First recorded ice entrapment of a beluga whale (Delphinapterus leucas) in east Greenland

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Abstract

Beluga whales are rare along the coast of east Greenland and the closest recognized stock occurs around Svalbard. Here we report on an ice entrapment of an adult beluga whale (Delphinapterus leucas) in north-east Greenland. The whale was observed entrapped in the fast ice on 21 April 2023 in Loch Fyne (73°54'N, 21°51'W) during a visual aerial survey for polar bears (Ursus maritimus). The whale was located >100 km from open water (i.e., pack ice) and appeared in poor body condition. A literature review back to the early 1900s failed to produce any other records of beluga whale ice entrapments in east Greenland.

Observations

A visual aerial line transect survey of polar bears (Ursus maritimus) was conducted along the east coast of Greenland between 20 March and 9 May 2023 from a de Havilland Twin Otter. The survey covered inshore and offshore coastal areas along the east coast between 66°N and 83°N. During this survey, an adult beluga whale of unknown sex was observed entrapped in the fast ice on 21 April 2023. The whale was located at 73°54'N, 21°51'W, in Loch Fyne, a long narrow fjord south of Godthåb Golf and Clavering Island (Fig. 1). The whale appeared in poor body condition. A literature review failed to produce any other records of beluga whale ice entrapments in east Greenland.
Fig. 1 (a) Beluga ice entrapment location shown on a satellite image (©2023, Planet Labs PBC) on 21 April 2023. (b) Satellite-based Moderate Resolution Imaging Spectroradiometer picture on 21 April 2023, showing the larger geographic area, with a red square indicating the location of (a). (c) A close-up of the entrapment shown in (a).

Fig. 2 (a) Photograph of the beluga ice entrapment in Loch Fyne taken on 21 April 2023 from a bubble window of a Twin Otter aircraft at 122 m altitude (photo: M. Zahn) and (b) image of the beluga at the surface (photo: K. Laidre).
During the observation period, the whale was either resting just below the surface or submerged 1–2 m underwater. It appeared to be in poor body condition, with visible undulations along the ridge of the back reflecting the vertebral processes and a general lack of rotundness along the lateral flanks (Fig. 2). The aircraft passed over the entrapment several times while observers collected photographs and observations. Polar bear tracks were seen around the entire perimeter of the hole and multiple adult polar bears were sighted within 20 km.

Loch Fyne is a narrow fjord, approximately 45 km long, with its head located in the isthmus area of Hold with Hope. The entrapment site was midway down the fjord in an area that narrows to approximately 1 km across. Loch Fyne annually freezes solid with fast ice in the fall. However, the area where the entrapment occurred is reported by the Danish military and local bush pilots to have open water all winter on account of strong currents and shallow depth (some areas are 2 m). Loch Fyne is in an uninhabited area and not located near any subsistence communities.

The entrapment most likely initially occurred in autumn, during the process of fast-ice freeze-up, similar to previous beluga entrapments in the Canadian Arctic, where whales get stuck in pools that gradually reduce in size through the winter (Freeman 1968; Heide-Jørgensen et al. 2002). High-resolution optical and microwave satellite imagery showed Loch Fyne was ice-free until at least 20 October 2022 and was completely frozen over no later than 23 November (documenting the exact date was prevented by cloud cover). Imagery showed the open water at the entrapment site gradually reduced in size until early December. Spring sea-ice break-up began in late June 2023, and by 5 July the fjord was entirely ice-free with some fast ice remaining in Godthåb Golf. We therefore estimate the whale had been trapped for at least six months at the time of the sighting and, assuming it survived, was trapped for at least eight months total. The fate of the whale is unknown. Belugas are capable of maintaining small openings while trapped in the fast ice. However, over time, fatigue and limited food reduce body condition. Polar bears often attack and wound or kill them (Lowry et al. 1987).

The geographic origin of the whale observed here is unknown; the closest stock is a population of approximately 500 belugas that remain resident in coastal waters around Svalbard (Hobbs et al. 2019; Vacquié-Garcia et al. 2020). Two months before this observation, during March 2023, five beluga whales were harvested by the community of Ittoqqortoormiit, indicating belugas had ranged along the east coast of Greenland for at least a few months (Å. Hammekken, pers. comm.). A literature review of ice entrapments in Greenland waters going back to the early 1900s (Porsild 1918) did not turn up another recorded ice entrapment of a beluga whale in east Greenland.

Acknowledgements

Thanks to Norlandair pilots Kristinn Elvar Gunnarsson and Nebojsa Marijan. Thanks to Benjamin Cohen for assisting with figures and Leigh Starns for providing access to Planet imagery. Thanks to the Danish military for support at Mestersvig and for providing information about Loch Fyne. Thanks to Lori Quakenbush for a manuscript review.

Disclosure statement

The authors report no conflict of interest.

Funding

The polar bear survey was funded by the Greenland Institute of Natural Resources, the National Environmental Protection Agency, Danish Ministry of Environment, under the programme of Environmental Support for the Arctic, and the Greenland Bureau of Minerals and Petroleum.

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