

# Gray Whale Calf Occurrence in the Alaskan Arctic, Summer and Fall 2012



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Photo by Cynthia Christman

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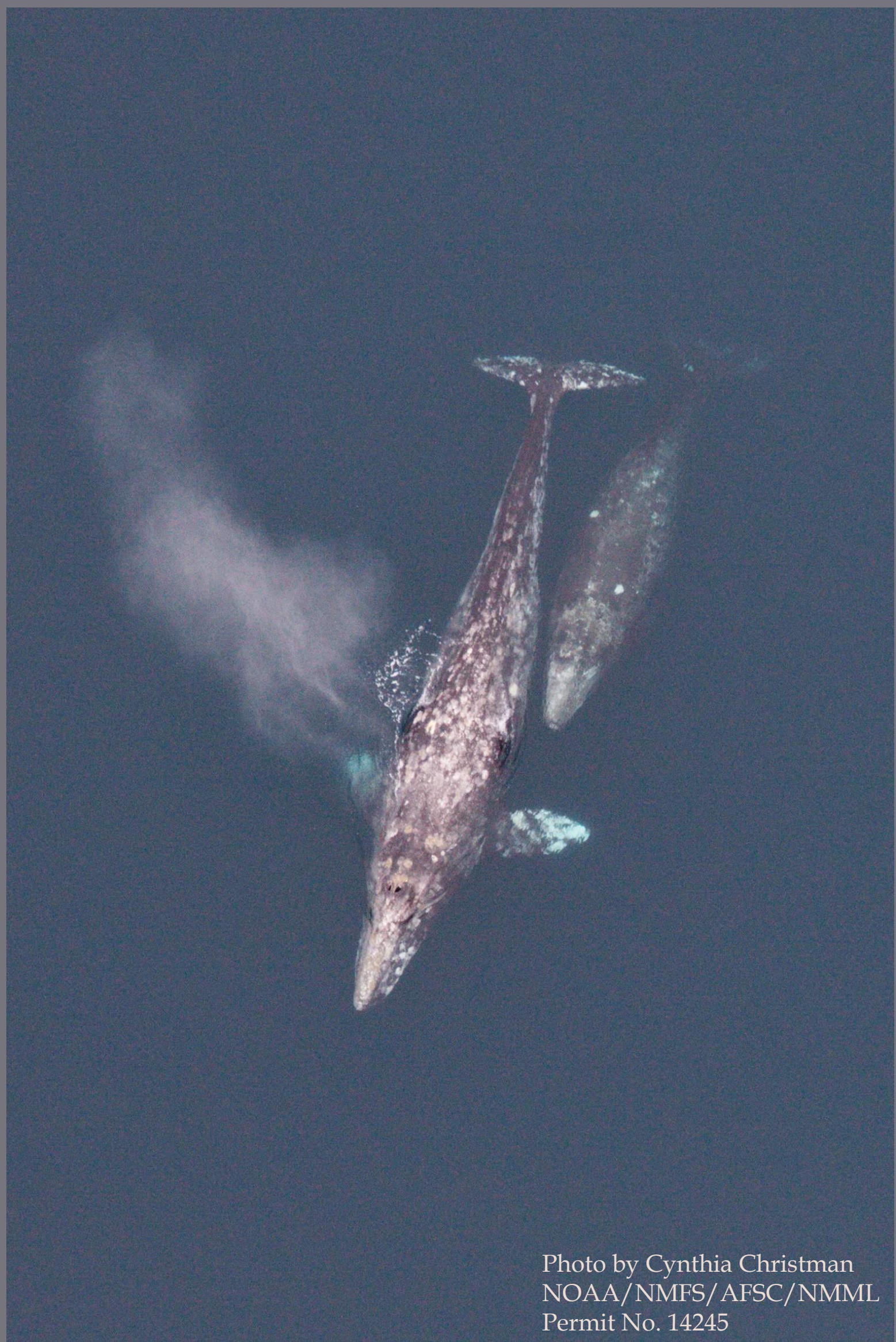


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## Abstract

Marine mammal surveys were conducted in the northeastern Chukchi and western Beaufort seas (68-72°N and 140-169°W) from July to late October, 2012, as part of the Aerial Surveys of Arctic Marine Mammals project conducted by the National Marine Mammal Laboratory and funded by the Bureau of Ocean Energy Management. Additional surveys, sponsored by the Alaska Beluga Whale Committee (ABWC), were flown in early July up to 45 nm offshore in the northeastern Chukchi Sea to target belugas. Surveys were conducted in the larger study area from 1982 to 1991, and recommenced in 2008. Gray whale (*Eschrichtius robustus*) calves were sighted with far greater frequency in the Chukchi Sea in 2012; total numbers are far higher than gray whale calf sightings recorded in previous years, which were highest in the years 1982, 1985, 2009, and 2011. Gray whale calves in 2012 were particularly abundant in the month of July (n=57); few calves were seen in August, September or October, similar to previous years. Distribution of calves was also similar to previous years: primarily nearshore along the Alaskan coast from Point Lay to just east of

Barrow, with particularly high numbers near Point Franklin and in ice-free, shallow water (<50 m). This area is an important foraging ground for gray whales; feeding was the dominant behavior documented in this area throughout the survey years. It is possible that these shallow waters provide protection from predators; killer whales were sighted in multiple locations in the Chukchi Sea in 2012. In gray whale calf counts conducted along the California coast by the Southwest Fisheries Science Center during the annual northern migration, calf counts were also high in 2012 when compared to previous years' counts. It is possible that conditions were favorable for foraging in 2010 and 2011 and many females were able to accumulate sufficient energy reserves to conceive in 2011 and give birth in 2012. Another possibility is that other habitats where gray whale cow-calf pairs have been documented in the past, such as just west of Point Hope and along the Chukotka Peninsula, may not have been as favorable to cow-calf pairs in 2012.

## Methods and Survey Effort

Transect flightlines of the study area lie perpendicular to the coastline, cutting across isobaths, prevailing currents, and expected gradients in marine mammal density. ASAMM flightlines in the Chukchi Sea (157°W-169°W) extended offshore to the study area borders, and the beluga survey flightlines extended 45 nm out from the coastline. A coastal transect between Point Barrow and Point Hope was regularly flown 1 km offshore and parallel to the coast. Flightlines for the Beaufort Sea portion of the study area (140°W-157°W) were flown along transect lines that were roughly north-south.

Survey effort was designated as "on-effort" (transect), "off-effort" (search and circling), or deadhead. Circling effort was incorporated into the survey design in 2009. Gray whale calf sighting rates include only on-effort sightings, and include the Chukchi Sea portion of the study area and block 12 of the Beaufort Sea study area. Sighting rates (whales per unit effort, WPUE) were calculated for gray whale calves as the number of calves per transect kilometer (Tr-km) surveyed per month. On- and off-effort sightings are included in the analyses of gray whale calf distribution, habitat, and behavior.

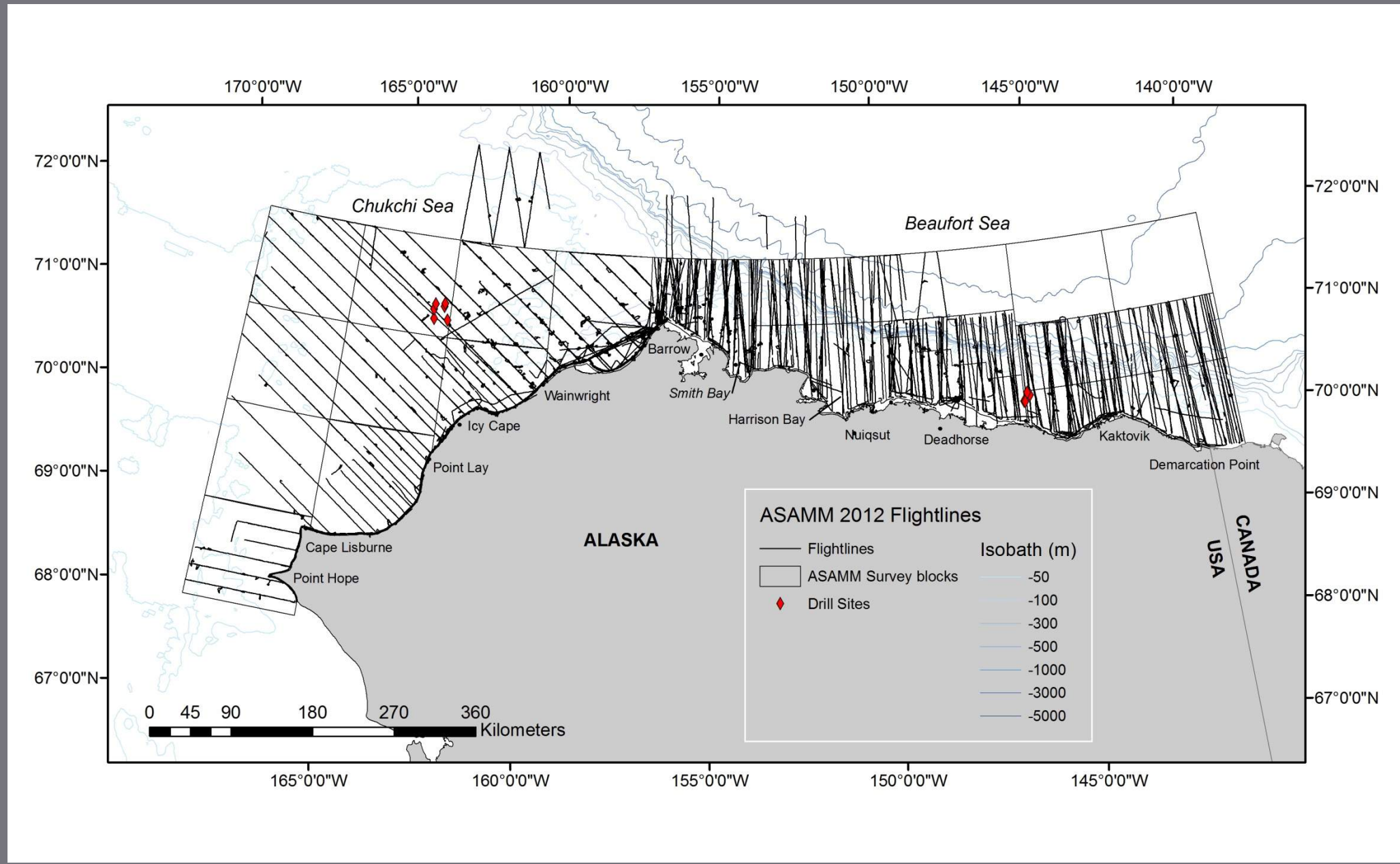


Figure 1. 2012 ASAMM and ABWC transect, search, and circling flight effort.

Surveys were conducted in twin turbine Aero Commander aircraft at a targeted altitude of 1200 ft (366 m) in the Chukchi Sea and 1500 ft (457 m) in the Beaufort Sea, and a speed of 110 kts (204 km/h). From 30 June to 28 October, 132 survey flights were initiated for a total of approximately 68,000 km flown on- and off-survey effort (Fig.1), 56,000 km were on transect. Of these, over 28,000 transect km were in the Chukchi Sea.

Survey effort in 2012 exceeded previous years' survey effort, in part because the Beaufort Sea surveys began in mid-July instead of August or September, and in part due to the additional survey effort of the beluga surveys, which increased survey coverage in the northeastern Chukchi Sea and the western Beaufort Sea in the first half of July. In 2012, more circling on cetacean sightings was initiated in an attempt to more accurately estimate group size and determine whether calves were present. About 12% of the total non-deadhead survey time in 2012 was spent on circling compared with 5% in 2011.

## Sighting Summary

➤ There were 310 sightings of 558 gray whales on- and off-effort in the study area; 67 of these individuals were calves (Fig. 2). When transect-only sightings were considered, there were 132 sightings of 232 gray whales on-effort in the study area; 39 of these individuals were calves. Some of these sightings were likely of the same calf on multiple days.

➤ Gray whale sightings spanned all months surveyed, but calves were only sighted in July and August. The month with the highest total number of gray whales sighted was July, which was also true for gray whale calves: 57 calves were sighted in July; 10 calves were sighted in August.

➤ There were more sightings of gray whale calves in 2012 than in previous survey years (Table 1). Prior to 2012, the years with the greatest number of calf sightings were 1982 and 2011, with 18 calves each year.

➤ In 2012, 43% of calves were sighted once circling was initiated, compared to 22% in 2011.

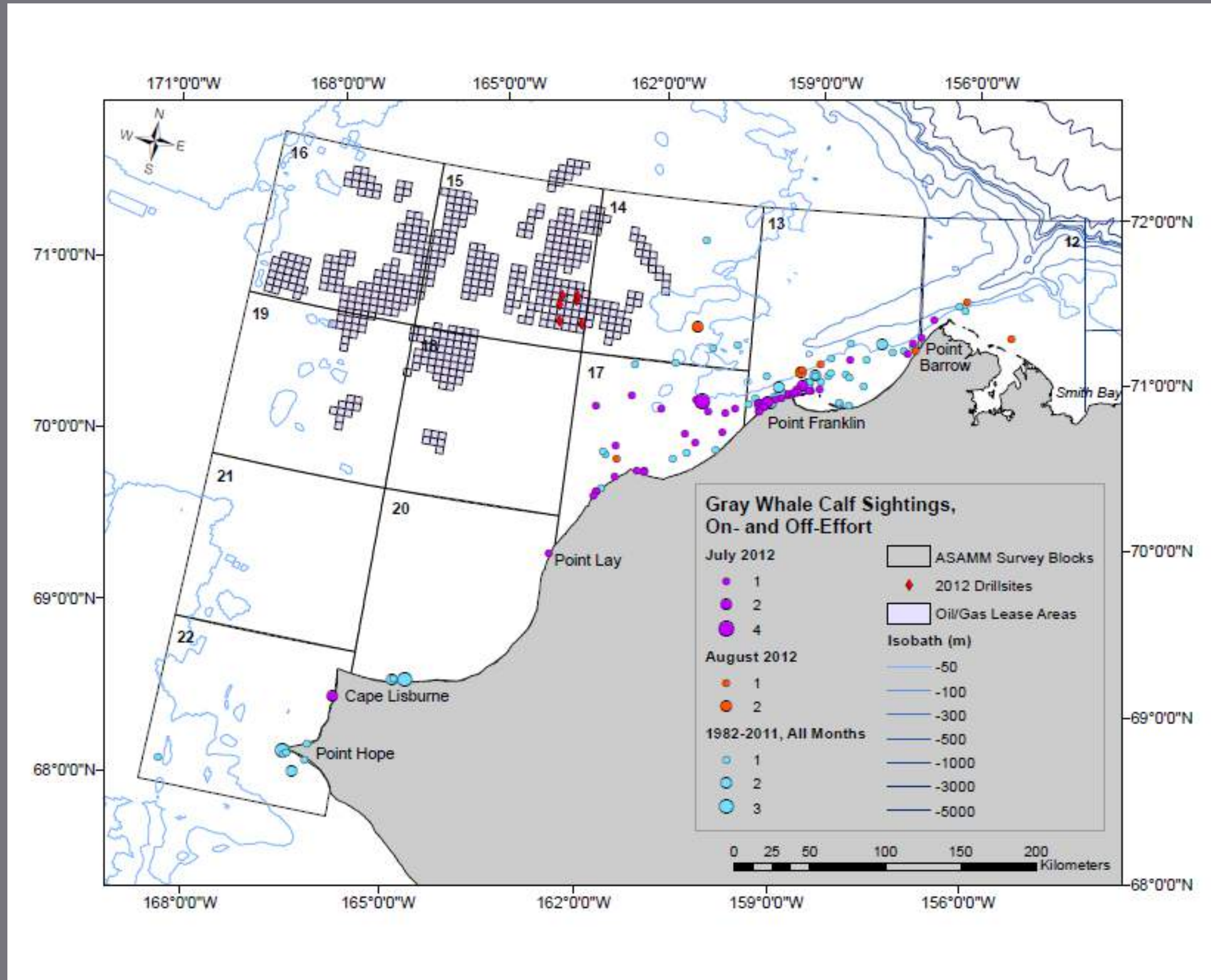


Figure 2. 2012 gray whale calf sightings on- and off-effort per month, and 1982-2011 calf sightings, all months shown.

## Sighting Distribution and Habitat

➤ Gray whale calf sightings in 2012 ranged from east of Barrow to Point Lay, and one sighting south of Cape Lisburne. The majority of calf sightings were <15 km from shore and in waters <50 m depth, with scattered sightings out to 68 km from shore and in water up to 112 m in depth.

➤ In July, 22 calves were sighted in 1-50% broken floe sea ice; in August, 2 calves were sighted in 15% broken floe sea ice.

➤ Distribution of gray whale calves was similar to non-calves.

➤ The distribution of calves in 2012 was similar to gray whale calf distribution in previous years, with the exception that in previous years gray whale calves have been sighted nearshore by Point Hope and one calf was sighted offshore west of Point Hope.

## Transect Sighting Rates per Year

➤ When transect-only gray whale calf sighting rates were compared to past years' transect-only gray whale calf sighting rates, the results were significantly higher in 2012 (Table 2). This suggests that despite the additional survey effort and increased circling in 2012, the higher gray whale calf sighting rates signify there were more calves in the northeastern Chukchi Sea in 2012. During the gray whale annual northern migration from February to May, 2012, the Southwest Fisheries Science Center (SWFSC) also had relatively high gray whale calf counts when compared to previous years' counts, which have been conducted since 1994 (see the SWFSC's Gray Whale Studies - Calf Production website at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>).

➤ When annual calf sighting rates are compared with annual total gray whale sighting rates, 2012 has a higher portion of calves (17%) compared with other years that had on-effort calf sightings (1985: 6%, 2009: 2%, 2011: 6%).

➤ In all years surveyed, July has consistently been the month with the highest gray whale calf sighting rates. Therefore, the continuation of broad-scale aerial surveys in the northeastern Chukchi Sea in July is imperative to assess the importance of this area to gray whale calves.

Table 2. Gray whale calf transect sightings (n = number of calves) and sighting rate (WPUE) of transect km (Tr-km) flown per month per year.

	June			July			August			September			October			Total		
Year	Tr-km	n	WPUE	Tr-km	n	WPUE	Tr-km	n	WPUE	Tr-km	n	WPUE	Tr-km	n	WPUE	Tr-km	n	WPUE
1982	0	0	0.0000	0	0	0.0000	0	0	0.0000	696	0	0.0000	4885	0	0.0000	5581	0	0.0000
1983	0	0	0.0000	0	0	0.0000	879	0	0.0000	2449	0	0.0000	6638	0	0.0000	9966	0	0.0000
1984	0	0	0.0000	2005	0	0.0000	1957	0	0.0000	2005	0	0.0000	3601	0	0.0000	9568	0	0.0000
1985	0	0	0.0000	5353	3	0.0006	0	0	0.0000	538	0	0.0000	3694	0	0.0000	9585	3	0.0003
1986	0	0	0.0000	0	0	0.0000	0	0	0.0000	6413	0	0.0000	6556	0	0.0000	12969	0	0.0000
1987	0	0	0.0000	0	0	0.0000	0	0	0.0000	10047	0	0.0000	4278	0	0.0000	14325	0	0.0000
1988	0	0	0.0000	0	0	0.0000	0	0	0.0000	0	0	0.0000	3982	0	0.0000	3982	0	0.0000
1989	0	0	0.0000	0	0	0.0000	0	0	0.0000	1475	0	0.0000	6143	0	0.0000	7618	0	0.0000
1990	0	0	0.0000	0	0	0.0000	0	0	0.0000	0	0	0.0000	1940	0	0.0000	1940	0	0.0000
1991	0	0	0.0000	0	0	0.0000	0	0	0.0000	2185	0	0.0000	8700	0	0.0000	10885	0	0.0000
2008	2787	0	0.0000	801	0	0.0000	5458	0	0.0000	546	0	0.0000	3684	0	0.0000	13276	0	0.0000
2009	1206	0	0.0000	5179	3	0.0006	3756	0	0.0000	6905	0	0.0000	5377	0	0.0000	22423	3	0.0001
2010	0	0	0.0000	7267	0	0.0000	4163	0	0.0000	4703	0	0.0000	3944	0	0.0000	20077	0	0.0000
2011	4121	1	0.0002	4979	5	0.0010	7139	4	0.0006	9793	1	0.0001	2983	0	0.0000	29015	11	0.0004
2012	422	0	0.0000	9996	37	0.0037	6541	2	0.0003	8554	0	0.0000	7605	0	0.0000	33118	39	0.0012

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