

# Aerial sightings of Pacific walrus (*Odobenus rosmarus divergens*) in the Alaskan Arctic, summer and fall 2012, with a comparison to sightings from 2009-2011

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**ABSTRACT** Marine mammal aerial surveys were conducted in the Alaskan Arctic from summer through fall 2012, as part of the ongoing Aerial Surveys of Arctic Marine Mammals (ASAMM) project, funded by the Bureau of Ocean Energy Management. Additional aerial surveys, funded by the Alaska Beluga Whale Committee, were conducted in July to assess the eastern Chukchi Sea stock of belugas. The primary study area encompassed the western Beaufort and northeastern Chukchi seas (68°N -72°N, 140°W-169°W), extending from the coast to a maximum of approximately 315 km offshore. A secondary survey area in the Chukchi Sea, located north of the primary study area (72°N -73°N, 160°W-163°W), was also flown. In 2012, Pacific walrus were primarily encountered in the northeastern Chukchi Sea, with few sightings in the western Beaufort Sea. From early to mid-summer, walrus were distributed nearshore between Point Barrow and Cape Lisburne, and offshore between 153°W-167°W. By late summer and early fall, walrus were mainly in the northern extent of the study area in Barrow Canyon, between Icy Cape and Point Barrow, and in the vicinity of Hanna Shoal (72°N, 162°W). Walrus were either in the water or hauled out on sea ice; none were observed hauled out on land along the northern Alaskan coastline. Pacific walrus were observed in the northeastern Chukchi Sea in the summer and fall of 2009-2011, and large walrus haulouts on land were encountered by either mid-August (2011) or early September (2009, 2010). Sea ice was absent in, and north of, the study area by late summer in 2009-2011, likely resulting in walrus movement closer to shore and, consequently, in the formation of large walrus aggregations on land. In 2012, despite sea ice receding to a record minimum extent, diffuse ice floes persisted in the northern part of the study area near Hanna Shoal. The persistence of sea ice remnants near Hanna Shoal throughout the summer and fall in 2012 likely provided enough at-sea haulout space, making land haulouts unnecessary.

## METHODS

- Primary Study Area:  
Northeastern Chukchi & Western Beaufort Seas  
(68°N -72°N, 140°W-169°W)
- Study Period:  
30 Jun – 28 Oct 2012
- Survey Design:  
Line-transect
- Survey Platform:  
Twin Turbine Aero Commander
- Target Altitude:  
1200-1500 ft (366-457 m)
- Target Speed:  
110 kts (57 m/s)
- Crew:  
Two pilots, three scientists  
(two primary observers & one data recorder)

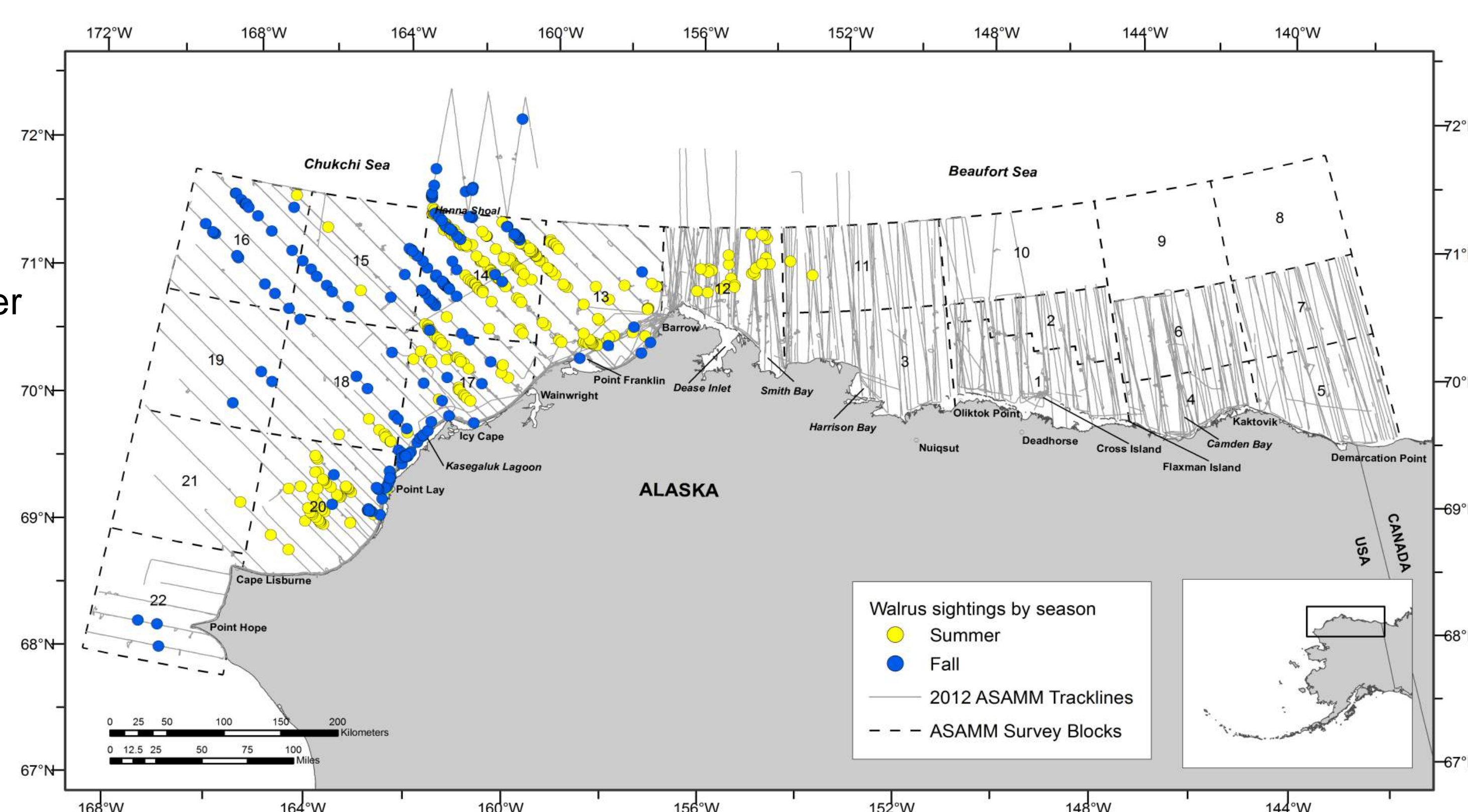
## 2012 RESULTS

- Total Effort:  
140,340 km flown over 549 hrs
- Transect Effort:  
56,007 km flown over 264 hrs
- Walrus were observed in all months of the study period (Jun-Oct), with the majority sighted in summer (Jul-Aug) (Figure 1).
- Most walrus were observed in the northeastern Chukchi Sea; few (28 sightings/923 individuals from transect, search, and circling effort) were in the western Beaufort Sea.
- Including sightings from transect, search, and circling effort, 475 walrus sightings of 12,897 individuals were observed (Table 1 shows daily totals).
- Walrus were observed in the water in all months (Jun-Oct) and hauled out on sea ice in summer and early fall (Jun-Sep). Behaviors included swimming, milling, diving, and resting.
- No walrus haulouts on the northwestern Alaskan coastline were observed in 2012.

Species	Project	Date	No. Animals Observed
Or	ASAMM	30-Jun-2012	573
Or	ASAMM	1-Jul-2012	90
Or	ASAMM	2-Jul-2012	222
Or	ASAMM	4-Jul-2012	8
Or	ASAMM	5-Jul-2012	123
Or	ASAMM	6-Jul-2012	527
Or	ASAMM	8-Jul-2012	48
Or	ASAMM	10-Jul-2012	61
Or	ASAMM	11-Jul-2012	35
Or	ASAMM	12-Jul-2012	178
Or	ASAMM	13-Jul-2012	4153
Or	ASAMM	14-Jul-2012	215
Or	ASAMM	19-Jul-2012	1
Or	ASAMM	21-Jul-2012	6
Or	ASAMM	22-Jul-2012	221
Or	ASAMM	23-Jul-2012	1
Or	ASAMM	25-Jul-2012	7
Or	ASAMM	26-Jul-2012	3
Or	ASAMM	28-Jul-2012	28
Or	ASAMM	6-Aug-2012	261
Or	ASAMM	11-Aug-2012	262
Or	ASAMM	12-Aug-2012	28
Or	ASAMM	14-Aug-2012	385
Or	ASAMM	16-Aug-2012	47
Or	ASAMM	18-Aug-2012	743
Or	ASAMM	20-Aug-2012	634
Or	ASAMM	21-Aug-2012	1798
Or	ASAMM	25-Aug-2012	1*
Or	ASAMM	29-Aug-2012	242
Or	ASAMM	3-Sep-2012	50
Or	ASAMM	8-Sep-2012	9
Or	ASAMM	10-Sep-2012	1637
Or	ASAMM	13-Sep-2012	1*
Or	ASAMM	14-Sep-2012	105
Or	ASAMM	15-Sep-2012	3
Or	ASAMM	18-Sep-2012	20
Or	ASAMM	19-Sep-2012	21
Or	ASAMM	24-Sep-2012	1*
Or	ASAMM	26-Sep-2012	41*
Or	ASAMM	29-Sep-2012	54
Or	ASAMM	1-Oct-2012	3
Or	ASAMM	2-Oct-2012	22*
Or	ASAMM	5-Oct-2012	4
Or	ASAMM	6-Oct-2012	16
Or	ASAMM	10-Oct-2012	5
Or	ASAMM	11-Oct-2012	4
Or	TOTAL		12897

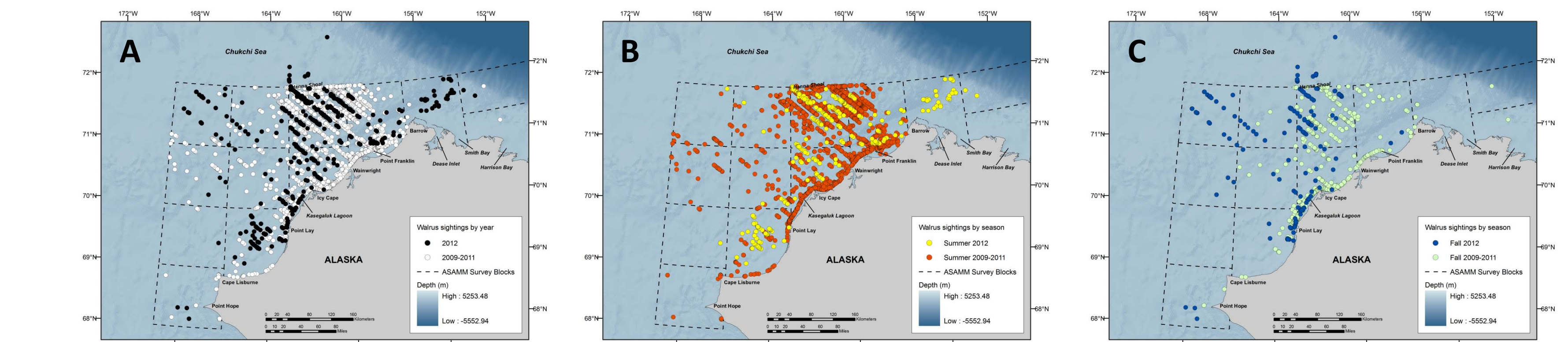
\*Includes one sighting of one walrus carcass.

**Table 1 (above).** Daily summary of walrus sightings from transect, search, and circling effort in 2012. Numbers combine all walrus sighted on the date specified and may include sightings made at multiple locations. Sightings that were known duplicates within the same day were excluded. Or=*Odobenus rosmarus*, ASAMM=Aerial Surveys of Arctic Marine Mammals

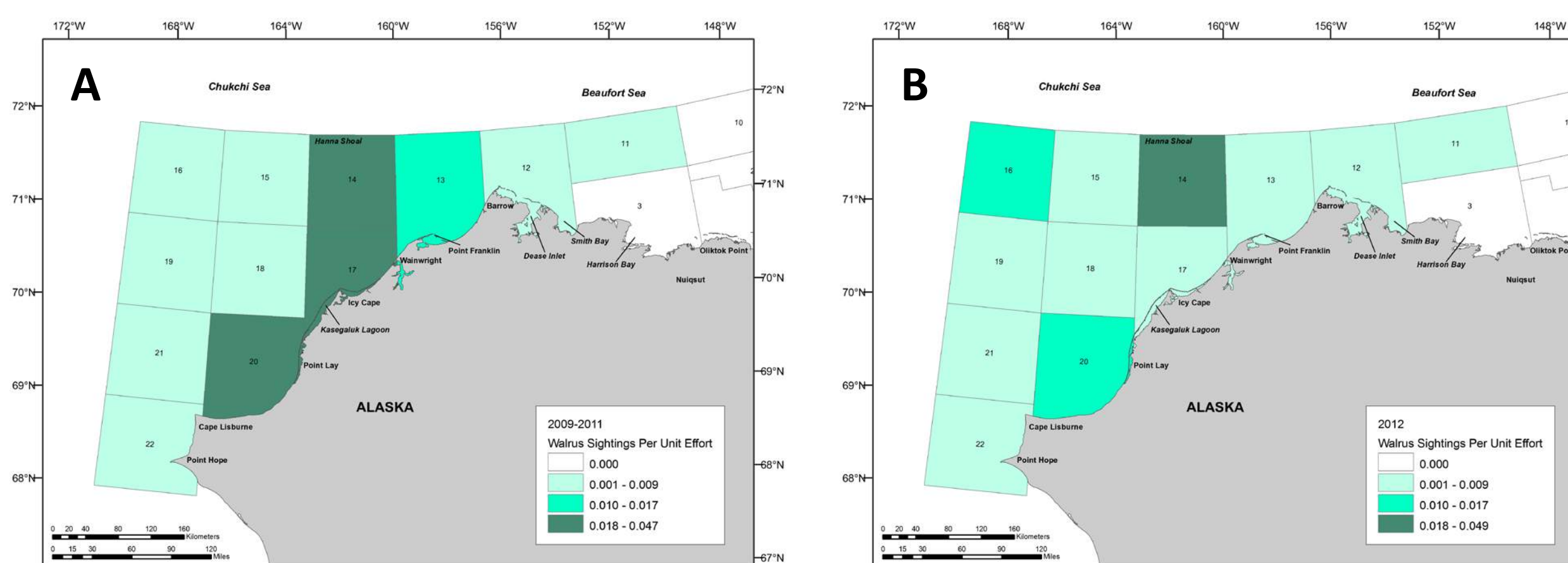


**Figure 1 (left).** Walrus sightings by season in 2012, overlaid on transect, search, and circling tracklines. Seasons are defined as Summer (Jun-Aug) and Fall (Sep-Nov).

## A COMPARISON WITH 2009-2011

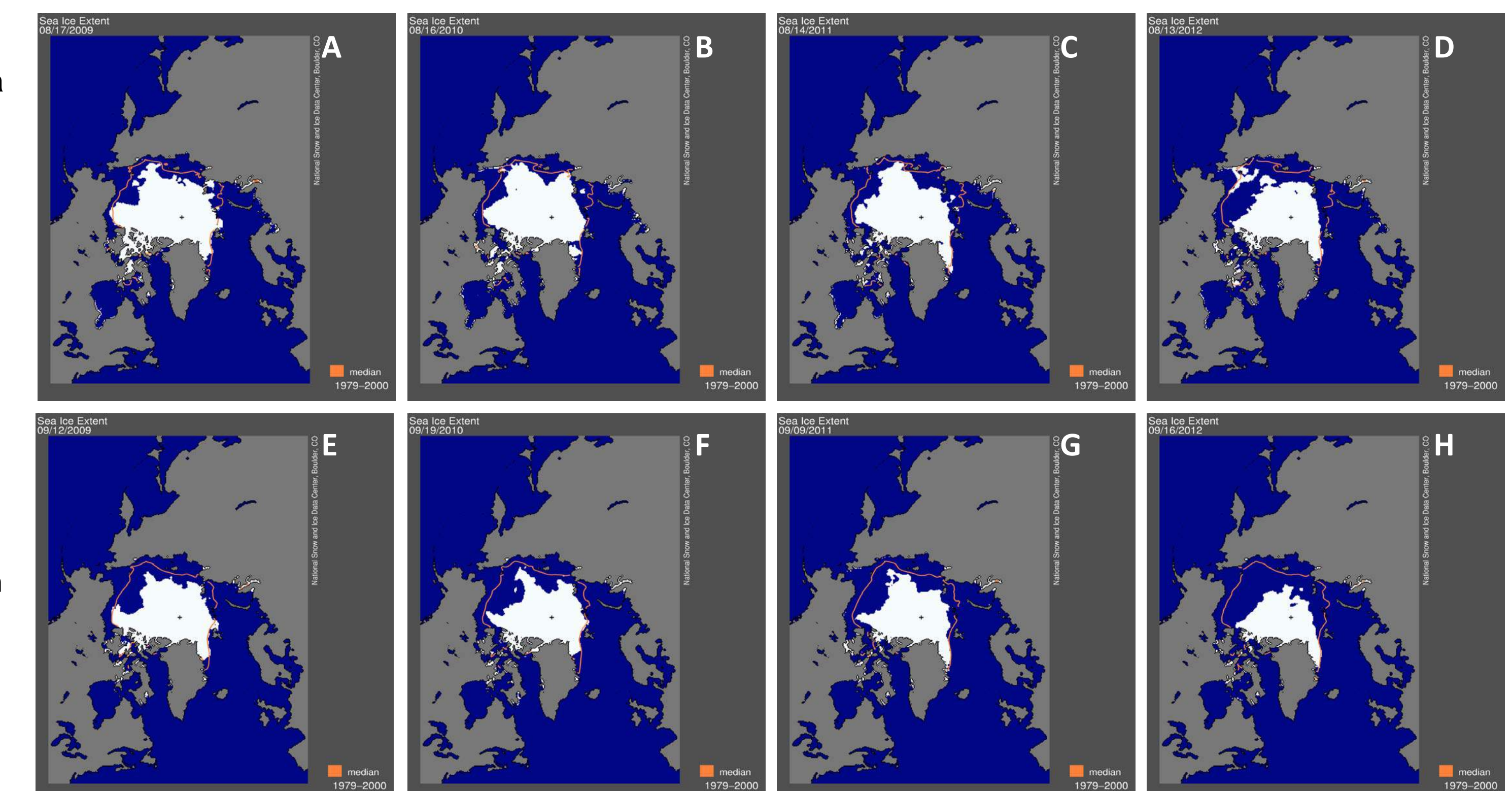


**Figure 2 A-C (above).** Walrus sighting distributions in 2009-2011 and 2012, depicted by year (A) and season (B-C). Seasons are defined as summer (Jun-Aug) and fall (Sep-Nov). All walrus sightings (excluding carcasses) regardless of survey mode are shown, including sightings made during transect, search, and circling effort. Walrus were similarly distributed in the northeastern Chukchi Sea in all years. In 2012, additional survey effort was conducted in the western Beaufort Sea offshore between Barrow and Smith Bay in summer and north of 72°N near Hanna Shoal in fall. Walrus sightings in those locations in 2012 are a result of the additional effort.



**Figure 3 A-B (left).** Walrus sightings corrected for survey effort. Sighting rates show number of walrus sightings per kilometer of effort flow in each survey block from 2009-2011 (A) and 2012 (B). Data were limited to walrus sightings made on transect (excluding repeats and carcasses) and kilometers of transect surveyed. In 2009-2011, blocks 14, 17, and 20 had the highest sighting rates (0.05, 0.04, and 0.02 respectively); in 2012, block 14 had the highest sighting rate (0.05).

**Figure 4 A-H (right).** Sea ice extent reported by the National Snow and Ice Data Center in mid-August 2009-2012 (A-D) and mid-September 2009-2012 (E-H). Ice extent is derived from satellite imagery and areas with 15% or less ice coverage may be depicted as "ice-free". In mid-August 2012, a segment of sea ice is visible in the northeastern Chukchi Sea near the northwestern Alaskan coastline (D). In mid-September 2012 in the same area, no sea ice is visible (H).



Despite an apparent lack of sea ice in the northeastern Chukchi Sea in mid-September 2012, as depicted by satellite imagery, walrus were observed hauled out on ice in this area during ASAMM surveys. Sea ice remnants persisted near Hanna Shoal, continuing to offer haulout space over the continental shelf. It is likely that the ice provided enough at-sea haulout space, making land haulouts unnecessary, as no walrus aggregations on the northwestern Alaskan coastline were observed. This is in contrast to 2009-2011, when sea ice was not observed by the survey team in the ASAMM study area and coastal haulouts were observed by mid-August (2011) or early September (2009, 2010).

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