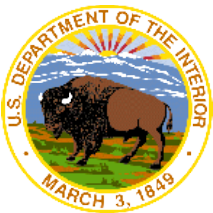


# ***BOEM-funded Long-Term Monitoring in the Arctic***

**Catherine Coon**

**BOEM Alaska OCS Region**

**Catherine.Coon@boem.gov**

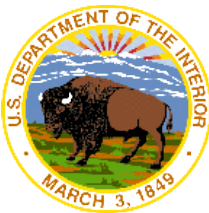


## **BOEM Assesses/Manages Potential Impacts on the Human, Marine and Coastal Environments that may be Affected by OCS Energy Development Activities**

- **Air Emissions**  
New, pending regulations
- **Coastal Activities**  
Pipeline landfalls; Support facilities
- **Accidental Oil Spills**
- **Disruption of Subsistence Activities**



- **Noise**  
Seismic Surveying; Anchoring;  
Drilling; Service vessels
- **Bottom Disturbance**  
Pipelines; Anchoring



- ~\$500M in Studies Funded
  - More Than 1,000 Reports & Published Articles
- Recently ~\$15M+ per Year with an Additional ~\$5M in Leveraged Funds
- 2007 – Present (Arctic Focus):
  - Whales (\$44.5M); Walrus (\$3.4M)
  - Polar Bear (\$1.8M); Seals (\$3.3M)
  - Ecosystem Monitoring (\$25.5M)
  - Fate and Effects Modeling (\$8.4M)
  - Social Systems (\$3.7M)
- Studies help evaluate potential environmental impacts and monitor for changes over time



Core monitoring focuses on marine mammal distribution, benthic productivity, contaminant levels, and subsistence activities



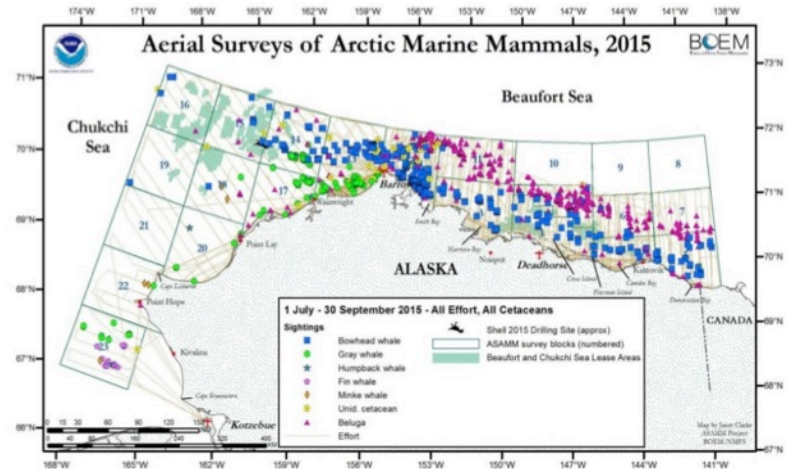


## ASAMM – Aerial Surveys of Arctic Marine Mammals

- Since 1979; July–October;
- 64,600 miles = ~400 hrs/year
- Abundance & distribution of marine mammals; inter-annual variability

## ANIMIDA – Arctic Nearshore Monitoring in the Development Area

- Since 1985; August–September;
- Chemical contaminants; water column turbidity; benthos; Boulder Patch productivity, subsistence disruption
- Participating in new Beaufort Sea Distributed Biological Observatory (DBO)



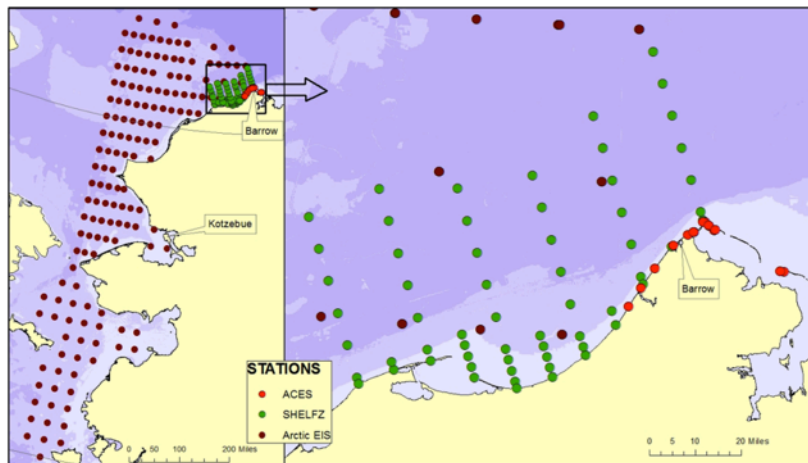
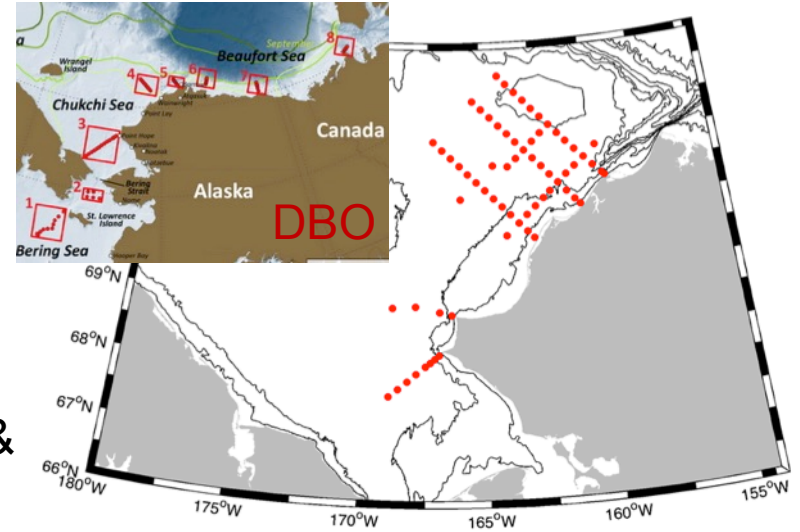
## Beaufort Sea Fish & Lower Trophic Surveys

- Intermittent sampling over decades; August–September;
- Fish and invertebrate presence, abundance, distribution and biomass; oceanographic chemistry; dietary habits and food web analysis



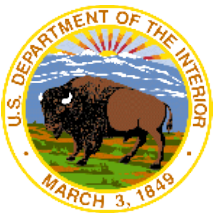
## Arctic Marine Biodiversity Observation Network (AMBON)

- a science partnership under NOPP including: BOEM, UAF, NOAA, and Shell Oil
- Biodiversity in the Chukchi Sea from an ecosystem perspective, sampling from microbes to whales
- Builds upon the DBO sites (and prior BOEM & industry sampling), to maintain a change detection array for the identification and consistent monitoring of biophysical responses



## Arctic Integrated Ecosystem Study

- Comprehensive surveys of the NE Bering Sea and E Chukchi Sea shelf; Aug-Sept 2012, 2013, 2017, 2018
- Provides assessment of the oceanography, lower trophic, crab, and fish communities



## Satellite Tracking of Marine Mammals

- Walrus, Ringed and Bearded Seals, Bowhead Whales, Polar Bears
- Studies engage residents of the North Slope to provide expertise

## Coastal Mapping

- ShoreZone–Shoreline Mapping of the North Slope of Alaska

## Ocean Acidification

- Ongoing and recently completed studies examining biogeochemical processes and sea-air CO<sub>2</sub> fluxes in the Chukchi Sea

## Ocean Circulation and Ice

- Observational and modeling studies of circulation in the Beaufort and Chukchi Seas
- Satellite tracking and modeling studies of ice movement and dispersion in the Beaufort and Chukchi Seas

## Local and Traditional Knowledge; Subsistence Monitoring

- GPS tracks of subsistence whale hunters, 2001-2012
- Mapping subsistence activities in the Beaufort and Chukchi Seas
- Studies examining social indicators, sharing networks, and community well-being

## Passive Acoustic Monitoring and Whale Ecology

- Studies include: BOWFEST, ArcWEST, CHAOZ
- Focus on bowhead feeding ecology, prey behavior, and the relationship to oceanographic parameters

