Photo by: Jessica Crance (NOAA/AFSC/NMML)

Spatio-temporal distribution of Alaskan beluga (*Delphinapterus leucas*) populations based on acoustic monitoring

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Abstract

Beluga whales (*Delphinapterus leucas*) are highly vocal animals which makes them ideal candidates for passive acoustic monitoring. In Alaska, two subpopulations migrate annually from their predictable summering grounds in the eastern Chukchi and western Beaufort Seas, to overwinter in the Bering Sea. Additional information is required on the timing and migration routes in spring and autumn to assist in following these subpopulations as they transit between the two regions. Preliminary results are presented on the temporal distribution of Alaskan belugas based upon acoustic detections (September 2010 to June 2011) from passive acoustic recorders located in the eastern Chukchi, western Beaufort, and Bering Seas. Due to the highly vocal nature of beluga and their migratory movement patterns within the region, multiple temporal peaks in vocal activity are evident. Within each temporal peak in vocal activity we will investigate the common call types to assist in differentiating migratory streams, and potentially identify each subpopulation as they transit through each region and the wider Arctic. [Work supported by the National Research Council and Bureau of Ocean Energy Management]

Methods

Photo by: Amy Kennedy (NOAA/AFSC/NMML)

Data:

- CHAOZ (eastern Chukchi Sea)
  - 40mile 'inshore' AURAL
  - 120mile 'offshore' AURAL
- BOWFEST (western Beaufort Sea)
- PRIEST (Bering Sea)

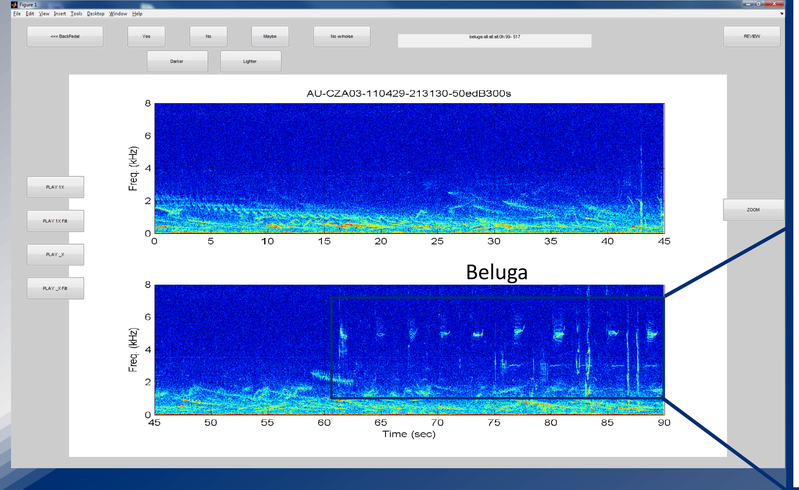
CHAOZ Recordings:

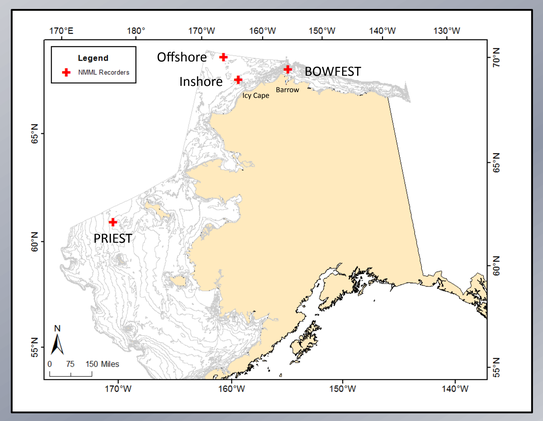
- 16 kHz
- Duty cycle: 90min every 5hr
- Determine presence using in-house Matlab based analysis program

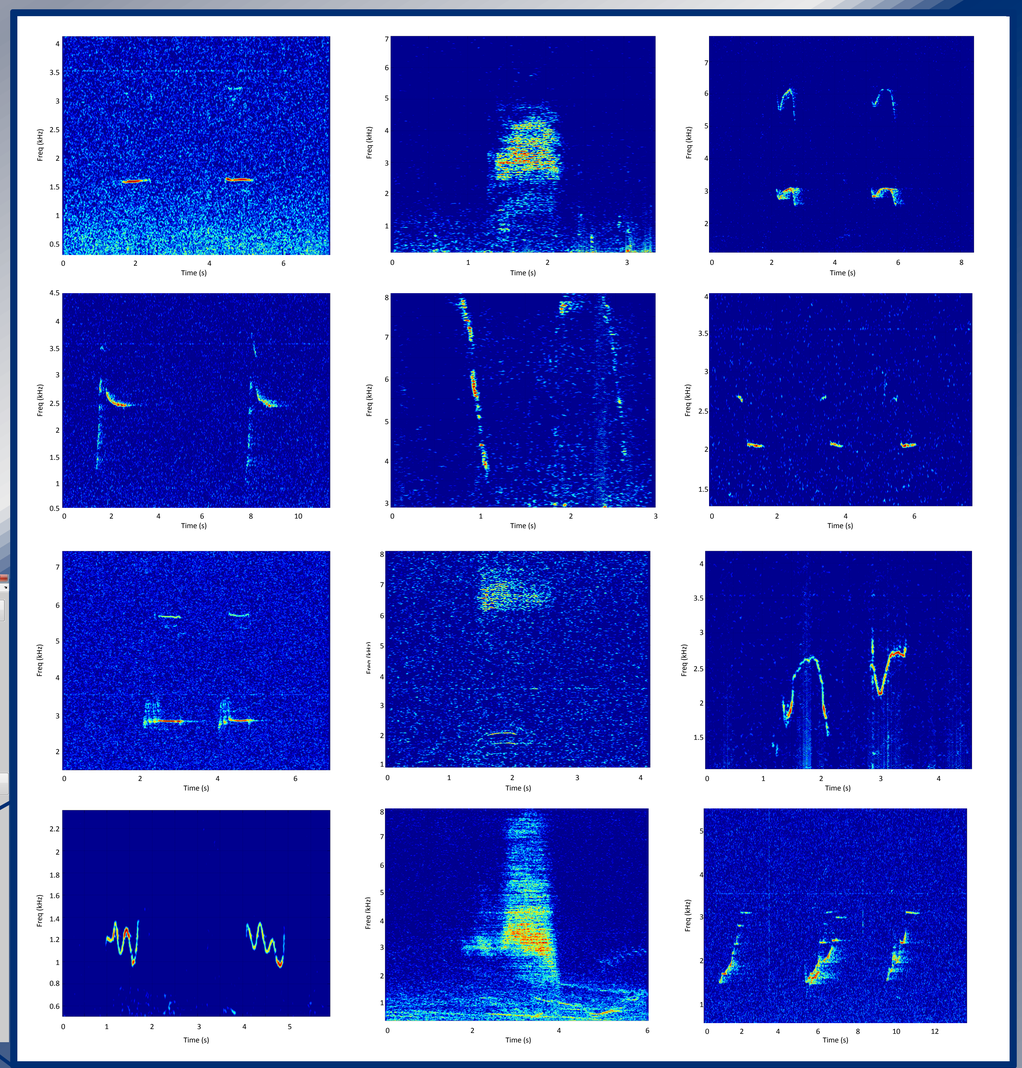
Laura Morse
NOAA/NMFS/AFSC/NMML
NMFS Permit No. 782-1719

Analysis:

- Seasonal peaks
- Call bouts
- Preliminary call classification







Summary

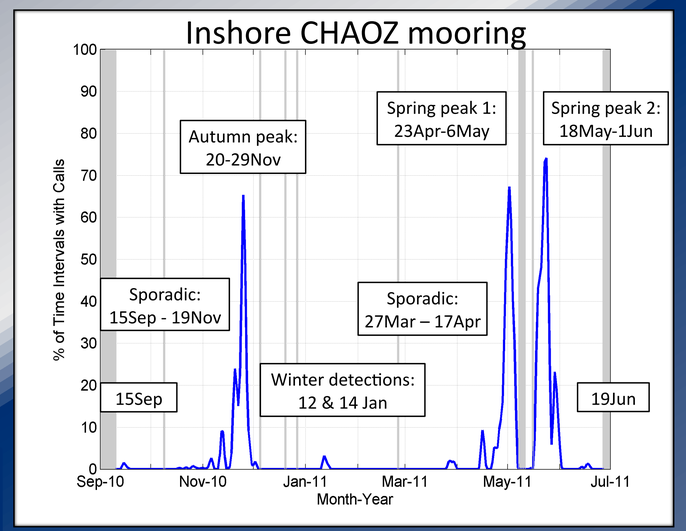
Belugas are associated with the ice edge

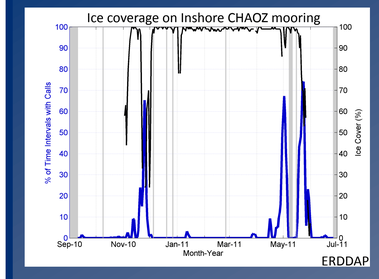
Inshore CHAOZ mooring

- Detections: 15Sep – 2Dec and 27Mar – 19Jun
- 3 migration peaks:
  - Autumn late Nov
  - Spring late Apr/early May
  - Spring late May
- Rare winter detections: belugas should be overwintering in the Bering Sea at this time

Offshore CHAOZ mooring

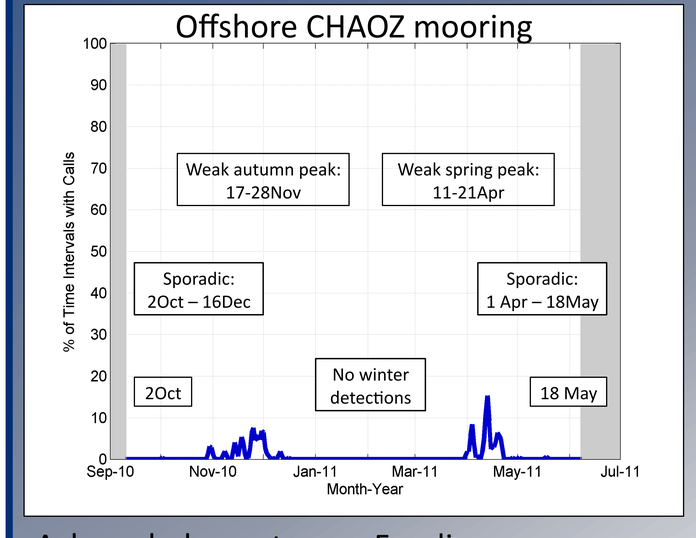
- Detections: 2Oct – 16Dec and 1Apr – 18May
- 2 weak migration peaks:
  - Autumn mid/late Nov
  - Spring mid April





Next steps

- Presence: Beaufort & Bering Sea moorings
- Measure: common call types in each peak
- Analyze: potential for vocal dialects based on common call types



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