

# Rare sightings of white-beaked dolphins (*Lagenorhynchus albirostris*) off south-eastern Baffin Island, Canada

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*We report two opportunistic and unusual observations of white-beaked dolphins (Lagenorhynchus albirostris) in the Canadian Arctic that are outside the known range of this species. Sightings occurred off the south-east coast of Baffin Island (Nunavut, Canada) in Frobisher Bay (September 2004) and Cumberland Sound (August 2013). Despite dedicated, multi-year marine mammal surveys in the region (boat-based and aerial), white-beaked dolphins have not previously been reported in the eastern Davis Strait. Our sightings suggest that white-beaked dolphins may infrequently inhabit coastal waters off south-eastern Baffin Island, and furthermore, that their habitat use may correspond with recent changes in prey distribution and availability.*

**Keywords:** distribution, western North Atlantic, white-beaked dolphins

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## INTRODUCTION

The distribution of white-beaked dolphins (*Lagenorhynchus albirostris*) is continuous across the North Atlantic in temperate and subarctic waters (Reeves *et al.*, 1998). In the eastern North Atlantic, they occur in waters off Iceland (Sigurjónsson & Víkingsson, 1997), east Greenland, the British Isles, and further north in the Greenland, Norwegian and Barents Seas (Reeves *et al.*, 1998; Weir *et al.*, 2007). In the western North Atlantic, white-beaked dolphins occur off Newfoundland and Labrador, and in Davis Strait off southern Greenland (Leatherwood *et al.*, 1976; Alling & Whitehead, 1987; Kingsley & Reeves, 1998; Reeves *et al.*, 1998; Lien *et al.*, 2001; Compton *et al.*, 2007; Heide-Jørgensen *et al.*, 2008; Higdon & Snow, 2008; Hansen & Heide-Jørgensen, 2013). The distribution of this species appears linked with bathymetry, where white-beaked dolphins often occur along continental shelves and close to deep water (Northridge *et al.*, 1995; Weir *et al.*, 2007; Hansen & Heide-Jørgensen, 2013). Their distribution is also linked with prey distribution and abundance (Canning *et al.*, 2008; Rasmussen *et al.*, 2013), where larger groups of white-beaked dolphins have been reported foraging in areas with high prey availability (Hansen & Heide-Jørgensen, 2013). Otherwise group sizes generally comprise only a few individuals, ranging approximately from one to 10 dolphins (Kingsley & Reeves *et al.*, 1998; Compton *et al.*, 2007). Despite sightings of white-beaked dolphins off west and southern Greenland,

the known range of white-beaked dolphins in Davis Strait is not known to extend eastward to the coast of Baffin Island.

## MATERIALS AND METHODS

We report two independent sightings of white-beaked dolphins outside their known range, off the south-east coast of Baffin Island (Figure 1). The first encounter took place on 6 September 2004 when 2 white-beaked dolphins were observed at the northern portion of the mouth of Frobisher Bay. The second sighting took place on 25 August 2013 when a group of 6–10 white-beaked dolphins were observed in Cumberland Sound along the coast of south-eastern Baffin Island (65°50'15.6"N 65°44'10.8"W) while conducting boat-based surveys for bowhead whales (*Balaena mysticetus*). The second sighting took place near the community of Pangnirtung, Nunavut, where the group of dolphins was milling near a cluster of islands at the mouth of Kingnait Fiord. The dolphins were elusive during the brief encounter (~15 minutes); however, photographs were taken to confirm species identification (Figure 2).

## RESULTS AND DISCUSSION

To the best of our knowledge, there are no published reports of white-beaked dolphin occurrence in waters off south-eastern Baffin Island. Dedicated boat-based surveys have taken place in Cumberland Sound and its associated fiords during four of the previous five summers (2008, 2010–2012), and none have reported any dolphin species other than killer whales (*Orcinus orca*) (Diemer *et al.*, 2011;

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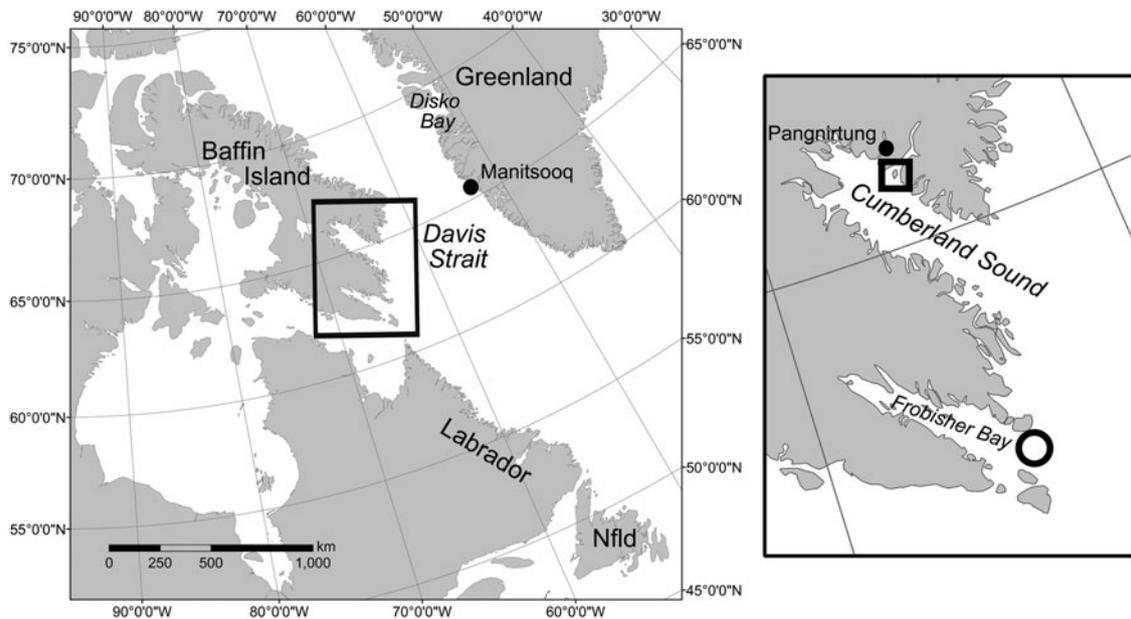


Fig. 1. Location of two white-beaked dolphins (*Lagenorhynchus albirostris*) sighted near the mouth of Frobisher Bay (inset) on 6 September 2004 (○) and a group of 6–10 dolphins sighted in Cumberland Sound (inset) near the mouth of Kingnait Fiord on 25 August 2013 (◻). Place names mentioned in text are included for reference.

S. Ferguson, Fisheries and Oceans Canada, unpublished data<sup>1</sup>). Furthermore, there have been no reports of white-beaked dolphins during any of the extensive aerial surveys or boat-based fieldwork conducted by Fisheries and Oceans Canada (DFO) in Cumberland Sound over the past several decades (e.g. Richard & Orr, 1986; Richard & Stewart, 2009; Richard, 2013). Our boat captain during the second observation, who is native to Pangnirtung, stated that he had never seen this species in this area, despite over 30 years of boating throughout Cumberland Sound during the open water season (R. Kilabuk, personal communication<sup>2</sup>). Similarly, previous surveys in the southern Davis Strait near Frobisher Bay did not sight white-beaked dolphins (MacLaren-Atlantic, 1978; MacLaren-Marex, 1979, 1980; McLaren & Davis, 1982).

The lack of white-beaked dolphin sightings despite considerable opportunity to observe them during research cruises suggests that their occurrence is rare in Cumberland Sound and Frobisher Bay during summer. Observations of white-beaked dolphins in the eastern Davis Strait by Hansen & Heide-Jørgensen (2013) were made as far north as Disko Bay along the west coast of Greenland, with eight observations occurring north of Maniitsoq, Greenland (65°25'N 52°54'W). Our observations occurred at similar latitudes as Maniitsoq (roughly 600 km away). White-beaked dolphins are documented to cover 1090 km in a single month (Rasmussen *et al.*, 2013), thus it is not unreasonable to expect at least sporadic, if not occasional, occurrence in the western Davis Strait. In the late 1970s, extensive surveys of the western part of Davis Strait were conducted and no white-beaked dolphins were sighted during these surveys (MacLaren-Atlantic, 1978;

MacLaren-Marex, 1979, 1980; McLaren & Davis, 1982). In comparison to the eastern Davis Strait where directed surveys for cetaceans have occurred at larger spatial scales (e.g. Compton *et al.*, 2007; Heide-Jørgensen *et al.*, 2008; Hansen & Heide-Jørgensen, 2013), limited survey effort and boat-activity in recent decades in the western part of Davis Strait could explain the absence of white-beaked dolphin sightings. However, it is possible that white-beaked dolphins occur along south-east Baffin Island/western Davis Strait, but are rarely observed due to a sparse human population in the area.

Movements of white-beaked dolphins may be linked to movements of their prey (Hansen & Heide-Jørgensen, 2013). For example, white-beaked dolphin abundance off Newfoundland is thought to be linked to the presence of spawning capelin (*Mallotus villosus*) (Lien *et al.*, 2001). Moreover, the northward migration of capelin in the Newfoundland region is thought to be mirrored by their dolphin predator (Carscadden *et al.*, 1989). While our sightings may simply reflect solitary occurrences of white-beaked dolphins outside their normal range in the western North Atlantic, it is also possible that their occurrence reflects recent changes in the Cumberland Sound and Frobisher Bay ecosystems, whereby capelin appears to be increasing in occurrence as a main prey source.

Capelin was previously absent in the diet of predators in Cumberland Sound (e.g. Moore & Moore, 1974), but now appears in the diets of Greenland halibut (*Reinhardtius hippoglossoides*), arctic char (*Salvelinus alpinus*) (Ulrich, 2013), and beluga whales (*Delphinapterus leucas*) (Dennard *et al.*, 2009; Marcoux *et al.*, 2012) in this region. Capelin has also recently appeared in stomach contents of Arctic char in Frobisher Bay (Spares *et al.*, 2012), where it was previously absent (Grainger, 1953). A similar trend towards an increasing abundance of capelin in the diet of predators is occurring in other areas of the Canadian Arctic (Carscadden *et al.* 2013), such as

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Fig. 2. White-beaked dolphins (*Lagenorhynchus albirostris*) observed on 25 August 2013 in south-eastern Baffin Island.

Hudson Bay (e.g. Gaston *et al.*, 2003, 2012; Chambellant *et al.*, 2013).

Deep bathymetry adjacent to shallower areas in Cumberland Sound and Frobisher Bay provide white-beaked dolphins with their preferred habitat (Northridge *et al.*, 1995; Weir *et al.*, 2007; IBCAO, 2008; Hansen & Heide-Jørgensen, 2013), and combined with the increasing occurrence of capelin in these regions, white-beaked dolphins may be attracted to the areas. White-beaked dolphins consume predominately low energy prey such as Atlantic cod (*Gadus morhua*), capelin (*Mallotus villosus*), squid, octopus and benthic crustaceans (Leatherwood *et al.*, 1976; Hai *et al.*, 1996; Canning *et al.*, 2008). Compared to Arctic cod (*Arctogadus glacialis*), capelin is lower in energy attributable to a difference in fat content (Brekke & Gabrielsen, 1994). If white-beaked dolphins are expanding their range into Arctic regions in response to capelin shifts, this highlights concerns that replacement of Arctic cod with a comparatively low energy prey species like capelin may have important implications for the nutritional regime of piscivorous Arctic predators (e.g. Tynan & DeMaster, 1997; Laidre *et al.*, 2008). Directed diet studies and systematic capelin and white-beaked dolphin surveys are required to draw conclusions regarding the potential link between the abundance and distribution of capelin and white-beaked dolphins in these regions.

In summary, we report two sightings of white-beaked dolphins, one in September of 2004 in Frobisher Bay, and the second in Cumberland Sound in August of 2013. Both sightings occurred during the open water season. Based on the lack of previous reported sightings in the western Davis Strait, white-beaked dolphins appear rare or absent in Cumberland Sound and Frobisher Bay. We consider the possibility that white-beaked dolphins occur more regularly in the western Davis Strait, but opportunities to observe them may be limited by factors such as sparse human population. Although these sightings could be isolated occurrences, further research is necessary to clarify this species' range in

the western North Atlantic, and to determine the extent of their distribution in the western Davis Strait.

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