ONR Major Arctic Research Initiatives

- **Marginal Ice Zone (MIZ) Initiative**
  - 2014 Field Program
- **Waves and Sea State Initiative**
  - 2015 Field Program
- **Canada Basin Acoustic Propagation Experiment (CANAPE)**
  - 2015, 2016-2017 Field Programs
- **Stratified Ocean Dynamics in the Arctic (SODA)**
  - 2017-2019 Field Programs
- **Arctic Mobile Observing System (AMOS)**
  - 2019-2023 Field demonstrations
- **Coordinated Arctic Acoustic Tomography Experiment (CAATEX)**
  - 2019-2020 Field Programs
- **Sea Ice Dynamics Experiment (SIDEx)**
  - 2020-2021 Field Programs
Stratified Ocean Dynamics in the Arctic (SODA)

- Understand role of upper ocean in controlling fate of sea ice.
- One year of autonomous sampling (moorings, gliders, ice-tethered sensors).
- September-October cruises (2018, 2019).

SODA Program Timeline

- Pilot Efforts
  - PIES Northwind Ridge
  - BGOS-A & B
  - CANAPE Recovery Cruise
  - IBRV ARAON
  - BGOS Service Cruise
- Acoustic Navigation Array
- ALAMO Floats
- Ice-Based Systems
- SODA-A, B & C
- Seagliders
- RV Ulqik
- Process Cruise
- Asset Deployment Cruise
- Asset Recovery Cruise
- Analysis

- Science mooring
- Navigation mooring
- Augmented BGOS mooring
- PIES
- ALAMO profiling floats

- AOFB + ITP-V + IAD (cluster)
- IAD (solo)
- Glider surveys
- Process cruise region

ALAMO Float

Seaglider

ITP
• Navigation at 900 Hz, 6 times per day, 20 seconds per signal.

• Office of Naval Research (ONR) and Naval Undersea Warfare Center (NUWC) undertook a study to assess potential impact on hunting activities.

• The study found that navigation sources had no impact due to distance from hunting areas and the moderate source levels.
2018 Sikuliaq Process Studies

What happens to heat carried in through Bering Strait?

Three focus areas:
1. Shelfbreak and slope.
2. Coastal current
3. Remnant ice edge
Deployed/Recovered
- (3) Science moorings
- (4) Nav moorings
- (3) Ice-based clusters (WINBO, AOFB, ITP)
- (2) WIMBO
- (2) AMOS buoys
- (2) Seagliders, (3) SGX gliders
- (1) Acoustic mooring
- Recovered (1) Harp and (1) NOAA mooring

Shipboard Measurements
- UCTD surveys
- Underway measurements

Instruments (and data!) will be recovered in autumn 2019.
Proposed SODA-AMOS-CAATEX Activity
USCGC Healy 2019

- AMOS navigation sources transmit at 900 Hz for 8 sec, 185 dB, 6 times per day.
- Drifting source buoys transmit at 900-1000 Hz for 60 sec, 185 dB, 6 times per day.
- The CAATEX source transmits at 34 Hz for 15 min, 195 dB, once every 3 days.
- Office of Naval Research (ONR) & Naval Undersea Warfare Center (NUWC) conducted study of potential impact on hunting activities and found no change in conclusions from the previous year.
ONR Arctic Research
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