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### Notes on an adventure

A flagstaff middle-school teacher writes to Daily Sun readers from her PolarTREC adventure on the Bering Sea

By JILLIAN WORSSAM Special to the Sun Sunday, August 03, 2008

Editor's note: Jillian Worsam is a teacher at New Start Middle School with the Flagstaff Unified School District. She e-mailed the Daily Sun just before embarking on her four-week adventure this summer on the Healy, a U.S. Coast Guard vessel conducting research in the Bering Sea.

Although she said she has been out before with the National Oceanic and Atmospheric Administration (NOAA), this is her first Coast Guard adventure. She wanted to share her science experiences and tales of life aboard a Coast Guard vessel. Worsam is serving as a teacher with PolarTREC, an educational research experience. Funded by the U.S. National Science Foundation and managed by the Arctic Research Consortium of the U.S., PolarTREC involves K-12 teachers in polar research. Teachers have an opportunity to work closely with scientists, as a pathway to improving science education.  Betsey Bruner, community editor

Welcome to the Bering Sea, one of the world's most unique and productive oceanic ecosystems. Bordered by Russia on the west the Aleutian Islands to the south and Alaska on the north and east, this two million kilometer extension of the Pacific Ocean produces approximately \$1.7 billion in fish catch every year.

Though harsh and often deadly in winter, summer months are typically calm with lots of fog, and allow for extensive research in monitoring how this ecosystem is developing with global climate changes.

And that brings us to BEST (Bering Ecosystem Study) a grant (funded by the National Science Foundation) designed to tell how climate change will affect this wonderfully rich marine ecosystems of the eastern Bering Sea.

#### CHANGES WITH ICE MELT

So, here I am aboard the Coast Guard Cutter "Healy," in their third "BEST" cruise this year. I am accompanied by an extensive scientific team of 48 people, studying everything from radon gas to juvenile pollock, from krill grazing, to iron sampling, right whale watchers to ornithologists, we are all here.

This research has one overlying goal, to document and hopefully make predictions on how this breathtaking ecosystem will alter and develop as temperature, faster melting sea ice and other effects of climate change, work on the living and non living components of the Bering Sea.

Every day is something new, as we move farther north along the Eastern Bering Sea Shelf.

This morning started with a CTD (Conductivity, Temperature, Depth) cast, followed by a cast for collecting iron in the water column, then it was the Multi-Core



In thick fog, some of the research scientists return to the Healy after a day at St. George Island. (Courtesy Photo)

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collecting sediment samples from 170 meters below on the shelf surface.

We then traveled to another station and did a calvet (a vertical tow for collecting micro zooplankton species).

DEVICES AT SEA

With so many scientists on board it is an amazing juggle to make sure that all research is being completed. What I find so fascinating is the collaboration on board. Scientists from Maryland, Oregon, Washington, and Alaska are all working together in shared research to better understand the dynamics of this ecosystem.

There are even scientists from Russia, France, Germany and India, all dedicated to learning more about the Bering Sea, and understanding the changes that might take place as the ice melts.

I haven't even mentioned the moorings, subsurface and bottom dwelling devices designed to be at sea for a year, collecting, and even transmitting real time data to scientists. Some of the mooring equipment includes:

Fluorometer -- measures chlorophyll (primary productivity organism) concentrations.

MicroCat -- measures conductivity, temperature and depth.

HOBO sensor -- a temperature sensor to look at the water column and temperature changes.

ADCP -- an Acoustic Doppler Current Profiler sends out a frequency, gets a return signal that has bounced off small animals and or particles that FLOAT/MOVE with the current (not swim) which can give them the speed and direction of the current.

As you can tell I am learning a lot. This is all new terminology for me, and new science.

BRINGING KNOWLEDGE BACK

Living in Flagstaff does not provide many opportunities to study an oceanic ecosystem, but thanks to the National Science Foundation and programs like PolarTREC, educators can experience some of the earth's most challenged and changing ecosystems.

I can then take the knowledge I have learned and bring it back to my students, we can observe aquatic changes in Frances Short Pond, go to Oak Creek and look at the species that inhabit a riparian ecosystem and compare with some of the shore species let's say on an island like Unalaska.

Another objective for me is to show that no matter where you are on the earth our ecosystems merge, there are common elements and to think that humans can radically alter one ecosystem and not affect others is naive. Though we might live in Flagstaff, we too are affected by the reduction in sea ice that forms within the Bering Sea.

We are little over half way through with leg three of this year's "BEST" research cruises. It has been amazing and I still have 14 more days to learn and explore.

I miss the monsoons of summer, but this year I am luckily getting a whole new perspective on another form of water, salt water, in the Bering Sea.

Infobox:

Readers interested in the day-to-day log of research aboard the Healy can follow along at:

[www.polar-trec.com/bering-ecosystem-study-08/journals/jillian-worssam](http://www.polar-trec.com/bering-ecosystem-study-08/journals/jillian-worssam)



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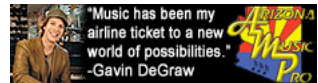
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