



NOAA Teacher at Sea
Karen Matsumoto
Onboard NOAA Ship *Oscar Elton Sette*
April 19 – May 4, 2010

NOAA Teacher at Sea: Karen Matsumoto

NOAA Ship: *Oscar Elton Sette*

Mission: Transit/Acoustic Cetacean Survey

Geographical Area: North Pacific Ocean; transit from Guam to O‘ahu, Hawai‘i, including Wake Is.

Date: Thursday, April 22, 2010

Science and Technology Log

Acoustic monitoring for cetaceans is a major part of this research effort. A hydrophone array is towed 24 hours each day, except when it needs to be pulled up on deck to allow for other operations, or required by weather or other maneuvers. The hydrophone array is hooked up to a ship-powered hydraulic winch system that brings up or lowers the hydrophone into the water. A team of two acoustic scientists listen to the hydrophone array during daylight hours and collect and record data by recording the sounds made by cetaceans, and locating their positions.

Sonobuoys, as described in the previous log entry are also used to collect acoustic data. Sonobuoys transmit data to a VHF radio receiver on the ship. Scientists monitor these buoys for an hour each recording session, and often communicate with the other group monitoring the hydrophone array about what they are hearing or seeing on the computer screen. They often don't hear or see the same things!



Left: Launching the hydrophone array.



Below: Monitoring the array.

A standard set of information is recorded each time a sonobuoy is launched. This includes the date, time (measured in Greenwich Mean Time!), Latitude and Longitude, approximate depth of the ocean where the buoy was launched, as well as specific information on the buoys. This is just like the information you would record in your field journals when conducting your own field investigations.



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Top: Setting the buoy instructions.

Top right: Launching the buoy into the water.

Right: Success! When the buoy is deployed, the orange flag pops up.



One of my duties as Teacher at Sea is to conduct acoustic monitoring. This means checking the buoy and setting it to the correct settings so information can be received by VHF radio, and data collected by computer on any cetacean vocalizations we may observe. Many of the cetacean calls can't be heard, only seen on the computer screen! The computer must be visually monitored, and it takes a keen eye to be able to pick out the vocalizations from other "noise" such as the ship's engine, sounds of the water hitting the buoy, and even the ship's radar!

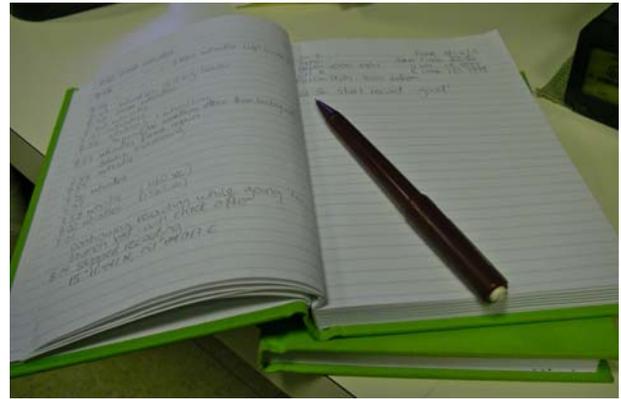
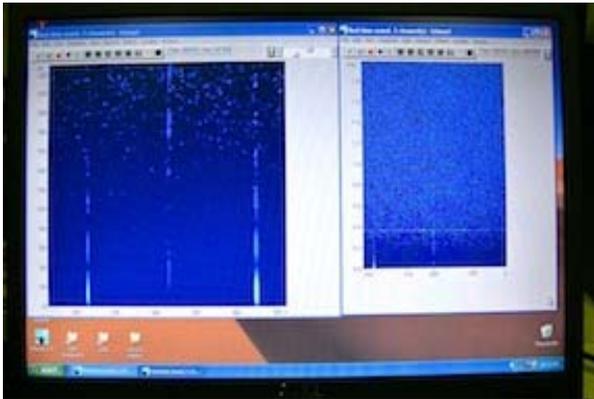


Above: Karen listening in and visually monitoring the Sonobuoy. I can actually hear minke whales "BOINGING"!

The person monitoring the buoy also wears headphones to hear some of the vocalizations. Clicks and "boings" made by some cetaceans can be heard by humans. Other sounds made by cetaceans, especially the large baleen whales are very low frequency, and can't be heard by the human ear.



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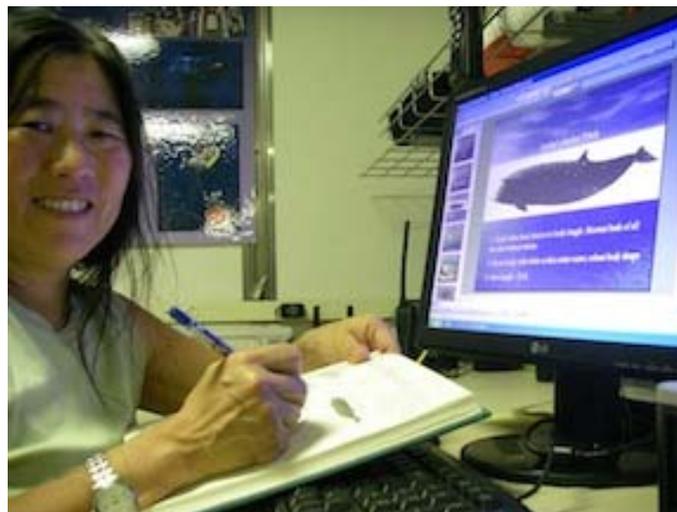


Left: Data is collected and recorded on the computer on a program called “Ishmael”.
Right: All observations are also hand written in a “Sonobuoy Log Book” to help analyze the computer data and as back up information.

Personal Log

There is so much to learn, and I am anxious to get up to speed with the research team (which could take many years!). I have always been fascinated by cetaceans, and have had a keen interest in gray whales since whale-watching on the coast of California since I was a child. Grey whales have also been an integral part of the culture of First Peoples living on the Washington Coast, and so I have been interested in learning more about them.

I am an avid birder, and it is always an exciting challenge to go to a new place, learn about other ecosystems and see birds I am not familiar with. I have always loved pouring through and collecting field guides, which are like wish lists of animals I want to see someday. Out here in the western Pacific ocean, I have a whole new array of whales for me to learn about, and learn how to identify by sight and sound! I have been reading my new field guide to whales and dolphins, reviewing PowerPoint presentations about them, and trying to learn all I can, as fast as I can! I have been drawing whales in my journal and taking notes, which helps me to remember their shape, form, and field identification features. At the top of my wish list is to see a sperm whale! I'll be happy just to hear one, knowing they are here!



Karen sketching whales in her journal to learn their profiles and field marks.



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Question of the Day: Did you know that many baleen whale vocalizations are at such a low frequency, that they can't easily be heard by the human ear? We need computers to help us "visually hear" calls of fin, sei, blue, and right whales.

New Term/Phrase/Word of the Day: mysticetes = baleen whales. Mysticeti comes from the Greek word for "moustache".

Something to Think About:

"Call me Ishmael," is one of the most recognizable opening lines in American literature and comes from the novel, *Moby Dick* by Herman Melville, published in 1851. The story was based on Herman Melville's experiences as a whaler. Melville was inspired by stories of a white sperm whale called "Mocha Dick" who allegedly battled whalers by attacking ships off the coast of Chile in the early 1800s! Melville's story was also an inspiration to the founders of Starbucks and also influenced the maker of the acoustic software we are using to track cetaceans on our research trip! (Can you tell me how?)

Animals Seen Today:

- Sooty shearwater
- Wedge-tailed shearwater

Did you know?

The earth has **one** big ocean with many features. The part of the ocean we are studying is called the North Pacific Ocean and divided into three very general regions east to west: The western Pacific, eastern Pacific, and the central Pacific. We are traveling along a transit from Guam, northeast to Wake Island, then almost due east to O'ahu, Hawai'i. Can you trace our route on a map of the Pacific?