**FINDING THE CALLS IN THE CHAOZ:**
Marine mammals and oceanographic conditions off Alaska’s northern slope

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Abstract
The Chukchi Acoustics, Oceanography, and Zooplankton (CHAOZ) study was a five-year BOEM-funded, multi-disciplinary study (2010-2015). Its primary objective was to document the distribution of large whales in areas of potential seismic activity, and to relate these changes to oceanographic conditions. Results presented here focus on the relationship between marine mammal distributions and oceanographic conditions. Three clusters of passive acoustic and biophysical moorings were deployed throughout the region. This study illustrates the importance of collecting concurrent passive acoustic and oceanographic data in a rapidly changing environment.

**Methods**

- **Field methods**
  - 2010, 2011, 2012
  - Biophysical mooring clusters
  - Passive acoustic
  - Oceanographic
  - Zooplankton
  - Transect line sampling
  - CTDs, zooplankton tow: Marine mammal surveys
  - Visual and passive acoustic

- **Analysis methods**
  - 100% of acoustic recordings
  - 12 spp. marine mammals (MM)
  - Generalized Additive Models (GAMs)
  - Correlate MM with 19 different oceanographic and environmental variables
  - Determine positive or negative associations
  - Transect sampling data plotted against MM survey data
  - Visual and passive acoustic

**Results**

**Salient” for Arctic climate change**

- GAMs: Significant parameters that are common among all top models are presented.
- Calling activity plots: Calling activity % of intervals per day with at least one call present. Grey areas no data.
- Calling activity vs. parameters plots: Each representative location presented for each species. Only variables with correlations are presented. Interaction bars above plots moderate models.

**Summary**

- **Gray whales**
  - Short-term sampling data
  - Gray whales detected in areas of:
    - High zooplankton concentrations
    - High ammonium, nitrate
    - High benthic biomass
  - GAMs: Significant parameters that are common among all top models are presented.
  - Calling activity plots: Calling activity % of intervals per day with at least one call present. Grey areas no data.
  - Calling activity vs. parameters plots: Each representative location presented for each species. Only variables with correlations are presented. Interaction bars above plots moderate models.

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