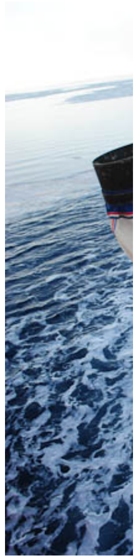
Beaufort Gyre Exploration Project: Dispatch 5: Plankton, Bongos, and Tigers of the Sea

Alex Kain
September 21, 2009

This morning's rough seas prevented the *Louis* from refueling, a process that requires an entire day and the pumping of two-million liters of fuel
Chief Scientist Sarah Zimmermann decided to travel farther north for rosette deployments and to return tomorrow to the fueling site.

The downtime today allowed scientists to begin analyzing samples that have been obtained during the first days of the expedition. One of those
Ocean Sciences (IOS) in Victoria, British Columbia. Kelly's zooplankton research is unique on board the *Louis*--among an array of physical and
In an interview, Kelly explained the importance of gathering biological samples from the Beaufort Sea and how zooplankton help explain the mo

Kelly Young, a seagoing technician from IOS, specializes in Arctic zooplankton research.



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Why is it important to study Arctic zooplankton?

Zooplankton are one trophic level away from the bottom of the food chain. They link larger marine species to the ocean's most fundamental sou
ocean's biological productivity--a high zooplankton concentration is required to sustain biodiversity in a given area.

Zooplankton are drifters and they need to exist in areas with stable currents that won't sweep them into regions where they won't survive. They'
conditions. For example, during El Niño years, zooplankton typically found off the coast of California end up drifting in a warm current to the coa

How are the biological samples obtained?

We collect samples in giant mesh sieves called bongo nets, which we tow vertically to the deck of the ship from a specified depth. The nets fun
from the fishing industry. We then disconnect the cod ends from the nets and transfer the samples into glass jars. We usually sample 100 meter
productivity in the water. There's lots going on below that depth, so occasionally we'll do up to 1000 meters, but that takes a long time to deploy

How do you calculate zooplankton distributions from your bongo data?

We have flow meters on the tops of all the nets, which measure the volume of water going through all the nets. From this data we can determine

From the top, plankton nets resemble a set of bongo drums, giving them the nickname "bongo nets". Flow meters are fastened to the center of each net frame.

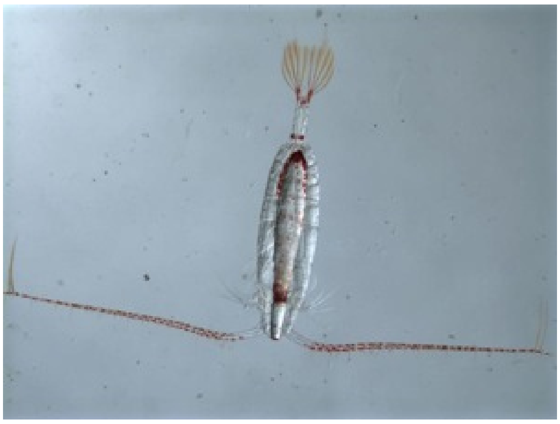
Lori Waters and Hugh Maclean from IOS and Louis sean the bongo nets as they descend into the water from the s

What sort of research will be performed on these samples?

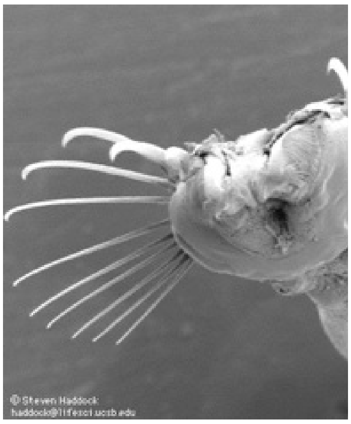
All the samples and data we obtain go to IOS scientists for genetic, oceanographic, and physical studies. Zooplankton samples preserved in eth zooplankton distribution throughout the ocean. Formalin, a solvent that preserves zooplankton anatomy, is used to store taxonomic samples. All understand how, when, and why they move.

What zooplankton species have been recovered during this expedition?

You can obtain up to forty unique species in one bongo net deployment. The majority that you see, though, are copepods, red-looking things wit worms, but jokingly called Tigers of the Sea because they eat everything. If you see a close-up picture of the worm's head, it's got these huge, fa forward and swallows it whole. There's also a common Arctic jelly species called a Aglantha digitale. You find them ubiquitously throughout the A beginnings of something that resembles a spinal cord, called a notochord.



A common Arctic copepod. Image courtesy of NOAA.



Electron scanning micrograph of a Tiger of the Sea, head showing its g Image courtesy Steven Haddock, U

We get mollusks in the form of pteropods, such as sea butterflies (with shells) and sea angels (without shells). Both have cool, jelly-like, transpar angels completely depend on the shelled pteropods for a food source. The two are pretty tightly linked--where you find one you find the other.

Limacina helicina, or a "sea butterfly." Its shell resembles the typical nautilus shape of a snail shell. Image courtesy of Arctic Ocean Diversity Project.

Clione limacina, or a sea angel. Imag
Ocean Diversity Project

Zooplankton samples obtained on September 20. Copepods appear as red specs.

Lori Waters inspects a cod end while
jars.

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