

Abbreviated Cruise Log – Jonathan Nash, R/V Pt. Sur RISE cruise CR05, 2 Aug – 26 Aug 2005.

Aug 2-3: Loading. Levi had two chameleons working well with the primary winch and an old line 5c-03-01. This line had several kinks in it, but had been re-terminated and is still usable. We tried out a new line, and found out that it was too small to accept a new line on the new, bigger spools. Also, we were unable to send signal through a new line and this winch. So we took the primary winch off; Mike and Ray fixed slip ring connector, and started using secondary winch.

Aug 4: Left dock at 1900 local time. Did several chameleon profiles in the turning basin. CR05 files 1-10. Collected profiles with both instruments.

Aug 5: 3:00 local time: started profiling on Washington line #1. Using one of last year's lines. 5C-03-01. This line already has lots of bad spots in it.

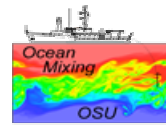
Aug 6<sup>th</sup>: They started losing sync with this when we were at the end of the Oregon line (south). They thought there was a problem at the winch connector, so they changed to the primary winch (now fixed), and used a new line (5C-03-02). They used this for a while, and it started to lose sync, so they swapped for another new line (5c-03-04). When it also started to lose sync, we realized the problem must be in the winch.

Aug 7<sup>th</sup>: Starting early evening, did nearfield along-axis line, which we continued through the following day.

Aug 8<sup>th</sup>: Spent the day profiling in the nearfield along axis line. Lost sync due to a solder blob on the primary winch slip rings. Replaced winch with secondary winch. Replaced the incredibly loud blue motor on the primary winch with a new white one (blue one needs new bearings or needs to be tossed). Fixed solder blob.

Aug 9<sup>th</sup>: Last night, the line jumped out of the plastic block (which was quite asymmetrical; however it jumped through the small crack), and tore up a section near the yellow part of line 5c-03-04, but it still syncs. We got on, did a couple of profiles on our nearfield along-axis line, and Robin broke all the gears in the secondary winch. We don't have a spare for one of the gears. The gears were out of alignment, possibly contributing to the problem. Running also on the large spool notes Ray.

Wecoma deployed several drifters at the mouth, and we happened to follow one of them out with a front, and spent the day profiling back and forth in the outer plume, getting both new and old plume mixing. Wecoma did some CTDs right near us, and we followed the drifter into the night. Returning from this profiling, a magnet fell into the motor and it stopped working. Mike replaced it with the secondary winch's motor, glued the magnet from the old motor back in place with epoxy, and we were off and running. Levi detwisted the line (5c-05-0?), but it wasn't too too bad...



Aug 10<sup>th</sup>. Ran our line which we call the nearfield timeseries (124 9.3' W to 124 11.4 W at 46 14.4 N) starting at 0400. Got an excellent morning of data, lasting into the evening. At 2100, Mike was on the winch and the gear shifter wouldn't keep the drive gear engaged. I drilled a small hole past the original one to fully engage the drive gear as a temporary workaround to keep the timeseries alive.

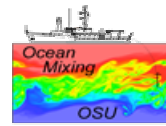
Aug 11<sup>th</sup> – 12<sup>th</sup>. Slip rings again a problem. Shorted out two instruments in diagnosing the problem. Spent the morning fixing the instruments, the winch slip rings, and the winch gear problem (Sam took the oil out, added set screws, tightened others, reglued machine. Now running a modified line 0 as of 1000. Crab pots everywhere. Profiling going marginally well. We ran our inner N-S line (line 0) for several thousand profiles. During this period (files 2880-3000), the FP07 (92-78) changed its calibration drastically so was eventually swapped out for 02-11. Continued running until file 3000ish (0619 GMT) when they started losing sync with line 5c-05-04. Switched to line 5c-04-02, which had a short in it, but was fixed. Also tried 5c-04-01, which had a short in it, which was also fixed (I believe these shorts were in the amphenol connectors?)

Continued on line 0. JN hit a piece of wood on the surface which tore off ¼ of the bottom crusher. Crazy! We replaced it in between 4207 and 4208 and kept on going.

Aug 13<sup>th</sup>: Shredded two more lines during profiles 4922 and 5022. Both of these were destroyed by the new-style block. 5C-04-02 ended up having long slits in the line well down from the instrument. 5C-04-01 jumped off of the block and its jacket also was ripped (through the yellow heat-shrink). The blocks are asymmetrical (there is a different amount of clearance on the left and right sides, so it is very possible to have the line go through the block if it jumps off towards the side with the bigger gap. The new block needs to be redesigned. Mike is looking after this by increasing the size of its sides on each sides of the pulley

Aug 13<sup>th</sup> (cont)... Moved to OR Haystack Rock line for joint operations with Ken on the Wecoma. We ran a E-W that passed both of their 62 and 77-m deep stations. Strong winds from the north allowed us to catch the offshore propagation of the upwelling front, out into the plume waters. Switched to a new line (5c-04-03) and the old-style block (with roller bearings in it – block #3). Starting with this transect, instrument 04-01 began to develop a noise problem (~1 mV at 15 Hz, but appears to be aliased because it is different for different ireps).

Aug 14<sup>th</sup>: after 500 profiles, the line developed an open on positive rail so we changed to line 5c-03-02, which had already been used on this experiment, but was discontinued because of a sync loss problem (that turned out to be a slip ring problem). With the changed line, the noise problem on 04-01 is still there. Line 5c-03-02 only lasted for another 50 drops, then it started losing sync, and instrument was replaced. We were close to the end of our line, so I suggested that Levi get the second instrument (04-04) up and



running with a new line (5c-03-03). There is apparently 37 wraps+72" of lead on it. I'm not sure what this means... perhaps it is leftover from last summer's measuring system. Anyway, it falls at about 1 m/s. One of the shear probes on it was broken; but they were also mislabeled, so that it was difficult to figure out the problem. As it turned out, it was 496 (S2) that was really glitchy. Each of 508 and 506 are ok.

Aug 15<sup>th</sup>: We moved to the WA line for another coordinated set of profiling with the Wecoma. After a bunch of effort (thanks to Ray), we figured out the shear probe problem. Using 03-03, it lost sync routinely on recovery, and never on profile. I suspect it is in the termination. We were able to profile with it for 600 profiles, but I suggest it be retired. Instrument 04-04 had a bit higher vibrational noise level but slightly less electrical contamination (but still there).. Eventually, the FP07 on it (02-12) began to drift. We used it for a while regardless, finally changing back to instrument 04-01. I think that there might be a difference in the dissipation noise levels on each of these, so that is something to keep in mind when doing the analysis. Anyway, the FP07 on 04-04 is new (02-14) and should be ready to go.

Aug 16<sup>th</sup>. Packed up and headed for Astoria. We have both 04-01 and 04-04 ready to go for a timeseries on the 17<sup>th</sup>.

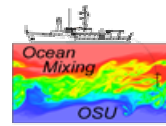
Aug 16<sup>th</sup> – Spent the night in Astoria. Picked up the ISUS that had been repaired in Halifax and was shipped back to us.

Aug 17<sup>th</sup> – Left Astoria at 0600 and got to the timeseries estuary station at 0830. We found a location at 46 15.315' N, 124 0.7' W defined as a quadrangle between the depths 80 80 82 and 81 ft on the 18521 Chart. We started using the 12c-XXX line. We needed a rechargeable battery pack for the ISUS, so Raphe sent one over in a boat at 1800 on the 17<sup>th</sup>.

Aug 18<sup>th</sup> – Left our timeseries station at 1000ish. We headed back out to our long E-W line at 46 14.4' N. We did this line until late afternoon on the 19<sup>th</sup>. We recharged the ISUS battery pack, but unfortunately the battery pack flooded when the ground wire on the endcap was forced into the o-ring. Ray cleaned out the battery pack, soldered all of the burnt-out connections, and got it working again. We charged it up and it gave us another profile or two of nitrate. But unfortunately, it didn't last, so Ray tried to make an alkaline pack, but it too didn't last. So we had no ISUS nitrate sensor.

Aug 19<sup>th</sup> – Continued our long (4km) transect until late afternoon. Then we changed to our short, 1.5 nm line for our timeseries with the Wecoma. Kept same line, same instrument. Might have changed a shear probe out, but apart from that, all continued well

Aug 20<sup>th</sup> - timeseries with the Wecoma. Did periodic CTDs. Continued until late afternoon, at which point we started a front tracking experiment. We started by profiling very near to the mouth, did a CTD there, and then moved outward along 46 14.4' N with the front. We did this for 4 consecutive ebb flows.



Aug 21<sup>st</sup> – Tracked fronts

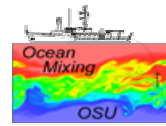
Aug 22<sup>nd</sup> – Continued to track fronts until the afternoon. Then we switched over to start a shortened line 1. The evening went well, but the morning started with a bunch of problems.

Aug 23<sup>rd</sup> - First, the primary winch finally gave up the ghost. The motor fully died. It was coughing and sputtering, first at slow speeds, then at all speeds. Finally, you would have to give it full power to get it to go at all, and then it would be really rough and not able to deal with a load. We replaced the primary winch with the secondary winch which worked fine, but which is really slow. A short time later, Ray started to see a few glitches on pressure near the surface. The realtime display was off by -11 m at the surface; it had been rock-solid at -0.27 m when screaming along the surface. So, we decided there must be a power problem and the line was likely the problem (it's a 12-conductor line with 3 conductors on positive, 3 on ground and 2 on negative.) If it lost one or two of these conductors, the resistance would go up to 54 or 110 ohms (from ~30), causing a drop in the voltage reference. We replaced the line with another 12c-X2-XX line that works great so far. During the morning, we had a bunch of traffic to deal with as well. I decided we had pretty much screwed up that tidal cycle, and Emily did lots of CTDs, and we just got ourselves organized again. Nice sunny day.

Aug 23<sup>rd</sup> (cont). Sam, Ray and I (and then Mike) fixed the winch by placing the new motor on it; it was way quieter, and of similar power to the previous motor. Levi's gang swapped the secondary winch out just prior to the ebb flow. We also shortened the length of the line so that it could be done in less time. Unfortunately, shortly after starting to profile, the motor started to leak oil out of it. Uri had made an oil seal for us (the new motor didn't have a proper one), and I guess this didn't work. Another possibility is that the oil was leaking through a pair of sheet-metal screws in the face of the motor, not through the shaft. Regardless, we're now using the secondary winch, which is ok but a bit slow.

Aug 24<sup>th</sup> – Running smoothly again on the secondary winch; primary is still not functional. The timeseries was pretty disrupted last night, especially during ebb flow. We'll continue this line at least through 1500 to get another good shot at the ebb.

The day went pretty smoothly until the secondary winch had a few gear grinds by persons to remain nameless. The winch self-destructed in Mike's hands. However, I don't think that anyone in specific is to blame. It is true that the shifting gear was not engaging fully, and its teeth were half worn. Probably a chunk of metal from the engaging gear got carried into the drive gear, which ended up losing all of its teeth. Also, one of the gears had loose setscrews, so this is a possible problem as well. I think that that gear could have been offset, so this is a potential cause as well. Regardless, the engaging gear is not fully engaging, so this needs to be fixed before this winch can be used again.



We're back to the primary winch with the thin, long, newish motor on it. Seems to be working fine for the moment. Quieter than the previous ones...

Aug 25<sup>th</sup>. Continued on the shortened line 1 until 6 AM. Started to see glitching in the P and T signals at about 5:30. We turned up the voltage on the positive power supply and this made the glitches go away. But after a while, P,T and many other signals got glitchy, so we pulled the instrument and changed lines to 84-8. We also changed out both shear probes so that they could be recalibrated while they are still functional. The 84-8 line was wrapped on the spool really poorly, all the way down to the bottom. We fixed the wrap after about a half hour, and then continued on.

At ~16:20, Jack spotted someone in the water. It turned out that there were two men, a father and a son, in a 20' long green jet boat that had capsized. The father was unconscious and the son cold but ok. We stopped profiling at 16:24, recovered Chameleon almost immediately, the small boat was launched, and the two men picked up. I have a photo of this at 16:38 GMT (9:30 camera time, but my camera is 8 minutes slow from GMT). At the time, I thought that this was taking forever, but in reality it was just 13 minutes after our last profile. Finally, the two men were on board, but the father way blue and lungs full of water; he was dead. The son was pretty shaken up but ok. A Coast Guard helicopter and boat came out to the scene at about 17:00 GMT. I took a few pictures; there's timestamps on these – but my camera is eight minutes slow (reads 3:27 at 3:35 local time)

At 17:55, we resumed our profiling inbound to the plume mouth, and following the front for a final front-tracking experiment. Considering all that happened, we are doing ok. We continued a final front-tracking experiment, passing a great front with a bunch of undulations in it (perhaps 8-10). We did a pair of CTDs in and out of the front, then broke off this line and headed south to the Oregon Haystack Rock line.

Levi tested Chameleons 2 and 3, which I believe both work well. Noise levels are a factor of 10 less than 1 and 4 which have bottom crashers.

One big problem while I was asleep was that Pequod's data acquisition card was removed for backup purposes, then when they attempted to restart the Biosonics for the Oregon line, the E-conductor had been disconnected. After this, it no longer could communicate with the head. I'm not sure what was wrong, but this needs to be checked out as soon as possible.

When he finally took the bottom crasher off of 04-01, he found that the ring was broken in the middle of one of the quadrants. I suspect this happened in the recent past, as I checked it pretty well prior to deploying it around the time of the rescue.

August 27<sup>th</sup> – 1500 GMT – Return to Newport and unload.