Masterplan Wind – Seabirds
Cruise Report October 2010

Steve CV Geelhoed & Hans Verdaat

Report number C182/10

IMARES Wageningen UR

Institute for Marine Resources & Ecosystem Studies

Client: Paul Boers
Rijkswaterstaat Waterdienst
Postbus 17
8200 AA LELYSTAD

Publication date: 10 March 2011

IMARES WAGENINGEN UR

IMARES is:

- an independent, objective and authoritative institute that provides knowledge necessary for an integrated sustainable protection, exploitation and spatial use of the sea and coastal zones;
- an institute that provides knowledge necessary for an integrated sustainable protection, exploitation and spatial use of the sea and coastal zones;
- a key, proactive player in national and international marine networks (including ICES and EFARO).

P.O. Box 68	P.O. Box 77	P.O. Box 57	P.O. Box 167
1970 AB IJmuiden	4400 AB Yerseke	1780 AB Den Helder	1790 AD Den Burg Texel
Phone: +31 (0)317 48 09 00	Phone: +31 (0)317 48 09 00	Phone: +31 (0)317 48 09 00	Phone: +31 (0)317 48 09 00
Fax: +31 (0)317 48 73 26	Fax: +31 (0)317 48 73 59	Fax: +31 (0)223 63 06 87	Fax: +31 (0)317 48 73 62
E-Mail: imares@wur.nl	E-Mail: imares@wur.nl	E-Mail: imares@wur.nl	E-Mail: imares@wur.nl
www.imares.wur.nl	www.imares.wur.nl	www.imares.wur.nl	www.imares.wur.nl

Cover Photo: Goldcrest on board the Tridens (Steve Geelhoed)
Distribution maps: Rob van Bemmelen

A_4_3_2-V11.2

Contents

Summary

Geelhoed SCV & Verdaat H 2010.
Masterplan Wind – Seabirds. Cruise Report October 2010.
IMARES Report C182/10, 22 pp.

This cruise report provides an overview of the seventh survey in a series of seabirds at sea surveys that will be carried out in 2010 and 2011 over the Dutch Continental Shelf (DCS) of the North Sea and adjoining waters. This seventh survey in the series was carried out in October 2010. Two seabird observers joined a cruise that was aimed at surveying plankton, by taking plankton samples at more or less hourly intervals. In between the plankton stations, the ship steamed full speed (speed ranging from 10-16 knots) and seabirds were surveyed during all daylight hours while the ship was steaming. The sailed route was more or less the same as the previous surveys.

During the week, a total of 412 counting bouts of on average almost 5 minutes each were conducted. These stretched over a total of 870.2 km and covered, at a strip width of 300 m, a total survey area of 261.1 km^2 (Table 1). A total of 5583 birds of 43 species, 18 marine mammals (2 Short-beaked Common Dolphins, 3 Bottlenose Dolphins and 13 Harbour Porpoises) and 5 balloons were recorded (Table 3). Weather conditions were moderate to poor and had a negative impact on the probability to detect seabirds and porpoises in particular. Two species of dolphins were observed. Two Short-beaked Common Dolphins were seen in Belgian waters, three Bottlenose Dolphins were seen along the eastern flank of the Dogger Bank. Both species were accompanied by Northern Gannets and gulls.

Guillemots were patchily distributed, with low densities in most parts of the study area. The Dogger Bank held high densities along the north and east flanks. In this area several Puffins were seen as well. Great Black-backed Gulls and Black-legged Kittiwakes were the most numerous gull species. Both were seen in low densities, with the exception of some large groups associated with several platforms and fishing vessels. Autumn migration resulted in several migrating passerines, some hitch-hiking on the ship for a while.

1 Introduction

This cruise report presents the seabird and marine mammal data collected during the seventh “fish eggs and fish larvae” survey, in a series of 12 monthly surveys from April 2010 till March 2011. These surveys cover the entire Dutch Continental Shelf (DCS); the first two surveys also covered waters south and west of the DCS. The grid with sampling stations for the “fish eggs and fish larvae” survey was adjusted after these surveys in order to focus more on the DCS; eg the westernmost stations were shifted to the east. The primary research topic during all cruises is plankton research (fish eggs and fish larvae), but the vessel conducting these surveys is an excellent platform for additional research on other vulnerable biota, such as seabirds. The plankton work is carried out 24 hours per day, i.e. also at night. Seabirds can only be surveyed during daylight, so the aim of the project is to survey seabirds during all daylight hours. Coverage of the area is therefore less than 100% as the survey ship continues working during the night.

2 Aim of the project and methods used

The aim of the project is to provide seabirds at sea data for as much of the DCS as possible, at a high level of observational detail. The data collected during these surveys are to be compared with aerial survey data, collected for the Masterplan Wind by Bureau Waardenburg and a long-term set of earlier aerial data collected by Rijkswaterstaat. During the shipboard surveys, seabirds and marine mammals are surveyed using standard ESAS ship-based survey techniques (fully described in the first cruise report in this series, see Leopold et al. 2010).

3 Results

3.1 Narrative

11-10-2010
Boarding the Tridens in the morning. After picking up and installing the bird observation box, departure Scheveningen at 08:20 hrs. South in coastal waters towards Belgium, afterwards heading west into the Channel and subsequently north outside the Dutch Continental Shelf. Good to poor observation conditions with a seastate 3 in the morning increasing to 5 Beaufort in the afternoon. Counting period: 8.29-18.45 hrs.

Most species appeared in low densities. Highest densities occurred in the coastal waters where Great Black-backed Gulls and other gull species were the most numerous species. Northern Gannets had a patchy distribution. Noteworthy were an immature Pomarine Skua, a British Storm-petrel and two Short-beaked Common Dolphins (accompanied by searching Gannets) in Belgian waters. Several passerine species were seen migrating or associated with the ship for a while. Two Harbour Porpoises.

12-10-2010
North crossing the Dogger Bank and after going and south again on a more easterly route. Counting period: 8.10- 18.50 hrs. Sighting conditions were good in the morning, and detoriated slightly in the afternoon when more white caps appeared as the seastate increased to 3 Beaufort.
Unevenly distributed Guillemots, with concentrations on the north side of the Dogger Bank and to a smaller extent along the eastern flank. A group of eight Harbour Porpoises, associated with a group of deep plunging Gannets and searching Kittiwakes were sighted. Southeast of the Dogger Bank three Bottlenose Dolphins, associated with Gannets, Kittiwakes and a Great Skua were seen.

13-10-2010
Central North Sea start off Rotterdam going north. Observation conditions started good but became moderate during the day, with an increasing seastate of max 5 Beaufort. Counting period: 8.34-17.57 hrs. Low densities of birds, except some flocks associated with platforms. The largest association consisted of 1200 Kittiwakes, 110 Great Black-backed Gulls, 2 Common Gulls and 90 Gannets. One Harbour porpoise.

14-10-2010
Southeast to the border, crossing the Borkum Reef. South to the Wadden Isles veering back west. Moderate to poor observation conditions, with an overcast sky, seastate 4 and some showers in the afternoon. Counting period: 8.34-20.14 hrs. Shortly before sunset an aggregation of several hundreds of resting Black-headed Gulls with Common and Great Black-backed Gulls was encountered north of Terschelling. Two Harbour Porpoises.

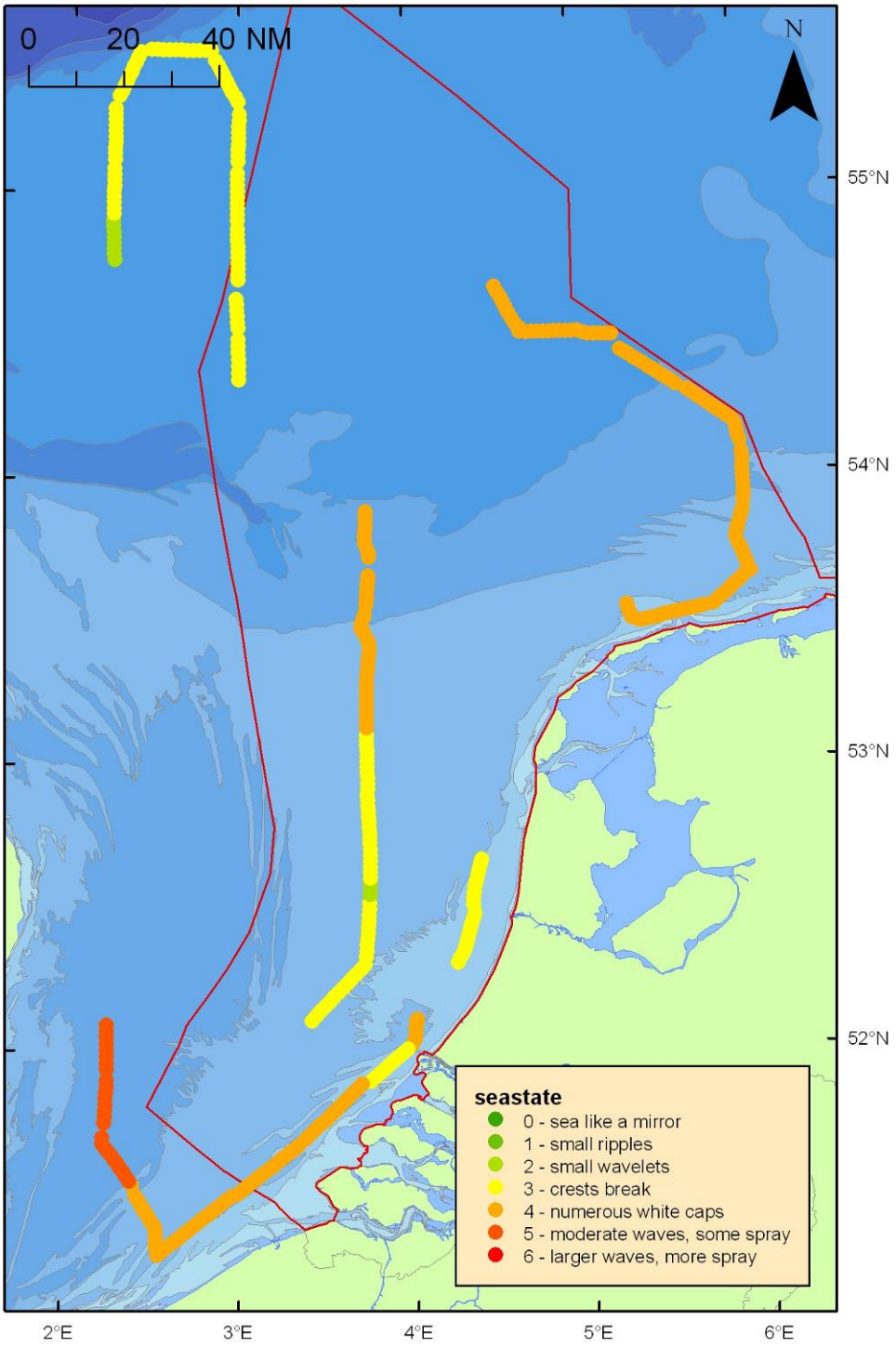
15-10-2010
West of the OWEZ wind farm south to Scheveningen. Good observation conditions with a seastate 3 and occasional drizzle. Counting period: 8.21-10.08 hrs. Low densities of gulls, and some migrating passerines. No Harbour Porpoises. Arrival in Scheveningen at 11.00 hrs.

During the week, a total of 412 counting bouts of on average almost 5 minutes each were conducted. These stretched over a total of 870.2 km and covered, at a strip width of 300 m, a total survey area of 261.1 km^2 (Table 1) A total of 5583 birds of 43 species, 18 marine mammals (2 Short-beaked Common Dolphins, 3 Bottlenose Dolphins and 13 Harbour Porpoises) and 5 balloons were recorded (Table 3). Observation conditions varied from good to predominantly poor.

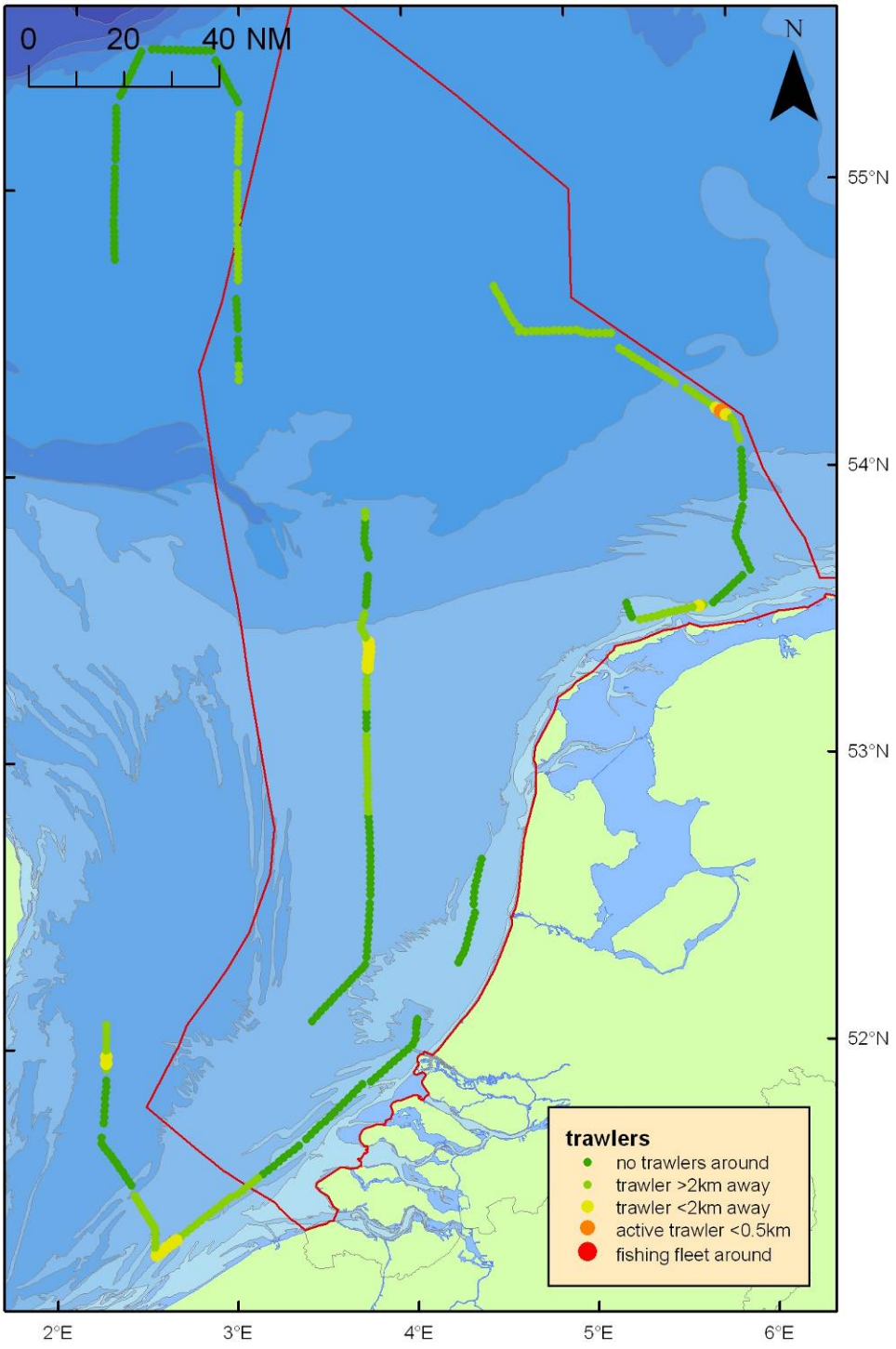
Overleaf, the surveyed tracks are plotted against the seastates encountered along the route (first map), and the presence of active fishing vessels and set-nets (the latter were not seen, second map).

Table 1. *Total survey effort per seastate.*

Seastate (Beaufort)	Surveyed area (km^2)	Surveyed distance (km)
0	-	-
1	-	-
2	6.7	22.2
3	109.5	364.8
4	127.2	424.1
5	17.7	59.1
	261.1	870.2



Effort and seastates. *Seabirds and marine mammals were surveyed along the plotted routes. Beaufort seastates along the survey route are presented.*



Floating matter. *Active trawlers seen during the survey and presence of set-nets.*

3.2 Detection probabilities

Detection probabilities are reviewed here for objects that were seen mostly on or in the water (as opposed to in flight): auks and Harbour Porpoises. Auks are normally rather hard to detect on the water as they often occur in small groups and are dark-backed, which makes them hard to spot under less sunny conditions and at greater distances. Auks dive at the approach of the vessel. Harbour Porpoises are supposedly even harder to detect, as they live mostly under water (they only surface to breath, as opposed to auks that only dive to feed: "surfacers" versus "divers"). Porpoises near the track line are often disturbed by the approaching vessel and might flee away suddenly, with a conspicuous splash, known as "rooster tail". Animals at greater perpendicular distances are less prone to disturbance and are more often missed.

Only Guillemots were seen in sufficient numbers to produce a detection curve (Table 2), in order to estimate the number of missed animals. Though the survey conditions in October varied from poor to good, they were good for most of the day on the 12th when 90% of all Guillemots were counted. Subsequently the percentage missed Guillemots (30%) was the lowest of all previous surveys, during which the observation conditions were on average worse.

Table 2. *Numbers of sightings of Guillemots (irrespective of group size), in relation to perpendicular distances during the entire October survey.*

	Band	Guillemot
Observed	A	34
	B	49
	C	48
	D	42
Missed	C	35
	D	41
	Total	76
	Percentage	30

Table 3*. Summary of all birds, mammals and other items recorded during the counts.*

Species	Soort		11 okt	12 okt	13 okt	14 okt	15 okt	Totaal
Counts with no birds	Tellingen zonder vogels		19	10	35	23	4	91
Red-throated Diver	Roodkeelduiker	Gavia stellata	1	2	1		1	5
Northern Fulmar	Noordse Stormvogel	Fulmarus glacialis	15	22	4	9		50
European Storm-petrel	Stormvogeltje	Hydrobates pelagicus	1					1
Northern Gannet	Jan van Gent	Sula bassana	158	248	153	46	3	608
Cormorant	Aalscholver	Phalacrocorax carbo	1					1
Shellduck	Bergeend	Tadorna tadorna		30				30
Eurasian Wigeon	Smient	Anas penelope				1		1
Black Scoter	Zwarte Zeeëend	Melanitta nigra		11	4	12	2	29
Merganser	Middelste Zaagbek	Mergus serrator	1			1		2
Ringed Plover	Bontbekplevier	Charadrius hiaticula	1					1
Purple Sandpiper	Paarse Strandloper	Calidris maritima		1				1

Species	Soort		11 okt	12 okt	13 okt	14 okt	15 okt	Totaal
Redshank	Tureluur	Tringa totanus	1					1
Arctic Skua	Kleine Jager	Stercorarius parasiticus		1				1
Pomarine Skua	Middelste Jager	Stercorarius pomarinus	1			1		2
Great Skua	Grote Jager	Stercorarius skua	4		2			6
Little Gull	Dwergmeeuw	Larus minutus	49	65		9	2	125
Black-headed Gull	Kokmeeuw	Larus ridibundus	16			331		347
Common Gull	Stormmeeuw	Larus canus	16	8	38	72	9	143
Lesser Black-backed Gull	Kleine Mantelmeeuw	Larus fuscus	2			2	1	5
Herring Gull	Zilvermeeuw	Larus argentatus	7	1		21	9	38
GreaterBlack-backed Gull	Grote Mantelmeeuw	Larus marinus	285	5	362	485	45	1182
Large gull species	ongedeterm. gr. meeuw	Larus spec.	45					45
Kittiwake	Drieteenmeeuw	Rissa tridactyla	4	83	1453	108	1	1649
Sandwich Tern	Grote Stern	Sterna sandvicensis	2					2
Common Guillemot	Zeekoet	Uria aalge	50	1070	29	41	3	1193
Razorbill	Alk	Alca torda	13	1	8	7		29
Atlantic Puffin	Papegaaiduiker	Fratercula arctica		6				6
Skylark	Veldleeuwerik	Alauda arvensis	2	1				3
Meadow Pipit	Graspieper	Anthus pratensis	2	1		1	1	5
Grey Wagtail	Grote Gele Kwikstaart	Motacilla cinerea		1				1
White Wagtail	Witte Kwikstaart	Motacilla alba		1				1
Robin	Roodborst	Erithacus rubecula	1					1
Ring Ouzel	Beflijster	Turdus torquatus	1					1
Blackbird	Merel	Turdus merula	12				2	14
Songtrush	Zanglijster	Turdus philomelos	1					1
Redwing	Koperwiek	Turdus iliacus	4		3			7
Mistle Trush	Grote Lijster	Turdus viscivorus	1					1
Blackcap	Zwartkop	Sylvia atricapilla	1					1
Chiffchaff	Tjiftjaf	Phylloscopus collybita	1					1
Goldcrest	Goudhaantje	Regulus regulus	2			1		3
Great Tit	Koolmees	Parus major	3	3				6
Starling	Spreeuw	Sturnus vulgaris	35	1		2	2	40
Chaffinch	Vink	Fringilla coelebs	3					3
Brambling	Keep	Fringilla montifringilla		1				1
Bottlenose Dolphin	Tuimelaar	Tursiops truncatus		3				3
Short-beaked Common Dolphin	Gewone Dolfijn	Delphinus delphis	2					2
Harbour Porpoise	Bruinvis	Phocoena phocoena	2	8	1	2		13
Balloon	Ballon		4	1				5
Total birds	Totaal vogels		742	1563	2057	1150	81	5593
Total marine mammals	Totaal zeezoogdieren		4	11	1	2	0	18

3.3 Distributions

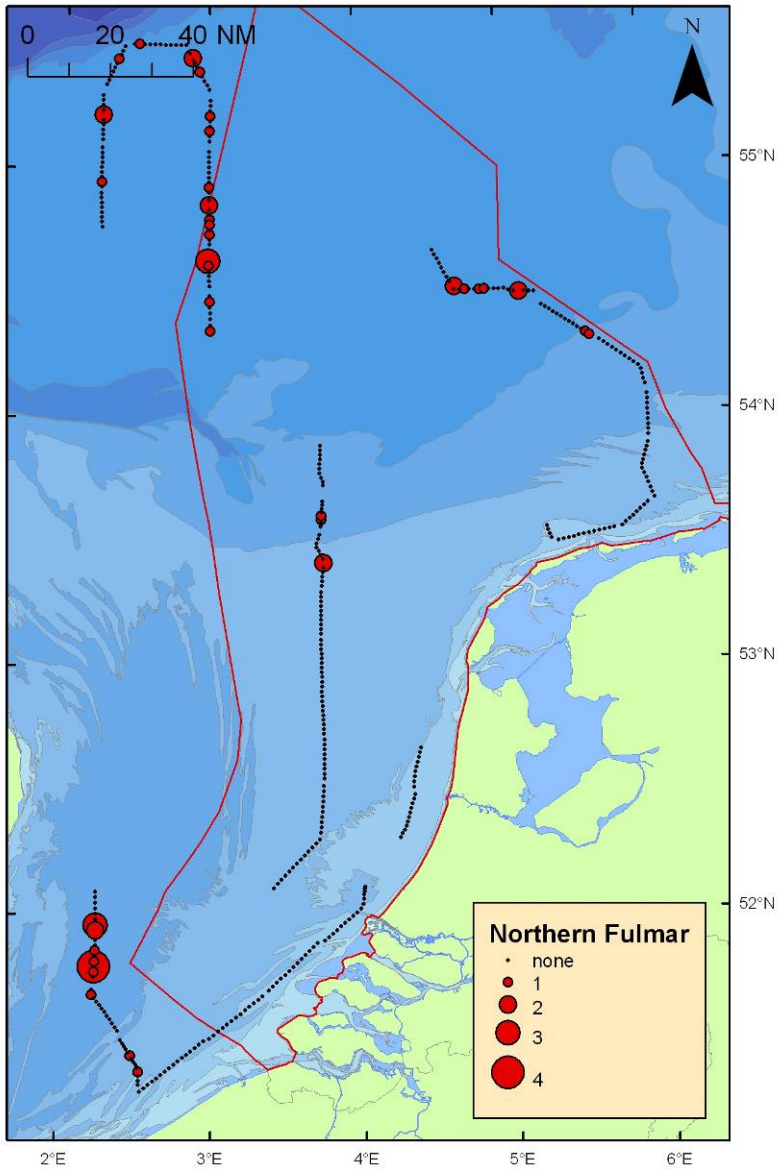
On the distribution maps on the next pages, the margin of the Dutch Continental Shelf (DCS) is indicated by a red line and on-effort (=sailing while surveying seabirds and marine mammals) indicated by grey dots. Depth contours are represented in blue shades.

1. Rare birds

Records worth mentioning are an European Storm-Petrel and a Pomarine Skua in Belgian waters on the 11th. Another Pomarine Skua was seen west of the German border on the 14th. Furthermore, there was some off-shore migration of waders (Purple Sandpiper as most remarkable species) and songbirds (thrushes, wagtails, pipits), of which some individuals landed on the vessel.

2. Northern Fulmar

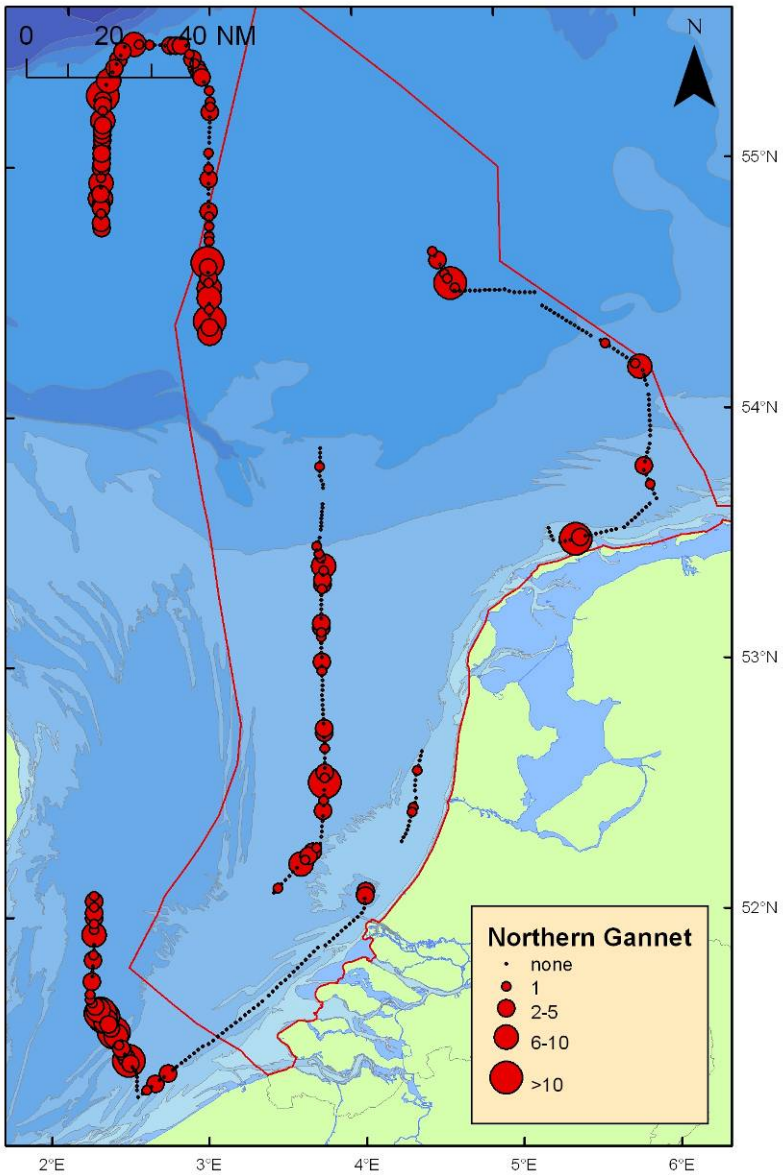
Fulmars were scarce, with scattered sightings on the DCS and a more regular distribution in Belgian and English offshore waters. In coastal waters this species was absent. Overall densities were low. All birds belonged to the light colour-phase. Moulting birds constituted 6.3% of all birds (n = 16).



Northern Fulmar

3. Northern Gannet

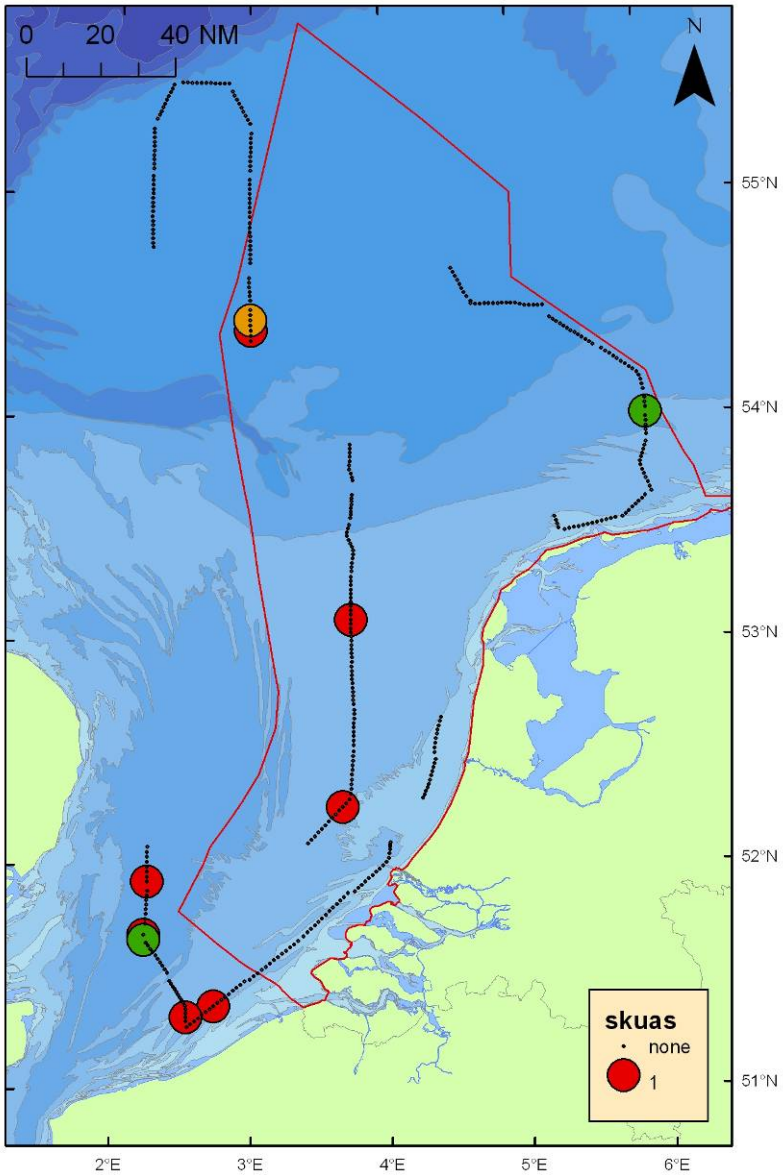
Gannets were widespread and occurred almost everywhere except in the coastal waters off the southern DCS. Densities seemed higher outside the DCS, with concentrations around the Dogger Bank and off Belgium. Gannets were mostly seen as singles or in small groups. Most were seen flying, apparently searching for prey, or diving for prey. Several associations with cetaceans were observed. Apart from searching animals associated with Harbour Porpoises Gannets were seen searching and diving in the vicinity of both observed dolphin species.



Northern Gannet

4. Skuas

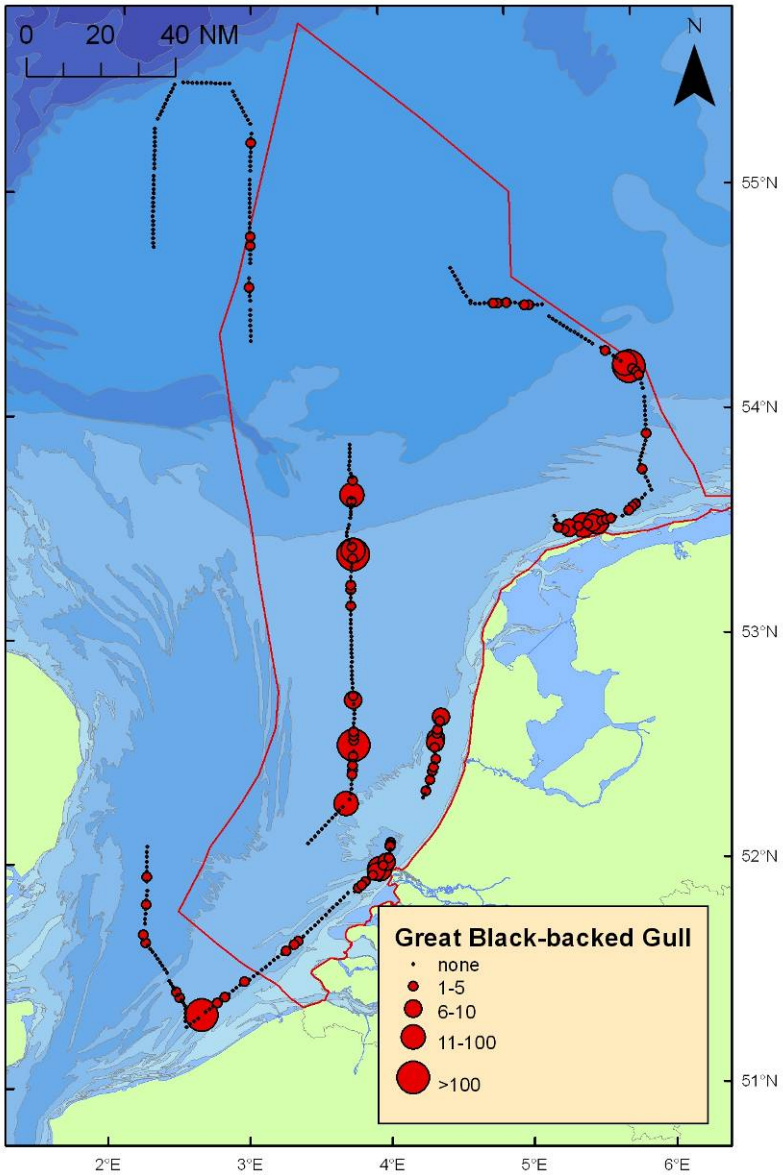
Skuas were scarce. Great Skuas were the most abundant species. They were predominantly present near bird concentrations around fishing vessels, and had a southerly distribution. Great Skuas were seen chasing other species on a number of occasions. The two other skua species were seen flying. All Arctic and Pomarine Skuas seen were immature.



Skuas
Artic Skua (orange), Pomarine Skua (green) and Great Skua (red)

5. Great Black-backed Gull

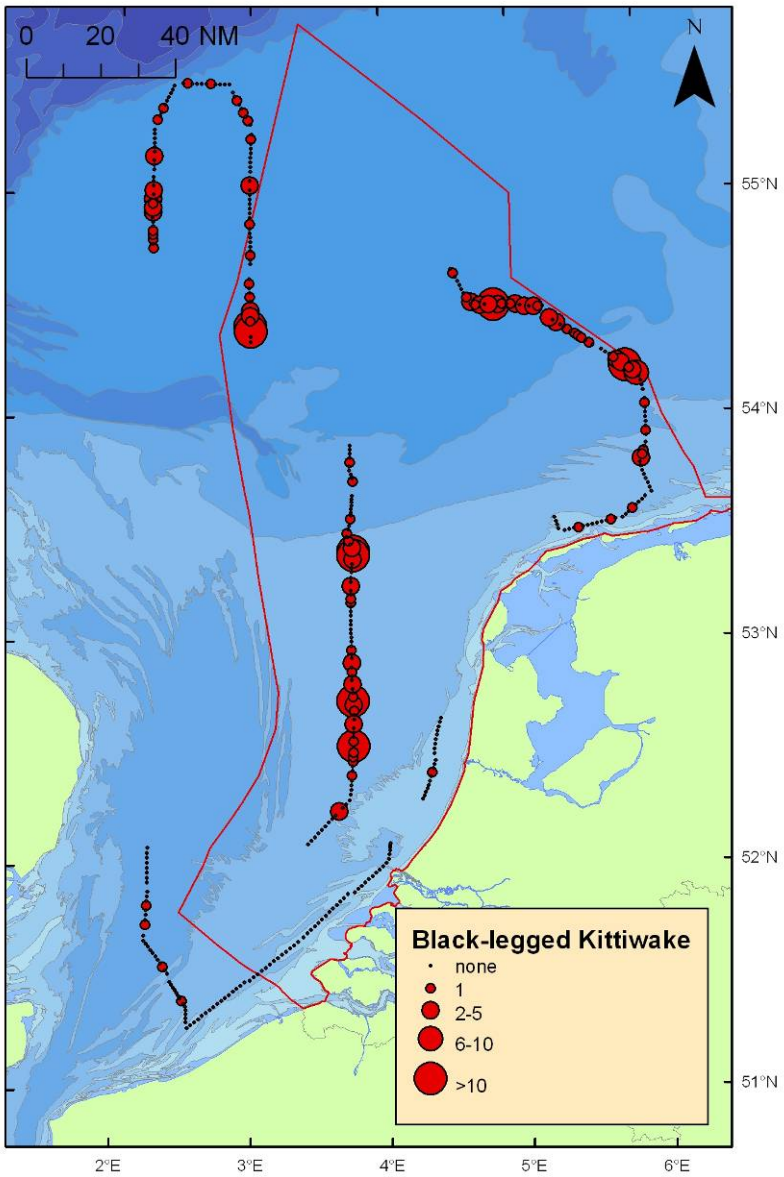
Great Black-backed Gulls were wide-spread with a patchy distribution on the DCS. Further offshore they were virtually absent. Highest densities were found associated with fishing vessels or platforms. The majority of the animals was adult (65.4%, n = 208). Of the remainder most animals were juvenile (29.8%, n = 208).



Great Black-backed Gull

6. Black-legged Kittiwake

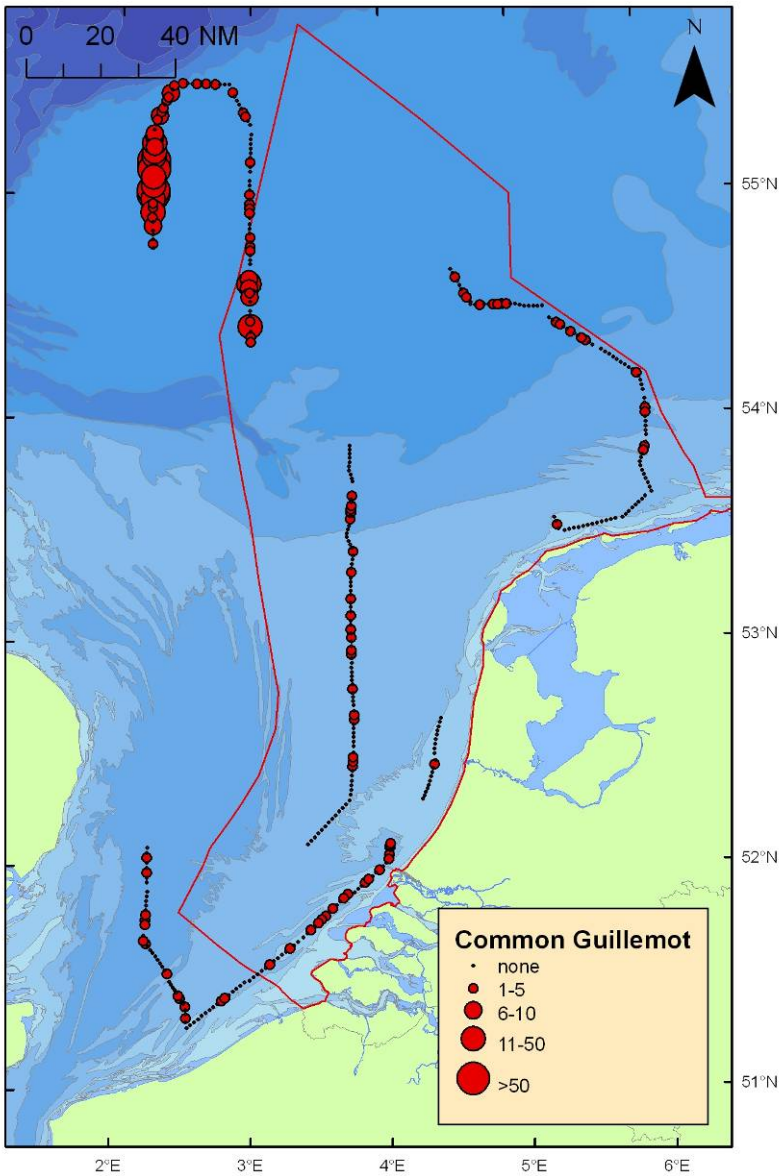
Kittiwakes showed an offshore distribution, confined to the central and northern part of the study area. They were virtually absent from the southern North Sea. The highest densities were found in the central part of the DCS. Contrary to the previous surveys the Dogger Bank did not hold high densities. Also contrary to previous surveys, Kittiwakes associated readily with fishing vessels and platforms where the highest concentrations were seen. Of these most birds were feeding; dipping and to a lesser extent surface seizing. Most Kittiwakes were adults (64.7%, n = 206), the remainder was juvenile or immature.



Kittiwake

7. Common Guillemot

Guillemots were evenly distributed in low densities in most parts of the study area. The majority of the birds were seen in the Dogger Bank area, where ca 90% off the total number was recorded. distribution ranged across the entire northern DCS, but numbers in the eastern part were lower than further west. The coastal zone and the southern parts of the study area were devoid of birds. Concentrations of Guillemots were observed north along the edges of the Dogger Bank.
Overall nearly all individuals were in winter plumage (99.8%, n = 411), with only one individual (0.2%) in transition plumage (Table 4).



Common Guillemot

Table 4. *Plumages of Common Guillemots at sea during the October 2010 survey.*

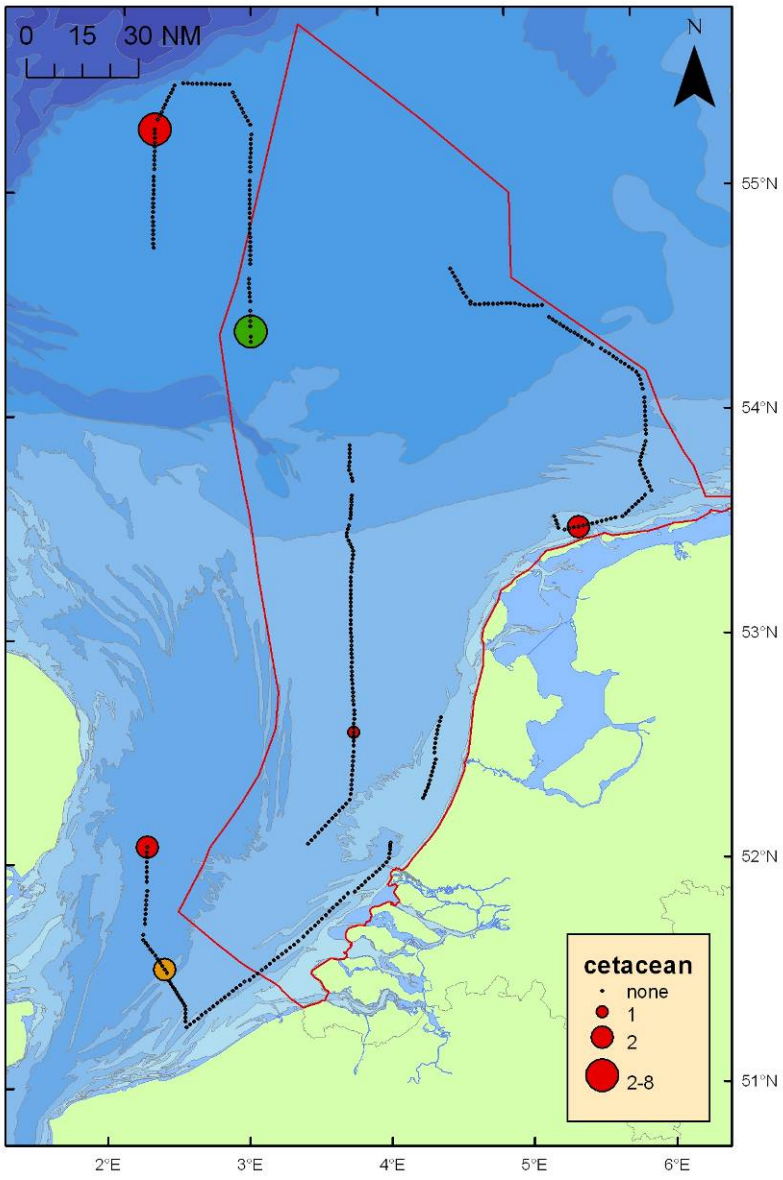
Plumage	N	%
Full breeding	-	0
Transition	1	0.2
Full winter	410	99.8
Total	**411**	

8. Cetaceans

Three species of cetaceans were seen: Harbour Porpoise, Short-beaked Common Dolphin and Bottlenose Dolphin.

Harbour Porpoise was the most abundant species. It was scarce, or at least rarely spotted, with only five observations of thirteen animals. One sighting consisted of eight individuals in a feeding association with Gannets and gulls. Observation conditions for this species were predominantly moderate or poor though.

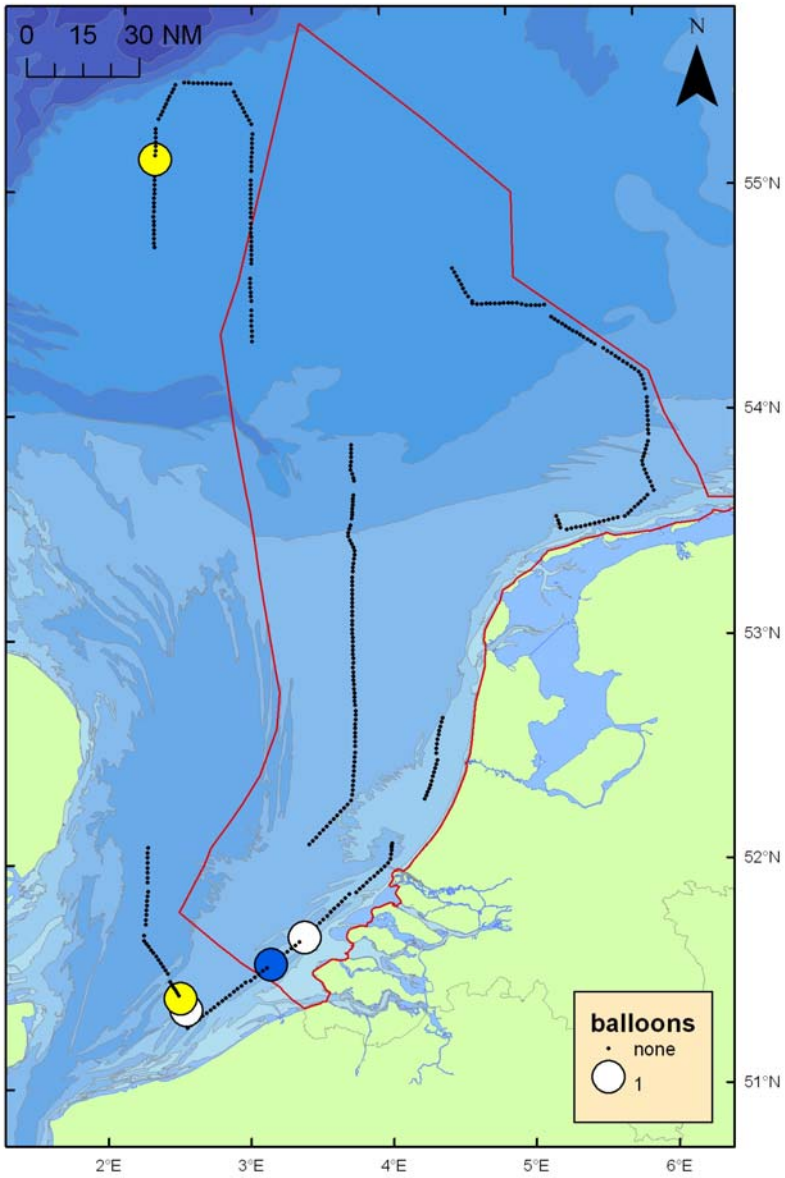
Two Short-beaked Common Dolphins were seen in Belgian waters on the 11th. They were associated with a group of searching and diving Gannets and gulls. Southeast of the Dogger Bank three Bottlenose Dolphins, associated with Gannets, Kittiwakes and a Great Skua were seen porpoising towards the ship on the 12th. One animal was accompanied by a big calf. According to the captain of the Tridens the sonar showed several groups of small fish in this area.



Cetaceans
Harbour Porpoise (red), Short-beaked Common Dolphin (orange) and Bottlenose Dolphin (green).

9. Balloons

A small number of balloons (n = 5) was seen during this survey, mostly in the southern parts of the study area.



Balloons

4 Conclusions

This seventh survey was successful. Weather conditions varied from poor to good. Numbers of Common Guillemots have increased since the previous survey, and the species' distribution had become more wide-spread. High densities were present around the Dogger Bank. Lesser Black-backed Gulls had largely left the DCS, to winter in SW Europe and Africa, and were 'replaced' by Greater Black-backed Gulls.
Remarkable were observations of two dolphin species: Short-beaked Common Dolphins in Belgian waters and Bottlenose Dolphins east of the Dogger Bank on the DCS.

5 Acknowledgements

We like to thank Rijkswaterstaat for the opportunity of conducting these surveys, that will add substantially to our knowledge of the occurrence of seabirds on the DCS and adjoining waters. Working on board of the Tridens was a pleasant experience, due to the good working conditions supported by captain Kinne and his crew of the Tridens, by the RWS meetleider and by our fellow IMARES scientists.

6 Quality Guarantee

IMARES utilises an ISO 9001:2008 certified quality management system (certificate number: 57846-2009-AQ-NLD-RvA). This certificate is valid until 15 December 2012. The organisation has been certified since 27 February 2001. The certification was issued by DNV Certification B.V. Furthermore, the chemical laboratory of the Environmental Division has NEN-AND-ISO/IEC 17025:2005 accreditation for test laboratories with number L097. This accreditation is valid until 27 March 2013 and was first issued on 27 March 1997. Accreditation was granted by the Council for Accreditation.

7 References

Leopold M.F., Verdaat H. & van Bemmelen R. 2010. Masterplan Wind – Seabirds. Cruise Report April 2010. IMARES Report C054/10.

Justification

Rapport C182/10
Project Number: 430.25015.02

The scientific quality of this report has been peer reviewed by a colleague scientist and the head of the department of IMARES.

Approved: Drs. M.F. Leopold

Signature: 

Date: 10 march 2011

Approved: J. Asjes, MSc.
Head of Fish Department

Signature: 

Date: 10 March, 2011