# Pacific walrus (*Odobenus rosmarus divergens*) haulouts along the northwestern Alaskan coastline, summer and fall 2009-2013

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**ABSTRACT** The Aerial Surveys of Arctic Marine Mammals (ASAMM) project, which is conducted by NOAA and co-managed and funded by BOEM, surveys the northeastern Chukchi and western Beaufort seas (68°N-72°N, 140°W-169°W). Flights consist of line-transect surveys that cover a wide range, from the northern Alaskan coastline to a maximum of 315 km offshore, and they are designed to document the distribution, relative abundance, and behaviors of marine mammals in the Arctic during the ice-free season (July-October). Pacific walruses (*Odobenus rosmarus divergens*) are frequently encountered during flights in the northeastern Chukchi Sea, and are seen in the water, hauled out on sea ice, and, in recent years, in large aggregations on land. During aerial surveys conducted in summer and fall 2009-2013, we observed large walrus haulouts along the northwestern Alaskan coastline in all years except 2012. Our initial encounters with coastal walrus haulouts occurred in either mid-August (2011) or early to mid-September (2009, 2010, and 2013). While the location of haulouts varied slightly among years (e.g., haulouts were documented near Icy Cape in 2009 and Cape Lisburne in 2010), walruses consistently hauled out near Point Lay, Alaska, in 2010, 2011, and 2013. The continued use of barrier islands near Point Lay for haul-out space suggests that it is important habitat for Pacific walruses, especially when sea ice habitat becomes less suitable. In 2009-2011 and 2013, years when coastal walrus haulouts were observed, sea ice was either sparse or absent in the study area by late summer. In 2012, when no coastal walrus haulouts were observed, diffuse sea ice persisted in the northern part of the study area near Hanna Shoal (~72°N, 162°W). The persistence of sea ice remnants near Hanna Shoal throughout the summer and fall of 2012 likely provided enough at-sea haul-out space, making land haulouts unnecessary. The amount and location of Arctic sea ice during summer and fall, and its suitability as an offshore haul-out platform for walruses, will be critical predictors of the occurrence and timing of walrus haulouts on land. Long-term, systematic aerial surveys along the coast can identify where and when walrus haulouts form.

## PROJECT OVERVIEW

- ASAMM (Aerial Surveys of Arctic Marine Mammals) is a project conducted by the National Marine Mammal Laboratory, a division of NOAA's Alaska Fisheries Science Center. The project is co-managed and funded by the Bureau of Ocean Energy Management.
- The main objective of ASAMM is to document the relative abundance, spatial and temporal distribution, and behaviors (e.g., calving, feeding, hauling out) of marine mammals in the Alaskan Arctic.
- ASAMM conducts offshore, line-transect aerial surveys in the Alaskan Arctic. The primary study areas are in the northeastern Chukchi and western Beaufort seas (68-72°N, 140-169°W).
- Flights are conducted during the open water (ice-free) season, from June/July through October.

## COASTAL WALRUS HAULOUTS

- Coastal walrus haulouts were sighted along the northwestern Alaskan coastline in all years from 2009-2013 except 2012 (Fig. 1).
- Coastal walrus haulouts were sighted by mid-August (2011) or early to mid-September (2009, 2010 and 2013) (Table 1).
- Sea ice was either sparse or absent in years when coastal walrus haulouts formed (Fig. 2).

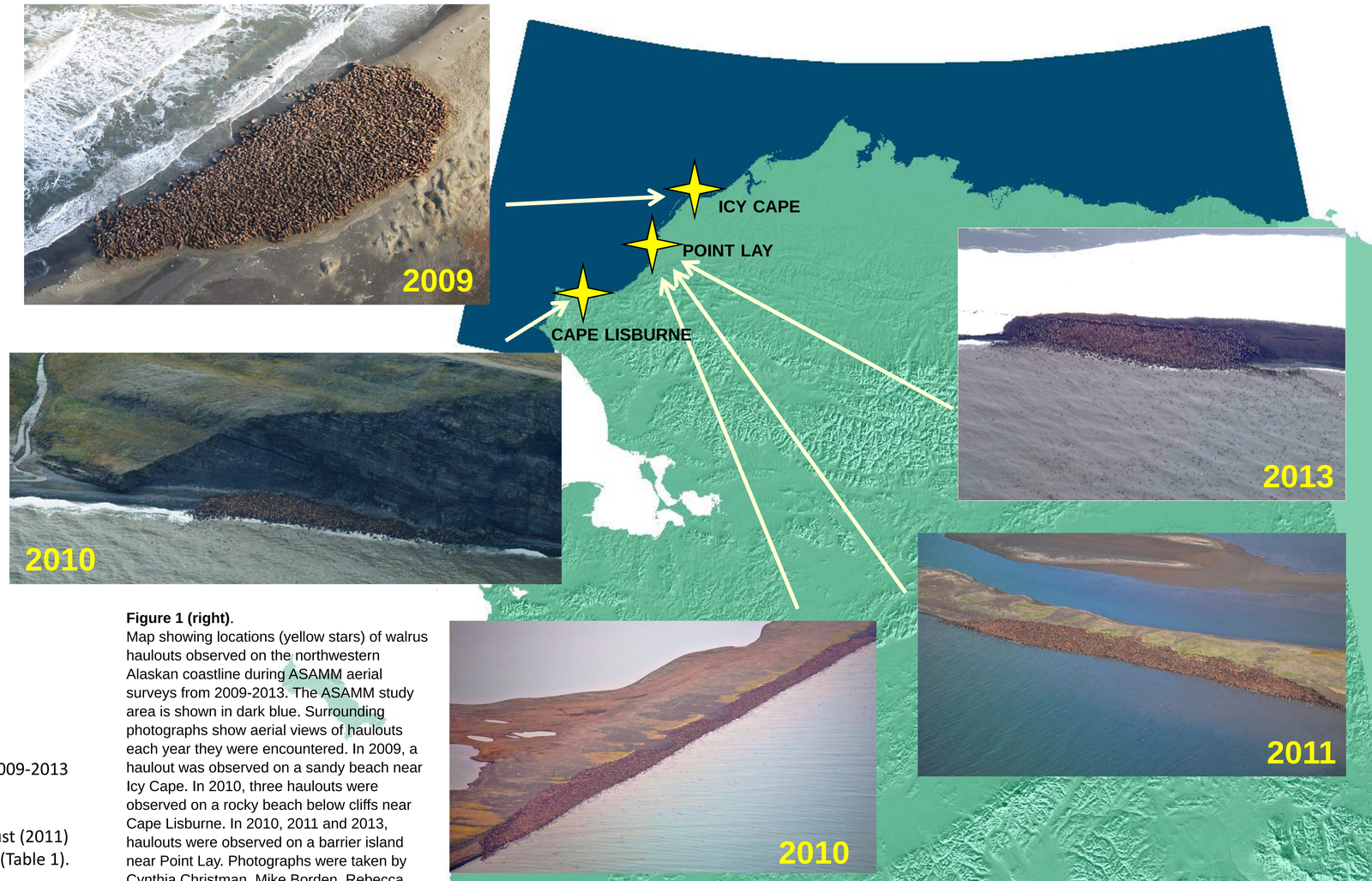


**Figure 1 (right).**
Map showing locations (yellow stars) of walrus haulouts observed on the northwestern Alaskan coastline during ASAMM aerial surveys from 2009-2013. The ASAMM study area is shown in dark blue. Surrounding photographs show aerial views of haulouts each year they were encountered. In 2009, a haulout was observed on a sandy beach near Icy Cape. In 2010, three haulouts were observed on a rocky beach below cliffs near Cape Lisburne. In 2010, 2011 and 2013, haulouts were observed on a barrier island near Point Lay. Photographs were taken by Cynthia Christman, Mike Borden, Rebecca Shea, and Stan Churches under USFWS Permit No. MA212570.

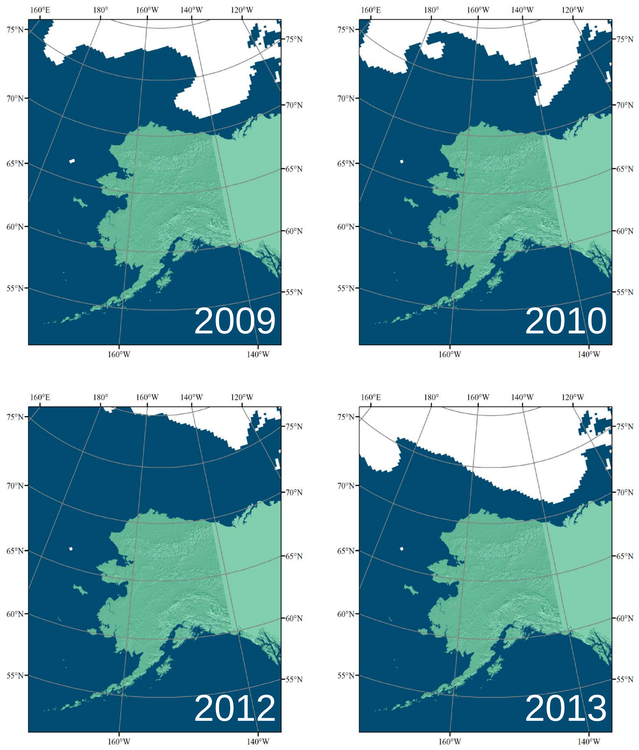


**Figure 2 (left).**
Maps showing Northern Hemisphere sea ice extent near Alaska for September 2009-2013. Ice extent is derived from satellite imagery and areas with 15% or less ice coverage may be depicted as "ice-free". Ice shapefiles are courtesy of the National Snow & Ice Data Center.

Maps depict large areas of open water in the northeastern Chukchi Sea, south of 75°N, in September of all years. These images correspond with observations made during ASAMM flights in 2009-2011 and 2013, when no sea ice was seen in the study area by September. In these years, coastal walrus haulouts were observed by mid-August (2011) or early September (2009, 2010, 2013).

Despite the lack of sea ice in satellite images of the northeastern Chukchi Sea in September 2012, walruses were observed hauled out on ice in this area during ASAMM surveys. Sea ice remnants persisted near Hanna Shoal (~72°N, 162°W), continuing to offer haul-out space over the continental shelf. It is likely that the ice provided enough at-sea haul-out space, making land haulouts unnecessary, as no walrus aggregations on the northwestern Alaskan coastline were observed.

| Year | Walrus Haulout Observed | Haulout Location(s) | First Encounter | Last Encounter† | Duration of Days from First to Last Encounter | Min. Group Size Estimate | Max. Group Size Estimate |
|---|---|---|---|---|---|---|---|
| 2009 | yes | Icy Cape | 2-Sep | 13-Sep | 12 | 2,500 | 4,000 |
| 2010 | yes | Point Lay<br>Cape Lisburne* | 30-Aug | 24-Sep | 26 | 800 | 15,000 |
| 2011 | yes | Point Lay | 17-Aug | 6-Oct | 51 | 1,000 | 20,000‡ |
| 2012 | no | - | - | - | - | - | - |
| 2013 | yes | Point Lay | 12-Sep | 27-Sep | 16 | 3,000 | 10,000 |

*Haulouts near Cape Lisburne were encountered only on 30-Aug.
†The last date the haulout was observed by ASAMM, may not be indicative of the last date the haul-out location was occupied.
‡Monson et al. (2013)§ estimated 30,000 walruses at this location in 2011 based on aerial images from a gyro-stabilized video system.
§Monson DH, Udevitz MS, Jay CV (2013) Estimating Age Ratios and Size of Pacific Walrus Herds on Coastal Haulouts using Video Imaging. PLoS ONE 8(7): e69806. doi:10.1371/journal.pone.0069806

**Table 1 (right).**
A comparison of haul-out locations, first encounter date, last encounter date, duration between first and last encounter, and minimum and maximum group size estimates for coastal walrus haulouts observed during aerial surveys from 2009-2013. With the exception of 2012, when no coastal haulouts were seen, a barrier island near Point Lay was consistently used as a haul-out location starting in 2010.

The first large-scale coastal walrus haulout on the northwestern Alaskan coastline was observed in 2007 (Thomas et al. 2009*). No large haulouts were seen in this area in 2008.

ASAMM data, along with local observations and USGS satellite-tagging studies, provide valuable information about the timing and location of walrus haulout formation along the northwestern Alaskan coastline.

*Thomas, T., W.R. Koski and T. Elliot. 2009. Chukchi Sea nearshore aerial surveys. (Chapter 4) *In*: Ireland, D.S., D.W. Funk. R. Rodrigues, and W.R. Koski (eds.) 2009. Joint Monitoring Program in the Chukchi and Beaufort seas, open water seasons, 2006–2007. LGL Alaska Report P971–2. Report from LGL Alaska Research Associates, Inc., Anchorage, AK, LGL Ltd., environmental research associates, King City, Ont., JASCO Research, Ltd., Victoria, BC, and Greeneridge Sciences, Inc., Santa Barbara, CA, for Shell Offshore, Inc., Anchorage, AK; ConocoPhillips Alaska, Inc., Anchorage, AK, and the National Marine Fisheries Service, Silver Springs, MD, and the U.S. Fish and Wildlife Service, Anchorage, AK. 485 p. plus Appendices.

## ACKNOWLEDGMENTS

This project was funded by the Bureau of Ocean Energy Management (BOEM), with oversight provided by BOEM Contracting Officer Representative Jeffrey Denton. It has also been strongly supported by Dr. Charles Monnett. At NMML, we would like to thank Dr. Phillip Clapham, Dr. Nancy Friday, and Kim Shelden for their contributions, as well as the administrative and travel personnel for assistance throughout the field season. In 2013, the surveys would not have been possible without the help of Mike Hay (Xera GIS) for programming support; Clearwater Air, Inc., including pilots Andrew Harcombe, Stan Churches, John Siegel, Jacob Turner, Jim Kopczynski, and Alex Shibakov for aircraft support; and the Bureau of Land Management (DOI) for providing real-time flight-following. Special thanks go to biologists Corey Accardo, Lisa Barry, Vicki Beaver, Ianjon Brower, Peter Duley, Jennifer Gatzke, Suzie Hanlan, Qaiyaan Harcharek, Bob Lynch, Christy Sims, Jessica Thompson, Dan Twyman, and Karen Vale for collecting and managing data.