



**NOAA Teacher at Sea  
Elsa Stuber  
Onboard NOAA Ship McARTHUR II  
June 4 – 9, 2007**

**NOAA Teacher at Sea: Elsa Stuber**

NOAA Ship MCARTHUR II Cruise S307

Mission: Collecting Time Series of physical, chemical and biological data to document spatial and temporal pattern in the California Current System

**DAY 2: Monday, June 4, 2007 San Francisco to sea**

Visibility: Some fog before 12:00, which later cleared

Wind direction: 282.14

Wind Speed: 9 knots

Sea wave height: 1 foot

Seawater temperature: 14.159 C.

Sea level pressure: 1017.15

Air temperature: 14.1 C

Cloud cover: 100% stratus

**Science and Technology Log**

Awoke 06:00 and did journal work until 07:15 breakfast. Studied cruise information. As suggested by CS Tim, I took a Dramine II last evening and one this morning. I don't want to have seasick problems. I don't feel any side effects from the medication.

Safety meeting 09:00 with FOO Middlemiss. It is important to close the heavy doors when going and coming on the ship. We reviewed procedures for Man Overboard, Fire, and Abandon Ship.

Fire: signal = 10-second continuous bringing of the General Alarm bell and a 10-second continuous sounding of the ship's whistle. Proceed to fantail of ship.

Abandon ship: signal = seven or more short blasts on the ship's whistle followed by one long blast. Bring survival clothing and PFD to life raft location on the bridge. We practiced putting on survival clothing: feet and legs in then hood on your head before putting arms in sleeves and zipping up. Difficult to do getting arms in by yourself; this is not a quick maneuver. Mine was the smallest size; feet and arm-hand portion pretty big on me, but I would survive. I brought my mustang survival jacket along on cruise as well.

Man Overboard: If witnessed throw life ring buoy into the water and call for assistance immediately. After one minute throw a second life ring buoy in the water. Try to keep visual surveillance of the person in the water. Signal = three short blasts on the ship's whistle.

For safety drills, dismissal from drill signal = three shorts blasts on the ship's whistle. Mess hall information, store information, medicine location given.

Ship departed San Francisco approximately 10:15 with very foggy weather, foghorn blowing. It is very loud. If wearing plugs, the hearing of anyone working close to foghorn such as the wildlife observer on the flying bridge would be affected over time. Special ear protection is needed for persons at that observational post. Kathryn Whitaker is the wildlife observer on this cruise. She is stationed on the bridge with a lap top computer to record type and quantity of all birds and sea life she observes. Kathryn is observing from daylight to sundown except going down for meals. She uses powerful binoculars and camera to photograph whatever she sees. On some cruises she has two or more staff working with her, one of whom is typing in the computer all that the observers are calling out that they are seeing which is often a great deal if the ship is nearer shore than we will be for most of this cruise. As we leave SF Bay we see a dead gray whale floating, Kathryn points out the grease trail from the decaying whale blubber floating out on the water. There are cormorants and seagulls in large numbers flying in the area of the ship for the first three and a half hours of our trip. Then we only observe some seagulls.

The overall survey plan is to proceed offshore along CalCOFI (California Cooperative Oceanic Fisheries Investigation) Line 60, occupying stations each 10-20 nMi (nautical miles) to ~175 nMi offshore. Then proceed to stations each 20nMi northeast to station 67-90 at the offshore terminus of Line 67, and work back into shore along Line 67 with stations 10-20 nMi apart. After the station work is completed, the ship will return to San Francisco and offload gear and personnel. I will include the CalCOFI station information in Table 1 and Figure 1 of this report.

Operations at the stations are to collect physical, chemical, and biological data by CTD (conductivity, temperature, depth) and its rosette bottles, net tows, and underway surface measurements. All CTD casts at the stations are to the bottom or 1000 dbars whichever is shallowest. At stations #12 and #16 two deep casts (4500m) are planned conditions and time permitting. Secchi disk cast will be made at daytime stations. HyperPro optical sensor casts are to be made at midday stations. Oblique bongo net tows will be to 200m depths.

CalCOFI survey continuous operations while underway will include logging meteorological and sea surface property, a pCO<sub>2</sub> measuring system in the wet lab, the incubators for chlorophyll seawater samples on the fantail, and the marine mammal observer.

Cast 1 @ 13:51 Station 60-50, Latitude 37.948N & Longitude -122.888W, Cast depth 40m, Bottom depth 48m, CTD cylinders tripped at 40, 30, 20, 10, 5, 1.5, 0 meters  
Data for cast is Table 2 and accompanying data graph including percent beam transmission, depth, temperature, and fluorescence at end of my report.  
Participants: Tim and Erich from MBARI, USN Charlotte, TAS Elsa

This was good hands on practice for the sampling work. Charlotte and I received a lot of help, tips for technique. Tim is very patient with our learning curve.

1. We check stopper at bottom of rosette cylinder to determine that it didn't leak. Pull out stopper and should only be a couple of milliliters squirting out. Then open valve at top of rosette to take the sample.

2. Open stopper by lining up black circle drawn on stopper with peg on stopper and pull out. Rinse 280ml sample bottle three times with @ 15ml of sea water from rosette and then fill sample bottle to overflowing, close stopper. Rinse small nutrient sample bottle 3 times and then fill it half to two-thirds full. Tim and Erich were filling other bottles for C14, N15, POC, QP, HPLC, FCM, and A\* tests which are described below.

3. In wet lab, nutrients numbered sequentially are put in cartons and then promptly put into the freezer. These will be processed later at the MBARI lab.

4. Funnels with filters for the twelve samples were set up prior to reaching the station. Turn on aspirator pump. Filter solutions through flasks. Suction for all samples is improved if you turn off valve on those that have already filtered through. You can't get paper filter off the filter piece if suction is still operating.

Be careful at all times to check that sample number matches its numbered filter apparatus, and glass vial the filter is stored in when filtration complete.

5. Put particular filter for the fractionated 5 micron and 1 micron filtering. Sample is labeled "F" collected by MBARI scientist. Pour 100ml of sample into each funnel for these samples.

6. Add the 10ml. measured amount of 90% acetone to each glass vial with its filter to "fix" the phytoplankton on the filter. Place these in the carton in sequential order to be placed in the freezer. These remain there in the dark for at least 24 hours before we can test for chlorophyll levels with the flurometer.

7. Label samples for casts read for example S307c#2, #5. Meaning June 3-9 Cruise S307 cast #2 sample #5

8. Three other filtrations were done which are color labeled: green POC organic carbon, how much carbon is in the water other than the plankton detritus; red A\* filter will be evaluated in spectrophotometer to get all wave lengths of life, not just chlorophyll; and blue, HPLC -high performance liquid chromatography which will show 23 pigment types commonly associated with different algae so they may be qualified and quantified for the level the sample was taken.

9. The MBARI scientists take the C14 and N15 radioactive samples.

10. Set empty bottles in rack and carrying case and put out on back deck to be ready for the next cast. Put new filters in the 12 funnels in the wet lab to be ready for the next cast.

Chief Scientist Tim Pennington sent a DVD with demonstrations on how different sampling and testing of the samples are handled. It was very helpful to see this walk through ahead, with emphasis on the problems that can arise with the techniques and suggestions on what to do about them.

Cast 2 @ 15:35 Station 60-52.5 , Latitude 37.864N Longitude -123.065W, Cast depth to 80m, bottom depth 90m; CTD cylinders tripped at 80, 60, 40, 30, 20, 10, 5, 0 meters  
Data for cast is Table 3 and accompanying data graph at end of report.

CTD goes down and is monitored by observer in dry lab, CTD technician Doug or Dr. Collins. The observer communicates with the bridge and crew to raise the CTD, stop at each specified depth, and to trip open the particular rosette flask at this depth.

I worked on Cast 2 and became a little more efficient. I'm continuing to try to observe all very carefully so as not to make any mistakes. Procedures are very precise for accuracy.

Casts 3, 4 were not on my watch. During that time I went to the flying bridge to do wildlife observation with Kathryn. There were numbers of cormorants and seagulls. She had seen four dolphins @ half a mile away earlier in the day.

Cast 5 at station 60-57.5 at 21:42 Latitude 36.86N Longitude -123.3612W Cast depth to 1000m; CTD cylinders tripped at 1000, 200, 150, 100, 80, 60, 40, 30, 20, 10, 5, 0 meters Data for cast is Table 4 and accompanying graph at end of report. The water from 1000 meters is very cold, 3.843 C compared to 12.144 C at the surface.

The seas are pretty calm so collecting water samples, working with the equipment, walking around is not a problem. I have no hint of seasickness so I won't continue to take dramamine unless I begin to feel queasy.

Spigot on rosette #12 black circle marker has faded and needs to be remarked.

Go to bed @ 00.30 6/5/07. I'm sharing quarters with three others and my bed is a top bunk. Bunks are not very big, but I'm only 5' tall so size of bunk is not a problem. I can just barely sit up though and it is tricky to make it up in the morning. Plenty of blankets and linens supplied.