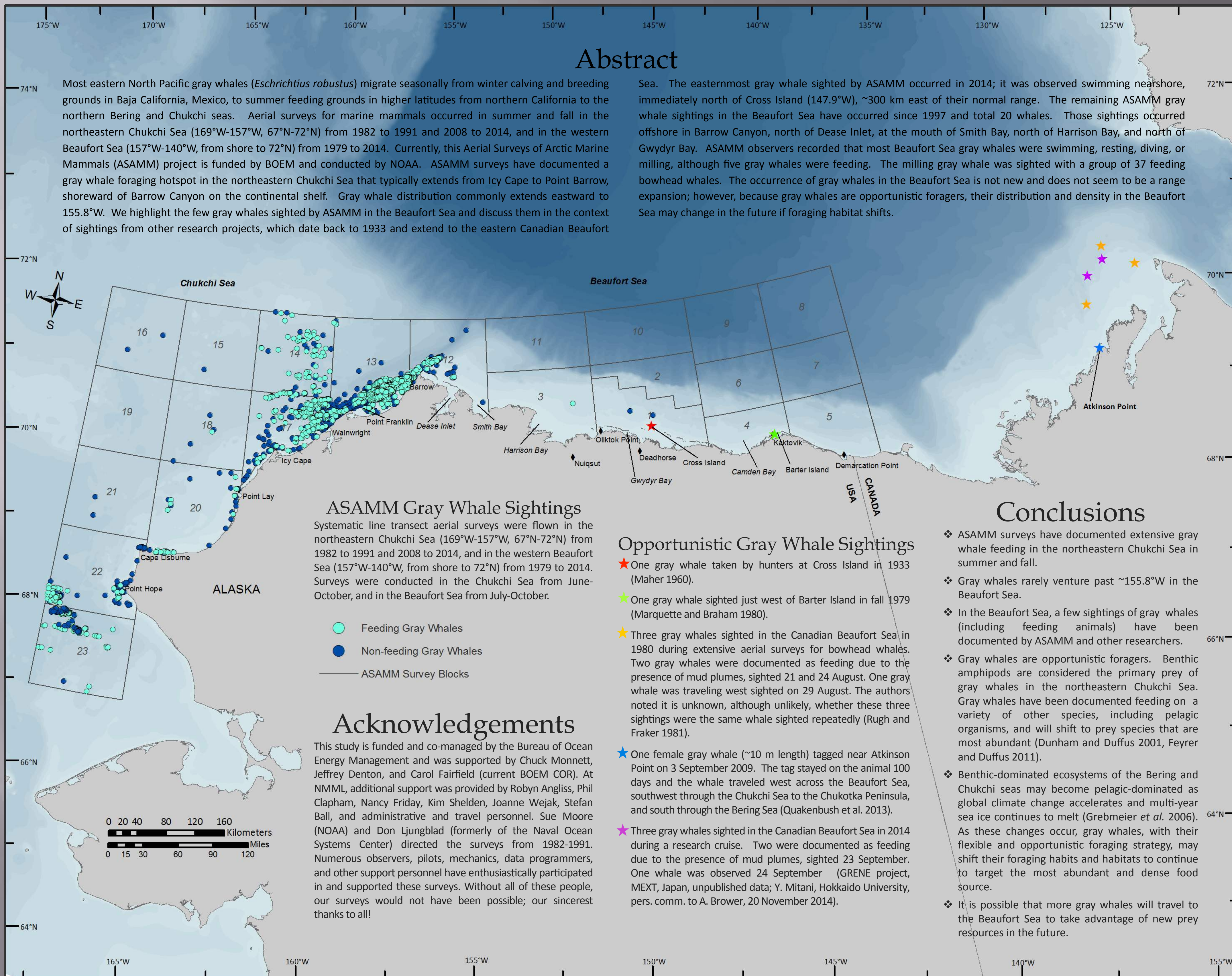




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## Abstract

Most eastern North Pacific gray whales (*Eschrichtius robustus*) migrate seasonally from winter calving and breeding grounds in Baja California, Mexico, to summer feeding grounds in higher latitudes from northern California to the northern Bering and Chukchi seas. Aerial surveys for marine mammals occurred in summer and fall in the northeastern Chukchi Sea (169°W-157°W, 67°N-72°N) from 1982 to 1991 and 2008 to 2014, and in the western Beaufort Sea (157°W-140°W, from shore to 72°N) from 1979 to 2014. Currently, this Aerial Surveys of Arctic Marine Mammals (ASAMM) project is funded by BOEM and conducted by NOAA. ASAMM surveys have documented a gray whale foraging hotspot in the northeastern Chukchi Sea that typically extends from Icy Cape to Point Barrow, shoreward of Barrow Canyon on the continental shelf. Gray whale distribution commonly extends eastward to 155.8°W. We highlight the few gray whales sighted by ASAMM in the Beaufort Sea and discuss them in the context of sightings from other research projects, which date back to 1933 and extend to the eastern Canadian Beaufort

Sea. The easternmost gray whale sighted by ASAMM occurred in 2014; it was observed swimming nearshore, immediately north of Cross Island (147.9°W), ~300 km east of their normal range. The remaining ASAMM gray whale sightings in the Beaufort Sea have occurred since 1997 and total 20 whales. Those sightings occurred offshore in Barrow Canyon, north of Dease Inlet, at the mouth of Smith Bay, north of Harrison Bay, and north of Gwydyr Bay. ASAMM observers recorded that most Beaufort Sea gray whales were swimming, resting, diving, or milling, although five gray whales were feeding. The milling gray whale was sighted with a group of 37 feeding bowhead whales. The occurrence of gray whales in the Beaufort Sea is not new and does not seem to be a range expansion; however, because gray whales are opportunistic foragers, their distribution and density in the Beaufort Sea may change in the future if foraging habitat shifts.

## ASAMM Gray Whale Sightings

Systematic line transect aerial surveys were flown in the northeastern Chukchi Sea (169°W-157°W, 67°N-72°N) from 1982 to 1991 and 2008 to 2014, and in the western Beaufort Sea (157°W-140°W, from shore to 72°N) from 1979 to 2014. Surveys were conducted in the Chukchi Sea from June-October, and in the Beaufort Sea from July-October.

- Feeding Gray Whales
- Non-feeding Gray Whales
- ASAMM Survey Blocks

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## Opportunistic Gray Whale Sightings

- ★ One gray whale taken by hunters at Cross Island in 1933 (Maher 1960).
- ★ One gray whale sighted just west of Barter Island in fall 1979 (Marquette and Braham 1980).
- ★ Three gray whales sighted in the Canadian Beaufort Sea in 1980 during extensive aerial surveys for bowhead whales. Two gray whales were documented as feeding due to the presence of mud plumes, sighted 21 and 24 August. One gray whale was traveling west sighted on 29 August. The authors noted it is unknown, although unlikely, whether these three sightings were the same whale sighted repeatedly (Rugh and Fraker 1981).
- ★ One female gray whale (~10 m length) tagged near Atkinson Point on 3 September 2009. The tag stayed on the animal 100 days and the whale traveled west across the Beaufort Sea, southwest through the Chukchi Sea to the Chukotka Peninsula, and south through the Bering Sea (Quakenbush et al. 2013).
- ★ Three gray whales sighted in the Canadian Beaufort Sea in 2014 during a research cruise. Two were documented as feeding due to the presence of mud plumes, sighted 23 September. One whale was observed 24 September (GRENE project, MEXT, Japan, unpublished data; Y. Mitani, Hokkaido University, pers. comm. to A. Brower, 20 November 2014).

## Conclusions

- ❖ ASAMM surveys have documented extensive gray whale feeding in the northeastern Chukchi Sea in summer and fall.
- ❖ Gray whales rarely venture past ~155.8°W in the Beaufort Sea.
- ❖ In the Beaufort Sea, a few sightings of gray whales (including feeding animals) have been documented by ASAMM and other researchers.
- ❖ Gray whales are opportunistic foragers. Benthic amphipods are considered the primary prey of gray whales in the northeastern Chukchi Sea. Gray whales have been documented feeding on a variety of other species, including pelagic organisms, and will shift to prey species that are most abundant (Dunham and Duffus 2001, Feyrer and Duffus 2011).
- ❖ Benthic-dominated ecosystems of the Bering and Chukchi seas may become pelagic-dominated as global climate change accelerates and multi-year sea ice continues to melt (Grebmeier et al. 2006). As these changes occur, gray whales, with their flexible and opportunistic foraging strategy, may shift their foraging habits and habitats to continue to target the most abundant and dense food source.
- ❖ It is possible that more gray whales will travel to the Beaufort Sea to take advantage of new prey resources in the future.

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