

# Welcome to Live from IPY!



With Jillian Worssam & the  
Bering Ecosystem Study '08  
Team onboard the USCGC  
Healy on the Bering Sea

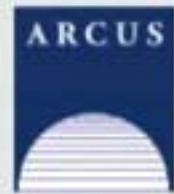
**July 21, 2008**

10:00 AM Alaska Daylight Time [9:00 AM HDT, 11:00  
AM PDT, 12:00 PM MDT, 1:00 PM CST, 2:00 PM EDT]





# Welcome to HorizonWimba



Arctic Research Consortium of the United States

Slides will be shown here

If using VOIP, press here to talk

'Chat' with one person or the entire group

List of all participants

Raise your hand to ask a question

Return to the lobby or exit

The screenshot shows a web browser window displaying a presentation slide. At the bottom of the browser, there is a toolbar with several icons. A red circle highlights the 'TALK' button. Below the toolbar is a chat window showing a list of messages. A red circle highlights the 'Main Room' dropdown menu. To the right of the chat window is a 'People' list showing three participants: Janet Warburton, [redacted], and [redacted]. A red circle highlights the 'Raise Hand' icon in the People list. At the bottom right of the browser window, there is a navigation menu with 'Exit - Lobby - Help' and the ARCUS logo. A red circle highlights the 'Exit - Lobby - Help' text.

**Please note:** Today's event will be recorded and archived at [www.polartrec.com](http://www.polartrec.com).



# **What is PolarTREC?**

PolarTREC is a professional development experience in which K-12 teachers are paired with researchers in authentic polar research experiences.

In the next three years 36 teachers from around the United States will join scientists in the Arctic and Antarctic in celebration of the International Polar Year!

**[www.polar trec.com](http://www.polar trec.com)**



**Wendy Warnick**  
PolarTREC PI  
Executive Director



**Helen Wiggins**  
Program Coordinator



**Janet Warburton**  
PolarTREC  
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**Kristin Timm**  
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**Ronnie Owens**  
Web Developer



**Ben Wade**  
Web Developer



**Tina Buxbaum**  
Electronic Media  
Project Manager



**Zeb Polly**  
Systems Administrator



**Joed Polly**  
Video Production

...with help from the  
entire staff at ARCUS



# International Polar Year (IPY)

2007-2009



The International Polar Year (2007-2009) is an exciting scientific campaign focusing on the world's polar regions!

IPY is a time for discovery, science, learning, and awareness about the polar regions with activities for youth, scientists, and the public.

**[www.ipy.org](http://www.ipy.org)**

# Where is Ms. Worssam & the Team?





**Chukchi Sea**

**Russia**

**Bering Strait**

**Alaska  
(USA)**

**St. Lawrence Island**

● **Anchorage**

**St. Matthew Island**

**Nunivak Island**

**Bering Sea**

**Gulf of Alaska**

● **Dutch Harbor**

**Aleutian Islands**

**Pacific Ocean**

*Map courtesy of  
Wikipedia Commons*

## US Coast Guard Cutter Healy





# Bering Ecosystem Study '08

**Dates: June 30 - August 2, 2008**

**Location: Bering Sea**

The team will conduct sampling along a series of transects over the eastern Bering Sea, with scientists documenting ocean conditions and the productivity of the Bering Sea ecosystem with measurements of the temperature, salinity, and nutrient content of the sea water, changes in sea ice cover, and the concentration of nutrients used and released by phytoplankton.

They will also conduct surveys of various marine organisms to assess the health of these populations, and give scientists an indication of the current status of the Bering Sea ecosystem and any changes that might affect the use of its resources, and the economic, social and cultural sustainability of the people who depend on it.



# Teachers at Sea / PolarTREC & The Armada Project



**Jillian Worssam**  
Project New Start  
Flagstaff, AZ

**John Karavias**  
Walt Whitman High School  
Huntington Station, NY



# Who are we talking with today?



**Ray Sambrotto**

Columbia University



**Alexei Pinchuk**

University of Alaska  
Fairbanks



**Tracy Shaw**

Oregon State  
University - Hatfield  
Marine Center,  
NOAA



**ENS Tara Schendorf**

Public Affairs Officer  
Assistant Marine Science Officer  
USCGC HEALY (WAGB-20)

# Welcome to The International Polar Year!



# Why

Why Study the Bering Sea?

One of the most productive marine ecosystems in the world.

Produces \$1.7 billion in fish catch each year.

Supports an abundance of birds & marine mammals.

Supports an extensive local harvest.

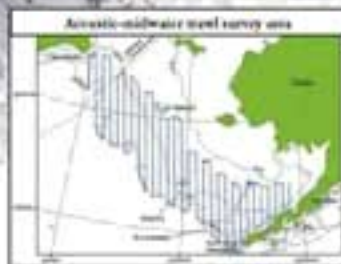


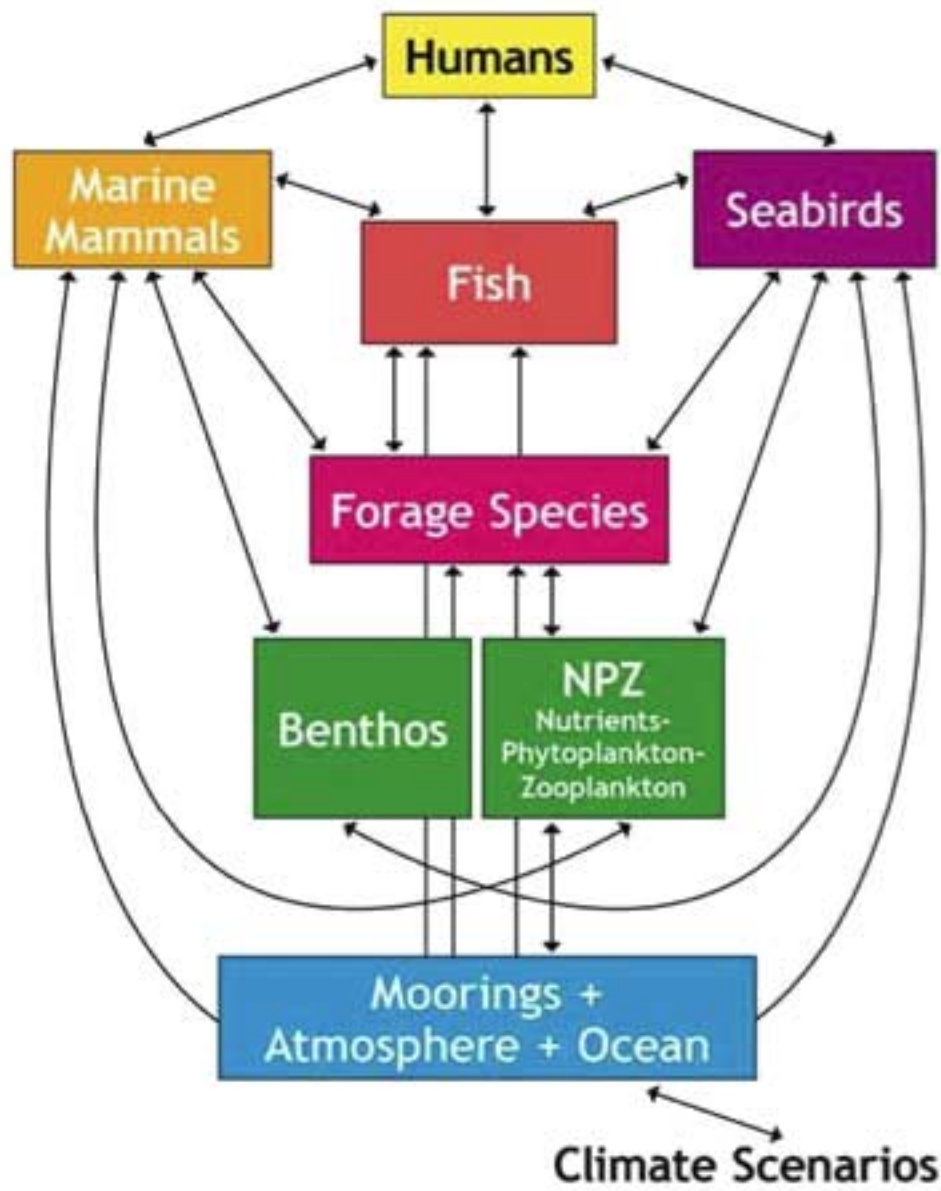
## Cruise Planning

Multiple meetings involving Coast Guard & Scientists

Truckloads of equipment & supplies loaded in Seattle

Planning results in over 60 days of time at sea each year.





Modeling

Data Management

Education + Outreach

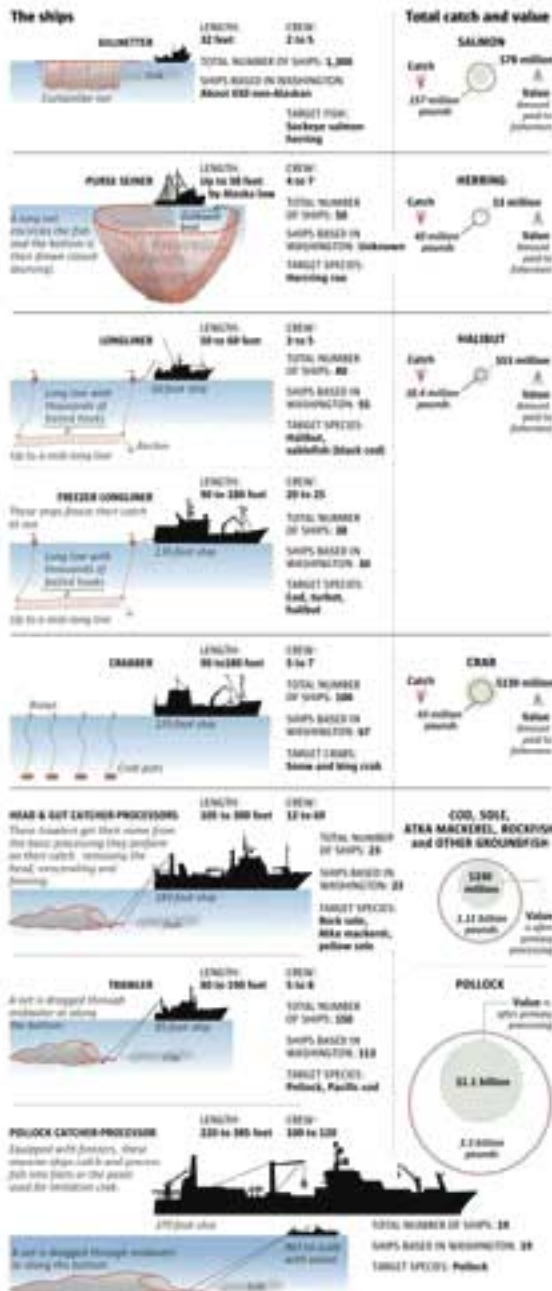
# Late-April ice edge



Sources: FSRI, NOAA/PMEL

MARK NOWLIN / THE SEATTLE TIMES



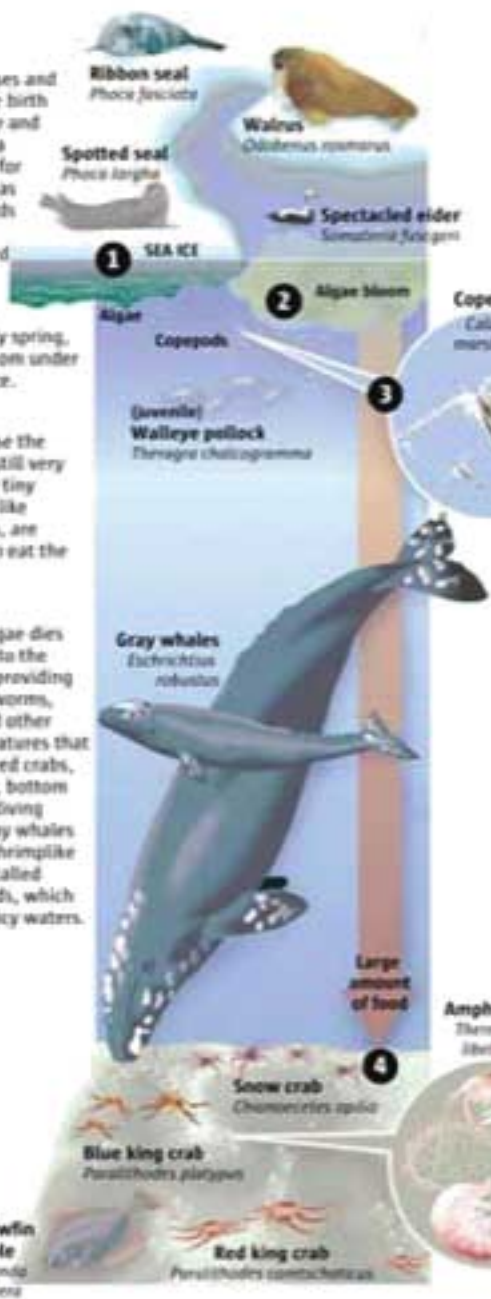


**1.** Walrus and seals give birth on sea ice and use it as a platform for hunting, as do seabirds like spectacled eiders.

**2.** In early spring, algae bloom under the sea ice.

**3.** Because the water is still very cold, few tiny animals, like copepods, are around to eat the algae.

**4.** The algae dies and falls to the bottom, providing food for worms, crabs and other small creatures that in turn feed crabs, walrus, bottom fish and diving birds. Gray whales feed on shrimplike animals called amphipods, which thrive in icy waters.



**1.** When the water doesn't freeze, or the ice melts early, walrus and seals have fewer places to give birth. Forced into deeper waters further north where ice remains, walrus can't reach the bottom to forage for clams.

**2.** Without ice to provide a substrate, algae don't bloom until later in the spring.

**3.** In the warmer waters, zooplankton, including copepods, flourish, consuming the algae.

**4.** The zooplankton provide food for small fish, including juvenile walleye pollock and cod, which also spread north as the pool of cold water shrinks; orca feed on the adult pollock and cod.

**5.** Less food reaches the bottom for crab and other bottom-feeders.

Sources: "B. Moore (University of Alaska) in the Northern Bering Sea," Science, vol. 311, March 10, 2006; "B.C. Bering Ecosystem Study Science Plan," Arctic Research Consortium of the United States (ARCUS), 2004

# Zooplankton, fish production, and seasonal bioenergetics

Ron Heintz (NOAA)

Nicola Hillgruber (UAF)

Alexei Pinchuk (UAF)

Elizabeth Siddon (UAF/NOAA)



# Zooplankton and fish production team

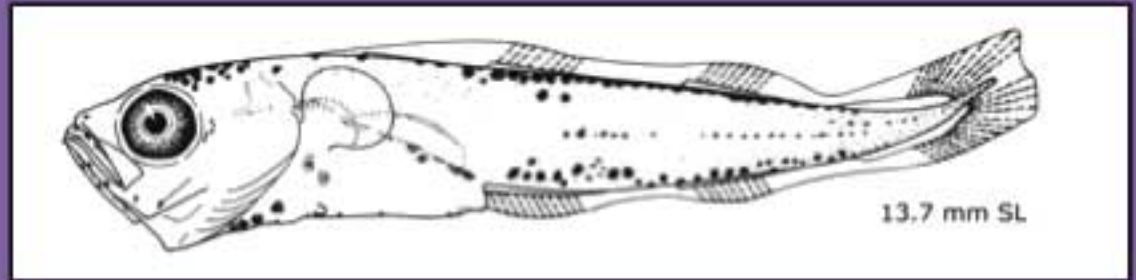


# Our project goals

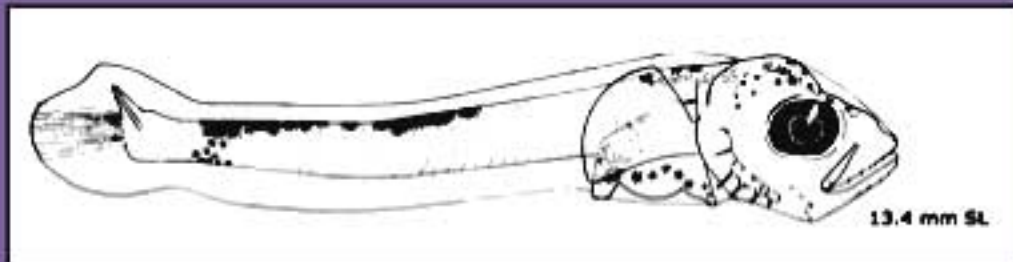
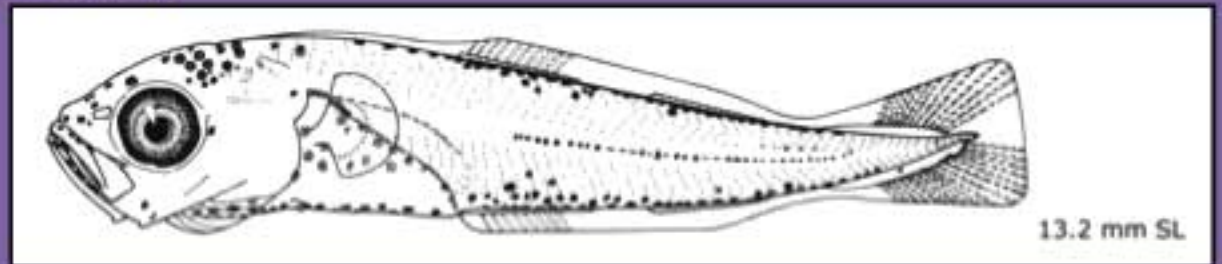
- Describe the distribution of fish larvae with season and between years.
- Examine the condition of fish larvae with season and between years.
- Understand the transport pathways for larval fishes in the eastern Bering Sea.
- Measure zooplankton communities across broad temporal and spatial (i.e. north to south and cross-shelf) gradients/ domains
- Understand the interactions between our observations and environmental conditions (e.g. water temperature, mixing events), shelf edge processes, and other factors known to govern Bering Sea community structure and function (e.g. timing of sea ice retreat)

# Fish species of interest

Walleye pollock (*Theragra chalcogramma*)



Pacific cod (*Gadus macrocephalus*)



Arrowtooth flounder  
(*Atheresthes stomias*)

# Zooplankton

## Copepods



## Euphausiids (krill)



© CGRISWOLD

# Zooplankton

## Jellyfish



## Pteropods (pelagic snails)

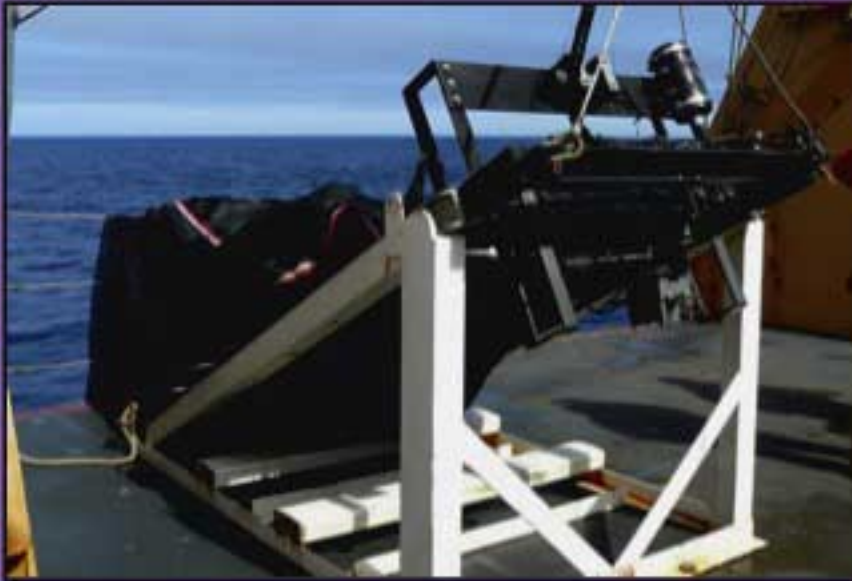


## Arrow worms

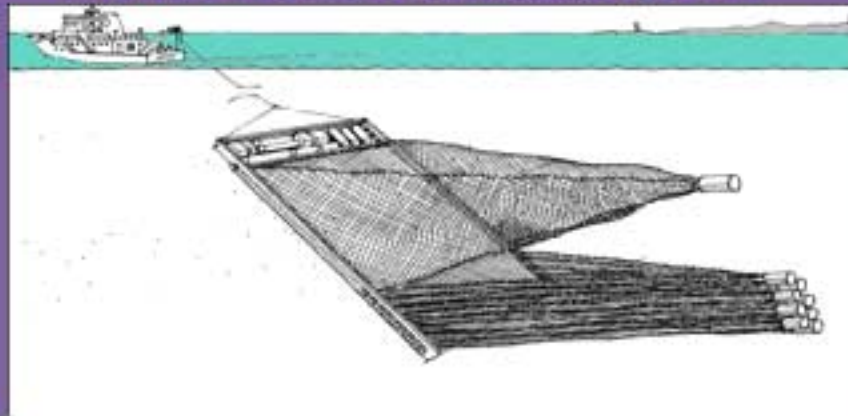


# Sampling methods

The **MOCNESS** to target krill and fish larvae



**M**ultiple **O**pening/**C**losing **N**et and  
**E**nvironmental **S**ampling **S**ystem



The **CalVET** net for vertical tows to target small zooplankton species



**Cal**ifornia **V**ertical **E**gg **T**ow net



# Our team at work



# Example of a zooplankton catch



(Picture A. Feldmann)

Different water depths contain vastly different organisms





# Meet Tracy Shaw & The Krill Grazers




# Zooplankton



- Krill (euphausiids) are important as food for fish, birds, and whales
- Goal of our research is to understand how changing sea-ice conditions affect krill
- One result of changing sea ice conditions may be that the food available to krill will change
- We are conducting feeding experiments to determine whether euphausiids prefer certain food types and whether they feed differently under different environmental conditions



A person wearing a yellow safety vest, dark jacket, and a helmet with goggles is standing on a ship's deck. They are leaning forward and pointing their right arm towards the right side of the frame. The deck is covered with a metal grating. In the background, there is a large body of water and a hazy sky. A white rounded rectangle is overlaid on the right side of the image, containing the title text.

## The Science of the U.S. Coast Guard Cutter Healy

LTJG Newton sending  
of the helicopter

*Bering Ecosystem Study '08*  
[www.polarrec.com](http://www.polarrec.com)







The crew taking a break and playing some Risk



Chief Rivera-Maldonado and Senior Chief Beasley observing ice operations

Bering Ecosystem Study '08  
[www.polarrec.com](http://www.polarrec.com)



MST2 Wright advancing to MST1 Wright

Bering Ecosystem Study '08  
[www.polarrec.com](http://www.polarrec.com)











# Smooth Sailing with The International Polar Year BEST Team!



## Questions?

Bering Ecosystem Study '08  
[www.polarrec.com](http://www.polarrec.com)

# Check out and register for upcoming events!



**28 July 2008—Jillian Worssam on the USCGC Healy, Bering Sea**

**8 August 2008—Missy Holzer and team in Svalbard, Norway**

*Register for these events and watch for others at [www.polartrec.com](http://www.polartrec.com)!*

# Thank You!



For more information, please  
visit [www.polartrec.com](http://www.polartrec.com)

Or Call 907-474-1600

Email: [infr@polartrec.com](mailto:infr@polartrec.com)



ARCUS

