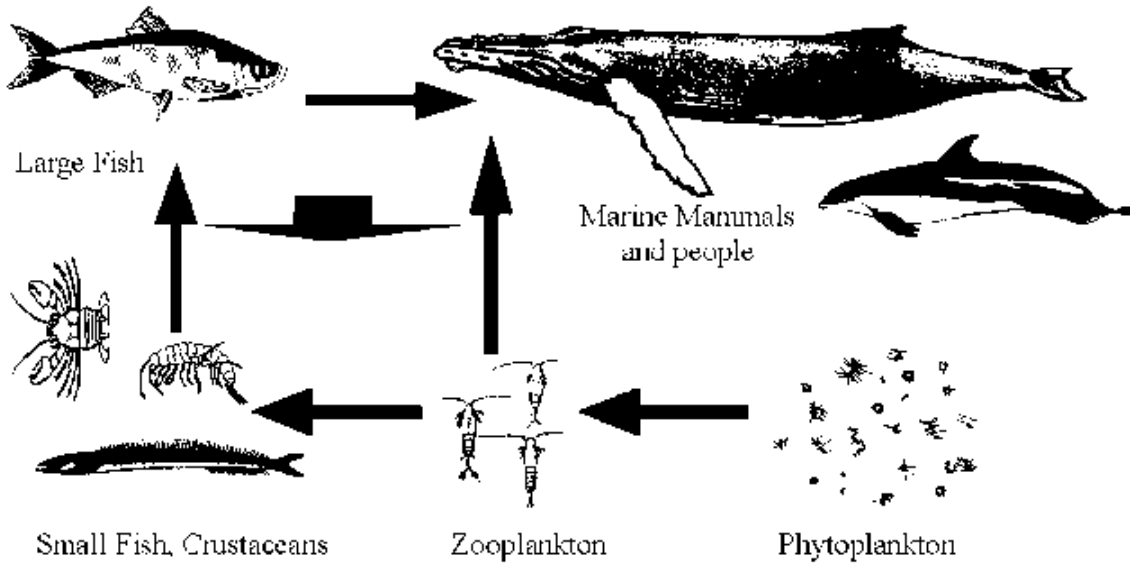
NOAA Teacher at Sea
Kathryn Lanouette
Onboard NOAA Ship *Oscar Dyson*
July 21 – August 7, 2009

NOAA Teacher at Sea: Kathryn Lanouette
NOAA Ship *Oscar Dyson*
Mission: Summer Pollock Survey
Date: Tuesday, July 28, 2009

Weather Data from the Ship's Bridge
Visibility: 8 nautical miles
Wind direction: 015 degrees (N, NE)
Wind speed: 7 knots
Sea wave height: 1 foot
Air temperature: 7.6˚C
Seawater temperature: 7.3˚C
Sea level pressure: 29.8 inches Hg and falling
Cloud cover: 8/8, stratus

Science and Technology Log
In addition to studying walleye pollock, NOAA scientists are also interested in learning about the really tiny plants (**phytoplankton**) and animals (**zooplankton**) that live in the Bering Sea. **Plankton** is of interest for a two reasons. First, phytoplankton are the backbone of the entire marine food chain. Almost all life in the ocean is directly or indirectly dependent on it. By converting the sun's energy into food, phytoplankton are the building blocks of the entire marine food web, becoming the food for zooplankton which in turn feed bigger animals like small fish, crustaceans, and marine mammals.



A simplified marine food chain
(Note: A complete marine food web involves hundreds of different species.)

Second, zooplankton and small fish are the primary food source for walleye pollock. By collecting, measuring, and weighing these tiny animals, scientists are able to learn more about the food available to walleye pollock. In addition, every time the scientists **trawl** for walleye pollock, the stomachs of 20 fish are cut out and preserved. Back at a NOAA lab in Seattle, the contents of these fish stomachs will be analyzed, giving scientists a direct connection between walleye pollocks' diet and specific zooplankton populations found throughout the Bering Sea.

The Methot net is the square shaped net in the background. It was just brought up and is filled with hundreds of zooplankton.

Two important zooplankton groups in the Bering Sea are copepods and euphausiids (commonly referred to as krill). Euphausiids are larger and form thick layers in the water column. In order to catch euphausiids and other zooplankton of a similar size, a special net called a **Methot** is lowered into the water. This fine meshed net is capable of catching animals as small as 1 millimeter. The same sonar generated images that show walleye pollock swimming below the water's surface are also capable of showing layers of zooplankton. Using these images, the scientists and fishermen work together, lowering the net into the zooplankton layers.

Once the Methot net is back onboard the boat, its contents are poured through fine sieves and rinsed. All species are identified. A smaller sub sample is weighed and counted. This information is applied to the entire catch so if there were 80 krill, 15 jellyfish, and 5 larval fish in a sub sample, then scientists would approximate that 80% of the entire catch was krill, 15% was jellyfish, and 5% was larval fish. Having only seen photos of some of these zooplanktons, it was interesting to hold them in my hands and look at them up close. They seemed better suited for space travel or a science fiction movie than the Bering Sea!

Here I am sorting different zooplankton species

Personal Log

The day before, I caught my first glimpse of Dall's porpoises. This pod of porpoises came swimming alongside the boat. It was awesome to see their bodies rise and fall in the water. I was surprised at how quickly they were swimming, darting in and out of the *Oscar Dyson*'s wake. Today, I also got my first glimpse of a whale! It was a fin whale, a type of **baleen whale**, about 20 meters from the boat. It was exciting to watch such a

large mammal swimming in such a vast expanse of water. I'm hoping to see a few more marine mammal species before we return to port.

The seas have been very calm for the last five days, at times as smooth as a mirror. I'm surprised that I've gotten used to falling asleep in the early morning hours and waking around midday. Now that I've adjusted to the 4pm to 4am shift, I'm wondering how strange it will be to return to my regular schedule back on the east coast.

Answer to July 25th Question of the Day: Why are only some jellyfish species capable of stinging?
As I picked up my first jellyfish in the wet lab (asking at least twice "Are you sure this won't sting?"), I wondered why some jellyfish don't sting. So I did some reading and asked some of the scientists a few questions. Here is what I found out: All jellyfish (called "gelatinous animals" in the scientific world) have stinging cells (nematocysts) in their bodies. When a nematocyst is touched, a tiny barb inside fires out, injecting toxin into its prey. It seems that in some jellyfish, the barbs are either too small to pierce human skin or that nematocysts don't fire when in contact with human skin.

Animals Seen
Capelin
Dall's porpoise
Euphausiid
Fin whale
Hyperiid amphipod
Slaty-backed gull

One euphausiid and two different species of hyperiid amphipod (They are between 1-3 cm long)

New Vocabulary
Baleen whale – a whale that has plates of baleen in the mouth for straining plankton from the water (includes rorqual, humpback, right, and gray whales)
Methot net – a square framed, small meshed net used to sample larval fish and zooplankton
Phytoplankton – plankton consisting of microscopic plants
Plankton – small and microscopic plants and animals drifting or floating in the sea or fresh water
Trawl – to fish by dragging a net behind a boat
Zooplankton – plankton consisting of small animals and the immature stages of larger animals

Question of the Day: How has the walleye pollock biomass changed over time?