



**NOAA Teacher at Sea
Justin Czarka
Onboard NOAA Ship *McArthur II*
August 10 – 19, 2009**

NOAA Teacher at Sea: Justin Czarka

NOAA Ship *McArthur II* (link: <http://www.moc.noaa.gov/mt/>)

Mission: Hydrographic and Plankton Survey

Geographical area of cruise: North Pacific Ocean from San Francisco, CA to Seattle, WA

Dates: August 9-10, 2009

Weather data from the Bridge (August 10, 2009)

Sunrise: 6:26 a.m. Sunset: 20:03 (8:03 p.m)

Weather: fog

Sky: partly to mostly cloudy

Wind speed: 15 knots

Wind direction: North

Visibility: less than 1 nautical mile (nm)

Waves: 9 feet

Science and Technology Log

August 9 was a day for getting all the science gear aboard. In order to conduct a research cruise at sea, you have to plan and pack all the materials you envision needing beforehand. Once out at sea, there is nowhere to stop and pick up additional supplies. Bill Peterson, the chief scientist from NOAA/ Northwest Fisheries Science Center (NWFSC), and another member of the science team, Toby Auth out of Oregon State University, Hatfield Marine Science Center (HMSC), drove down from Newport, Oregon, with all of the science equipment. We used the crane to haul up all the science equipment onto the deck of the *McArthur*. Some of the equipment we hauled onto the ship included bongo frames and bongo nets (used to collect specimen samples in the ocean), Niskin bottles (to collect water samples in the water column at various depths), dissecting microscopes, a fluorometer (to measure the amount of phytoplankton in the water), and crate after crate of sample jars.

In order to transfer all of the science equipment onto the *McArthur II* we laid out a cargo net flat on the pier that the crane



The *McArthur II* at port in San Francisco prior to the cruise. She is 224 feet long with a breadth (width) of 43 feet.

dropped to us. Then we hauled the equipment from the truck and placed it on the cargo net. Next the cargo net holds were attached to the crane, which lifted the materials onto the deck of the ship. We unpacked the cargo net, conducted additional cargo lifts, and then stored all the equipment in the labs. Using the crane sure beat hauling up all the equipment by hand! The scientists have to get all the equipment placed in the labs, which is a lot of work. I helped one of the scientists, Tracy Shaw, who studies zooplankton, set up the dissection microscope by securing it to the table. On dry land, tables will not move around, but we had to tie it down to prepare for any possible rough seas.



This is me working to prepare the CTD for a practice launch in San Francisco Bay. We made sure that the Niskin bottle seals were in working condition.

August 10 we were to set sail in the morning. That has been changed until this afternoon, which gives the science team time to prepare some of the equipment before heading out to sea, along with conducting emergency drills and briefings. This morning the science team and NOAA crew worked together to prepare the **C**onductivity, **T**emperature, and **D**epth (CTD) probe. This involved cleaning the Niskin bottles and replacing cracked O-rings to ensure a secure seal around the bottle openings. If the bottles are not sealed properly, water and air (upon reaching the surface) can enter the bottle from the water column at an undesired location. We also ensured that the lids close tightly, providing a vacuum seal.

Personal Log

Living and working on a boat will be a new experience for me. There are many unknowns in the process, but it is exciting to be learning something new nearly every minute. I took a walk around the ship's interior this afternoon, amazed by how much space is contained inside the *McArthur II*. The staterooms

(where one sleeps) are large, containing a desk and a lounge chair. They also have a sink, with a bathroom that is shared by the adjoining stateroom. The *McArthur* also has a fitness room for staying fit at sea, along with a lounge to for relaxing with movies, books, and even espresso! The *McArthur II* surely will be home for the next nine or ten days.

I have been most impressed with the welcome I have received from both the NOAA crew and the scientists from NOAA, Oregon State University, the Joint Institute for the Study of the Atmosphere and Ocean (JISAO) and the U.S. Coast Guard. Everyone is friendly, helpful, and full of cooperation. It is encouraging to observe the teamwork between people. I appreciate having the opportunity to learn alongside the scientists and crew. Being a teacher, I am used to being the one with the knowledge to impart or the activity to do. It is exciting being aboard

because now I am the student, eager to take notes, ask questions, and learn from those alongside me. I have to say, each person has been an effective teacher! So we are off to Bodega Bay for our first sampling and there's a rumor going around that a Wii Fit competition might be getting under way!

Today's Vocabulary

Transect line- when conducting research at a predetermined latitude or longitude and continue to collect data samples along that line

Niskin bottles- these containers have openings on both the top and bottom. As it drops through the water column it fills with water. At a predetermined depth both ends close, capturing water from that specific depth inside the bottle that can be brought back to the surface and analyzed.

Water Column- a vertical section of water where sampling occurs