

Welcome to *PolarConnect*



Northern Chukchi Integrated Study

With PolarTREC Teacher Piper Bartlett-Browne

& Team Researchers Dr. Lee Cooper and Dr. Jackie Grebmeier

August 20, 2019

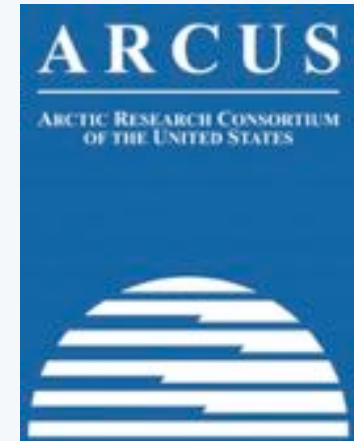
Participant Introductions

**In the Chat box, please introduce yourself
by typing in your:**

- ✓ Name
- ✓ School or Institution
- ✓ The number of students and adults participating with you in the same location

What is PolarTREC?

- Since 2004, the Arctic Research Consortium of the United States (ARCUS), a non-profit organization, has been administering the PolarTREC Program.
- PolarTREC is professional development for U.S. middle and high school teachers and informal STEM educators. They are paired with researchers for 3-6 week research experiences in the polar regions.
- Over 150 educators from around the United States have joined scientists in the Arctic and Antarctica to learn about science, the polar regions, and to share what they have learned with their students and communities.



25 Years of Connecting Arctic Research
www.arcus.org

Questions

During the Presentation:

- Type your question into the text chat box and we will insert your question when the right opportunity arises.
- Don't worry! If we haven't been able to ask your question during the presentation, we will save it for the end.
- At the end of the presentation, we often open the webinar up to family and friends who want to say "Hello" or have any last minute questions for the presenters.

Where Are We?

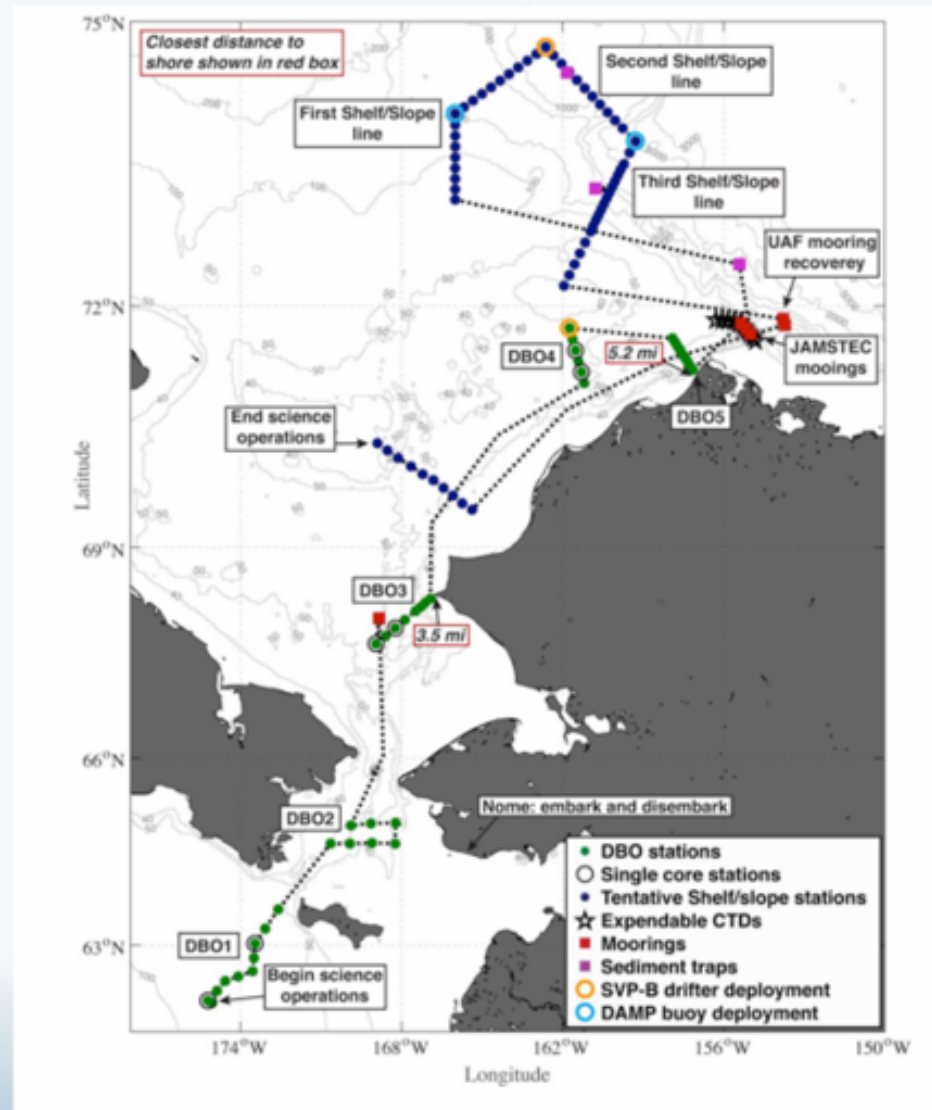


- Aboard the USCGC Healy
- In the Bering and Chukchi Seas
- 40 researchers and 65 Coast Guard personnel on board.



The Distributed Biological Observatory (DBO)

- The DBO is a series of locations that have been chosen for their high biodiversity and/or biomass
- These same locations have been sampled and studied for up to 30 years.
- We have completed DBO lines 1-5 on this expedition.
- While working together, each research team collects different data (atmospheric, benthic, physical oceanography, chemical oceanography, etc.) at each line to create an overview of the area's ecosystem health.

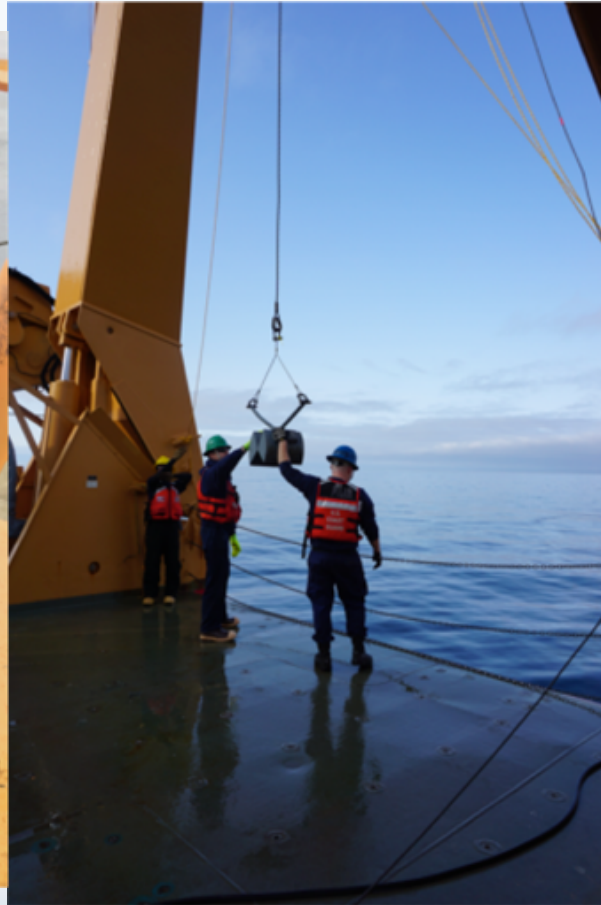


The Benthic Team

- The benthic team is collecting mud and organisms from the seabed to determine productivity, biodiversity, biomass and oxygen demand.



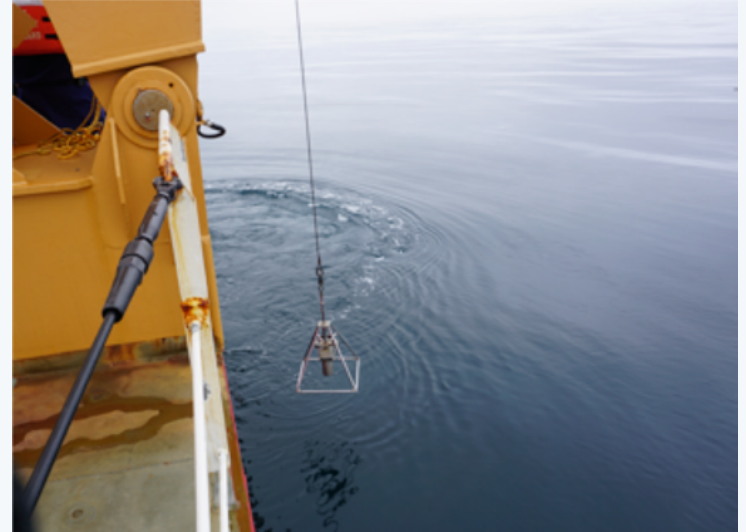
van Veen Grabs



- van Veen grab collects 0.1 m² of mud from the bottom of the ocean.
- Empty it weighs 117 pounds!
- Contents put into a sieve and cleaned to identify for biodiversity.
- The team has seen a reduction in biomass in the last few years including amphipods, which are food for Gray Whales.

HAPS Core

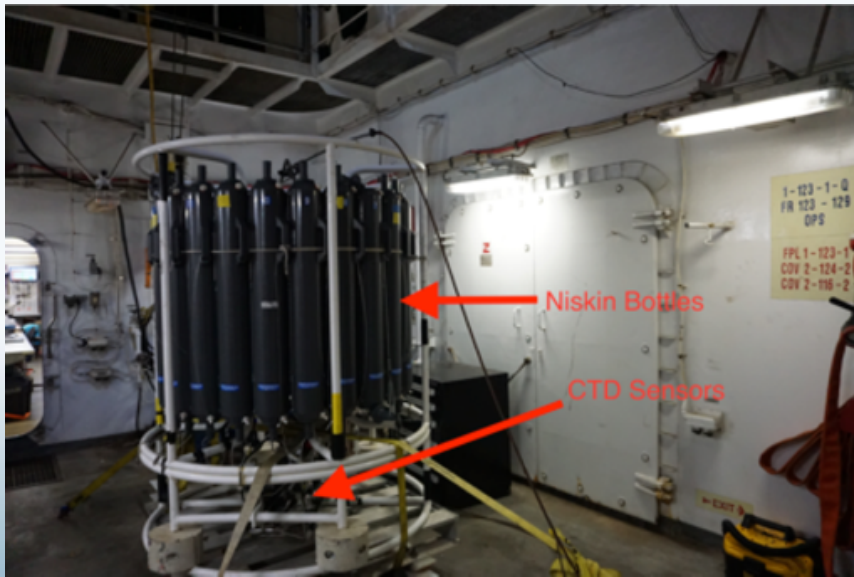
- The HAPS core takes a vertical mud sample that includes the organisms that live there.
- The team is measuring the rate of oxygen use (respiration) by benthic animals in the core samples. This is generally correlated with available food supply



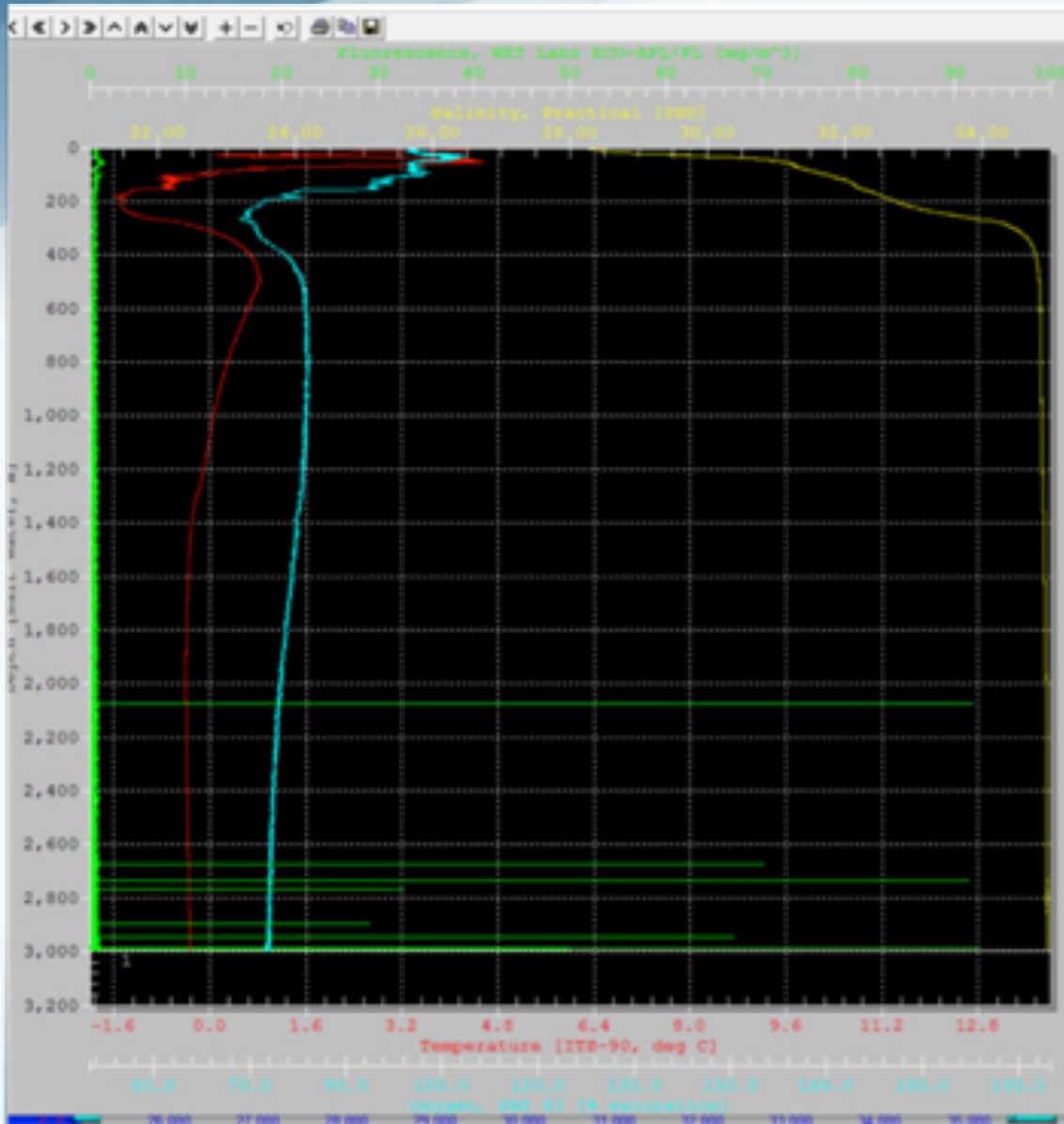
CTD



- Conductivity, Temperature, and Depth sensors.
- Taken at every throughout the expedition to compliment the data collected by the research teams.
- 24 Niskin bottles around the floret collect water at different depths.
- Teams are looking at primary productivity, acidification, algal blooms, and much more.

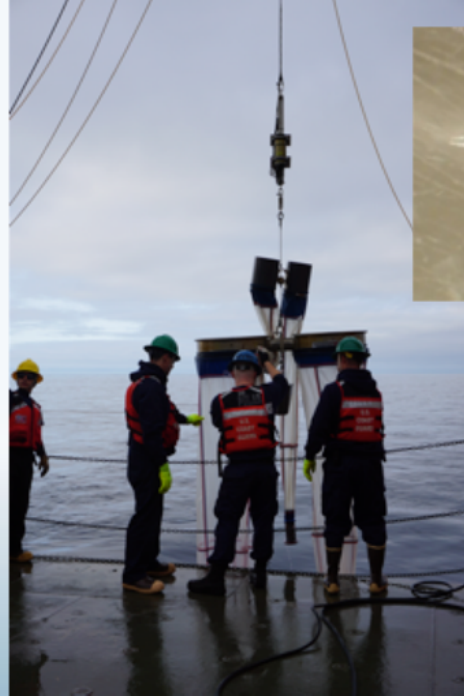


Conductivity-
Temperature-
Depth (CTD)
Trace – This is an
electronic
measurement
made in the
water. Water
samples also
collected from
this device

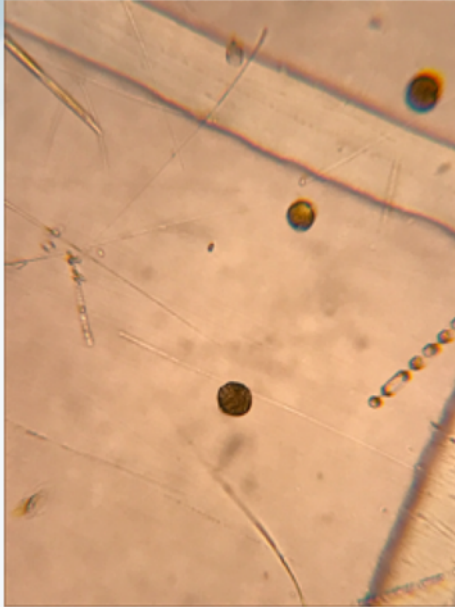


Plankton Team

- Janet Duffy-Anderson, Jan Benson, and Chrissy Hayes are looking at fish larvae (Arctic Cod specifically) to study distribution and abundance.
- Their data help to determine if Arctic species are being out-competed by sub-arctic species moving north
- Arctic Cod thrive in cold waters. Climate change is warming bottom temperatures and their population is at risk of declining.



Harmful Algal Bloom (HABs)



- Evie Fachon and her team from the Anderson Lab at Woods Hole Oceanographic Laboratory are studying harmful algal blooms.
- HABs are photosynthetic so with declining sea ice, they have access to more sunlight and warmer seas. This results in frequent and long-lasting blooms.
- *Alexandrium* sp. are dinoflagellates that cause paralytic shellfish poisoning.
- They have overwintering cysts that live in the mud and can re-animate when conditions improve.



Saildrones



- Drones use wind power to move and solar energy to power sensors.
- They can be remote controlled and spend May through October collecting data in the Arctic.
- The Healy met with one to calibrate the sensors.
- There are at least 16 sensors on the saildrones that include atmospheric, ocean surface, and ocean sub-surface sensors.

Bird Surveys – US Fish and Wildlife Service



- Charlie and Linnaea Wright identify and count seabirds on the bridge.
- They are looking at population densities and diversity.
- Alaska has had a large bird die-off this year with starvation (lack of food) likely a key cause. Diseases could also be contributing factors



Marine Mammals



Also being identified and counted from the ship's bridge

Life on the Healy



- Gym, laundry, store, barber shop, 4 meals a day
- Morale events like trivia and sumo wrestling
- 3 people to a room
- 24 hour science-teams in shifts



Coast Guard Operations



A Special Thanks to...

- Dr. Lee Cooper, Dr. Jackie Grebmeier, and the whole benthic team.
- Jessica Cross, Janet Duffy-Anderson, Evie Fachon, Charlie and Linnaea Wright, and all other research parties.
- Lindsey Leigh Graham (NOAA) for the use of her photos.
- Danyelle Tauscher (USCG IT), Dr. Robert Pickart (Woods Hole), and Trevor Layman (Coast Guard Public Affairs) for making this webinar possible.

Join PolarTREC!

www.polartrac.com/about/join

Everyone can participate in different ways:

- **Follow Expeditions**
- **Participate in PolarConnect Events**
- **Join the Polar Education Email List**
- **Check out the great resources**
- **Become a PolarTREC Teacher or Researcher**
- **Become a member of ARCUS**

Thank You!

An archive of the event will be available shortly.

<http://www.polar-trec.com/polar-connect/archive>



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