

# Summer distribution of seabirds and marine mammals in the Greenland Sea, 1985-90

## *Verspreiding van zeevogels en zeezoogdieren in de Groenland Zee, zomer 1985-90*

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### Introduction

The Greenland Sea supports very large numbers of seabirds nesting on Svalbard, East Greenland, Bear Island, Jan Mayen and along the north coast of Iceland (Norderhaug *et al.* 1977, Evans 1984, Van Franeker & Luttkik 1984, Van Franeker *et al.* 1986, Mehlum & Fjeld 1987). Surprisingly little information is available about the distribution of seabirds at sea in this area. Qualitative descriptions of birds seen from ships were published by Joiris (1976), Byrkjedal *et al.* (1976) and Bruns (1981). More thorough investigations were published by Brown (1984), Joiris (1991), Mehlum (1989), and Petersen & Petersen (1991). Summer observations during 1985-88 of seabirds and marine mammals in largely ice-free waters of the Greenland Sea between Iceland and Svalbard, using methods currently standard in the North Sea and wide areas of the NE Atlantic (*cf.* Tasker *et al.* 1984), are reported here. Added are the results of ship-based surveys around Spitsbergen in 1989-90. Details (number, plumage, location) are provided for scarce (sea-) birds and marine mammals encountered in the Greenland Sea and offshore around Svalbard, distribution maps for commoner species. For any details with respect to the inshore distribution of seabirds and marine mammals in the Svalbard archipelago see Camphuysen (1993).

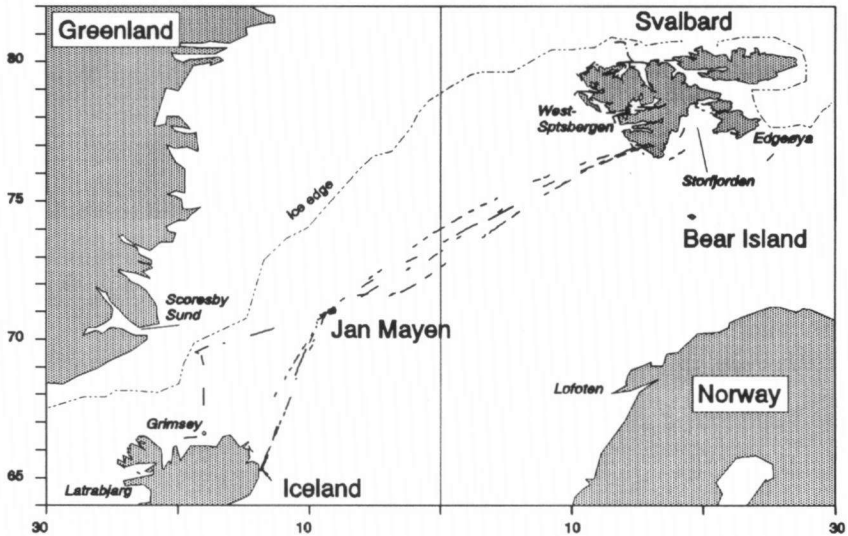


Figure 1. Observation tracks (broken lines) onboard MV Plancius, summer 1985-90.  
 Figur 1. Waarnemingsroutes (gebroken lijnen) aan boord van MS Plancius, zomer 1985-90.

## Methods

Observations were done from the bridge wing of the ship, 7 metres above sea level, while steaming (max. speed 10 knots) between Iceland, Jan Mayen and Svalbard (figure 1). Birds were recorded ahead of the ship ( $180^\circ$  scan) and within a 300 m transect on one side and in front of the ship, in 10 or 15 min periods, similar to methods described by Tasker *et al.* (1984). The scan was used to present numbers of birds and marine mammals per unit distance (total observations over 2399 nautical miles; figure 2). The main job of the observer onboard was to act as tourist guide and the presence of tourists on the bridge wing made it difficult to fully concentrate on the band transect. Hence, the transect method was only used when no other people were present on deck (473.6 km<sup>2</sup> covered, see figure 3). Birds in transect were used to calculate densities (birds per unit area). Birds and marine mammals were detected by naked eye, but identified and aged using binoculars. Large whales were usually followed by the ship for a while in order to obtain better views.

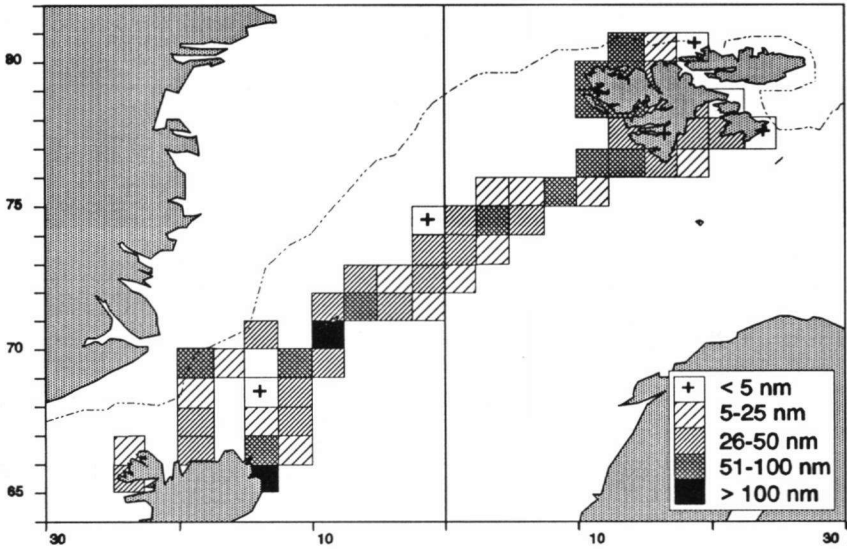


Figure 2. Observer effort (1): nautical miles travelled, using 180° scan.

Figuur 2. Waarnemingsinspanning (1): afgelegde afstand tijdens 180° scan.

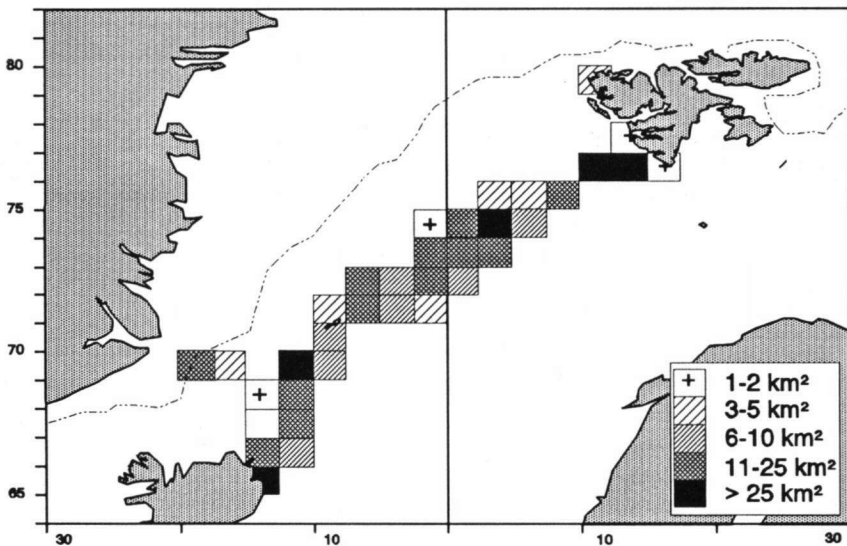


Figure 3. Observer effort (2): area covered (km²) using transect method.

Figuur 3. Waarnemingsinspanning (2): onderzocht gebied met transect tellingen.

## Sea ice

The Greenland Sea, between East Greenland and Spitsbergen, north of Iceland, is partly ice covered during most of the year (Vinje 1982). Interannual variations in sea ice extensions are considerable, however, in almost every area and any month. The pack ice edge in the Greenland Sea was encountered only twice. Off Scoresby Sund, East Greenland, the ice was reached after steaming in a northerly direction from Grimsey (N. Iceland) on 20 June 1985 at 69°33'N, 18°45'W. On 17 June 1988, the ice edge was encountered between Jan Mayen and Svalbard at approximately 71°35'N, 03°35'W, and it appeared that Jan Mayen had been totally surrounded by ice only one week earlier (station crew *pers. comm.*). Large amounts of drift ice (7/10-9/10 coverage) were met off SW Spitsbergen on 16 June 1986 blocking the entrance of Hornsund. The ice edge drawn on maps in this paper is the average July sea ice concentration (>4/10) over 1971-80 after Vinje (1982), except off Scoresby Sund, where the ice situation as met on 20 June 1985 is given.

## Results (1): birds

**Red-throated Diver** *Gavia stellata* Some sightings in inshore waters around Iceland and Spitsbergen.

**Manx Shearwater** *Puffinus puffinus* One individual, 17 June 1985, W Iceland (65° 21'N, 24°00'W).

**Fulmar** *Fulmarus glacialis* Fulmars are among the most abundant and widespread species in the Greenland Sea (figure 4). Even in dense fog, not a single ten-minute count was without this species. Highest numbers were found near colonies (Iceland, Jan Mayen, Svalbard) and densities were lowest between Jan Mayen and Svalbard. Large numbers of feeding Fulmars were found at the shelf edge off SW Spitsbergen and near the ice edge north of Svalbard and off Scoresby Sund. Several thousands of Fulmars were seen scavenging at a shellfish trawler off NW Spitsbergen (28 June 1989, 79°57' N, 11°37'E; see Camphuysen 1993). Fulmars breeding on Iceland and Jan Mayen are mainly double light phase birds, whereas most birds on Svalbard are 'coloured' (light, dark or double dark phase; Van Franeker & Wattel 1982, Van Franeker *et al.* 1986). About one quarter of the population in East Greenland is coloured. At sea around Iceland virtually all Fulmars were double light phase birds, coloured birds became more frequent near Jan

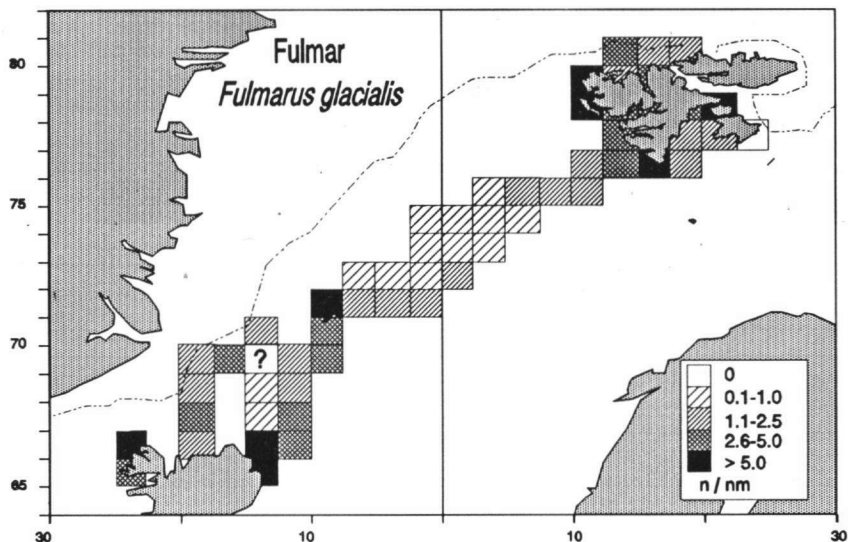


Figure 4. Distribution of Fulmar *Fulmarus glacialis* (n/nm), 1985-1990.  
 Figuur 4. Verspreiding van de Noordse Stormvogel (n/nm), 1985-1990.

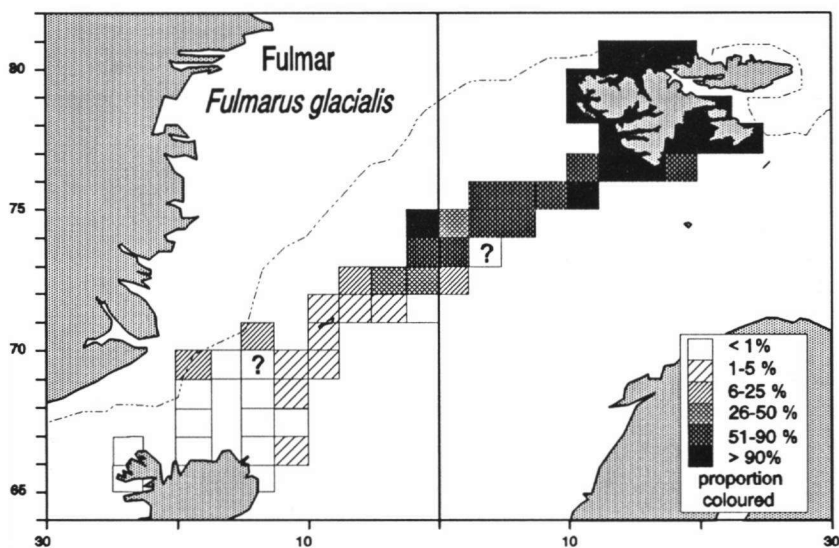


Figure 5. Colour phase of Fulmars at sea (if  $n > 10$  individuals).  
 Figuur 5. Kleurfase van Noordse Stormvogels op zee (indien  $n > 10$  individuen).

Mayen (figure 5). Between Jan Mayen and Svalbard, where densities at sea were lowest, the colour phase distribution suddenly changed and virtually all Fulmars were coloured around Spitsbergen. Off Scoresby Sund, at the ice edge, rather large numbers of coloured birds were seen. Considering the state of primary moult, most coloured Fulmars around Jan Mayen and many light phase birds between Jan Mayen and Svalbard were immature or non-breeding adults.

**Gannet *Sula bassana*** Occasional records, mainly immatures:

- 10 June 1986, 1 imm. off E Iceland (65°05'N, 13°10'W)
- 15 June 1986, 1 imm. Jan Mayen-Svalbard (75°07'N, 04°16'E)
- 12 June 1987, 1 imm. off E Iceland (65°29'N, 13°33'W)
- 12 June 1987, 1 adult off E Iceland (66°22'N, 12°46'W)
- 13 June 1988, 1 imm. off E Iceland (66°43'N, 12°27'W)
- 26 June 1989, 1 imm. off W Spitsbergen (79°48'N, 10°20'E)
- 7 August 1990, 1 imm. off Edgeøya, E Svalbard (77°23'N, 20°58'E)

**Barnacle Goose *Branta leucopsis*** One record off Spitsbergen: 29 June 1989, 3 adults (79°46'N, 11°30'E).

**Pink-footed Goose *Anser brachyrhynchus*** One record off Spitsbergen: 28 June 1989, 1 individual, 79°52'N, 11°24'E.

**Eider *Somateria mollissima*** Numerous in coastal waters around Iceland and Spitsbergen.

**Harlequin Duck *Histrionicus histrionicus*** Three records in coastal waters of East Iceland (1♂, 1♀ 11 June 1986, 2♀ 12 June 1986, 1♂ 12 June 1987).

**Common Scoter *Melanitta nigra*** One record in coastal waters of East Iceland (1♂, 1♀ 11 June 1986).

**Ringed Plover *Charadrius hiaticula*** One record off Northeast Iceland: 1 adult, 13 June 1988 (66°43'N, 12°25'W).

**Dunlin *Calidris alpina*** One record between Iceland and Jan Mayen: 1 transitional plumage adult, 14 June 1988 (69°52'N, 09°45'W).

**Purple Sandpiper *Calidris maritima*** One record between Iceland and Jan Mayen (1 summer plumage adult, 13 June 1988, 69°24'N, 10°30'W).

**Sanderling *Calidris alba*** One record between Iceland and Jan Mayen: 1 summer plumage adult, 13 June 1988 (67°17'N, 11°58'W).

**Grey Phalarope *Phalaropus fulicarius*** One record between Jan Mayen and Svalbard: 1 transitional plumage adult, 24 June 1985 (72°53'N, 01°01'W).

**Pomarine Skua *Stercorarius pomarinus*** Scattered records of solitary Pomarine Skuas or small groups (total 74 individuals), usually immatures, throughout the Greenland Sea and around Spitsbergen, but particularly near the ice edge north of Spitsbergen and off Scoresby Sund (figure 6). Most skuas seen were light phase birds and considering the scarcity of true summer plumage adults, most were probably wandering non-breeding birds. Pomarine Skuas were particularly abundant in 1990, when a summer influx occurred in the Svalbard area. Large groups were seen at sea near Edgeøya, and most of these birds formed tundra roosts (see Camphuysen 1993).

**Arctic Skua *Stercorarius parasiticus*** Arctic Skuas breed on Iceland, Jan Mayen and Spitsbergen. Most individuals were seen at sea around these islands and only occasionally far offshore in the Greenland Sea. Compared with Pomarine and Long-tailed Skuas, few birds were seen along the pack ice

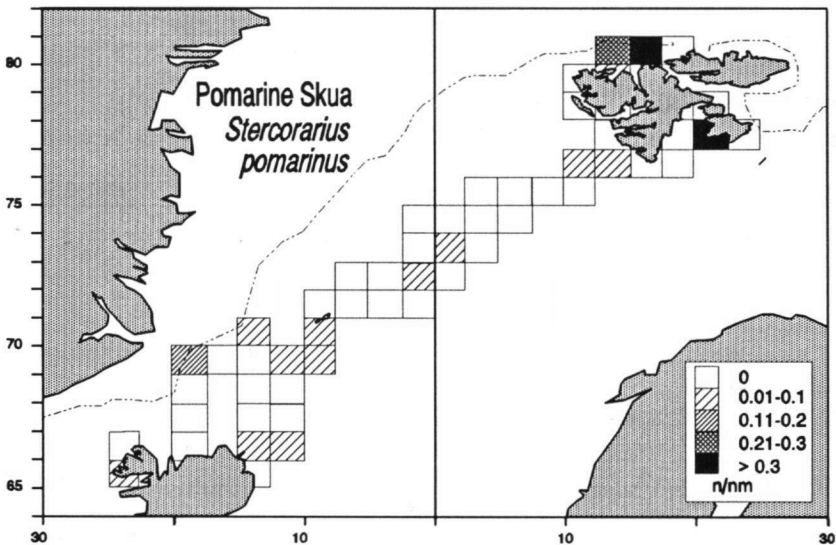


Figure 6. Distribution of Pomarine Skuas *Stercorarius pomarinus* (n/nm), 1985-1990.  
Figuur 6. Waarnemingen van Middelste Jagers (n/nm), 1985-1990.

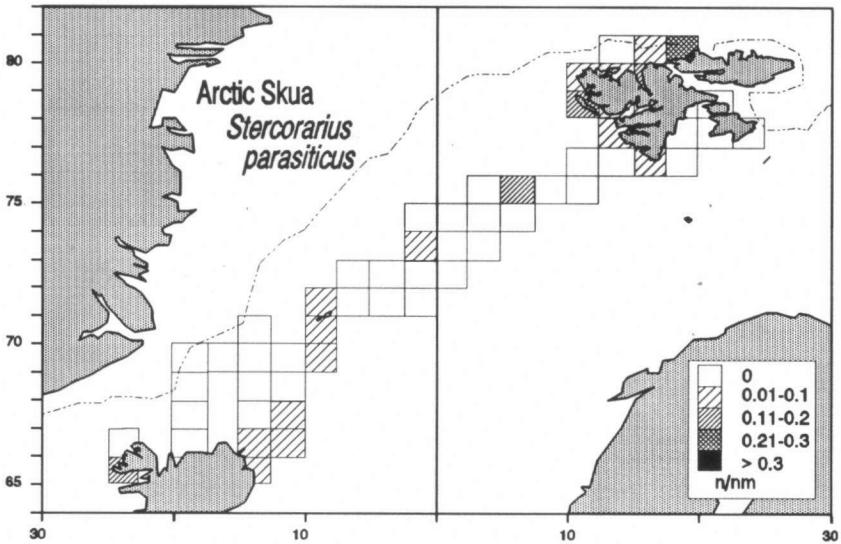


Figure 7. Distribution of Arctic Skuas *Stercorarius parasiticus* (n/nm), 1985-1990.  
 Figur 7. Verspreiding van Kleine Jagers (n/nm), 1985-1990.

(figure 7). Arctic Skuas were rather numerous at sea in fjords in Spitsbergen and most birds seen here were adult and in summer plumage; these individuals were obviously breeding in nearby tundra areas. Several of the birds seen offshore in the Greenland Sea were immatures, but adults were comparatively numerous. In all, 62 Arctic Skuas were seen during ship-based surveys, making it the second most frequently seen skua at sea.

**Long-tailed Skua *Stercorarius longicaudus*** A total of 47 Long-tailed Skuas was seen during ship-based surveys, 42 of which were seen on 28 July 1990 while steaming from Verlegenuken (NE Spitsbergen) towards Nordaustlandet (see Camphuysen 1993). In the Greenland Sea, single birds were seen between Iceland and Jan Mayen: 20 June 1985, 1 adult light phase (69°18'N, 18°08'W), 21 June 1985, 1 imm. light phase (70°14'N, 14°01'W), 10 June 1987, 1 adult light phase (64°45'N, 12°35'W).

**Great Skua *Catharacta skua*** Great Skuas are common breeding birds on (S) Iceland and have recently colonised Jan Mayen (Van Franeker *et al.* 1986), Norway and Svalbard (Vader *et al.* 1992). At sea, frequent sightings of Great Skuas occurred between Iceland and Jan Mayen and around Spitsbergen (fi-



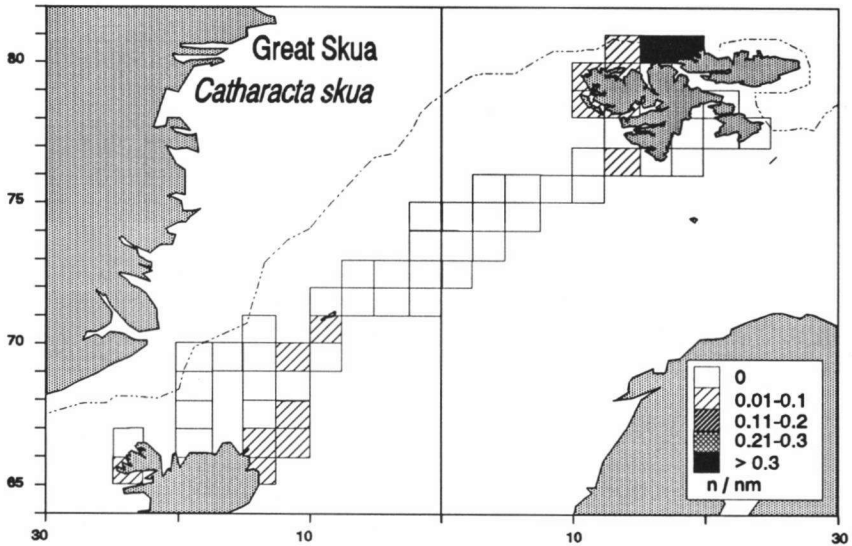


Figure 8. Distribution of Great Skuas *Catharacta skua* (n/nm), 1985-1990.

Figuur 8. Verspreiding van de Grote Jager (n/nm), 1985-1990.

figure 8). The presence of Great Skuas between Iceland and Jan Mayen indicates a frequent contact between both populations. The lack of sightings between Jan Mayen and Spitsbergen is remarkable. Possibly, the Svalbard population is mainly in contact with Great Skuas in Norway and, considering some colour ringed birds seen in Svalbard (F. Mehlum *pers.comm.* and *pers.obs.*), Scottish stocks. Two adult Great Skuas off East Iceland were seen to kill an apparently healthy and fit Puffin *Fratercula arctica*, 12 June 1987.

**Lesser Black-backed Gull *Larus fuscus*** Frequently recorded in coastal waters around Iceland. Three records between Iceland and Jan Mayen: 20 June 1985, 2 adults (ice edge, 69°40'N, 18°10'W), 13 June 1987, 1 adult (69°26'N, 10°26'W), 13 June 1988, 2 adults (67°30'N, 11°46'W).

**Herring Gull *Larus argentatus*** Common in coastal waters around Iceland. One between Jan Mayen and Spitsbergen: 16 June 1987, 1 adult (74°05'N, 02°12'E).

**Great Black-backed Gull *Larus marinus*** Very common in coastal waters around Iceland, small numbers around Jan Mayen. Scarce offshore, one

record between Jan Mayen and Spitsbergen: 15 June 1987, 2 adults (72°12'N, 05°03'W).

**Glaucous Gull *Larus hyperboreus*** Common in coastal waters around Iceland, Jan Mayen and Spitsbergen. Few records offshore: between Iceland and Jan Mayen (12 June 1986, 1 imm. 67°01'N, 12°22'W) and between Jan Mayen and Spitsbergen (24 June 1985, 1 imm. 72°34'N, 02°30'W, 1 imm. 73°02'N, 00°40'W).

**Kittiwake *Rissa tridactyla*** Kittiwakes were common in most areas of the Greenland Sea, but particularly off Iceland, Jan Mayen and West Spitsbergen (figure 9). Low numbers occurred at great distances of land and around East Spitsbergen. The ice edge off Scoresby Sund was not particularly rich in Kittiwakes, but some 3000 Kittiwakes were seen scavenging at a shellfish trawler in the ice off Northwest Spitsbergen (28 June 1989) and large concentrations of surface feeding gulls were occasionally seen near the ice edge off Spitsbergen. Off Northeast Iceland, where Kittiwakes were relatively common further offshore, large groups of immature (2nd calendar year) Kittiwakes were encountered. Flocks often comprised several hundreds of individuals with exceptionally worn feathers.

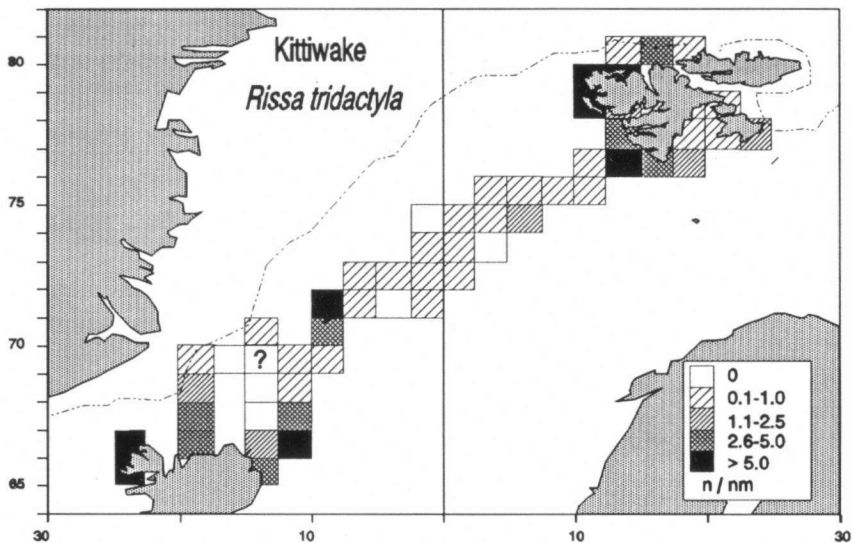


Figure 9. Distribution of Kittiwake *Rissa tridactyla* (n/nm), 1985-1990.

Figuur 9. Verspreiding van Drieteenmeeuwen (n/nm), 1985-1990.

**Ivory Gull** *Pagophila eburnea* Absent in ice free waters of the Greenland Sea, occasional records at the pack ice edge north of Spitsbergen and frequently found in inshore waters around Spitsbergen (see Camphuysen 1991, 1993).

**Arctic Tern** *Sterna paradisaea* Frequent in coastal waters of Iceland, Jan Mayen and Spitsbergen, one adult at the ice edge off Scoresby Sund (East Greenland, 20 June 1985). Two records between Jan Mayen and Spitsbergen: 2 adults, 17 June 1988 (71°53'N, 02°27'E), 15 June 1986, 1 2nd calendar year (74°38'N, 02°00'E).

**Guillemot** *Uria aalge* Guillemots breed in large numbers on Iceland, but are scarce at Jan Mayen and Spitsbergen (Norderhaug 1974, Van Franeker *et al.* 1986). At sea, Guillemots were only seen off Iceland and north of 67°N all positively identified large auks were Brünnich's Guillemots *Uria lomvia*.

**Brünnich's Guillemot** *Uria lomvia* Brünnich's Guillemots occurred throughout the Greenland Sea in small numbers but were abundant near colonies on Northwest Iceland (>10/nm during 180° scan; not mapped), Jan Mayen and Spitsbergen (similar numbers per nm, densities over 5/km<sup>2</sup>; figure 10). In coastal waters of West Iceland, Brünnich's Guillemots were mixed with Guillemots and Razorbills, but around NW Iceland *lomvia* predominated. Remarkably, virtually all Brünnich's Guillemots seen at sea further offshore took off and circled a number of times around the ship. Very large numbers were seen off Jan Mayen near colonies in Krossbukta (*ca.* 60,000 breeding individuals; Van Franeker *et al.* 1986). Massive numbers (many thousands) were seen feeding off North Spitsbergen (29 June 1989, 79°53'N, 12°32'E). Adults and small chicks were encountered at sea off Sørkapp on 30 July 1989, between Agardhbukta and Sørkapp (Storfjorden) on 6 August 1989, and off Kapp Linné on 8 August 1989. Not a single chick was seen there one year later (see Camphuysen 1993).

**Razorbill** *Alca torda* Small numbers at sea off Northeast Iceland and abundant off West Iceland, particularly around Latrabjarg. No Razorbills were seen around Jan Mayen and Spitsbergen, where very small breeding populations occur (Van Franeker *et al.* 1986, Camphuysen 1993).

**Puffin** *Fratercula arctica* Puffins were abundant off West Iceland and occurred in small numbers elsewhere (figure 11). Two subspecies of Puffins breed

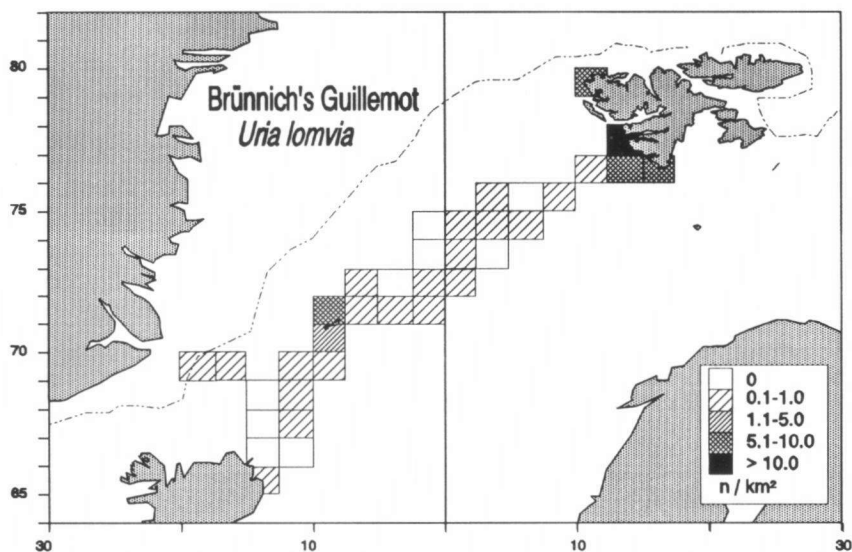


Figure 10. Distribution of Brünnich's Guillemots *Uria lomvia* (n/km<sup>2</sup>), 1985-1990.  
 Figuur 10. Dichtheden Dikbekzeekoeten (n/km<sup>2</sup>), 1985-1990.

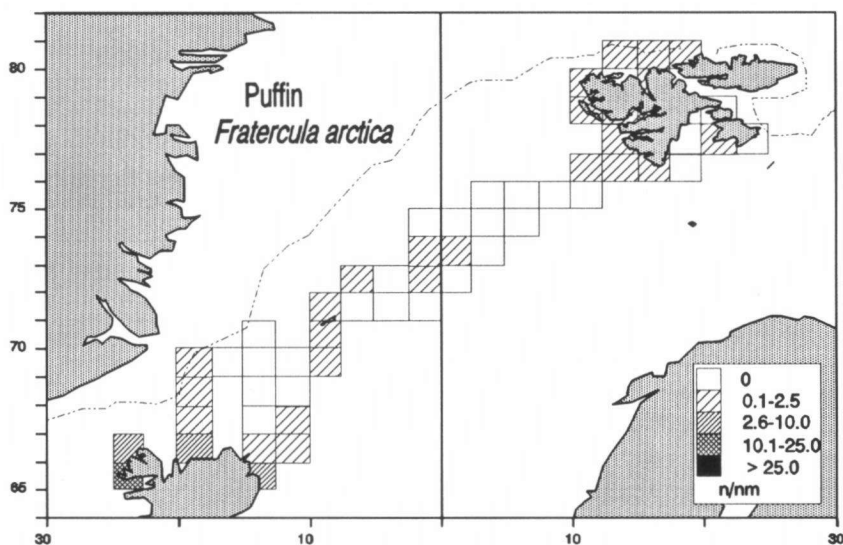


Figure 11. Distribution of Puffins *Fratercula arctica* (n/nm), 1985-1990.  
 Figuur 11. Verspreiding van Papegaaiduikers (n/nm), 1985-1990.

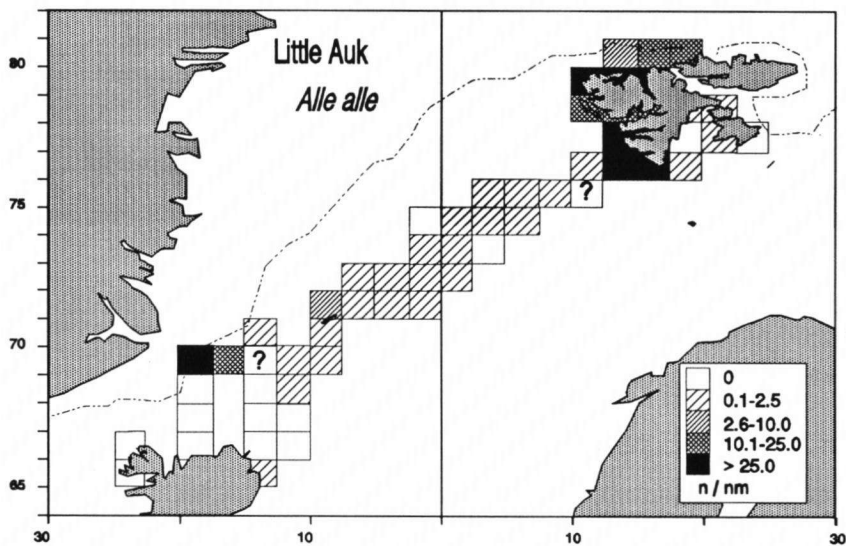


Figure 12. Distribution of Little Auks *Alle alle* (n/nm), 1985-1990.

Figuur 12. Verspreiding van Kleine Alken (n/nm), 1985-1990.

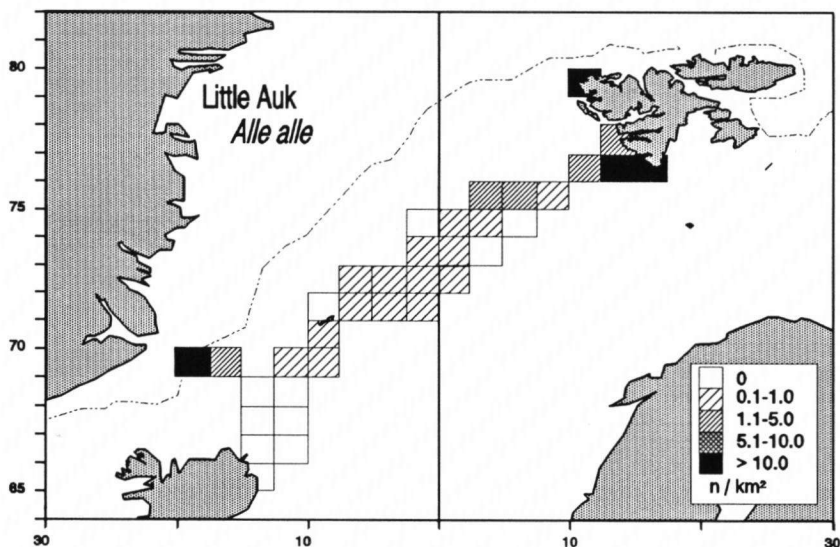


Figure 13. Distribution of Little Auks *Alle alle* (n/km²), 1985-1990.

Figuur 13. Dichtheden Kleine Alken (n/km²), 1985-1990.

in the Greenland Sea: *Fratercula arctica arctica* on Iceland and *F. a. naumanni* on Jan Mayen and Spitsbergen (Harris 1984, Cramp 1985, Camphuysen 1990), but these cannot usually be separated at sea. Offshore sightings of Puffins between Iceland and Jan Mayen and between Jan Mayen and Spitsbergen were scarce, but indicate that these populations are in contact. Colonies of Puffins on Jan Mayen and Spitsbergen are, typically, very small and low densities occurred at sea near these breeding stations. On Iceland, however, very large colonies are found and densities at sea were often high.

**Little Auk *Alle alle*** Virtually absent near Iceland, where a very small population exists at Grimsey (N Iceland). Steaming from Grimsey towards the ice edge off Scoresby Sund on 20 June 1985, the first Little Auks were encountered at 69°05'N, 18°03'W (figure 12). Although occasional individuals were seen further to the south, between Northeast Iceland and Jan Mayen, the first groups of Little Auks were seen at 68°41'N, 11°06'W (13 June 1987). Little Auks were abundant at the ice edge off Scoresby Sund, many thousands of Little Auks were seen feeding off North Spitsbergen (e.g. 29 June 1989, 79°53'N, 12°32'E; 26 June 1989, 79°05'N, 11°31' E), and very high densities were seen off Southwest Spitsbergen (figure 13, see Camphuysen 1993). Off Hornsund, up to 800 Little Auks were seen in transect within a single 10-minute count (16 June 1986, 76°53'N, 14°35'E; density ca. 960/km<sup>2</sup>), but, obviously, accurate counts were notoriously difficult to make under these conditions. Many of these birds were feeding actively, and large numbers were under water, just popping out the sea or diving when the ship passed by. Moreover, large groups of Little Auks were seen flying by (feeding flights). A group of 350 Little Auks joined the ship when it left the ice off Scoresby Sund, only to circle around it for 6.5 hours without a break. This group left suddenly when the ship entered a fog patch, but, considering that the birds maintained a speed of ca. 80 km/hour, the flock must have been circling around the ship over 520 kilometres!

**Black Guillemot *Cephus grylle*** Black Guillemots are common breeding birds around the Greenland Sea. Known as inshore species, it was quite surprising to see how frequently Black Guillemots were observed far offshore in very deep waters of the Greenland Sea (figure 14). Most Black Guillemots were seen in Svalbard, where high numbers occurred in fjords. Black Guillemots were not particularly numerous at the ice edge north of Spitsbergen and were absent at the ice off Scoresby Sund.

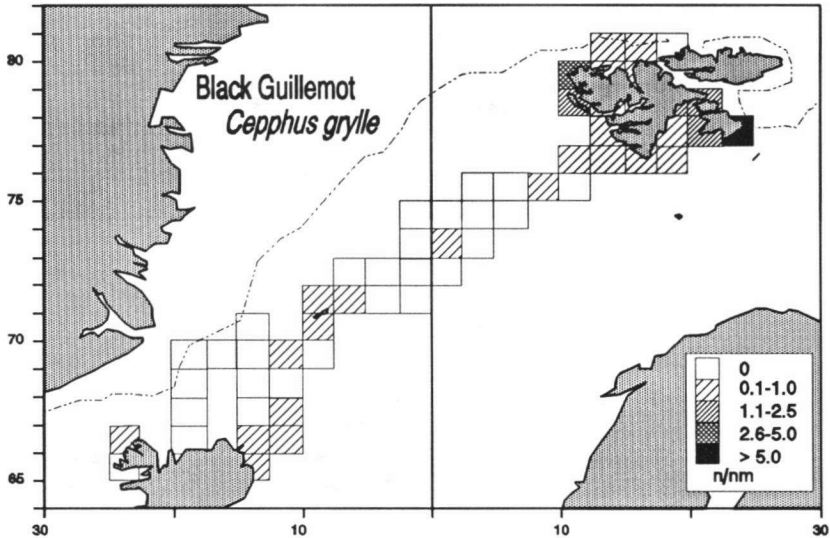


Figure 14. Distribution of Black Guillemots *Cephus grylle* ( $n/km^2$ ), 1985-1990.

Figuur 14. Verspreiding van Zwarte Zeekoeten ( $n/km^2$ ), 1985-1990.

## Results (2): marine mammals (seals and cetaceans)

**Grey Seal *Halichoerus grypus*** Two records in coastal waters of N Iceland between Adalvík and Grimsey: 18 June 1985, 1 ♂ ( $66^{\circ}21'N$ ,  $23^{\circ}06'W$ ), 1 ind. ( $66^{\circ}32'N$ ,  $22^{\circ}39'W$ ).

**Bearded Seal *Erignathus barbatus*** Bearded Seals were frequently seen in fjords and on icefields around Spitsbergen (sometimes resting on small icefloes; see Camphuysen 1993).

**Ringed Seal *Phoca hispida*** In fjords of Spitsbergen, this is by far the commonest seal (see Camphuysen 1993).

**Harp Seal *Phoca groenlandica*** Harp Seals were the only species occasionally found in the Greenland Sea, even in waters which were absolutely ice-free and several thousands of metres deep (figure 14). Usually, small groups were seen sticking heads out of the water, sometimes seals were porpoising at the bow. Large numbers were seen off Spitsbergen ( $76^{\circ}50'N$ - $77^{\circ}00'N$ ,  $15^{\circ}00'E$ - $14^{\circ}20'E$ ) associated with pack ice remains on 16 June 1986 (at least 657).

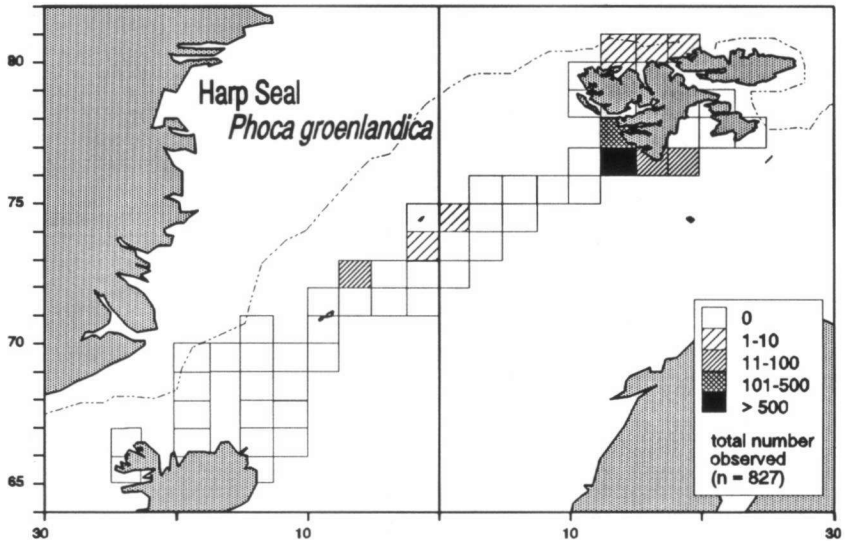


Figure 14. Distribution of Harp Seals *Phoca groenlandica* (numbers), 1985-1990.  
 Figuur 14. Verspreiding van Zadelrobben (aantallen), 1985-1990.

Several tens were seen on loose drift ice in Storfjorden on 30 July 1989 (79 individuals). Small numbers were seen in the pack ice north of Spitsbergen.

**Walrus** *Odobenus rosmarus* Occasionally encountered in the ice to the north of Spitsbergen and around Edgeøya (see Camphuysen 1993).

**Fin Whale** *Balaenoptera physalus* Between Iceland, East Greenland and Jan Mayen: 20 June 1985, 1 adult (69°18'N, 18°08'W), 21 June 1985, 4 large individuals (70°06'N, 14°54'W). Between Jan Mayen and Svalbard: 25 June 1985, adult ♀ and calf (74°30'N, 04°17'E).

**Minke Whale** *Balaenoptera acutorostrata* Frequent sightings in coastal waters of Spitsbergen (including feeding individuals at the shelf edge; see Camphuysen 1993), near the shore around Jan Mayen and off Iceland (figure 15). Minke Whales were scarce at great distances from the coast between Jan Mayen and Spitsbergen and between Iceland and Jan Mayen.

**Humpback Whale** *Megaptera novaeangliae* Off East Iceland: 12 June 1987, 2 ind., 66°01'N, 13°06'W; 12 June 1987, 1 ind., 66°03'N, 13°04'W.



**Sperm Whale *Physeter macrocephalus*** One record off East Iceland: 12 June 1987, 1 adult ♂, 66°36'N, 12°38'W.

**Bottle-nosed Whale *Hyperoodon ampullatus*** Small groups or solitary Bottle-nosed Whales were frequently seen in deep waters, far offshore, between Iceland/Greenland and Jan Mayen and between Jan Mayen and Spitsbergen (figure 15). Large groups were seen between East Greenland and Jan Mayen: 21 June 1985, 15 individuals (70°06'N, 14°54'W), 13 June 1987, 10 individuals (70°08'N, 09°43'W).

**White Whale *Delphinapterus leucas*** Several sightings in fjords in Spitsbergen (see Camphuysen 1993), no records in the Greenland Sea.

**White-beaked Dolphin *Lagenorhynchus albirostris*** Small groups of dolphins were seen off Iceland and off Southwest Spitsbergen (figure 15). Those that could be identified were all White-beaked Dolphins.

**Harbour Porpoise *Phocoena phocoena*** One record in coastal waters off Iceland: 13 June 1988, 3 ind. 65°33'N, 13°24'W.

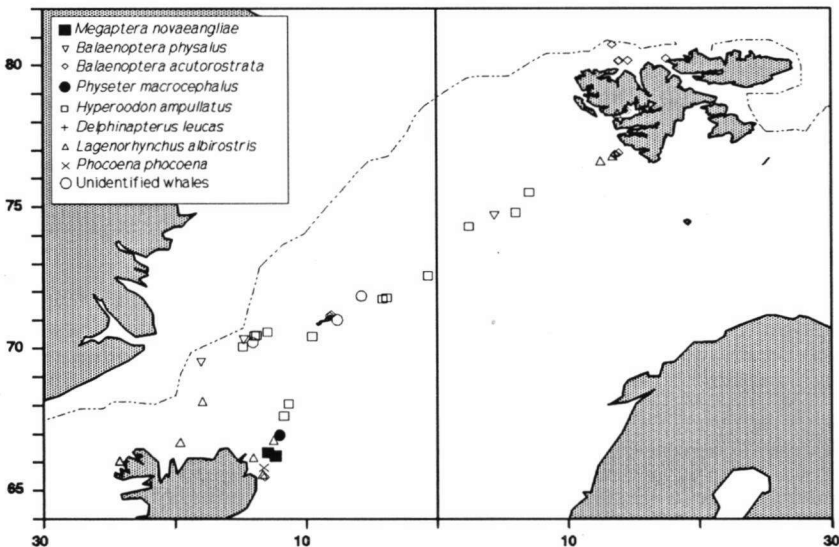


Figure 15. Individual records of cetaceans, 1985-1990.

Figuur 15. Waarnemingen van walvisachtigen, 1985-1990.

## Discussion

The avifauna of the Greenland Sea is dominated by Fulmars, Kittiwakes and two species of auks: Brünnich's Guillemots and Little Auks. Frequently observed offshore, but occurring in small numbers, were four species of skuas, Puffins and Black Guillemots. All other species of seabirds were either typical inshore species (Red-throated Diver, Great and Lesser Black-backed Gull, Herring Gull, Glaucous Gull, Ivory Gull and Arctic Tern) or rare (Manx Shearwater, Gannet). Razorbills and Guillemots were abundant around Iceland, but scarce or absent north of 67°N. Brown (1984) concluded that the principal species in the Greenland Sea during February-April were Fulmar, Kittiwake, Ivory Gull, *Uria* spp. and Little Auk. Mehlum (1989), reporting on ship-based surveys in summer in the northern Greenland Sea, found, similar to the results presented here, Little Auk, Fulmar, Kittiwake and Brünnich's Guillemots as dominating species, but encountered considerably larger numbers of Ivory Gulls, Black Guillemots, Glaucous Gulls, Pomarine Skuas and Arctic Terns and also Ross' Gulls *Rhodostethia rosea*.

Fulmars and Kittiwakes are numerous and widespread, but the Greenland Sea is probably most important for auks. Wintering Brünnich's Guillemots and Little Auks from Svalbard are frequently recovered in southwest Greenland, but many, perhaps most winter in the ice-free parts of the Barents Sea and Greenland Sea (Salomonsen 1967, Brown 1985). The numbers of auks at sea near Scoresby Sund, around Jan Mayen and off West Spitsbergen as found during the summer cruises described in this paper were immense. Crude calculations on the number of Little Auks present in the areas surveyed using the transect method, led to estimates of at least 250,000 individuals. The large numbers off Scoresby Sund were near the ice in which even higher densities are known to occur (Kampp *et al.* 1987). The species occurs highly concentrated, however, and much of the Greenland Sea is of limited value for this species in summer. Yet, for the small population of the European high arctic race of the Puffin *F. a. naumanni* (confined to northern half of Greenland, Jan Mayen, Svalbard and northern Novaya Zemlya; Cramp 1985, Camphuysen 1990), the Greenland Sea and western Barents Sea are probably the only areas of any significance, both in summer and winter.

Harp Seals were the only seal frequently found in the Greenland Sea. This was remarkable, for Hooded Seals *Cystophora cristata* are known to be numerous in the ice of the central Greenland Sea (Ugland & Ree 1983, Joiris 1991, Reijnders *et al.* 1993). It is possible that a small number of Hooded Seals has been overlooked in the seal concentration off Hornsund in 1986.

Around Svalbard, Minke Whale and White Whale were numerically dominating species (cf. Ugland & Ree 1983). Yet, cetaceans were not particularly numerous and compared to the western half of the Greenland Sea, around Iceland and off Greenland. Bottle-nosed Whales is the small whale most frequently seen offshore in the Greenland Sea, being virtually confined to very deep waters. Minke Whales were typical and rather common inshore species.

### Acknowledgements

Plancius Foundation in Amsterdam is thanked for the financial support to publish the data collected during cruises onboard their ship. I would like to thank the captains, crews and passengers of MV *Plancius* manning the ship in summers 1985-90 for their co-operation and enthusiasm.

### Samenvatting

*In de zomers van 1985 tot en met 1988 werd de Groenland Zee overgestoken vanaf IJsland, via Jan Mayen naar Spitsbergen aan boord van het M.S. Plancius en in de zomers van 1989 en 1990 werd rond Spitsbergen gevaren.. Zeevogels en (zee-) zoogdieren werden systematisch geregistreerd en dit artikel is een weergave van de belangrijkste waarnemingen. De voornaamste zeevogels in de zomer in de Groenland Zee waren Noordse Stormvogel, Drieteenmeeuw, Dikbekzeekoet en Kleine Alk. De meest voorkomende zeezoogdieren waren Zadelrob, Dwergvinvis en Butskop, maar daarnaast werd een flink aantal andere soorten waargenomen. Geconcludeerd wordt dat de Groenland Zee vooral van grote betekenis is voor alkachtigen.*

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