyed region, and one of these being without birds in 2016.

Kittiwake. In total, 19 sites with kittiwake colonies are found in the Southeast Greenland region. Of these, only eight were occupied in 2014 and 2016, and two of these had not been recorded before. The largest colony is found at Cape Brewster and the second largest just south of here - on Steward Island.

Ivory Gull. Six colonies are known from the region, all on nunataks or in high mountains far from the coast (Gilg et al. 2009, Merkel et al. 2010). Observation of two adult birds in Køge Bugt (south of Tasiilaq) in 2014 may indicate colonies in the inland to the west.

Arctic tern. Thirteen colony sites are reported from the region between Cape Farewell and Tasiilaq and five between Tasiilaq and Scoresby Sound. In 2014, five of the previously known colonies were not visited, four were without birds and four were occupied by small colonies (maximum 20 individuals). In 2016, a new site was located (although not occupied), one site was without birds and six were occupied – five of these by up to 85 birds and the last on Patulajaviit, being the only large colony counting > 1,500 birds.

Thick-billed murre. Only one colony is found in the surveyed region, on Cape Brewster. It was not surveyed in 2016, but in 2010 4,800 individuals were recorded here (GINR unpublished).

Black guillemot. This species is the most widespread and numerous seabird in the surveyed region, and a total of 137 colonies were surveyed in 2014 and 2016.

4.3 Important areas for seabirds

Based on observations during the 2014 and 2016 surveys, the most important areas for colony breeding seabirds in the surveyed region of Southeast Greenland are:

- The mouth of Scoresby Sound and the coast from here and southwards to Manby Peninsula and Turner Island/Sound.
- The mouth of Kangerlussuaq and archipelagoes south to Patulajaviit.
- The region between Dannebrog Island and Umiivik
- The mouth of Timmiarmiut Fjord.

4.4 Important areas for marine mammals

It is more difficult to designate areas of importance for marine mammals based on this survey. The target species were the two coastal seals – harbour and grey, and the many new seabird colonies found on this survey give an indication of how poorly investigated the surveyed coastline have been until now. Undiscovered colonies of harbour seals or of the in Greenland newly discovered grey seal, were therefore not unlikely to be found. But no grey seals were seen and all harbor seal sightings were on a well-known locality. The survey mainly covered the exposed coastal areas, and it cannot be ruled out that coastal seals have colonies inside some of the fjord systems that were not surveyed. But at least the archipelago Qeqertat east of Cape Farewell is important to harbour seals (see also Rosing-Asvid et al. 2013).

Unlike nesting seabirds, areas of importance to marine mammals are not linked to the coast, and localities of importance to other seal species than the ones observed and to cetaceans undoubtedly exist in both inshore and off-shore areas not comprised by our survey. In our coastal search, the most remarkable findings of marine mammals were the high numbers of polar bears observed at the the Blosseville Coast and the concentrations of late moulting hooded seals in all coastal regions (outside the fjords) exhibiting extended areas of ice suitable for haul-out.

5 References

- Andersen, J. 1981. Kaptajn Ejnar Mikkelsens Mindeekspedition 1980. Scoresbysund-Angmagssalik. – Field report.
- Bakken, V., Boertmann, D., Mosbech, A., Olsen, B., Petersen, A., Strøm, H., Goodwin, H. 2006. Nordic seabird colony databases. – TemaNord 2006: 512: 1-96.
- Boertmann, D. 2011. Seabirds in the central North Atlantic, September 2006: Further evidence for an oceanic seabird aggregation area. – Marine Ornithology 39: 183-188.
- Boertmann, D. & Nielsen, R.D. 2010. Geese, seabirds and mammals in North and Northeast Greenland. Aerial surveys in summer 2009. – NERI Technical Report No. 773. 66 pp. <http://www2.dmu.dk/Pub/FR773.pdf>
- Boertmann, D. & Rosing-Asvid, A. 2014. Seabirds and seals in Southeast Greenland. Results from a survey in July 2014. – Scientific Report from DCE – Danish Centre for Environment and Energy No. 117, 42 pp.
- Boertmann, D., Olsen, K. & Nielsen, R.D. 2009. Seabirds and Marine Mammals in Northeast Greenland. Aerial surveys in spring and summer 2008. – NERI Technical Report 721. National Environmental Research Institute, Aarhus University, Roskilde. <http://www2.dmu.dk/Pub/FR721.pdf>
- Boertmann, D., Mosbech, A., Bjerrum, M., Labansen, A.L. & Merkel F. 2010. The Greenland seabird colony register. – Poster presented at 1st Seabird World Conference, Victoria 7-11 Sept. 2010.
- Born, E.W. 1983. Havpattedyr og havfugle i Scoresbysund: Fangst og forekomst. – Råstofforvaltningen for Grønland og Grønlands Fiskeri og Miljøundersøgelser. 112 pp.
- Degerbøl, M. & Möhl-Hansen, U. 1935. The Scoresby Sound Committee's East Greenland Expedition in 1932 to King Christian IX's Land. Birds. – Meddelelser om Grønland 104, 18: 1-30.
- Falk, K. & Kampp, K. 1997. A manual for monitoring thick-billed murre populations in Greenland. – Pingortitaleriffik, Greenland Institute of Natural Resources, Technical report no. 7.
- Feilberg, J. 1985. Grønlands varme kilder - naturens egne mistbænke. – Tusaat 1985/2: 10-15.
- Gilg, O. (ed.). 2005. Ecopolaris – Tara 5 expedition to NE Greenland 2004. – Preliminary Field Report, Groupe de Recherches en Ecologie Arctique.
- Gilg, O., Boertmann, D., Merkel, F., Aebischer, A. & Sabard, B. 2009: Status of the endangered ivory gull, *Pagophila eburnea*, in Greenland. – Polar Biology 32: 1275-1286.

Gilg, O., Moe, B., Hanssen, S.A., Schmidt, N.M., Sittler, B., Hansen, J., Re-neerkens, J., Sabard, B., Chastel, O., Moreau, J., Phillips, R.A., Oudman, T., Biersma, E.M., Fenstad A.A., Lang, J. & Bollache, L. 2013. Trans-Equatorial Migration Routes, Staging Sites and Wintering Areas of a High-Arctic Avian Predator: The Long-tailed Skua (*Stercorarius longicaudus*). – PLoS ONE 8(5): e64614. doi:10.1371/journal.pone.0064614

Glahder, C. 1992. Hunting in Kangerlussuaq, East Greenland 1951-1991. An interview-investigation. – Greenland Environmental Research Institute, Report series no. 3.

Glahder 1995. Hunting in Kangerlussuaq, East Greenland, 1951-1991. An assessment of local knowledge. – Meddelelser om Grønland, Man & Society 19.

GM & OC (Falk, K., Kampp, K, Boertmann, D. & Mosbech, A.) 1992. Database over Grønlands havfuglekolonier. – Grønlands Miljøundersøgelser og Ornis Consult.

Halliday, G., Kliim-Nielsen, L. & Smart, I.H.M. 1974. Studies of the flora of the north Blosseville Kyst and on the hot springs of Greenland. – Meddelelser om Grønland 199, nr. 2.

Helms, O. 1926. The birds of Angmagssalik. – Meddr Grønland 58, 4: 205-274.

Hørring, R. 1939. Birds. In: 6. og 7. Thule expedition til Sydøstgrønland 1931-33. – Meddelelser om Grønland 108, 6: 44 pp.

Kliim-Nielsen, L. & Pedersen, H. 1974. Grønlands varme kilder. – Naturens verden 1974/1: 4-15.

Meltofte, H. 1976. Ornithologiske observationer i Scoresbysundområdet, Østgrønland, 1974. – Dansk Ornitologisk Forenings Tidsskrift 70: 107-122.

Merkel, F.R., Rasmussen, L.M. & Rosing-Asvid, A. 2010. Seabirds and marine mammals in South and Southeast Greenland, June 2008. – Technical Report No. 81, Pinngortitaleriffik, Greenland Institute of Natural Resources.

Mikkelsen, E. 1933. Report on the Expedition. The Scoresby Sound Committee's 2nd East Greenland Expedition in 1932 to King Christian IX's Land. – Meddelelser om Grønland 104: 1: 10-71.

Ray, H.P.C. 1973. Some Notes on the Birds Observed in the Kungmiut and Tugliluk Areas of East Greenland during the Summer of 1967. – Dansk Orn. Foren. Tidsskr. 67: 43-52.

Rosing-Asvid, A. 2002. The polar bear hunt in Greenland. – Greenland Institute of Natural Resources, Technical report no. 45.

Rosing-Asvid, A., Dietz, R., Teilmann, J., Olsen, M.T. & Andersen, S.M. 2013. Preliminary report about seals and their sensitivity to oil-exploration in South Greenland. – Report to the Ministry of Industry and Minerals.

Salomonsen, F. 1950. Grønlands Fugle, The Birds of Greenland. – Munksgaard, København: 609 pp.

Salomonsen, F. 1967. Fuglene på Grønland. – Rhodos, København: 341 pp

Sandell, H.T. & Sandell, B. 1991. Archaeology and environment in the Scoresby Sund Fjord. Ethno-archaeological investigations of the last Thule culture of Northeast Greenland. – Meddelelser om Grønland, Man & Society 15.

Sandell, H.T., Sandell, B., Born, E.W., Dietz, R. & Sonne-Hansen, C. 2001. Isbjørne i Grønland. En interviewundersøgelse om forekomst og fangst, 1999. – Pingortitaleriffik, Grønlands Naturinstitut, Teknisk rapport nr. 40.

Stirling, I., Thiemann, G.W. & Richardson, E. 2008. Quantitative support for a subjective fatness index of immobilized polar bears. – Journal of Wildlife Management 72: 568-574.

Strand, J. in prep. Statusrapport for første år af DANCEA projektet "Første systematiske undersøgelser af marint affald i Grønland (SUMAG)". – Scientific report from DCE-Danish Centre for Environment and Energy, Aarhus University.

Strand, J., Tairova, Z. & Metcalfe, R. d'A. 2016. Status on beach litter monitoring in Denmark 2015. – Scientific report from DCE-Danish Centre for Environment and Energy, Aarhus University, No. 177.

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SEABIRDS AND MARINE MAMMALS IN SOUTHEAST GREENLAND II

Results from a survey between Scoresby Sound and Tasiilaq
in July and August 2016

This report describes the results of the second part of the survey of breeding colonial seabirds and marine mammals in Southeast Greenland. The survey covered the coasts between Scoresby Sound and Tasiilaq. Generally, the assembly of breeding seabirds was poor, just as in the area surveyed during the first part of the project in 2014. Again in 2016 the most widespread and numerous species were glaucous gull and black guillemot. However, there is an important and relatively rich area at the coast between Cape Brewster and the Manby Peninsula, with several colonies of kittiwake, a large thick-billed murre colony, little auks at several sites and many other breeding seabird species including common eider, Arctic tern, Arctic skua and lesser black-backed gull. This area is clearly influenced by the polynya in the mouth of Scoresby Sound. Another area with more seabirds is the mouth of Kangerlussuaq and the coast from here south to Patulajaviit, where there are colonies of common eiders and Arctic terns. South of the Cape Brewster-Manby Peninsula area only one kittiwake colony was found and no colonies of other auk species besides black guillemots.

