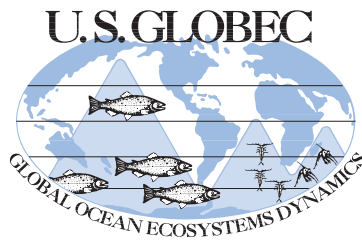


GLOBEC Northeast Pacific, Northern California Current

Cruise Report, R/V *New Horizon* (NH0007)

27 July – 12 August 2000



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Port of Departure: Redwood City, CA

Port of Return: Newport, OR

Cruise Goals

The cruise provided mesoscale and fine-scale oceanographic and ecological data in support of numerous objectives of the GLOBEC Northeast Pacific, Northern California Current program, with specific emphasis on the following projects:

W.T. Peterson - GLOBEC: A comparison of the effects of coastal upwelling on the population dynamics and vital rates of the euphausiids *Euphausia pacifica* and *Thysanoessa spinifera* in the Northern California Current, north and south of Cape Blanco, Oregon.

C.T. Tynan and D.G. Ainley – GLOBEC target species: Interactions with top trophic levels.

Summaries of each of the GLOBEC projects may be found at the web site: <http://globec.oce.orst.edu/groups/nep/projs.html>.

Table 1. GLOBEC Cruise Participants

Bill Peterson	National Marine Fisheries Service, Newport, OR
Julie Keister	Watch Chief, Hatfield Marine Science Center, CIMRS, Newport OR
Hal Batchelder	Watch Chief, Oregon State University, COAS, Corvallis, OR
Leah Feinberg	Hatfield Marine Science Center, CIMRS, Newport, OR
Anders Roestad	Hatfield Marine Science Center, CIMRS, Newport, OR
Jaime Gomez-Guiterrez	Oregon State University, COAS, Corvallis, OR
Karen Haberman	Western Oregon College, Monmouth, OR
Se-Jung Ju	University of Maryland, Solomons, MD
Jay Peterson	University of Wisconsin, Madison, WI
Rob Campbell	University of British Columbia, Vancouver, BC
Andrew King	Scripps Institution of Oceanography, San Diego, CA
Cindy Tynan	Chief, Mammal Observations, National Marine Fisheries, Seattle, WA
David Ainley	Chief, Bird Observations, Harvey & Associates, San Francisco, CA
Larry Spear	Bird Observations, Harvey & Associates, San Francisco, CA
Michael Newcomer	Indep. Contractor, mammal observer, Los Altos, CA
Todd Pusser	Indep. Contractor, mammal observer, San Luis Obispo, CA
Greg Krutzikowsky,	Hatfield Marine Science Center, CIMRS, Newport, OR
Shad Baiz	Scripps Institution of Oceanography, Resident Technician
Jim Schmitt	Scripps Institution of Oceanography, Marine Technician

Daily Cruise Summary Narrative — Compiled from Daily Reports and from Emails between the Chief Scientist and Ted Strub at Oregon State University (who provided SST satellite images during the cruise)

27 July. We came by car, we came by truck, we came by boat, we came by plane. David, Larry and Michael drove from their homes in the Bay area; Hal, Bill and Jaime came in truckin' from Newport; our friends on the good ship *New Horizon* steamed in from San Diego; everybody else took the plane - Todd flew from SLO, Julie, Leah, Anders and Greg flew from Eugene, Karen from Portland, Cyndy from Seattle, Rob from Vancouver BC, Andrew from Honolulu, Jay from Minneapolis, and Se-Jung from Solomons MD. From the four corners they came.

We all met up at the ship at the Port of Redwood City, Dock 5, adjacent to the U.S. Geological Survey port dock staging facility. The truckers were the first to show, arriving late Tuesday night. Jay was next; then everyone else arrived Wednesday. We greeted old friends on the *New Horizon*, met some new ones, then went to bed, late. Hal, Bill, Jaime and Jay unpacked the 24' Uhaul truck in the morning with Shad on the crane. Out of the truck came the MOCNESS, the steel support frame, 70 cm Bongos plus depressor, and several tons of MOCNESS spare parts, plankton nets, computers, zooplankton sample jars, experimental stuff, drying ovens, fluorometer, nutrient bottles, gallons and gallons of formaldehyde, acetone, and methanol, and 1200 GF/F filters.

We worked until late afternoon getting the labs on the ship organized. After one of Eddie's fabulous trademark dinners, the captain met with the scientific party to go over health and safety issues, and various ships' policies concerning life aboard a ship. We then beat it into town for some last minute shopping for batteries, AC/DC converters for cell phones, duct tape, film and other miscellaneous things. We sat around talking and waiting for the last member of the scientific party, Se-Jong. Most everyone gave up and went to bed at eleven (except for the chief scientist who dutifully waited for him to show). He finally appeared, exhausted, at 2330 h after several flight cancellations, delays and a two-hour holding pattern at SFO. (NOTE: all times in the narrative are local time, which is +7 h later than GMT).

Lines were cast off at 0800 h Thursday, 27 July, and we were off. We had our first scientific party science meeting at 0830 during which the cruises objectives were discussed as well as the overall objectives of the GLOBEC program. Safety issues were again reviewed. Following the general science meeting the zooplankton team met to discuss research objectives and to set up watch schedules. Watch chiefs were assigned and we settled on the following: The A-Team included Julie (Chief), Leah, Jaime, Se-Jong, and Rob; and the B-Team with Hal (Chief), Jay, Karen, Anders and Andy. We adjourned at 10:30 then enjoyed the vistas as we sailed by San Francisco, Alcatraz, then under the Golden Gate Bridge onto the bounding main.

Had our first fire and boat drill at 1300 h. The ocean was kind to us this time as compared to our first *New Horizon* trip last May. Sea conditions remained lovely until we moved west and north and eventually out from beneath the shadow of Point Reyes. Conditions deteriorated rapidly due to 25-30 knot winds but the discomfort extended for no more than 4-6 hours. Toward evening things calmed down and the sea glassed off. We wouldn't see high winds for a few more days.

Our first stations were three coastal stations, each in 100 m of water. The first was near Pt. Arena, the other two off Cape Vizcaino and the Eel River. We did CTD and vertical plankton tows to 90 m. The purpose of this sampling was to determine if there is an alongshore gradient in species composition of the coastal zooplankton. We know that somewhere between Crescent City and Monterey Bay the copepod species composition changes from dominance by *Calanus marshallae*, *Pseudocalanus*, and *Acartia longiremis* (in the north) to *Calanus pacificus*, *Paracalanus parvus* and *Ctenocalanus vanus* (in the south). It has long been proposed that the Cape Blanco-to-Cape Mendocino region is a faunal boundary but no one has analyzed samples taken along the gradient between Blanco and Monterey. Though the CalCOFI program sampled this region during the 1950's, the samples have not been examined to test the faunal boundary hypothesis.

The next five days of the cruise would be devoted to sampling along the GLOBEC standard LTOP (Long Term Observation Program) stations. Transects are located off Crescent City, Rogue River, Coos Bay, Heceta Bank, and Newport, and are sampled with CTD (for T, S, and nutrients and chlorophyll), and with plankton nets for zooplankton, three times per year (April, July, September), from the 30 m isobath out to 100 km. On this particular cruise, three ships would be working these lines, with the R/V *Wecoma* towing a Seasoar along with the HTI 244 High-Frequency Zooplankton acoustics package, the R/V *Sea Eagle* sampling juvenile salmonids and other pelagic fish with our Nordic 264 pelagic trawl, and the R/V *New Horizon* doing CTDs (with nutrients and chlorophyll), vertical

plankton tows, MOCNESS tows and meter-net tows to collect living zooplankton for experimental work. The mesoscale survey is a prelude to 10 days of process studies that will be carried out at sites characterized by contrasting degrees of physical structure at the fine scale, and of spatial relations between fine scale structure and the biomass and production of zooplankton, biomass of salmonids and other pelagic fish, and analysis of top-down control of euphausiids and pelagic fishes by bird and mammal populations. To that end, here is our status report, as of Monday 31 July 2000.

We arrived off Crescent City at 2300 h 28 July 2000 and began to sample along the Crescent City (CR) transect line (41° 54'N) with CTD's (+ nutrients and chlorophyll) and vertical plankton net tows (0.5 m diameter net, 0.202 mm mesh). The newly-trained B-Team rose to the occasion and promptly completed their one station in 45 minutes—a little slow but not too shabby. Since the A-Team came on watch at midnight, the B-Team went promptly to bed with visions of a perfect cruise dancing through their heads. The A-Team did not disappoint—they knocked off their stations in record time, finishing up their work at seven stations just as their watch ended at noon on the 29th. We then did a 180° turn and steamed back to CR-1 doing bird and mammal observations along the way. We also did some albacore tuna observations - we got six lines in the water but we all got skunked except for the captain who got two fish on. He brought in the first one himself. For the second fish he passed the pole to Anders who landed “the biggest fish he ever caught”. Smiles all around!!! We arrived at the CR1 by 1930 h, did another 180 and began MOCNESS tows at CR2. We did four MOCNESS tows along CR line, at CR2 (72 m depth), CR3 (137 m depth), CR4 (508 m depth) and CR5 (654 m), finishing up at approximately 0730 h on the 30th.

The *New Horizon* then steamed to the outside end of the Rogue River (RR) Line and sampled stations RR 7, 6, 5, 4, 3, 2, and 1 with CTD and vertical plankton nets beginning at noon on the 30th. We sampled inbound at stations 7, 6, 5, then broke off to complete the transect before dark so that bird and mammal people could have a complete transect with daylight. At 1900 h we resumed the CTD and plankton work at RR 1, 2, and 3, and with MOCNESS at RR3. Miscommunications at the changing of the watch at midnight resulted in NOT sampling RR4 with CTD or vertical tow. Que lastima! Oh well, c'est la vie. We did get a great MOCNESS series with night tows at RR 3 and 4 followed by day tows RR 2, 3, 4, and 6. The *Wecoma* passed by just as we were sampling RR3 with the MOCNESS, and called to report excitedly that the acoustic was seeing lots of “euphausiids” between 100 and 150 m - we sampled that layer and found large numbers of pteropods, but no euphausiids, demonstrating the value of using the MOCNESS for acoustic target verification.

We wrapped up the Rogue River line by 1345 h then headed north for the Coos Bay transect line. We passed over Coquille Bank at 1700 h but saw very little avifauna. The bird scientists were disappointed because this was a hotspot for birds and mammals on the June Mesoscale Survey. We had planned to stop and do two or three CTD and vertical plankton net stations, but did not due to the apparent impoverished nature of the ocean.

Talked to Jack (Barth; chief scientist on the *Wecoma*) at 1800h and 2300 h and formulated a plan for tomorrow (Tuesday, 1 June). That plan is to extend the FM line out to 126 10'W so as to sample the complex mesoscale field out there.

1 August. Things are going very well with us. Weather has deteriorated greatly since last night but the high winds have hit whilst we were doing CTD and Vertical Net stations (which are not so weather dependent) so we have not lost any data yet. Tonight the schedule calls for four MOCNESS tows at FM 7, 6, 5 and 4 but I doubt we will be able to do them. Pity, because the *Wecoma* will do another drive-by at around midnight while we are at FM 6. But, maybe the winds will drop a bit and we can do MOCNESS. We arrive at approx. 2200 h at FM 7.

Last night and today we sampled along the FM line out to 80 miles from shore. We sampled the LTOP stations (FM 1-9) then created two new FM stations (FM10 (125° 45'W) and FM11 (126° 10'W)). We crossed the southern portion of the large eddy that sits off Coos Bay so have a very nice CTD section (with full nutrients at all stations and depths), fluorescence and chlorophyll samples from the upper 30 m and the chl max. The vertical plankton tows are very, very interesting in that at FM10 (60 miles out and within the “cool water” of the satellite image) the copepods were chiefly coastal species. This is the first demonstration (for Oregon waters) that large eddies can pull water off the shelf and into very deep water.

The bird and mammal people continue to have very little to write home about. There are very few individuals of either persuasion flying or swimming about. I think today they saw a total of two porpoises and maybe ten birds.

We heard from the *Sea Eagle* this morning. They were at FM9 and working their way toward inshore waters. They had caught nothing at FM9. At FM8 they were fighting 35 knot winds. At the time that they called we were at FM10 (30 miles away) and had only 25 knot winds. We had only 25 knots for the most part all morning out to FM11. Now we are near FM9 and seeing 35-40 knot winds so it looks like the wind field is strongest near shore, not offshore. The *Sea Eagle* is going in to Coos Bay (Charleston) tonight to offload their fish and will then come out later tonight to begin sampling the Heceta Line.

Our plan for tonight is to do MOCNESS tow at FM 7, 6, 5, and maybe 4. Time will tell how that plan plays out. We will try to get the data. The next phase of the plan is to steam on a 315° course from FM4 and to CTD and vertical tows through the “jet” and into the warm eddy, probably doing 3-4 stations along the way. We will go as far as 43° 30'N, 125° 15'W then will cut back inshore on a 45° course and do another 3-4 stations before arriving at Heceta Head Line, station HH1, sometime tomorrow. We will then work out the HH line with CTD and vertical nets, getting yet another crossing of the “jet”.

Concerning the satellite image that we received today - it was very useful and came in clear enough. It does help a lot when you label the different temperatures. Adding the drifter tracks was most useful. It has been clear most of today so hopefully another good image will be available tomorrow. The INMARSAT will again be turned on and available between 1130 and noon.

Here is what we have so far in terms of stations and samples:

Sampling Protocols

CTD casts taken to 200 m or to within 5 m of the bottom in shallower water. Samples are collected for nutrient analysis at depths of 1, 5, 10, 20, 30, 40, 50, 70, 100, 150 and 200 m. In addition a sample is collected from the chlorophyll max. Chlorophyll samples are taken from depths of 1, 5, 10, 20, 30 m and from the chlorophyll max. Vertical plankton tows are with a 0.5-m diameter, 0.202 mm mesh net towed from 100 m to the surface or from 5 m of the bottom to the surface. MOCNESS samples are taken over strata that include 0-10, 10-20, 20-50, 50-100, 100-150, 150-200, 200-300 and 300-350 m depths. In water < 200 m, the extra nets are used to sample acoustic targets at those stations where we are near the *Wecoma* and know where targets might be found. The MOCNESS has nets of 0.333 mm mesh. LIVE tows are made with a 1-m diameter 0.333 mm mesh net towed horizontally, usually over a strata of 50 m to the surface.

Samples Collected

For the LTOP transect lines, we sampled the line in one direction with CTD and vertical tows then returned to do the MOCNESS tows at our standard MOCNESS-LTOP stations. X indicates sampling was conducted. For the MOCNESS tows we indicate Day or Night tows by D or N.

	CTD	Nutes	Chlorophyll	Vertical Plankton Tow	MOCNESS	Live Tow
Pt. Arena	X	X	X	X		
C. Vizcaino	X	X	X	X		
Eel River	X	X	X	X		
CR-1	X	X	X	X	D	
CR-2	X	X	X	X		
CR-3	X	X	X	X	N	X
CR-4	X	X	X	X	N	X
CR-5	X	X	X	X	D	
CR-7	X	X		X		
CR-9	X	X		X		
RR-1	X	X	X	X		X
RR-2	X	X	X	X	D	X
RR-3	X	X	X	X	N	X
RR-3					D	
RR-4					N	X
RR-4					D	
RR-5	X					
RR-6	X	X	X	X	D	X
RR-7	X	X	X	X		
FM-1	X	X	X	X		
FM-3	X	X	X	X		
FM-4	X	X	X	X		X
FM-5	X	X	X	X		X
FM-7	X	X	X	X		X
FM-8	X	X	X	X		X
FM-9	X	X	X	X		
FM-10	X	X	X	X		X
FM-11	X	X	X	X		

2 August. Winds have not changed much. We have had sustained speeds of 35 knots for most of the afternoon. The weather does settle down some at night in that by dawn speeds are down to 20 knots. We all look forward to tomorrow when (if the forecasters are correct) the winds are expected to drop.

Due to rough seas, we cancelled the MOCNESS tows planned for last night. Because this wind event was particularly strong, the hydrography of the FM line had changed greatly since our visit on Monday night so we decided to resample FM 1-7 with CTD and vertical tows. We found that cold water had been pushed 20 miles farther to sea than we observed on Monday. Pretty impressive for 24 h of wind stress. Last night was particularly productive in terms of collecting animals for experimental work. Since we weren't able to do MOCNESS tows, the time was used to take lots of live tows and to set up experiments. Today, we sampled the Dogleg (DL) line that extends from FM 1 to 43° 35'N, 125° 00'W and from that point to HH1. At the time of this note (1800 h), we just completed DL5. DL6

will be completed by 1930 h putting us at HH1 by 2045 h tonight. The bird/mammal folks will then have had an entire day of data along the Dogleg transect line.

I took a look at the zooplankton samples from the vertical net tows today, made some notes and have the following to share: whatever we are calling this “feature” that we have been observing over the past day or two, I think now that it is a blob of coastal water shed from Heceta Bank. The copepods that dominate the “blob” are coastal species (the same ones in fact that were found way offshore at FM10). *Pseudocalanus* is their name, they are very pink in color and thus unmistakable. We found goodly numbers at every dogleg station. We also found large numbers from CR1-CR3, RR1-RR7 and FM1-FM7. All of these stations are inside of the 15 C (yellow) line which you drew on this morning’s satellite photo.

I am also confused on whether or not the thing is cyclonic or anticyclonic. Before beginning discussion, let me define the thing: a circular feature centered on 43° 30’N, 125° 20’W. The N, S, E, and W sides are at 44° N, 125° 30’W; 43° 15’N, 125° 30’W; 43° 30’N, 124° 45’W; and, 43° 30’N 126° W. The hydro sections from Seasoar indicate depressed isotherms and isopycnals between about 125 30’W and the coast consistent with anticyclonic flow. The ADCP confirms this. Offshore of this you see up-warping of isopycnals centered at 126. Thus it seems to me that the large eddy is anticyclonic but you and Jack continue to speak of a cyclonic gyre. The small piece offshore at 126° W appears to be something cyclonic but the rest of the thing is anticyclonic. Is this small loop offshore the thing that you refer to as “cyclonic”? The inside edge of the offshore piece (at 125° 50’W) has coastal copepods (*Pseudocalanus*); the anticyclonic piece also contains *Pseudocalanus* (at least the part that we sampled today during our dogleg). So, I do not know what is going on here. Are we seeing two different features?

To continue the general report: we continue to take lots and lots of nutrient samples. By the end of this calendar day, we will have taken 40 CTD casts and filled 360 nutrient bottles. By the end of the Newport Line we will have 48 CTDs in total. We will continue to fill bottles until we run out.

Thanks again for the satellite picture. Wish we could get them in color and when the wind dies down we should try again to send an e-mail attachment. I will let you know if it looks possible. Until then, we await your faxes. Everyone is now getting accustomed to the 1130-1200 h window for receiving faxes.

Tonight’s plan is to begin to sample HH line. If the wind settles down we will do some nighttime MOCNESS work, but if not, we will just run the line out to HH5 with vertical nets and CTD, then steam back to HH2 to rendezvous with the *Wecoma* at 0900. We will do MOCNESS at HH2 and HH4, with them. This should work because winds do fall off in the night. We would really like to get some MOCNESS work in tonight, too, so that we have a set of samples collected during both day and night at the same stations to use for studying vertical migration, especially of the euphausiid *Thysanoessa spinifera*.

Experimental work is going well. For our euphausiid work, we have set up 2 egg production experiments, 6 moulting rate experiments and 1 set of gut pigment measurements. We’ve picked 60 individuals for length-weight measurements. Huntley’s three people are really excellent. They are doing feeding experiments as well as egg production measurements of copepods. I don’t have a tally for you, but do know that they are doing well. Very refreshing. Se-Jung is also very good. And Karen Haberman is excellent. All in all, we have a terrific crew this time. Believe it or not, by Friday, we will have completed nearly as much work as we completed during all of the last trip. We already have taken more CTDs! We’ve got about half as many vertical plankton tows but will have more MOCNESS tows by Friday than the entire trip last time. Not too amazing as we have the necessary personnel, fairly agreeable weather, and a healthy ship.

Ted, thanks for the long e-mail. You did clarify greatly things relative to the cyclonic vs. anticyclonic flows. Now I understand. After reading your message I took a look at the 23 July color image that we had and that helped. So, what is the deal here with this “California Current”? How much of it actually flows north and how often does this happen? From the viewpoint of a coastal copepod that would prefer to stay in cool waters, getting caught in a filament at Blanco could be a good thing as it sends you north again. What I am wondering now though is if this northward moving feature will reconnect with other “coastal” waters? Anyhow, I now would love to get back out to that feature and take another look. We only have a single daytime vertical tow, and it would be useful to know if the feature contains just coastal copepods or whether or not there are coastal euphausiids as well, and whether the day vs. night vertical distributions are different compared to what they would be if they were at the coast. Your idea of

looking at copepod vital rates is a good one, but from what I gathered from Jack, they found VERY high chlorophyll levels associated with that feature, suggesting that vital rates would probably be very high and thus this may well be a great place to live.

We have begun to develop an interest in the offshore jet because of the strong frontal features there and because of the interesting little birds that we found there. Remember the phalaropes we saw way offshore along the FM line? They reappeared again today, at HH7 along with lots of kelp and other debris that was swept off the shore from the coast. The whole scene looked just like FM-10 two days ago. I'm wondering now if these birds and flotsam aren't maybe associated with some sort of upwelling front that may be associated with the jet. Maybe the drifting kelp indicates the location of the upwelling front. I'm interested in these frontal structures and interested in knowing if the bugs on either side of the front are growing at different rates, thus, I hope to squeeze in some work at the outer edge of Heceta. The work could be done anywhere near Newport, near Line 3 or Line 4. Tomorrow we do the NH line and if we see these little birds again (NH25 is where I predict them to be), then we will definitely do a little study of this narrow zone where birds and flotsam accumulate because it may turn out to be a very long (though narrow) and important feature. Being a front, we need to sample within it to determine if particles are concentrated there. And, of course, maybe it is a great place for juvenile salmon.

As for retention on Heceta, I agree that it would be useful to run a line of plankton stations through the warm pool. We will do that and probably more. 1-2 days may be what it takes.

As for work in the southern box, my eyes zeroed in on the same feature which you described. I would really love to be able to sample the feature you mention, plus intercept any cool waters that have spun off (for example, in the 23 July color image that we have, there is a patch of "green" water centered at 42°N 125.2°W). One plankton tow would tell us if this water contained coastal bugs or not.

3 August. We worked the Heceta Head line today. Thursday began with a nighttime MOCNESS at HH2 then a MOCNESS at HH4. We then returned toward HH1 to meet the *Wecoma*, but en route sampled HH3 with the vertical net. Got to HH1 at approx. 1730 h and the bird and mammal corps began their observations. We met the *Wecoma* at HH2 at 0845 h and conducted an historic experiment - we sampled with the MOCNESS just as the *Wecoma* was steaming by with the HTI acoustics gear pinging away. As soon as we got the net aboard, we got underway and chased after the *Wecoma* so that we could repeat this exercise at HH4. We were successful once again. We finished off the day with another MOCNESS at HH5 (along with CTD and vertical net) and a CTD and vertical net at HH7. I'm real pleased because we got two day-night comparisons at stations plus had two drive-by shootings by the *Wecoma*. We are now underway for NH45, expecting to arrive at 2300 h this evening. The remainder of the evening (and most of tomorrow) will be spent sampling the Newport Line.

The *Wecoma* will pass by at some point around early afternoon tomorrow, probably at NH15. They will go to the beach and offload three souls then return to meet us for the first fine scale study. What that will be is still under discussion. I like the idea of working way offshore in that cyclonic feature; I like the idea of working southern Heceta Bank. And I like the idea of working just outside the shelf break off the Heceta region. The latter thought is based on tonight's observations at HH7 of windrows of kelp, fair numbers of birds, and phalaropes (a kind of bird). We saw phalaropes at FM10 in that coastal water so I'm wondering if we didn't maybe find today where that coastal water is getting ripped off the shelf. We need to see how the entire survey looks first though, and see if there is some pattern where juv. salmonids are caught. The southern Heceta Region is quite interesting to look at in detail because this is where we have found the largest concentrations of euphausiids for this trip. Also, the mammal people might be interested in the southern Heceta Region, particularly near HH5, because they saw a sperm whale there this afternoon, as well as their very first Pacific white-sided porpoise sightings.

4 August. Just a short report tonight. Finished up the mesoscale today. Did MOCNESS, CTD (w/nutrients and chl) and vertical tow at NH45, 35, 25, 15, and 5 and CTD and vertical tow at NH20, 10 and 1. Spoke with just about everyone today about plans and have made the decision to focus on dynamics in the vicinity of Lines 3 and 4 over the Heceta Bank for the next 48 hours, possibly a bit longer. The cool water near shore, the warm pool, and cold tongue offer interesting contrasts in plankton and bird dynamics. Hopefully there will be a salmon dynamic as well.

Got the color satellite images from the *Sacajawea*, hand-delivered by Jay Austin, a perfect transaction. They are great, even better than in black and white so now we are all pumped.

5 August. Last night we worked our way out along Line 3 (which we call BOB). We sampled six stations. The first five stations (BOB1-5) are on the bank; BOB6 is in approx. 800 m water. The line had interesting hydrography with very cold water at the coast ($<9^{\circ}\text{C}$), a very sharp gradient in sea surface temperature between BOB1 and BOB2 with a rise from $<11^{\circ}\text{C}$ to $>14^{\circ}\text{C}$ in the space of a few 100 meters. This is the warm blob that appears in all of the satellite photos. BOB3 is about 7 miles west of BOB2 and was chosen because it is where the Seasoar showed a chlorophyll maximum. Temperatures began to drop at BOB3 then remained in the 11°C range out to BOB5. This is the cold tongue that appears on the satellite pictures and which the Seasoar mapped so well. Euphausiid numbers were high at BOB2 at night but not so high elsewhere. It is noteworthy that we found the same to be true along the HH line --euphausiids were very abundant at HH2 but nowhere else.

We did vertical tows by night on the way out; most of the nighttime was spent setting up experiments on copepods and euphausiids. We got so many live tows in that we used up all of our incubation bottles. Luckily, Hal has some extra bottles, so we will be able to set up more experiments tonight. We timed our work in order to be at BOB6 at dawn so that the higher trophic level people could get a complete transect in (from offshore to inshore). They had a great day, seeing one sperm whale, 6 killer whales, some white-sided dolphins and large numbers of harbor porpoises. The plankton team worked each station back in and did CTD and another series of vertical tows. We met up with the *Wecoma* precisely as they turned the corner to begin to sample Line 3, so we did a MOCNESS-acoustics comparison at BOB2. We then steamed ahead of them and did another comparison at BOB4.

Today the *Sea Eagle* sampled Line 3 from BOB5 to the coast. They even got closer to shore than BOB1, sampling at BOB0. They did catch salmon on this line—I think 10 at BOB2 or BOB1 (not sure). I spoke with them at 1645 h this afternoon and recommended that they do one more trawl, within the strong temperature front between BOB1 and BOB2. They did find large numbers of jack mackerel at BOB2 (within the warm pool) suggesting that the pool has been isolated for quite some time because I don't think these fish just cruise around anywhere; rather they prefer to cruise in warm water. They successfully sampled the front between BOB1 and BOB2 and caught 4 salmon plus approx. 3000 pounds of sardines and mackerel!

Later tonight we will be at HH5 doing a 24 h series of MOCNESS sampling to look at some of the details of euphausiid and copepod diel vertical migration. We will sample at 2200, 0100, 0600, 1200, 1800 and probably again at 2200 h. We will also sample whenever the *Wecoma* should pass by, probably mid-morning tomorrow. During the times when we are not MOCNESSing, we plan two forays into deep water offshore to cross the VERY INTERESTING upwelling jet/front that lies at approx. 125.2°W . In the morning, we will go off on a course of 305° from HH5, steam 2 hours, then return. In the afternoon, we will go due west for two hours, then drop south for 1 hour then return to HH5. We will get data on bird and mammal distributions and SST (from ship's recorders); depending on time, we will take vertical tows on either side of the "front" and perhaps CTD's. I only have allowed two hours station time during each of the forays and that only allows two CTDs and two vertical tows, or 5-6 vertical tows during each foray. These are just scouting expeditions as we plan to work these waters pretty hard with the *Wecoma* on Monday (see below)

Tomorrow night we will do another round of experimental work, probably focusing on some grazing measurements. Then, Monday morning (or very late Sunday night), we will begin to work with the *Wecoma* to map out and study plankton dynamics within the chlorophyll-rich region associated with both the eastward side of the main upwelling jet (at 125.2°W) and the westward side of the northward-flowing jet (at 125.8°W , 43.5°N) that broke away from Blanco several weeks ago. The latter coordinates are shown quite clearly on the SeaWiFS image which you sent -- the most northern arm of the arc that sweeps north from Blanco. This is where the birds are, where the chlorophyll is high, and where the coastal bugs were found in great numbers. Once this is completed, we will be somewhere in the vicinity of Cape Blanco Tues/Wednesday, then back up north by Friday morning. Maybe earlier. Something like that.

Winds have laid down, as you know, and we are in the midst of a major relaxation. When we return north later this week, I expect plankton distributions and dynamics to be very different.

Here's the latest count on net tows and CTDs:

27	MOCNESS, each tow using all nine nets
61	Vertical Tows
57	CTD casts
324	chlorophyll samples filtered
684	nutrient bottles filled and frozen

Compared to the last trip, we've already nearly doubled our number of CTDs and MOCNESS tows and still have another week to go. I think the nutrient count is probably triple last time. Chlorophyll are already four times greater.

7 August. We completed the 24-h series of MOCNESS tows at HH5 and were also able to complete both scouting expeditions, one in the early morning hours toward the northwest of HH5 and the other to the southwest. The northwest one was most interesting in that we again found the "cool water" that the *Wecoma* continues to miss. It has not been seen on any of the transect lines so whatever this feature is, it is less than 15 miles in diameter, appears to be cyclonic (due the cold core), and contains coastal copepods. When we begin to get to our zooplankton samples, maybe we will get some clues as to the origins of this water based on species composition. The temperature contrast between the "cold feature" and adjacent waters is high, approx. 3°C over a few hundred meters distance. We saw again the phalaropes and Cassin's auklets. David did a "small boat op" and collected a few of the auklets for stomach analysis. Of the four birds, two had been eating myctophids, one an anchovy or some related fish, and the other dungeness crab megalopae. The bird/mammal people also saw some other unusual birds as well as some unusual whales (some kind of beaked whale). We did do CTD, vertical tow and MOCNESS there at around noon, then returned to HH5 for another MOC. We then forayed out to the southwest for 18 miles, into the anticyclonic meander thing. After that foray, we turned north, back to the "cold feature" and did a nighttime CTD and MOCNESS. As before, virtually all of the species captured were things that are common in coastal waters. We then returned to HH5, did a couple more MOCNESS, finishing up at 0730 h. During the night, the euphausiid team took down quite a few experiments. I finally did some science of my own and set up copepod egg production measurements from copepods captured at the "cold feature" station.

We next steamed to the end of Line 5 to begin the "cold ribbon" survey. Got to near the end of the line but did not find the cold ribbon at the surface, so did some surveying on our own. Since the *Wecoma* was so far behind us, we had to spend several hours surveying so that we could pick our first stations. Finally found the cold water about 6 miles south of Line 5. We returned to Line 5 to do a station at 126°W when out of nowhere appeared 5 unbelievably large fin whales. They put on quite a show, leaping out of water then crashing down creating monstrous splashes. All this within 200 yards of the ship. On at least two occasions, individuals passed directly along side of us. One even "attacked" the MOCNESS. It was probably just a friendly young curious whale, but it was certainly checking out our equipment.

Sea Eagle completed a trawl at the station at 125.75°W on Line 5 where the cool water was present, though as a subsurface feature. No salmon were caught. They sampled approximately the same place last night and caught myctophids, squid, pomfret and some juv. fish (possibly anchovy). We've gotten two stations done so far on this "cool ribbon" survey. The zooplankton within the cool ribbon were very different from those in the warmer waters to the side. We found mostly doliolids in the vertical tow, consistent with the notion that there is a downstream (or offshore) succession of zooplankton in upwelling systems. In general, zooplankton species in upwelling systems have distinct zonation patterns with a certain group of species found only near shore, another group mid to outer shelf, followed by a slope group and finally an "offshore group". The doliolids are found at the offshore edges of upwelling systems. In this case, if our hypothesis is more-or-less correct, we will find younger water and a "younger ecosystem" as we survey south, then to the east, finally arriving at Blanco. Could be the classic picture.

We did a MOC at the 126°W station just as the *Wecoma* was driving by so got yet another acoustics-MOCNESS comparison.

Jackie (Popp-Noskov; chief scientist on the *Sea Eagle*) just called moments ago and the *Sea Eagle* is now down at Station 3 (43° 30'N, 125° 48'W), about twenty miles from here. The surface water there is 14.9° C and surface salinity has risen to 32.49 (from 32.2 up here at the first station). We are heading for that same station and will arrive there at 2100 h at about the same time as the *Wecoma*. Thus, we will get a second comparison of acoustics/MOC today. We've now gotten, I would guess, a dozen such comparisons.

That's all for now. This cool ribbon survey is very interesting. We are pulling all of the tricks out of the GLOBEC bag in that we've got all the tools working. We have three ships surveying simultaneously, sampling the physical fields as well as all of the biota from chlorophyll-bearing creatures through copepods and euphausiids to fish, birds and mammals, using acoustics, MOCNESS and the workhorse 0.5-m vertical plankton tow!!!!

Hey, one more thing...one of the observers saw a flying fish this evening—probably the first on record for Oregon!

8 August. It is early afternoon now. I decided to begin my report early so that it will be a bit more coherent than the one of yesterday. I was so busy yesterday discussing our next six days of science with everyone that I forgot the time and had to hack a quick report at 1830 h.

So.....the survey of the "cold feature" is going well. We are doing full stations along the way with CTD-nutes, chl, vertical plankton tow and MOCNESS so stations take about 2.5 h to complete. We will be very happy with this data set because we are successfully sampling a steady temperature gradient. Plus, we will have the samples necessary to look at changes in vertical distribution in the downstream direction, in relation to position of the chlorophyll max, and (possibly) in relation to the age of the water. Salinity has been steadily increasing suggesting that we have in fact been sampling along a temporal gradient as well. We will wrap up this survey by approx. midnight, perhaps a bit later.

Our next activity will be a very fine scale survey in the coastal waters in the vicinity of Cape Blanco. After much discussion with everyone, we decided that this would be the best thing to do. The *Sea Eagle* is not catching any salmon in these offshore (although cool) waters. They did not catch any salmon offshore of 5-10 miles on any line except for Newport. Our BPA sampling has revealed the same fact, that for the most part, juvenile salmon are only in shelf waters. We've only found salmon offshore during May (out to 40 miles), and only in the Columbia River plume. So, it looks more and more like a general fact that the juveniles reside in shelf waters only and are not swept offshore by wind-driven upwelling-generated flows. The chinook salmon juveniles continue to puzzle us in that they may well prefer living as close to shore as they can get and certainly closer than we can sample. So, given these considerations, we have set up a grid of stations along lines 7A, 8, 8A and 9 with stations at distances of 1, 3, 5, 10, 15, and 20 miles from shore. This gives us good coverage of the near shore zone plus gets us out to beyond the shelf break. We will do CTD and vertical plankton tows at each station and MOCNESS at those stations where the *Wecoma* is near by, giving us probably three more acoustics/MOC comparisons.

The Blanco survey will take about 36 hours, beginning at 0600 h tomorrow (Wednesday). The *Sea Eagle* will join us for those two days as well as will the *Wecoma*. Jack and I just had a long discussion of how best to work together and we will do one of two things. Jack could modify his Seasoar run and do our finer grid, running ahead of us, completing it in about 15 hours. The other idea is to not modify his grids at all. Initially, it looks as if he may not need to modify his grids because since we will be doing extensive station work (at 24 stations), by the time we have completed our short line, he will have time to run all the way out and return on the next line meeting us at about the same time as we are ending the next line. We're talking again at 1830 h to make the final decision. Once we get that settled, then I'm on the phone again to the *Sea Eagle*. You'll be amused with all the stories we will bring back from this trip, especially related to communications. Communications have been excellent. That is the story. I cannot count the number of conversations I have had with Jackie on Channel 10 when, at the end of our call, Jack will break in from the *Wecoma*. Vice versa with calls from me to Jack when Jackie breaks in at the end. We've even had several conference calls this trip!

Jack also plans to return north and will almost certainly link up with us on Friday. He too liked the idea of revisiting Line 3 with the strong contrast between near shore front-warm eddy-cold tongue. He mentioned that the recent NW winds had probably changed things so we may well see a different picture. Thus, depending on how things look hydrographically, we may just work Line 3 for about 30 hours, rather than try to do Line 3 as well as the Newport line. Much as I'd like to get Newport sampled again, I know that we'd all be very pleased with a repeat of at least one of the fine-scale surveys. I know for sure that the OPC guys will be happier if we can repeat the fine-scale survey with plankton tows.

It is now 1820 h, just talked to Jackie and they are heading in to Coos Bay to offload fish and take on more supplies. They will be meeting us at the inshore end of Line 7A at 0600 h tomorrow. Jack will call in a few minutes, so I'll sign off now.

9 August. This morning we worked our way in on Line 7A from 125°W to the beach, taking vertical tows along the way. The water depth at the outermost station is 1200 m so we covered all of the interesting features--deep water offshore, shelf break, and near shore upwelling zone. Arrived at the nearest-to-shore station, 1 mile from shore, at 0600 h. David Ainley and Shad launched the inflatable boat and drove off into thick fog to collect sea birds. Came back with 4 common murrelets and 4 Cassin's auklets. After securing the boat, we worked our way out along Line 7A and did the CTD casts for nutrients and chlorophyll. The *Wecoma* was nearby so after the second station, Jack called and told us that they had recently crossed a "separated jet" at 125° 12'W along 7A. He sent over a fax of the hydrography, fluorescence and acoustics along Line 7A. After a careful and exhaustive examination of these data, we decided to extend our transect line out past 125°W to get to 125° 12'W. We got to the jet, did the CTD, compared the profile to the T and S data from the Seasoar, and confirmed that we were indeed in the jet. Did a vertical plankton tow as well. The mammal folks found lots of porpoises, a couple of elephant seals along with seaweed debris, and some jaegers. We are now steaming back toward the coast on a diagonal line that will bring us to the near shore station just south of Blanco at Line 8A. Since Blanco is very rocky, that station is 2 miles offshore.

Tonight's work will be as follows: run Line 8A from near shore offshore to 125°W doing just vertical plankton tows and live tows for experiments. We will then turn south and run Line 9 in to the beach and do both vertical tows and CTD's (for nutrients and chlorophyll). I'll try to do a tally tonight of the number of nutrient bottles which we have filled. My guess is that we are easily at 1200-1400. We are trying as hard as possible to fill every bottle that we brought along-- nutrient bottles as well as jars for MOCNESS and vertical plankton tows. Filling all jars seems like an admirable goal and being goal-oriented, it seems like the sporting thing to do. We are actually close on both counts. Our other goal is to break what we believe to be the GLOBEC record for number of MOCNESS tows taken on one GLOBEC cruise. Hal thinks that if we make 41 we will have a record and hence braggin' rights. We will, of course, be checking the record books on this one. Should we come home with 41 tows completed we will have also brought home at least 16 man-months of work just to process samples (calculated assuming it takes one day to process a sample -- I think it will take longer since these samples contain so much interesting stuff). And we have completely run out of our standard MOC and vertical plankton tow data sheets so are thankful that the ship has a xerox machine. We've had to resort to photocopying a used data sheet, then erasing the data on it, then using that as a master.

Sea Eagle is once again catching salmon, but in very low numbers. They did catch a steelhead this morning again confirming that these guys are found only in the vicinity of Blanco and points south. They may be the only salmonid that "matches" with our hypothesis that salmon will do better down in southern Oregon waters because upwelling is strong, the water is productive, and the habitat complex. They only caught a few jellyfish suggesting that the high numbers of jellies on Heceta Bank may be there due to retention on the bank.

Just talked with Jack a few minutes ago and we are on schedule. It is amazing how well you can script a cruise when the weather cooperates. We will be wrapping up our work in the southern process box on Thursday afternoon. Jack is expecting that the *Wecoma* will be finished at about the same time as us; the *Sea Eagle*, too, will be finishing up Thursday afternoon, so I am pleased to report that we all will be working together, again, in the north, during our second northern process study. I'm proposing a boat race to see who can be first to arrive at the inshore end of Line 3. Standing start only! My money is on the *Wecoma* (unless they decide to pull the Seasoar along behind).

The plan for the northern study at this point is to first run a hydrographic section along Line 3 across the bank to determine if some of the features we saw before are still present: the near shore upwelling front, the warm pool, and the cold tongue. We hope the *Wecoma* completes this before we arrive. If these same features are present, we will repeat what we did before: run a line of plankton net stations, set up experiments using euphausiids and copepods from each of the water types, and carry out another study of diel vertical migration and diel variations in euphausiid feeding rate, probably at one of the mid-shelf stations (approx. 100 m depth). Ted, you had asked at one point why we chose to do the first diel study in deep water and the answer is that we wanted to determine the usual daytime depths for *Euphausia pacifica*. We know that it is on the order of 200-300 m in offshore waters, thus we needed to carry out that work in slope water. For our work on the shelf, we will encounter the other euphausiid species, *Thysanoessa spinifera*, so will focus on it during our second process study in the north. Once this diel study is completed we will have solved just about all of the mesoscale problems outlined in our cherished science plan.

We have completed quite a lot of work in the far offshore waters. We ran the Crescent City line (Line 12) out past 126°W, we ran the Five Mile Line (Line 7) out to 126° 10'W, and we ran Line 5 out to the same distance. Newport

Line was out to NH45 which is at 125°W. We also sampled the offshore separated jet during our “cool ribbon” study and much of that work was out at 126°W. So, we’ve done a fair bit of work out there.

Ted, you also asked about salmon work in the near shore zone. I know that the *Sea Eagle* scientists are a little bit discouraged about all the jellyfish that they catch. One of their hauls on Heceta contained (by their best guess) 8000 lbs of large red jellies. Not a pretty sight I tell ye’. The jellies are apparently just in the very near shore zone, within about 1 mile from shore.

Let’s see....just a general observation on the bird and mammals. It seems to me that far more birds and whales and other mammals were seen in the north, either on Heceta Bank, just adjacent to the Bank or well offshore in those frontal features that we discovered (Jack now thinks that the small frontal features that we discovered were instabilities that spun off from the main upwelling jet). Back to birds and mammals--the southern region is relatively free of avifauna and marine mammals. Makes you wonder if the higher trophic level organisms simply cannot deal with all the mesoscale variability. It may just be too dynamic for them in that there are no predictable areas where prey can become concentrated. Up north, the system seems to be a bit more “linear” and a little more gentle such that the animals don’t have to use much energy hunting for dinner. A workable strategy might be to simply cruise/fly along northward or southward track lines along some set depth zone. Just an idle thought.

10 August. Last night the A-team wrapped up sampling along 8A (the line off Blanco) by 0030 h, then the ship steamed down to Line 9 and we worked it from offshore to inshore. Did CTD, vertical nets and live tows at stations with five-mile spacing, from 20 miles offshore to 5 miles, then sampled stations 3 and 1. Got to the 10-mile station on schedule (0630 h) so that the bird watchers could survey the inner most part of the line. We finished up the line at around 1100 h or so, then steamed north to sample Line 8. On the way to line 8 we passed a strong front about 4 miles from shore, brown water on one side, blue on the other. There were literally 1000’s of birds along this front. The feature was no more than 50-100 m wide. After discussions with the birders, we decided to continue on our trackline to the inshore end of Line 8 where we commenced sampling at our standard stations of 1, 3, 5, 10, etc. miles from shore. We did 1, 3, 5 then broke off the line and steamed south two miles to find the highest concentration of birds. Found them. Did vertical tows and CTD within the front and on either side (in the brown water, then in the blue water). We also did a MOCNESS but it took forever. Unfortunately, we had some software glitch and lost about 2 hours troubleshooting it. Things are ok now though.

We will soon be steaming north to a point 10 miles off the coast along Line 3 and expect to arrive at 0400 h Friday morning. The plan is to look at diel variations in gut pigment content of euphausiids both during the pre-dawn to dawn period and in the pre-dusk to darkness period, for the euphausiids that we find at the 10 mile station. Based on the satellite image of a couple of days ago, the Heceta Bank region looks just like it looked a week ago, with a stripe of cold water near shore, a patch (or eddy) of warm water between 10 and 20 miles offshore, then a cold tongue between 20 and 30. We plan to sample these three hydrographic features plus the front between them along Line 3 tomorrow during the day. The *Wecoma* will pass by in the morning and we will do a MOCNESS with them for acoustics calibration purposes. David also wants to collect more birds and will do that Friday morning.

Friday night we will run the line again during nighttime. We then will steam to NH25 and sample the Newport line inbound, with CTD and vertical tows. If we finish up our work on Line 3 before 0200 h, we will be able to get up the NH line before dawn and so then will sample NH 25 both during night and day. We will also do another MOCNESS wherever we meet up with the *Wecoma*, probably at NH10.

Here is the total count for our many operations:

	<u>Count</u>
Sampling at a station	117
CTD profiles	81
Vertical net tows	96
Live Tows	41
MOCNESS tows	39

Leah said that we have over 400 chlorophyll samples; nutrient samples are approximately 1800. By the end of the cruise, we’ll have another 3 MOCNESS tows, probably 15 vertical tows, 5-10 live tows and a few more CTDs.

That's it for Thursday night. Gotta go and take a look at the MOCNESS. I just heard that we made the biggest catch ever of juvenile euphausiids in our tow through the frontal feature where the birds were aggregated.

11 August. We left Line 8 at 1905 h last night, and steamed north for 83 miles. Did it in 9 h, arriving at BOB3 at 0400 h. Sampled BOB3 with vertical plankton tow and a live tow. There were only a few euphausiids (but tons of *Calanus marshallae*). My hypothesis for this is that fish ate them all - recall that last week the *Sea Eagle* sampled the warm tongue and found lots of jack mackerel in it. My guess is that they ate all the euphausiids. Since we needed to get to BOB1 by dawn we did not sample BOB2 as hoped, but instead went right in to BOB1. We then resumed working out BOB line to intercept the complex of fronts created by the banded cold water--warm water--cool water--warm water. Got to BOB2 and whaddaya know...three humpback whales breached. These were probably the same whales that Leah saw on the Newport line during our most recent *Sacajawea* cruise. Whatever... they were actively feeding using the bubble net-lunge approach, a behaviour that is usually associated with feeding on fishes. So, we decided to do a MOCNESS, but it completely crashed. We were having trouble with it last night but were able to get a tow done. This morning, however it was different—none of the band-aids worked, Julie was baffled, and our Scripps tech tried lots of different things but to no avail. We don't know if it is software or electronics. Anders has been on it since he came on watch at noon and thinks he may have the problem licked. So, we'll try it early this evening. As you may know, the *Sea Eagle* broke down this morning—another omen. Maybe its time to go home!

But, not until we finish our work! I've probably spoken those words to every scientist and every crew member today. Speaking of work, we sampled out BOB (Line 3) at seven stations, one in the cool coastal water, one in the front, one in the warm water, one in the next front, one in the cool water, one in the next front, then one in the warm water beyond. The whales were on the warm side of the first front near the coast and another group was found on the warm side of the other cool water tongue (visible on the satellite image). We decided to do a bit more mapping of the cool-warm-cool-warm features so drew up a transect line that fell just south of Line 2. It was selected based on the picture you sent this morning so we are sampling along latitude 44° 27'N. We immediately called Jack to tell him of the slight change in plan so he will then tow the Seasoar along 44° 27'N rather than 44° 30'N. The idea is to look at the front that pretty much parallels this latitude line. It lies at the northern terminus of the "warm tongue". Just north of this point all of the water is cool.

We just pulled into the first station (called AB5 for Alsea Bay), 124° 30'W which is just inside the cool water tongue and bingo—two humpies and a minke whale. We are now doing CTDs in along the line. We'll do vertical tows out the line after dark. We could do both CTD and vertical tows, but we want to get to the beach before dark so that the birders get another complete transect.

Tonight we go back out BOB with the vertical net. We will also do a MOCNESS. If it works OK, we'll arrange for a *Wecoma* acoustics drive by. If not, I don't know what to do. I have a conference call set up for 2100 h to Daryl (our own MOCNESS tech who is presently on the *Wecoma*) to get his ideas about what is wrong. We need to get the net up and running again so that it is ready to go for our next LTOP cruise and we need to get it fixed now because when we did deck testing earlier today, everything worked OK. We gotta get it wet and deep. We'll do that tonight. It was the 40th tow that failed. I think Pete Wiebe has put some "millenium bug" into the software so that no one can beat the GLOBEC record of 40 MOCs for a given cruise! Enough silliness...

12 August. We wrapped things up today.

Final tally of stations and operations is as follows:

Stations visited	151
Vertical Plankton Tows	122
Live Net Tows	52
MOCNESS Tows	44

Needless to say, we are all delighted with these results. We tripled our output as compared to the May-June cruise on the *New Horizon*; thus, far exceeding our expectations. Thanks to all who contributed to this overwhelming success, with special thanks to Shad and Jim and to the officers and crew members of the *New Horizon*, our new friends. We had a wonderful time. Without their support, we would not have had such a wonderful trip. The upbeat

nature of all on the *New Horizon* contributed immeasurably to the success of this mission. We sincerely hope that in the future, we will be able to work together again. Thanks!

Brief Reports from other groups

Mesozooplankton group (submitted by Rob Campbell)

The primary goals of the mesozooplankton group (R. Campbell, J. Peterson and A. King) on NH0007 were to:

- (1) Conduct feeding and growth rate experiments with fresh-caught copepods, and
- (2) To assist in plankton tows and MOCNESS deployments.

In situ feeding activity was estimated using the gut fluorescence technique. Samples of zooplankton were collected with the 1-m live net, and aliquots were preserved (frozen at -20° C) at regular intervals during short (1 h) incubations. The frozen samples collected on this cruise will be analyzed at a later date; samples will be sorted by species, and fluorescence (i.e., chl-*a* and phaeopigments) will be measured. In addition, fecal pellets were collected at three stations. Fecal pellets will be analysed for carbon content using the high-temperature combustion oven method of Urban-Rich (1998). Carbon measurements will complement the gut fluorescence work, in order to quantify non-fluorescent prey consumption (e.g., heterotrophic microplankton). Since the gut fluorescence measurements could be conducted in a short time (slightly more than one hour), they were found to be amenable to the time scale of the finescale sampling lines where stations were often less than one hour apart.

Growth rate was to be estimated by measurements of egg production rates of female copepods. Throughout the cruise, however, adult females were either very scarce, or numerically overwhelmed by copepodid stages. It was found that sorting females (when there were enough present for an incubation) from the samples was very time consuming, because large amounts of samples needed to be processed in order to obtain sufficient sample sizes. A small number of egg production rate measurements were made during the mesoscale survey, but it was decided to focus on gut fluorescence measurements during the finescale surveys.

In addition to the gut fluorescence measurements, a number of subsamples (30-50 copepods on a qualitative filter paper) were collected from the live net tows and frozen in liquid nitrogen for proxy measurements of growth or condition (e.g. RNA:DNA ratio, lipid contents). Where zooplankton was dominated by non-copepod forms (gelatinous zooplankton were very common at offshore stations), samples were sorted prior to freezing. Wherever possible, duplicate samples were taken, although there were a number of stations where there were only enough copepods present for one filter.

Table 2: Summary of samples

Station	Gut Fluorescence	EPR	Liquid N
AB 2.5	X		X
AB 6	X		X
BK	X		
BOB 1	X		X
BOB 2	X	X	X
BOB 3		X	X
BOB 4	X		X
BOB 5	X		X
BOB 6			X
CR 3		X	
FM 1	X		X
FM 10			X
FM 3	X		X
FM 4	X		X
FM 5			X
FM 8	X		X _l
FM7	X _a		X _l
HH 1	X		X
NH 20	X		X
NH 10	X		X
RR 1		X	
RR 3	X		
RR 4			X
RR 6			X
RR2			X
Z 3	X _a		X _l
Z 5	X _a		X _l
Z 7	X _a		
Z 8	X		X
Z9	X		
7a-2	X		X
7a-4	X		X
7a-7	X		X
8a-1	X _a		
8a-4	X		
8a-6	X _a		
9-2	X		X
9-4	X		X
9-5	X		X

a: gut evacuation aborted - either insufficient abundance of copepods or filtering was impossible due to gelatinous forms;

l: only 1 replicate frozen

Chemical Analysis Group. Summary of sample collection during *New Horizon* (NH0007) cruise July 27- Aug.12, 2000 (submitted by Se-Jung Ju).

This cruise was mainly planned to collect enough euphausiids (particularly, *E. pacifica* and *T. spinifera*) with various sizes (or life stages: furcilia, juveniles, and adults) to develop the aging method understanding population demographic structure of euphausiids. And in order to examine the nutritional condition of euphausiids (including their prey—phytoplankton) using lipids and fatty acid composition, animals (with different life stages) were collected from offshore vs. nearshore, upwelling vs. oligotrophic region, and inside vs. outside of episodic eddies. Lipid classes and fatty acids are indicators of food quality, an important influence on growth and reproduction in fish populations, and efficiency of energy transfer between trophic levels.

Additionally, particular organic compounds (i.e., lignin) are source specific (i.e., autochthonous vs. allochthonous). Therefore, the composition of dissolved organic matter (DOM) in the water may indicate the origin of the water mass (i.e., cold-nutrient rich deep water vs. warm-nutrient poor water or oceanic vs. terrestrial). DOM samples collected from the RR-line may indicate terrestrial organic matters input from Rogue River to offshore. Moreover, FM-line and DL-line were across the episodic eddy during this cruise based on the satellite temperature image and, thus, DOM samples were collected from this line to compare between DOM inside and outside the warm eddy.

29 July. Crescent City line (CR)

CR3

Collected *E. pacifica* and *T. spinifera* for aging from live tow.

Lots of *E. pacifica* for lipid analysis (I-chem jar).

PC/PN 200ml, TSP 200ml, GF/F 1.5L.

CR4

20 *E. pacifica* from MOCNESS (for lipid), 5-10 juveniles for aging.

Blank DOC taken from easy pure system.

30-31 July. Rogue River line (RR)

RR7 (30 July 0730 h): offshore ocean

Collected DOM (Dissolved Organic Matter) using C18-SPE; 19.6 L surface seawater was filtered through 3 and 0.2um cartridge. C18 followed by 1L of acidified easy pure water.

Other samples included:

2 GF/F - 2.5l

1 TSP - 500ml

2 PC/PN - 200ml

1 PC/PN - 400ml

1 DOC

RR1 (30 July 1905 h): the nearshore coastal ocean (upwelling area: cold surface water)

Collected DOM using C18-SPE; 12 L surface seawater (2m deep).

Other samples included:

2 GF/F - 1 and 1.5 L

1 TSP - 300ml

2 PC/PN - 200ml

1 PC/PN - 300ml

1 DOC

RR3 (31 July 0200 h)

Lots of euphausiids seen in live tows. Sorted furcilia (10) for aging and large *E. pacifica* (with empty guts determined through microscope) for lipid analysis.

RR4 (31 July 0330 h)

Collected DOM using C18-SPE; 14.3 L surface seawater was filtered through 3 and 0.2um cartridge. C18 followed by 1L of acidified easy pure water.

Other samples included:

2 GF/F - 2 L

1 TSP - 200ml

2 PC/PN - 200ml

1 PC/PN - 400ml

1 DOC and blank DOC from easy pure water system

31 July. FM line sampled (2200 h) - based upon satellite image (this line seems like the cross eddy) FM3 to FM9 is in the eddy.

FM1

Collected DOM using C18-SPE; 12.0 L surface water was filtered.

Other samples included:

2 GF/F - 1.8 and 2 L

1 TSP - 300ml

3 PC/ PN - 200ml

1 DOC

FM5 (1 Aug)

Collected DOM using C18-SPE - 13.6 L surface water was filtered.

Other samples included:

2 GF/F - 2 L

1 TSP - 300ml

2 PC/ PN - 300ml

1 PC/PN - 400ml

1 DOC

FM8 (1 Aug)

Collected DOM using C18-SPE; 19.0 L surface water was filtered.

Other samples included:

2 GF/F - 4 L

1 TSP - 500ml

1 PC/ PN - 300ml

1 PC/PN - 500ml

1 DOC

FM11 (2 Aug)

Collected DOM using C18-SPE; 20.0 L surface water was filtered.

Other samples included:

2 GF/F - 3 L

1 TSP - 300ml

3 PC/ PN - 300ml

1 DOC

FM3B

Lots of furcilia (*T. spinifera*) were collected for both lipid and LF analysis.

FM5B

For lipid analysis, surface (2L) and chl-max particles (2L) were filtered and 20 *E. pacifica* also were collected and placed in I-chem jar.

DL3 (additional station not on original plan) - assumed this station was the center of big eddy.

Collected DOM using C18-SPE; 18.7 L surface water was filtered.

Other samples included:

1 GF/F - 3 L

1 TSP - 500ml

2 PC/ PN - 400ml

1 DOC

HH2

Collected lots of *E. pacifica*, some were placed in I-chem jar for lipid analysis (also collected particle-GF/F 2L). For aging, three different size groups of euphausiids were sorted and collected in plastic vials and frozen.

3-4 August.

NH35 and NH45

Collected lots of *E. pacifica*, some were placed in I-chem jar for lipid analysis (also collected particle-GF/F 2L).

NH20

Collected DOM using C18-SPE; 13.1 L surface water was filtered—seasonal change (compare with previous cruise (June) sample).

Other samples included:

2 GF/F - 2 L

1 TSP - 300ml

2 PC/ PN - 200ml

1PC/PN - 400ml

1 DOC

NH5

Collected DOM using C18-SPE; 14.4 L surface water was filtered.

Other samples included:

1 GF/F - 2 L

1 TSP - 300ml

2 PC/ PN - 300ml

1 DOC

5-6 August.

BOB3 and BOB4

Collected lots of *T. spinifera*, some were placed in I-chem jar for lipid analysis (also collected particle-GF/F 2L). For ageing, four different size groups of animals were sorted and collected in plastic vials and frozen.

HH5B

Collected lots of euphausiids (not sorted but most of them are *E. pacifica*); were placed in I-chem jar for lipid analysis (also collected particle-GF/F 4L with TSP 500ml).

8-9 August.

G9

Collected lots of small size euphausiids which were placed in I-chem jar for lipid analysis (also collected particle-GF/F 4L, TSP 400ml).

7A7 and 6

Collected lots of euphausiids (with wide size range) which were placed in I-chem jar for lipid analysis (also collected particle-GF/F 3.5L, TSP 500ml).

10 August.

9-5 (760m deep)

Collected lots of euphausiids (with wide size range) were placed in I-chem jar for lipid and lipofuscin analysis (also collected particle-GF/F 4L, TSP 500ml).

9-1 (40m deep-near the coast) - no adult euphausiids (some furciliars).

1 GF/F - 2L and 1 TSP - 300ml

Euphausiid Experimental Work. (submitted by Bill Peterson and Leah Feinberg)

Date	Station	Experiment
July 30 2000	CR3	Molting Rate
July 30 2000	CR4	Molting Rate
July 31 2000	RR3	Molting Rate, Length-Weight
July 31 2000	RR4	Gut Fluorescence
August 1 2000	FM7	Egg Production, Length-Weight
August 1 2000	FM4	Egg Production
August 2 2000	FM5b	Molting Rate
August 2 2000	FM4b	Molting Rate, Egg Production
August 2 2000	FM3b	Molting Rate, Length-Weight
August 4 2000	BOB2	Gut Fluorescence, Egg Production
August 4 2000	BOB3	Gut Fluorescence, Molting Rate, Egg Production, Length-Weight
August 5 2000	BOB2b	Gut Fluorescence, Molting Rate, Egg Production
August 5 2000	BOB4	Molting Rate, Egg Production
August 5 2000	BOB5	Gut Fluorescence
August 5 2000	HH5	Gut Fluorescence
August 6 2000	BKb	Gut Fluorescence
August 7 2000	Z3	Gut Fluorescence, Molting Rate
August 8 2000	Z5	Molting Rate
August 9 2000	7a-7	Gut Fluorescence, Molting Rate
August 9 2000	7a-4	Gut Fluorescence, Molting Rate
August 10 2000	8a-4	Molting Rate
August 10 2000	9-2	Molting Rate
August 10 2000	9-5	Gut Fluorescence, Egg Production
August 11 2000	BOB2	Gut Fluorescence
August 11 2000	BOB3	Gut Fluorescence
August 2000	8-3	Gut Fluorescence
August 2000	8a-4	Gut Fluorescence
August 11 2000	AB 3.5	Gut Fluorescence
August 12 2000	AB 2.5	Gut Fluorescence
August 12 2000	AB6	Gut Fluorescence
August 12 2000	9-5	Egg Production
August 12 2000	NH20	Gut Fluorescence

We also did a few incubations for copepod egg production rates, at BOB1, 8A4, 8-3, BK, BKB, Z3 and Z8. We incubated *Calanus marshallae*, *Eucalanus californicus* and *Centropages abdominalis*.

Survey Effort, Station Plots, Event Log and Satellite Imagery

During the cruise we completed a total of 94 CTDs (Table 3), 43 MOCNESS tows (Table 4), 120 vertical plankton tows (VPT) (Table 5), and 62 one-meter ring net tows (for live zooplankton) (Table 6). The seabird survey effort covered 886 nm over 98.5 hours of observations. An example of the survey coverage for top trophic surveys is also provided in a figure showing coverage with 25X power 'Big-eye' binoculars for mammal effort during mesoscale and fine-scale surveys. Plots of the cruise track during mesoscale and fine-scale survey effort, as well as the locations of MOCNESS, CTD, vertical plankton tow (VPT), and live tow (one meter ring net) stations are provided. For reference, station locations are plotted over the 12 mesoscale track lines of the R/V *Wecoma*. Line 12 refers to the first line of the survey conducted off Crescent City and Line 1 refers to the most northern line off Newport, Oregon. Station plots are also available on the GLOBEC NEP website at

http://globec.oce.orst.edu/groups/nep/reports/ccs-cruises/nh0007/nh0007_index.html.

The event log (Appendix I) contains a summary of the times and locations for all sampling activities; separate specific tables are also provided for each instrument. Top trophic mammal and seabird survey effort is summarized in the master event log. Two satellite images of SST during or following the cruise are shown in Figures 7 and 8: June 1, during the upwelling favorable conditions; and June 16, just after the cruise. Figure 9 shows chlorophyll concentration composite for June 1-8, 2000.

Table 3: CTD Casts

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH20900.06	CTD	1	1	G-1	27	7	2113	s	38.7976	-123.6919	102	90	B-Team	Transit	
NH20900.07	CTD	1	1	G-1	27	7	2133	e	38.7971	-123.6949	104	nd	B-Team	Transit	
NH21000.01	CTD	2	2	G-2	28	7	0540	s	39.7721	-123.8932	90	85	A-Team	Transit	
NH21000.08	CTD	3	3	EEL-1	28	7	1310	s	40.6063	-124.4731	265	150	B-Team	Transit	
NH21000.09	CTD	3	3	EEL-1	28	7	1345	e	40.6006	-124.4822	354	nd	B-Team	Transit	
NH21000.19	CTD	4	4	CR-1	28	7	2302	s	41.9001	-124.3044	45	40	B-Team	Line12	
NH21000.20	CTD	4	4	CR-1	28	7	2311	e	41.9006	-124.3068	45	nd	B-Team	Line12	
NH21100.02	CTD	5	5	CR-2	29	7	0025	s	41.8972	-124.4005	70	70	A-Team	Line12	Hit bottom
NH21100.03	CTD	5	5	CR-2	29	7	0041	e	41.8950	-124.4054	71	nd	A-Team	Line12	
NH21100.04	CTD	6	6	CR-3	29	7	0124	s	41.8996	-124.5016	139	130	A-Team	Line12	
NH21100.05	CTD	6	6	CR-3	29	7	0145	e	41.8981	-124.5019	140	nd	A-Team	Line12	
NH21100.08	CTD	7	7	CR-4	29	7	0300	s	41.8995	-124.6003	509	200	A-Team	Line12	
NH21100.09	CTD	7	7	CR-4	29	7	0325	e	41.8995	-124.5960	498	nd	A-Team	Line12	
NH21100.10	CTD	8	8	CR-5	29	7	0410	s	41.9017	-124.7000	666	nd	A-Team	Line12	
NH21100.11	CTD	8	8	CR-5	29	7	0435	e	41.8993	-124.7088	669	nd	A-Team	Line12	
NH21100.14	CTD	9	9	CR-7	29	7	0634	s	41.9023	-125.0039	852	200	A-Team	Line12	No ending record
NH21100.19	CTD	10	10	CR-9	29	7	0833	s	41.8999	-125.3340	3120	200	A-Team	Line12	
NH21100.20	CTD	10	10	CR-9	29	7	0906	e	41.9027	-125.3464	3122	nd	A-Team	Line12	
NH21100.27	CTD	11	11	CR-10	29	7	1120	s	41.8956	-125.6700	2948	200	A-Team	Line12	
NH21100.28	CTD	11	11	CR-10	29	7	1152	e	41.8929	-125.6704	2948	nd	A-Team	Line12	
NH21200.24	CTD	12	16	RR-7	30	7	1230	s	42.5016	-125.2080	3026	200	B-Team	Line10	
NH21200.25	CTD	12	16	RR-7	30	7	1302	e	42.5056	-125.2173	3037	nd	B-Team	Line10	
NH21200.30	CTD	13	17	RR-6	30	7	1440	s	42.5009	-125.0032	1797	nd	B-Team	Line10	
NH21200.31	CTD	13	17	RR-6	30	7	1511	e	42.5036	-125.0083	nd	nd	B-Team	Line10	
NH21200.37	CTD	14	18	RR-5	30	7	1620	s	42.4996	-124.9005	1174	200	B-Team	Line10	
NH21200.38	CTD	14	18	RR-5	30	7	1635	e	42.5044	-124.9036	1250	nd	B-Team	Line10	
NH21200.49	CTD	15	19	RR-1	30	7	1905	s	42.5007	-124.4995	37	32	B-Team	Line10	
NH21200.50	CTD	15	19	RR-1	30	7	1920	e	42.5032	-124.5010	38	nd	B-Team	Line10	
NH21200.54	CTD	16	20	RR-2	30	7	2039	s	42.5029	-124.6028	90	80	B-Team	Line10	Bottle 9 hung up; no sample
NH21200.55	CTD	16	20	RR-2	30	7	2053	e	42.5055	-124.6054	90	nd	B-Team	Line10	Up and dn fluor traces very different
NH21200.56	CTD	17	20	RR-2B	30	7	2117	s	42.5007	-124.6018	90	80	B-Team	Line10	Labeled RR2B; no nisks
NH21200.57	CTD	17	20	RR-2B	30	7	2127	e	42.5021	-124.6034	nd	nd	B-Team	Line10	
NH21200.58	CTD	18	21	RR-3	30	7	2207	s	42.5003	-124.7011	141	135	B-Team	Line10	
NH21200.59	CTD	18	21	RR-3	30	7	2224	e	42.5008	-124.7048	145	nd	B-Team	Line10	
NH21300.45	CTD	18	27	FM-1	31	7	1926	e	43.2132	-124.4351	38	30	B-Team	Line7	
NH21300.46	CTD	18	27	FM-1	31	7	1937	e	43.2069	-124.4421	38	nd	B-Team	Line7	
NH21300.51	CTD	19	28	FM-3	31	7	2007	s	43.2163	-124.5012	60	55	B-Team	Line7	Bottles no good; cast aborted
NH21300.52	CTD	19	28	FM-3	31	7	2022	e	43.2119	-124.5083	nd	nd	B-Team	Line7	
NH21300.54	CTD	20	28	FM-3B	31	7	2048	s	43.2164	-124.5019	64	55	B-Team	Line7	
NH21300.55	CTD	20	28	FM-3B	31	7	2102	e	43.2150	-124.5082	64	55	B-Team	Line7	
NH21300.56	CTD	21	29	FM-4	31	7	2134	s	43.2165	-124.5853	87	80	B-Team	Line7	
NH21300.57	CTD	21	29	FM-4	31	7	2153	e	43.2163	-124.5938	98	nd	B-Team	Line7	
NH21300.62	CTD	22	30	FM-5	31	7	2330	s	43.2171	-124.6702	175	150	B-Team	Line7	
NH21300.63	CTD	22	30	FM-5	31	7	2353	e	43.2197	-124.6792	nd	nd	B-Team	Line7	
NH21400.05	CTD	23	31	FM-7	1	8	0209	s	43.2185	-124.8596	348	200	A-Team	Line7	
NH21400.06	CTD	23	31	FM-7	1	8	0242	e	43.2196	-124.8725	nd	nd	A-Team	Line7	
NH21400.07	CTD	24	32	FM-8	1	8	0335	s	43.2166	-125.0003	1093	200	A-Team	Line7	
NH21400.08	CTD	24	32	FM-8	1	8	0400	e	43.2203	-125.0161	1104	nd	A-Team	Line7	

Table 3: CTD Casts (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21400.12	CTD	25	33	FM-9	1	8	0540	s	43.2167	-125.1668	1695	200	A-Team	Line7	
NH21400.13	CTD	25	33	FM-9	1	8	0612	e	43.2207	-125.1819	1732	nd	A-Team	Line7	
NH21400.23	CTD	26	34	FM-10	1	8	0918	s	43.2301	-125.6796	1445	200	A-Team	Line7	
NH21400.24	CTD	26	34	FM-10	1	8	0947	e	43.2360	-125.6854	1438	nd	A-Team	Line7	
NH21400.31	CTD	27	35	FM-11	1	8	1246	s	43.2222	-126.1733	1397	200	B-Team	Line7	
NH21400.32	CTD	27	35	FM-11	1	8	1327	e	43.2336	-126.1962	1395	nd	B-Team	Line7	
NH21400.38	CTD	28	36	FM-7B	1	8	2201	s	43.2192	-124.8407	341	200	B-Team	Line7	
NH21400.39	CTD	28	36	FM-7B	1	8	2227	e	43.2230	-124.8502	346	nd	B-Team	Line7	
NH21500.03	CTD	29	37	FM-5B	2	8	0055	s	43.2249	-124.6729	172	163	A-Team	Line7	
NH21500.04	CTD	29	37	FM-5B	2	8	0121	e	43.2270	-124.6928	172	nd	A-Team	Line7	
NH21500.05	CTD	30	38	FM-4B	2	8	0220	s	43.2189	-124.5888	94	82	A-Team	Line7	
NH21500.06	CTD	30	38	FM-4B	2	8	0242	e	43.2193	-124.5915	94	nd	A-Team	Line7	
NH21500.11	CTD	31	39	FM-3C	2	8	0434	s	43.2182	-124.5080	62	52	A-Team	Line7	
NH21500.12	CTD	31	39	FM-3C	2	8	0449	e	43.2028	-124.5096	64	nd	A-Team	Line7	
NH21500.13	CTD	32	40	FM-1B	2	8	0540	s	43.2178	-124.4380	39	30	A-Team	Line7	
NH21500.14	CTD	32	40	FM-1B	2	8	0550	e	43.2194	-124.4404	42	nd	A-Team	Line7	
NH21500.22	CTD	33	41	DL-1	2	8	0812	s	43.3599	-124.6575	192	181	A-Team	Dogleg	
NH21500.23	CTD	33	41	DL-1	2	8	0850	e	43.3635	-124.6718	215	nd	A-Team	Dogleg	
NH21500.29	CTD	34	42	DL-2	2	8	1030	s	43.4780	-124.8440	546	200	A-Team	Dogleg	
NH21500.30	CTD	34	42	DL-2	2	8	1104	e	43.4864	-124.8512	568	nd	A-Team	Dogleg	
NH21500.36	CTD	35	43	DL-3	2	8	1236	s	43.5826	-125.0028	1093	200	B-Team	Dogleg	
NH21500.37	CTD	35	43	DL-3	2	8	1312	e	43.5828	-125.0093	nd	nd	B-Team	Dogleg	
NH21500.43	CTD	36	44	DL-4	2	8	1455	s	43.6894	-124.7992	665	200	B-Team	Dogleg	
NH21500.44	CTD	36	44	DL-4	2	8	1533	e	43.6902	-124.8042	nd	nd	B-Team	Dogleg	
NH21500.50	CTD	37	45	DL-5	2	8	1705	s	43.7821	-124.6207	300	200	B-Team	Dogleg	
NH21500.51	CTD	37	45	DL-5	2	8	1730	e	43.7800	-124.6217	nd	nd	B-Team	Dogleg	
NH21500.57	CTD	38	46	DL-6	2	8	1845	s	43.8515	-124.4937	158	124	B-Team	Dogleg	
NH21500.58	CTD	38	46	DL-6	2	8	1907	e	43.8519	-124.4978	134	nd	B-Team	Dogleg	
NH21500.63	CTD	39	47	HH-1	2	8	2108	s	43.9991	-124.2060	56	50	B-Team	Line4	
NH21500.64	CTD	39	47	HH-1	2	8	2116	e	43.9988	-124.2081	nd	nd	B-Team	Line4	
NH21500.68	CTD	40	48	HH-2	2	8	2314	s	44.0010	-124.4095	124	115	B-Team	Line4	
NH21500.69	CTD	40	48	HH-2	2	8	2330	e	44.0027	-124.4139	nd	nd	B-Team	Line4	
NH21600.02	CTD	41	49	HH-4	3	8	0307	s	44.0005	-124.8003	114	100	A-Team	Line4	
NH21600.03	CTD	41	49	HH-4	3	8	0328	e	44.0012	-124.8005	110	nd	A-Team	Line4	
NH21600.26	CTD	42	53	HH-5	3	8	1440	s	43.9999	-125.0034	960	200	B-Team	Line4	
NH21600.27	CTD	42	53	HH-5	3	8	1516	e	43.9988	-125.0093	994	nd	B-Team	Line4	
NH21600.36	CTD	43	54	HH-7	3	8	1824	s	43.9977	-125.1997	1734	200	B-Team	Line4	
NH21600.37	CTD	43	54	HH-7	3	8	1842	e	43.9948	-125.2015	nd	nd	B-Team	Line4	
NH21600.44	CTD	44	55	NH-45	3	8	2337	s	44.6178	-125.1334	895	200	B-Team	Line1	
NH21700.01	CTD	44	55	NH-45	4	8	0003	e	44.6187	-125.1435	954	200	B-Team	Line1	
NH21700.04	CTD	45	56	NH-35	4	8	0346	s	44.6531	-124.8856	460	200	A-Team	Line1	Shark
NH21700.05	CTD	45	56	NH-35	4	8	0410	e	44.6519	-124.8922	482	nd	A-Team	Line1	
NH21700.15	CTD	46	57	NH-25	4	8	0730	s	44.6501	-124.6562	282	200	A-Team	Line1	
NH21700.16	CTD	46	57	NH-25	4	8	0813	e	44.6480	-124.6675	248	nd	A-Team	Line1	
NH21700.24	CTD	47	58	NH-20	4	8	1011	s	44.6532	-124.5352	150	140	A-Team	Line1	
NH21700.25	CTD	47	58	NH-20	4	8	1036	e	44.6543	-124.5417	150	nd	A-Team	Line1	
NH21700.30	CTD	48	59	NH-15	4	8	1120	s	44.6512	-124.4107	95	90	A-Team	Line1	Sea Eagle sampling NH15 simultaneously

Table 3: CTD Casts (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21700.31	CTD	48	59	NH-15	4	8	1140	e	44.6526	-124.4139	94	nd	A-Team	Line1	
NH21700.40	CTD	49	60	NH-10	4	8	1407	s	44.6553	-124.3002	84	78	B-Team	Line1	
NH21700.41	CTD	49	60	NH-10	4	8	1429	e	44.6565	-124.3035	84	nd	B-Team	Line1	
NH21700.46	CTD	50	61	NH-5	4	8	1524	s	44.6524	-124.1771	59	nd	B-Team	Line1	
NH21700.47	CTD	50	61	NH-5	4	8	1541	e	44.6520	-124.1805	60	nd	B-Team	Line1	
NH21700.58	CTD	51	62	NH-1	4	8	1718	s	44.6554	-124.1012	31	20	B-Team	Line1	
NH21700.59	CTD	51	62	NH-1	4	8	1731	e	44.6565	-124.1028	33	nd	B-Team	Line1	
NH21800.09	CTD	52	69	BOB-6	5	8	0658	s	44.2507	-125.1121	1224	200	A-Team	BOB	
NH21800.10	CTD	52	69	BOB-6	5	8	0722	e	44.2501	-125.1158	1247	nd	A-Team	BOB	
NH21800.15	CTD	53	70	BOB-5	5	8	0915	s	44.2514	-124.9023	150	150	A-Team	BOB	
NH21800.16	CTD	53	70	BOB-5	5	8	0940	e	44.2528	-124.9090	157	nd	A-Team	BOB	
NH21800.23	CTD	54	71	BOB-4	5	8	1122	s	44.2522	-124.7054	100	89	A-Team	BOB	
NH21800.24	CTD	54	71	BOB-4	5	8	1138	e	44.2537	-124.7096	102	nd	A-Team	BOB	
NH21800.31	CTD	55	72	BOB-3	5	8	1255	s	44.2534	-124.4986	104	nd	B-Team	BOB	Lots of flotsam on the surface; wood, eelgrass, leaves
NH21800.32	CTD	55	72	BOB-3	5	8	1317	e	44.2548	-124.5007	105	nd	B-Team	BOB	
NH21800.39	CTD	56	73	BOB-2	5	8	1442	s	44.2515	-124.3830	91	80	B-Team	BOB	
NH21800.40	CTD	56	73	BOB-2	5	8	1503	e	44.2527	-124.3745	nd	nd	B-Team	BOB	
NH21800.45	CTD	57	74	BOB-1	5	8	1607	s	44.2486	-124.1800	54	45	B-Team	BOB	
NH21800.46	CTD	57	74	BOB-1	5	8	1621	e	44.2487	-124.1844	nd	nd	B-Team	BOB	
NH21900.28	CTD	58	82	BK	6	8	2230	s	44.1719	-125.1760	1509	200	B-Team	BK	
NH21900.29	CTD	58	82	BK	6	8	2256	e	44.1767	-125.1829	nd	nd	B-Team	BK	
NH22000.17	CTD	59	85	Z-2	7	8	1341	s	43.7523	-126.0042	3053	200	B-Team	Zag	Wecoma at BOB1 simultaneously
NH22000.19	CTD	59	85	Z-2	7	8	1407	e	43.7548	-126.0106	3055	nd	B-Team	Zag	
NH22000.20	CTD	60	86	Z-1	7	8	1611	s	43.6542	-125.9328	3068	200	B-Team	Zag	
NH22000.21	CTD	60	86	Z-1	7	8	1642	e	43.6640	-125.9423	nd	nd	B-Team	Zag	
NH22000.33	CTD	61	88	Z-3	7	8	2115	s	43.4992	-125.8087	3079	200	B-Team	Zag	14.4 SST
NH22000.34	CTD	61	88	Z-3	7	8	2140	e	43.5040	-125.8069	nd	nd	B-Team	Zag	
NH22100.02	CTD	62	89	Z-4	8	8	0235	s	43.3526	-125.5050	3097	200	A-Team	Zag	
NH22100.03	CTD	62	89	Z-4	8	8	0309	e	43.3622	-125.5180	3100	nd	A-Team	Zag	
NH22100.08	CTD	63	90	Z-5	8	8	0733	s	43.2263	-125.8064	3081	200	A-Team	Zag	
NH22100.09	CTD	63	90	Z-5	8	8	0800	s	43.2328	-125.8115	nd	nd	A-Team	Zag	
NH22100.14	CTD	64	91	Z-6	8	8	0934	s	43.0815	-126.0012	3082	200	A-Team	Zag	
NH22100.15	CTD	64	91	Z-6	8	8	1003	e	43.0842	-126.0068	3082	nd	A-Team	Zag	
NH22100.21	CTD	65	92	Z-7	8	8	1227	s	42.9535	-125.6533	3088	200	B-Team	Zag	
NH22100.22	CTD	65	92	Z-7	8	8	1255	e	42.9604	-125.6600	nd	nd	B-Team	Zag	
NH22100.33	CTD	66	93	Z-8	8	8	1916	s	42.8180	-125.1505	2250	350	B-Team	Zag	
NH22100.34	CTD	66	93	Z-8	8	8	1938	e	42.8185	-125.1550	nd	nd	B-Team	Zag	
NH22100.37	CTD	67	94	Z-9	8	8	2200	s	42.9495	-124.8231	149	140	B-Team	Zag	=sta 8-9
NH22100.38	CTD	67	94	Z-9	8	8	2222	e	42.9493	-124.8265	145	140	B-Team	Zag	
NH22200.12	CTD	68	101	7A-1	9	8	0633	s	43.0837	-124.4597	31	25	A-Team	Blanco	
NH22200.13	CTD	68	101	7A-1	9	8	0646	e	43.0813	-124.4603	33	nd	A-Team	Blanco	
NH22200.20	CTD	69	102	7A-2	9	8	0853	s	43.0841	-124.5099	67	55	A-Team	Blanco	
NH22200.21	CTD	69	102	7A-2	9	8	0910	e	43.0827	-124.5152	69	nd	A-Team	Blanco	
NH22200.26	CTD	70	103	7A-3	9	8	0930	s	43.0835	-124.5493	93	80	A-Team	Blanco	
NH22200.27	CTD	70	103	7A-3	9	8	0950	e	43.0863	-124.5540	95	nd	A-Team	Blanco	
NH22200.32	CTD	71	104	7A-4	9	8	1037	s	43.0842	-124.6640	157	140	A-Team	Blanco	
NH22200.33	CTD	71	104	7A-4	9	8	1103	e	43.0841	-124.6723	161	nd	A-Team	Blanco	

Table 3: CTD Casts (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22200.38	CTD	72	105	7A-5	9	8	1147	s	43.0855	-124.7780	232	200	A-Team	Blanco	Finished by B-Team
NH22200.39	CTD	72	105	7A-5	9	8	1218	e	43.0890	-124.7808	nd	nd	B-Team	Blanco	
NH22200.44	CTD	73	106	7A-6	9	8	1303	s	43.0853	-124.8902	417	200	B-Team	Blanco	
NH22200.45	CTD	73	106	7A-6	9	8	1336	e	43.0898	-124.8898	nd	nd	B-Team	Blanco	
NH22200.50	CTD	74	107	7A-8	9	8	1521	s	43.0818	-125.2000	2028	200	B-Team	Blanco	
NH22200.51	CTD	74	107	7A-8	9	8	1555	e	43.0780	-125.1965	nd	nd	B-Team	Blanco	
NH22200.05	CTD	75	114	9-6	10	8	0306	s	42.6829	-124.9042	761	200	A-Team	Blanco	
NH22200.06	CTD	75	114	9-6	10	8	0331	e	42.6830	-124.9101	800	nd	A-Team	Blanco	
NH22200.07	CTD	76	115	9-5	10	8	0427	s	42.6845	-124.7873	650	200	A-Team	Blanco	
NH22200.08	CTD	76	115	9-5	10	8	0454	e	42.6871	-124.7948	655	nd	A-Team	Blanco	
NH22200.13	CTD	77	116	9-4	10	8	0626	s	42.6875	-124.6760	153	150	A-Team	Blanco	
NH22200.14	CTD	77	116	9-4	10	8	0647	e	42.6915	-124.6779	155	nd	A-Team	Blanco	
NH22200.21	CTD	78	117	9-3	10	8	0815	s	42.6833	-124.5643	93	83	A-Team	Blanco	
NH22200.22	CTD	78	117	9-3	10	8	0834	e	42.6843	-124.5708	96	nd	A-Team	Blanco	
NH22200.30	CTD	79	118	9-2	10	8	0941	s	42.6892	-124.5285	76	65	A-Team	Blanco	
NH22200.31	CTD	79	118	9-2	10	8	0956	e	42.6902	-124.5348	76	nd	A-Team	Blanco	
NH22200.35	CTD	80	119	9-1	10	8	1025	s	42.6833	-124.4760	36	20	A-Team	Blanco	
NH22200.37	CTD	80	119	9-1	10	8	1038	e	42.6852	-124.4797	nd	nd	A-Team	Blanco	
NH22200.63	CTD	81	123	FR-1	10	8	1700	s	42.8873	-124.6177	65	50	B-Team	Blanco	Brown side of front/slick
NH22200.64	CTD	81	123	FR-1	10	8	1717	s	42.8882	-124.6193	68	nd	B-Team	Blanco	
NH22200.65	CTD	82	124	FR-2	10	8	1725	s	42.8940	-124.6305	79	60	B-Team	Blanco	Blue side of front/slick
NH22200.66	CTD	82	124	FR-2	10	8	1755	e	42.8937	-124.6335	nd	nd	B-Team	Blanco	
NH22200.51	CTD	83	137	AB-5	11	8	1524	s	44.4471	-124.5010	88	80	B-Team	LineAB	AB=Alsea Bay; satellite shows intermix ing waters
NH22200.52	CTD	83	137	AB-5	11	8	1545	e	44.4468	-124.5052	nd	nd	B-Team	LineAB	
NH22200.57	CTD	84	138	AB-4	11	8	1622	s	44.4492	-124.4001	76	60	B-Team	LineAB	
NH22200.60	CTD	84	138	AB-4	11	8	1641	e	44.4487	-124.4048	78	nd	B-Team	LineAB	
NH22200.63	CTD	85	139	AB-3	11	8	1717	s	44.4497	-124.3012	74	60	B-Team	LineAB	
NH22200.64	CTD	85	139	AB-3	11	8	1736	e	44.4505	-124.3058	nd	nd	B-Team	LineAB	
NH22200.69	CTD	86	140	AB-2	11	8	1813	s	44.4492	-124.2015	60	50	B-Team	LineAB	
NH22200.70	CTD	86	140	AB-2	11	8	1828	e	44.4490	-124.2057	nd	nd	B-Team	LineAB	
NH22200.75	CTD	87	141	AB-1	11	8	1850	s	44.4505	-124.1408	46	35	B-Team	LineAB	
NH22200.76	CTD	87	141	AB-1	11	8	1905	e	44.4503	-124.1438	nd	nd	B-Team	LineAB	
NH22200.89	CTD	88	146	AB-3_5	11	8	2315	s	44.4517	-124.3567	72	65	B-Team	LineAB	
NH22200.90	CTD	88	146	AB-3_5	11	8	2336	e	44.4521	-124.3593	nd	nd	B-Team	LineAB	
NH22200.07	CTD	89	150	NH-20B	12	8	0529	s	44.6499	-124.5276	143	130	A-Team	Line1	
NH22200.08	CTD	89	150	NH-20B	12	8	0547	e	44.6551	-124.5328	nd	nd	A-Team	Line1	
NH22200.09	CTD	90	151	NH-15B	12	8	0630	s	44.6494	-124.4120	89	80	A-Team	Line1	
NH22200.10	CTD	90	151	NH-15B	12	8	0641	e	44.6491	-124.4152	89	nd	A-Team	Line1	
NH22200.20	CTD	91	152	NH-10B	12	8	0805	s	44.6511	-125.3021	84	70	A-Team	Line1	
NH22200.21	CTD	91	152	NH-10B	12	8	0828	e	44.6535	-124.3072	84	nd	A-Team	Line1	
NH22200.26	CTD	92	153	NH-5B	12	8	0910	s	44.6516	-124.1761	59	50	A-Team	Line1	
NH22200.27	CTD	92	153	NH-5B	12	8	0932	e	44.6546	-124.1804	59	nd	A-Team	Line1	
NH22200.37	CTD	93	154	NH-3B	12	8	1039	s	44.6506	-124.1329	50	40	A-Team	Line1	
NH22200.38	CTD	93	154	NH-3B	12	8	1051	e	44.6519	-124.1354	50	40	A-Team	Line1	
NH22200.43	CTD	94	155	NH-1B	12	8	1110	s	44.6517	-124.0996	30	20	A-Team	Line1	
NH22200.44	CTD	94	155	NH-1B	12	8	1120	e	44.6500	-124.1000	nd	nd	A-Team	Line1	

New Horizon CTD stations: July–Aug 2000

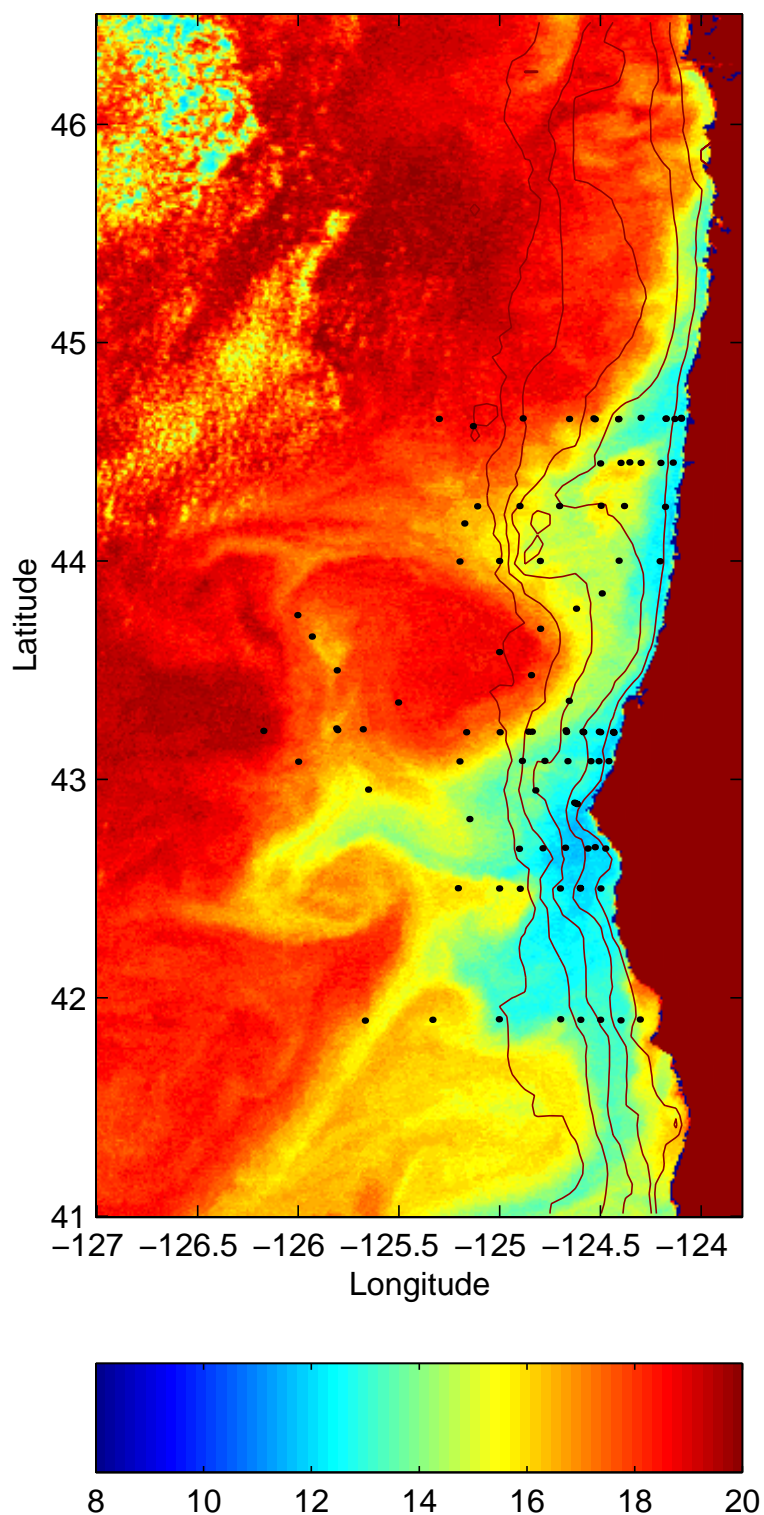


Figure 1. Locations of CTD Stations, July - August, 2000, GLOBEC Cruise, NH0007, Satellite Image of SST from 2 August, 2000

Table 4: MOCNESS Sampling

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21100.37	MOC	1	12	CR-1	29	7	2005	s	41.9016	-124.4050	75	60	B-Team	Line12	
NH21100.38	MOC	1	12	CR-1	29	7	2026	e	41.9135	-124.4167	75	nd	B-Team	Line12	
NH21100.39	MOC	2	13	CR-3	29	7	2225	s	41.8992	-124.4971	135	120	B-Team	Line12	
NH21100.40	MOC	2	13	CR-3	29	7	2302	e	41.9160	-124.5117	145	nd	B-Team	Line12	
NH21200.07	MOC	3	14	CR-4	30	7	0245	s	41.9060	-124.5967	nd	nd	A-Team	Line12	
NH21200.08	MOC	3	14	CR-4	30	7	0341	e	41.9342	-124.5883	nd	nd	A-Team	Line12	
NH21200.11	MOC	4	15	CR-5	30	7	0548	s	41.8898	-124.6933	664	350	A-Team	Line12	
NH21200.12	MOC	4	15	CR-5	30	7	0654	e	41.9224	-124.7150	nd	nd	A-Team	Line12	
NH21200.62	MOC	5	21	RR-3	30	7	2312	s	42.5025	-124.7033	190	161	B-Team	Line10	
NH21300.63	MOC	5	21	RR-3	30	7	2349	e	42.5167	-124.7167	nd	nd	B-Team	Line10	
NH21300.03	MOC	6	22	RR-4	31	7	0310	s	42.5011	-124.8017	544	350	A-Team	Line10	
NH21300.04	MOC	6	22	RR-4	31	7	0410	e	42.5329	-124.8245	528	nd	A-Team	Line10	
NH21300.05	MOC	7	23	RR-2	31	7	0616	s	42.4934	-124.6000	90	75	A-Team	Line10	
NH21300.06	MOC	7	23	RR-2	31	7	nd	e	nd	nd	nd	nd	A-Team	Line10	
NH21300.12	MOC	8	24	RR-3B	31	7	0802	s	42.4998	-124.7050	nd	150	A-Team	Line10	
NH21300.13	MOC	8	24	RR-3B	31	7	0829	e	42.5105	-124.7167	nd	nd	A-Team	Line10	
NH21300.18	MOC	9	25	RR-4	31	7	0919	s	42.5010	-124.8017	621	350	A-Team	Line10	
NH21300.19	MOC	9	25	RR-4	31	7	1014	e	42.5248	-124.8267	590	nd	A-Team	Line10	
NH21300.25	MOC	10	26	RR-6	31	7	1205	s	42.5020	-125.0007	1800	350	B-Team	Line10	
NH21300.26	MOC	10	26	RR-6	31	7	1313	e	42.5406	-125.0088	nd	nd	B-Team	Line10	
NH21500.70	MOC	11	48	HH-2	2	8	2357	s	44.0035	-124.4067	123	105	B-Team/ A-Team	Line4	B-Team started; A-Team finished
NH21600.01	MOC	11	48	HH-2	3	8	0027	e	44.0138	-124.4183	nd	nd	A-Team	Line4	
NH21600.05	MOC	12	49	HH-4	3	8	0355	s	44.0041	-124.8100	103	90	A-Team	Line4	
NH21600.06	MOC	12	49	HH-4	3	8	0419	e	44.0170	-124.8167	103	nd	A-Team	Line4	
NH21600.12	MOC	13	51	HH-2B	3	8	0926	s	44.0143	-124.4050	121	110	A-Team	Line4	Wecoma circled NH during cast; peak scatterers at 90-100m
NH21600.13	MOC	13	51	HH-2B	3	8	1008	e	44.0275	-124.4150	nd	nd	A-Team	Line4	Wecoma nearby during cast
NH21600.20	MOC	14	52	HH-4B	3	8	1235	s	44.0034	-124.8300	110	100	B-Team	Line4	
NH21600.21	MOC	14	52	HH-4B	3	8	1319	e	44.0277	-124.8050	nd	nd	B-Team	Line4	
NH21600.29	MOC	15	53	HH-5	3	8	1535	s	44.0014	-125.0156	1051	350	B-Team	Line4	
NH21600.30	MOC	15	53	HH-5	3	8	1639	e	44.0268	-124.4150	nd	nd	B-Team	Line4	
NH21700.02	MOC	16	55	NH-45	4	8	0018	s	44.6241	-125.1502	925	350	A-Team	Line1	
NH21700.03	MOC	16	55	NH-45	4	8	0120	e	44.6570	-125.1750	nd	nd	A-Team	Line1	
NH21700.08	MOC	17	56	NH-35	4	8	0453	s	44.6533	-124.9050	581	350	A-Team	Line1	
NH21700.09	MOC	17	56	NH-35	4	8	0553	e	44.6750	-124.9433	nd	nd	A-Team	Line1	
NH21700.17	MOC	18	57	NH-25	4	8	0823	e	44.6499	-124.6717	245	200	A-Team	Line1	
NH21700.18	MOC	18	57	NH-25	4	8	0851	e	44.6571	-124.6883	nd	nd	A-Team	Line1	
NH21700.33	MOC	19	59	NH-15	4	8	1210	s	44.6537	-124.4317	100	87.5	B-Team	Line1	
NH21700.34	MOC	19	59	NH-15	4	8	1243	e	44.6663	-124.4333	106	nd	B-Team	Line1	
NH21700.50	MOC	20	61	NH-5	4	8	1601	s	44.6520	-124.1863	64	55	B-Team	Line1	Sharp turns to avoid crabpots
NH21700.51	MOC	20	61	NH-5	4	8	1624	e	44.6587	-124.2000	66	nd	B-Team	Line1	
NH21800.48	MOC	21	75	BOB-2	5	8	1721	s	44.2494	-124.3644	90	88	B-Team	BOB	Wecoma steamed by; real close to bottom
NH21800.49	MOC	21	75	BOB-2	5	8	1748	e	44.2570	-124.3815	90	88	B-Team	BOB	Wecoma steamed by while on station
NH21800.50	MOC	22	76	BOB-4	5	8	1945	s	44.2483	-124.7000	100	90	B-Team	BOB	
NH21800.51	MOC	22	76	BOB-4	5	8	2014	e	44.2582	-124.7150	nd	nd	B-Team	BOB	
NH21800.54	MOC	23	77	HH-5B	5	8	2320	s	44.0010	-125.0088	1000	350	B-Team	HH5Diel	
NH21900.01	MOC	23	77	HH-5B	6	8	0028	e	44.0260	-125.0565	nd	nd	A-Team	HH5Diel	A-Team relieved B-Team on MOC

Table 4: MOCNESS Sampling (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21900.02	MOC	24	78	HH-5C	6	8	0303	s	44.0034	-125.0025	900	350	A-Team	HH5Diel	
NH21900.03	MOC	24	78	HH-5C	6	8	0355	e	44.0280	-125.0463	nd	nd	A-Team	HH5Diel	
NH21900.04	MOC	25	79	HH-5D	6	8	0600	s	43.9933	-124.9894	862	350	A-Team	HH5Diel	
NH21900.05	MOC	25	79	HH-5D	6	8	0656	e	44.0148	-125.0243	nd	nd	A-Team	HH5Diel	
NH21900.14	MOC	26	80	BK	6	8	1302	s	44.1620	-125.1418	1555	350	B-Team	BK	At birdkill site; 4 Cassins Auklets shot
NH21900.15	MOC	26	80	BK	6	8	1400	e	44.1885	-125.1717	nd	nd	B-Team	BK	
NH21900.18	MOC	27	81	HH-5E	6	8	1550	s	44.0067	-125.0016	950	350	B-Team	HH5Diel	
NH21900.19	MOC	27	81	HH-5E	6	8	1656	e	44.0421	-125.0371	1149	nd	B-Team	HH5Diel	
NH21900.30	MOC	28	82	BKB	6	8	2314	s	44.1759	-125.1700	1509	350	B-Team	BK	
NH22000.01	MOC	28	82	BKB	7	8	0020	e	44.2109	-125.1900	nd	nd	A-Team	BK	
NH22000.02	MOC	29	83	HH-5F	7	8	0303	s	44.1305	-125.0091	970	350	A-Team	HH5Diel	
NH22000.03	MOC	29	83	HH-5F	7	8	0415	e	44.0481	-125.0253	nd	nd	A-Team	HH5Diel	
NH22000.04	MOC	30	84	HH-5G	7	8	0613	s	44.0080	-125.0100	1162	350	A-Team	HH5Diel	
NH22000.05	MOC	30	84	HH-5G	7	8	0700	e	44.0306	-125.0113	nd	nd	A-Team	HH5Diel	
NH22000.24	MOC	31	87	W-1	7	8	1745	s	43.7417	-126.0024	2580	350	B-Team	Zag	Group of fin whales nearby
NH22000.26	MOC	31	87	W-1	7	8	1847	e	43.7708	-126.0172	nd	nd	B-Team	Zag	
NH22000.37	MOC	32	88	Z-3	7	8	2226	s	43.5150	-125.8433	3079	350	B-Team	Zag	
NH22000.38	MOC	32	88	Z-3	7	8	2338	e	43.5431	-125.8800	3079	nd	B-Team	Zag	
NH22100.04	MOC	33	90	Z-5	8	8	0505	s	43.2211	-125.8127	3079	350	A-Team	Zag	
NH22100.05	MOC	33	90	Z-5	8	8	0617	e	43.2654	-125.8267	nd	nd	A-Team	Zag	
NH22100.25	MOC	34	92	Z-7	8	8	1338	s	42.9730	-125.6700	3086	350	B-Team	Zag	
NH22100.26	MOC	34	92	Z-7	8	8	1437	e	43.0115	-125.6900	nd	nd	B-Team	Zag	
NH22100.31	MOC	35	93	Z-8	8	8	1745	s	42.8175	-125.1527	2250	350	B-Team	Zag	
NH22100.32	MOC	35	93	Z-8	8	8	1847	e	42.8382	-125.1867	nd	nd	B-Team	Zag	
NH22100.41	MOC	36	94	Z-9	8	8	2331	s	42.8383	-125.1867	136	120	B-Team	Zag	
NH22200.01	MOC	36	94	Z-9	9	8	0013	e	42.9744	-124.8467	136	nd	A-Team	Zag	
NH22200.63	MOC	37	110	8A-3	9	8	2053	s	42.8257	-124.6550	76	nd	B-Team	Blanco	
NH22200.64	MOC	37	110	8A-3	9	8	2120	e	42.8394	-124.6633	nd	nd	B-Team	Blanco	
NH22200.68	MOC	38	112	8A-5	9	8	2325	s	42.8153	-124.8850	363	335	B-Team	Blanco	
NH22300.01	MOC	38	112	8A-5	10	8	0032	e	42.8361	-124.9117	453	nd	A-Team	Blanco	
NH22300.19	MOC	39	117	9-3	10	8	0736	s	42.6775	-124.5600	90	80	A-Team	Blanco	
NH22300.20	MOC	39	117	9-3	10	8	0754	e	43.6879	-124.5717	91	nd	A-Team	Blanco	
NH22300.68	MOC	40	125	FR-1	10	8	1825	s	42.8927	-124.6227	71	60	B-Team	Blanco	Towed along slick; towed in trough
NH22300.69	MOC	40	125	FR-1	10	8	1902	e	42.8993	-124.6050	nd	nd	B-Team	Blanco	Lost software on descent; reacquired later
NH22400.13	MOC	41	130	BOB-1FW	11	8	0730	s	44.2659	-124.2750	75	65	A-Team	BOB	MOCNESS messed up; nonquantitative
NH22400.84	MOC	42	144	AB-2_5	11	8	2124	s	44.4522	-124.2600	75	60	B-Team	LineAB	M2A2_5.pro MOC filename
NH22400.85	MOC	42	144	AB-2_5	11	8	2203	s	44.4613	-124.2750	nd	nd	B-Team	LineAB	
NH22500.03	MOC	43	149	AB-6	12	8	0300	s	44.4599	-124.6833	135	120	A-Team	LineAB	Wecoma targets
NH22500.04	MOC	43	149	AB-6	12	8	0331	e	44.4714	-124.6883	135	nd	A-Team	LineAB	

New Horizon MOC stations: July–Aug 2000

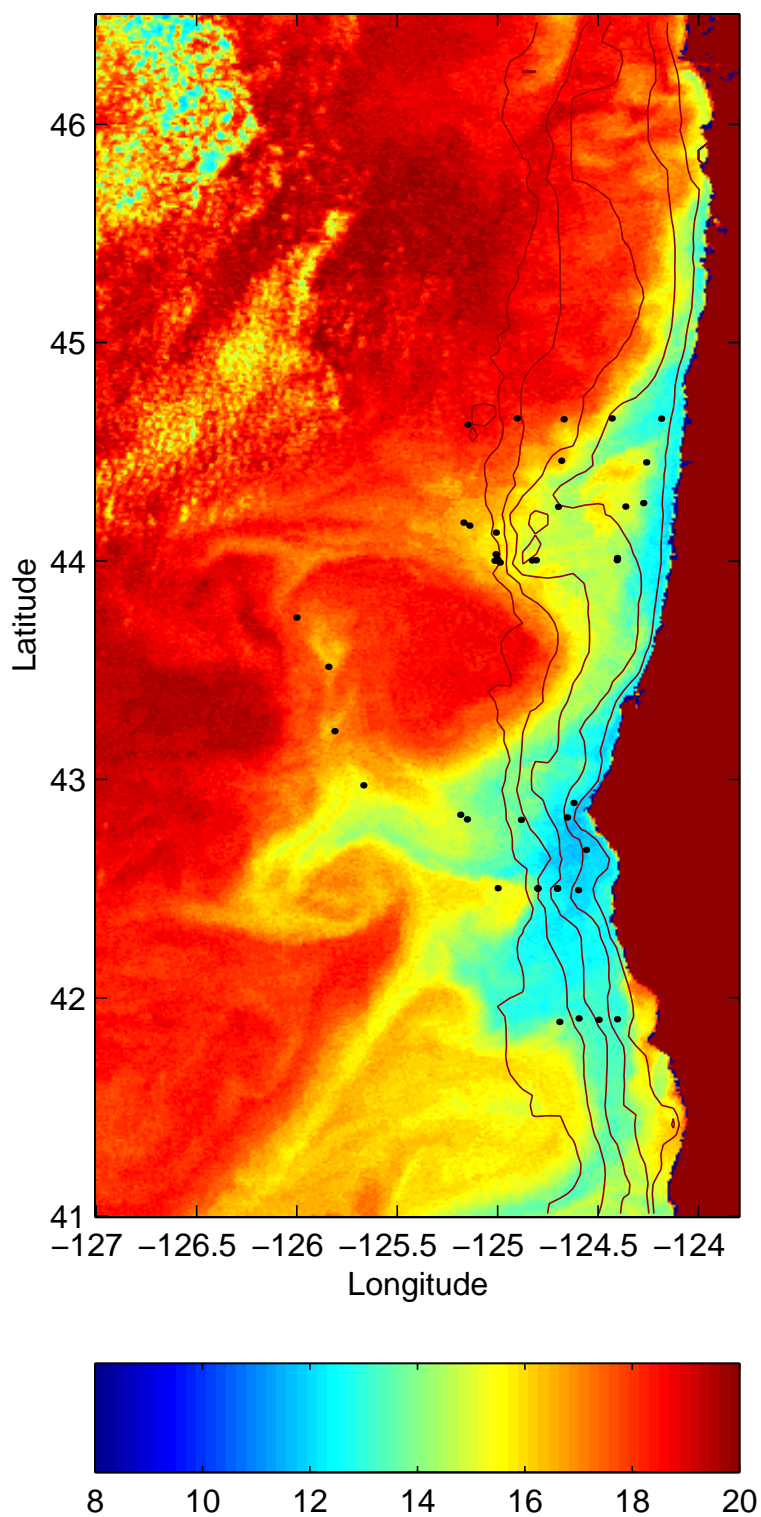


Figure 2. Locations of MOCNESS Stations, July - August, 2000, GLOBEC Cruise, NH0007, Satellite Image of SST from 2 August, 2000

Table 5: Vertical Plankton Tows

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH20900.08	VPT	1	1	G-1	27	7	2146	s	38.7971	-123.6949	104	95	B-Team	Transit	
NH21000.02	VPT	2	2	G-2	28	7	0600	s	39.7717	-123.8967	90	85	A-Team	Transit	
NH21000.07	VPT	3	3	EEL-1	28	7	1250	s	40.6070	-124.4668	190	100	B-Team	Transit	
NH21000.21	VPT	4	4	CR-1	28	7	2320	s	41.9007	-124.3075	45	35	B-Team	Line12	Very near bottom
NH21100.01	VPT	5	5	CR-2	29	7	0010	s	41.8990	-124.4034	71	66	A-Team	Line12	
NH21100.06	VPT	6	6	CR-3	29	7	0150	s	41.8989	-124.5003	140	100	A-Team	Line12	
NH21100.07	VPT	7	7	CR-4	29	7	0238	s	41.8997	-124.6012	512	100	A-Team	Line12	
NH21100.12	VPT	8	8	CR-5	29	7	0447	s	41.9003	-124.7165	688	100	A-Team	Line12	
NH21100.13	VPT	9	9	CR-7	29	7	0617	s	41.9018	-124.9985	839	100	A-Team	Line12	
NH21100.21	VPT	10	10	CR-9	29	7	0915	s	41.9038	-125.3506	3122	100	A-Team	Line12	
NH21100.26	VPT	11	11	CR-10	29	7	1103	s	41.8976	-125.6678	2948	100	A-Team	Line12	
NH21200.23	VPT	12	16	RR-7	30	7	1207	s	42.4999	-125.2027	3013	100	B-Team	Line10	
NH21200.32	VPT	13	17	RR-6	30	7	1523	s	42.5046	-125.0113	1866	100	B-Team	Line10	
NH21200.51	VPT	14	19	RR-1	30	7	1924	s	42.5039	-124.5019	38	30	B-Team	Line10	
NH21200.53	VPT	15	20	RR-2	30	7	2020	s	42.5000	-124.5986	88	80	B-Team	Line10	
NH21200.60	VPT	16	21	RR-3	30	7	2230	s	42.5018	-124.7058	160	100	B-Team	Line10	
NH21300.44	VPT	17	27	FM-1	31	7	1914	s	43.2132	-124.4351	36	30	B-Team	Line7	
NH21300.53	VPT	18	28	FM-3	31	7	2030	s	43.2097	-124.5108	60	55	B-Team	Line7	Wire angle >45; sample discarded
NH21300.58	VPT	19	29	FM-4	31	7	2202	s	43.2169	-124.5974	106	90	B-Team	Line7	
NH21300.60	VPT	nd	30	FM-5	31	7	2254	s	43.2176	-124.6732	170	100	B-Team	Line7	
NH21300.61	VPT	20	30	FM-5	31	7	2307	s	43.2177	-124.6818	175	100	B-Team	Line7	
NH21400.04	VPT	21	31	FM-7	1	8	0150	s	43.2185	-124.8457	344	100	A-Team	Line7	
NH21400.10	VPT	22	32	FM-8	1	8	0430	s	43.2226	-125.0310	1100	100	A-Team	Line7	
NH21400.14	VPT	23	33	FM-9	1	8	0619	s	43.2218	-125.1850	1704	100	A-Team	Line7	
NH21400.21	VPT	24	34	FM-10	1	8	0847	s	43.2188	-125.6688	1499	100	A-Team	Line7	
NH21400.33	VPT	25	35	FM-11	1	8	1343	s	43.2392	-126.1962	1395	100	B-Team	Line7	
NH21400.40	VPT	26	36	FM-7B	1	8	2234	s	43.2249	-124.8551	349	100	B-Team	Line7	
NH21500.01	VPT	27	37	FM-5B	2	8	0017	s	43.2196	-124.6688	167	100	A-Team	Line7	
NH21500.08	VPT	28	38	FM-4B	2	8	0304	s	43.2228	-124.6166	106	95	A-Team	Line7	
NH21500.10	VPT	29	39	FM-3C	2	8	0419	s	43.2167	-124.5048	60	54	A-Team	Line7	
NH21500.16	VPT	30	40	FM-1B	2	8	0607	s	43.2223	-124.4422	40	35	A-Team	Line7	
NH21500.21	VPT	31	41	DL-1	2	8	0755	s	43.3589	-124.6527	185	100	A-Team	Dogleg	
NH21500.28	VPT	32	42	DL-2	2	8	1012	s	43.4755	-124.8413	546	100	A-Team	Dogleg	
NH21500.35	VPT	33	43	DL-3	2	8	1221	s	43.5824	-125.0002	1106	100	B-Team	Dogleg	
NH21500.42	VPT	34	44	DL-4	2	8	1440	s	43.6886	-124.7983	664	100	B-Team	Dogleg	
NH21500.49	VPT	35	45	DL-5	2	8	1650	s	43.7818	-124.6188	296	100	B-Team	Dogleg	
NH21500.56	VPT	36	46	DL-6	2	8	1833	s	43.8520	-124.4877	158	100	B-Team	Dogleg	
NH21500.65	VPT	37	47	HH-1	2	8	2124	s	43.9985	-124.2100	56	45	B-Team	Line4	
NH21500.67	VPT	38	48	HH-2	2	8	2259	s	44.0002	-124.4042	122	100	B-Team	Line4	
NH21600.04	VPT	38	49	HH-4	3	8	0335	s	44.0027	-124.8007	107	100	A-Team	Line4	
NH21600.07	VPT	39	50	HH-3	3	8	0536	s	43.9995	-124.6009	155	100	A-Team	Line4	
NH21600.28	VPT	40	53	HH-5	3	8	1518	s	43.9984	-125.0109	1005	100	B-Team	Line4	13.97 SST
NH21600.38	VPT	41	54	HH-7	3	8	1845	s	43.9933	-125.2016	1846	100	B-Team	Line4	
NH21600.43	VPT	42	55	NH-45	3	8	2321	s	44.6174	-125.1266	886	100	B-Team	Line1	Sta. 2 mi S of NH45; AtlantisII at NH45
NH21700.07	VPT	43	56	NH-35	4	8	0430	s	44.6523	-124.8996	532	100	A-Team	Line1	
NH21700.14	VPT	44	57	NH-25	4	8	0719	s	44.6506	-124.6511	296	100	A-Team	Line1	
NH21700.23	VPT	45	58	NH-20	4	8	0957	s	44.6518	-124.5343	148	100	A-Team	Line1	
NH21700.32	VPT	46	59	NH-15	4	8	1150	s	44.6526	-124.4139	95	90	A-Team	Line1	

Table 5: Vertical Plankton Tows (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21700.39	VPT	47	60	NH-10	4	8	1352	s	44.6543	-124.2972	84	75	B-Team	Line1	
NH21700.48	VPT	48	61	NH-5	4	8	1545	s	44.6517	-124.1813	63	55	B-Team	Line1	
NH21700.56	VPT	49	62	NH-1	4	8	1708	s	44.6535	-124.1008	31	25	B-Team	Line1	
NH21700.66	VPT	50	63	BOB-1	4	8	2018	s	44.2508	-124.1895	55	nd	B-Team	BOB	
NH21700.67	VPT	51	64	BOB-2	4	8	2144	s	44.2522	-124.3696	89	80	B-Team	BOB	
NH21700.69	VPT	52	65	BOB-3	4	8	2246	s	44.2511	-124.5010	104	95	B-Team	BOB	
NH21800.01	VPT	53	66	BOB-4	5	8	0012	s	44.2501	-124.7004	99	90	A-Team	BOB	
NH21800.06	VPT	54	68	BOB-5	5	8	0506	s	44.2490	-124.8992	153	100	A-Team	BOB	
NH21800.08	VPT	55	69	BOB-6	5	8	0642	s	44.2511	-125.1100	1220	100	A-Team	BOB	14.6 SST
NH21800.17	VPT	56	70	BOB-5B	5	8	0954	s	44.2532	-124.9088	158	100	A-Team	BOB	
NH21800.22	VPT	57	71	BOB-4B	5	8	1108	s	44.2512	-124.7025	98	90	A-Team	BOB	
NH21800.33	VPT	58	72	BOB-3B	5	8	1320	s	44.2552	-124.5012	105	100	B-Team	BOB	
NH21800.38	VPT	59	73	BOB-2B	5	8	1429	s	44.2511	-124.3689	89	75	B-Team	BOB	
NH21800.47	VPT	60	74	BOB-1B	5	8	1626	s	44.2488	-124.1859	55	45	B-Team	BOB	
NH21900.12	VPT	61	80	BK	6	8	1221	s	44.1538	-125.1337	1533	100	B-Team	BK	
NH22000.16	VPT	62	85	Z-2	7	8	1323	s	43.7508	-126.0008	3057	100	B-Team	Zag	Zag = Cold Tongue; fish caught 2.7nm SSW of this station
NH22000.22	VPT	63	86	Z-1	7	8	1646	s	43.6640	-125.9423	3068	100	B-Team	Zag	
NH22000.35	VPT	64	88	Z-3	7	8	2140	s	43.5040	-125.8069	nd	100	B-Team	Zag	
NH22100.01	VPT	65	89	Z-4	8	8	0215	s	43.3480	-125.4977	3097	100	A-Team	Zag	
NH22100.07	VPT	66	90	Z-5	8	8	0717	s	43.2247	-125.8045	3081	100	A-Team	Zag	
NH22100.16	VPT	67	91	Z-6	8	8	1005	s	43.0861	-126.0092	3079	100	A-Team	Zag	
NH22100.23	VPT	68	92	Z-7	8	8	1300	s	42.9618	-125.6618	3088	100	B-Team	Zag	
NH22100.35	VPT	69	93	Z-8	8	8	1942	s	42.8184	-125.1545	2250	100	B-Team	Zag	
NH22100.39	VPT	70	94	Z-9	8	8	2249	s	42.9499	-124.8172	159	100	B-Team	Zag	
NH22200.03	VPT	71	95	7A-7	9	8	0143	s	43.0873	-125.0009	1114	100	A-Team	Blanco	
NH22200.04	VPT	72	96	7A-6	9	8	0234	s	43.0846	-124.8886	399	100	A-Team	Blanco	
NH22200.05	VPT	73	97	7A-5	9	8	0322	s	43.0847	-124.7767	230	100	A-Team	Blanco	
NH22200.06	VPT	74	98	7A-4	9	8	0410	s	43.0901	-124.6739	164	100	A-Team	Blanco	
NH22200.08	VPT	75	99	7A-3	9	8	0515	s	43.0812	-124.5490	93	85	A-Team	Blanco	
NH22200.10	VPT	76	100	7A-2	9	8	0553	s	43.0835	-124.5113	66	59	A-Team	Blanco	
NH22200.11	VPT	77	101	7A-1	9	8	0620	s	43.0838	-124.4596	30	22	A-Team	Blanco	
NH22200.52	VPT	78	107	7A-8	9	8	1600	s	43.0780	-125.1965	2028	100	B-Team	Blanco	
NH22200.59	VPT	79	108	8A-1	9	8	1936	s	42.8151	-124.5869	28	20	B-Team	Blanco	12.2 SST
NH22200.61	VPT	80	109	8A-2	9	8	2009	s	42.8169	-124.6085	38	30	B-Team	Blanco	11.8 SST
NH22200.62	VPT	81	110	8A-3	9	8	2037	s	42.8193	-124.6525	67	60	B-Team	Blanco	10.7 SST
NH22200.65	VPT	82	111	8A-4	9	8	2200	s	42.8184	-124.7672	210	100	B-Team	Blanco	
NH22200.67	VPT	83	112	8A-5	9	8	2300	s	42.8128	-124.8810	348	100	B-Team	Blanco	
NH22300.02	VPT	84	113	8A-6	10	8	0114	s	42.8171	-125.0011	1449	100	A-Team	Blanco	
NH22300.04	VPT	85	114	9-6	10	8	0252	s	42.6831	-125.9012	720	100	A-Team	Blanco	
NH22300.10	VPT	86	115	9-5	10	8	0510	s	42.6902	-124.7991	649	100	A-Team	Blanco	
NH22300.11	VPT	87	116	9-4	10	8	0600	s	42.6904	-124.6737	152	100	A-Team	Blanco	
NH22300.23	VPT	88	117	9-3	10	8	0840	s	42.6843	-124.5712	97	85	A-Team	Blanco	
NH22300.29	VPT	89	118	9-2	10	8	0928	s	42.6874	-124.5252	76	65	A-Team	Blanco	
NH22300.38	VPT	90	119	9-1	10	8	1039	s	42.6867	-124.4805	40	25	A-Team	Blanco	
NH22300.45	VPT	91	120	8-1	10	8	1326	s	42.9510	-124.5110	34	25	B-Team	Blanco	
NH22300.50	VPT	92	121	8-2	10	8	1350	s	42.9490	-124.5520	62	55	B-Team	Blanco	
NH22300.55	VPT	93	122	8-3	10	8	1450	s	nd	nd	nd	nd	B-Team	Blanco	

Table 5: Vertical Plankton Tows (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22300.60	VPT	94	123	FR-1	10	8	1545	s	42.8958	-124.6240	75	65	B-Team	Blanco	Front with Cassins Auklets and Phalaropes
NH22300.62	VPT	95	123	FR-1B	10	8	1645	s	42.8866	-124.6130	61	55	B-Team	Blanco	Brown side of front/slick
NH22300.67	VPT	96	124	FR-2	10	8	1802	s	42.8937	-124.6345	79	60	B-Team	Blanco	Blue side of front/slick; stn orig. labeled FR-1
NH22400.02	VPT	97	126	BOB-3	11	8	0358	s	44.2501	-124.5078	105	95	A-Team	BOB	
NH22400.06	VPT	98	128	BOB-1	11	8	0624	s	44.2533	-124.1864	54	40	A-Team	BOB	
NH22400.11	VPT	99	129	BOB-1F	11	8	0700	s	44.2490	-124.2815	76	65	A-Team	BOB	Front station
NH22400.12	VPT	100	130	BOB-1W	11	8	0722	s	44.2611	-124.2726	74	65	A-Team	BOB	Near whales
NH22400.18	VPT	101	131	BOB-2	11	8	0846	s	44.2508	-124.3771	90	80	A-Team	BOB	
NH22400.23	VPT	102	132	BOB-3B	11	8	0937	s	44.2601	-124.5919	105	99	A-Team	BOB	Hit bottom
NH22400.28	VPT	103	133	BOB-3C	11	8	1010	s	44.2504	-124.5693	106	97	A-Team	BOB	BOB3C is a new station; not a resample of BOB3
NH22400.34	VPT	104	134	BOB-4C	11	8	1057	s	44.2504	-124.6976	101	90	A-Team	BOB	Cold side of front?
NH22400.37	VPT	105	135	BOB-4W	11	8	1200	s	44.2495	-124.8004	121	100	B-Team	BOB	Warm side of front?
NH22400.42	VPT	106	136	BOB-5	11	8	1244	s	44.2488	-124.9010	152	100	B-Team	BOB	
NH22400.77	VPT	107	141	AB-1	11	8	1905	s	44.4503	-124.1438	46	37	B-Team	LineAB	
NH22400.80	VPT	108	142	AB-0	11	8	1941	s	44.4493	-124.1160	12	12	B-Team	LineAB	LoopSST=11.04; Bucket SST=11.2; Bucket Nutrients taken
NH22400.81	VPT	109	143	AB-2	11	8	2032	s	44.4503	-124.2017	60	50	B-Team	LineAB	
NH22400.82	VPT	110	144	AB-2_5	11	8	2055	s	44.4497	-124.2467	70	60	B-Team	LineAB	
NH22400.86	VPT	111	145	AB-3	11	8	2225	s	44.4508	-124.2983	75	65	B-Team	LineAB	
NH22400.87	VPT	112	146	AB-3_5	11	8	2251	s	44.4490	-124.3452	75	65	B-Team	LineAB	
NH22400.91	VPT	113	147	AB-4	11	8	2358	s	44.4493	-124.3999	78	69	B-Team	LineAB	
NH22500.01	VPT	114	148	AB-5	12	8	0052	s	44.4490	-124.5027	88	80	A-Team	LineAB	
NH22500.05	VPT	115	150	NH-20B	12	8	0505	s	44.6464	-124.5216	136	100	A-Team	Line1	
NH22500.12	VPT	116	151	NH-15B	12	8	0647	s	44.6496	-124.4167	88	80	A-Team	Line1	
NH22500.17	VPT	117	152	NH-10B	12	8	0738	s	44.6483	-124.2989	82	72	A-Team	Line1	
NH22500.28	VPT	118	153	NH-5B	12	8	0936	s	44.6546	-124.1805	59	50	A-Team	Line1	
NH22500.35	VPT	119	154	NH-3B	12	8	1026	s	44.6490	-124.1301	48	40	A-Team	Line1	
NH22500.45	VPT	120	155	NH-1B	12	8	1125	s	44.6499	-124.1025	34	20	A-Team	Line1	

New Horizon VPT stations: July–Aug 2000

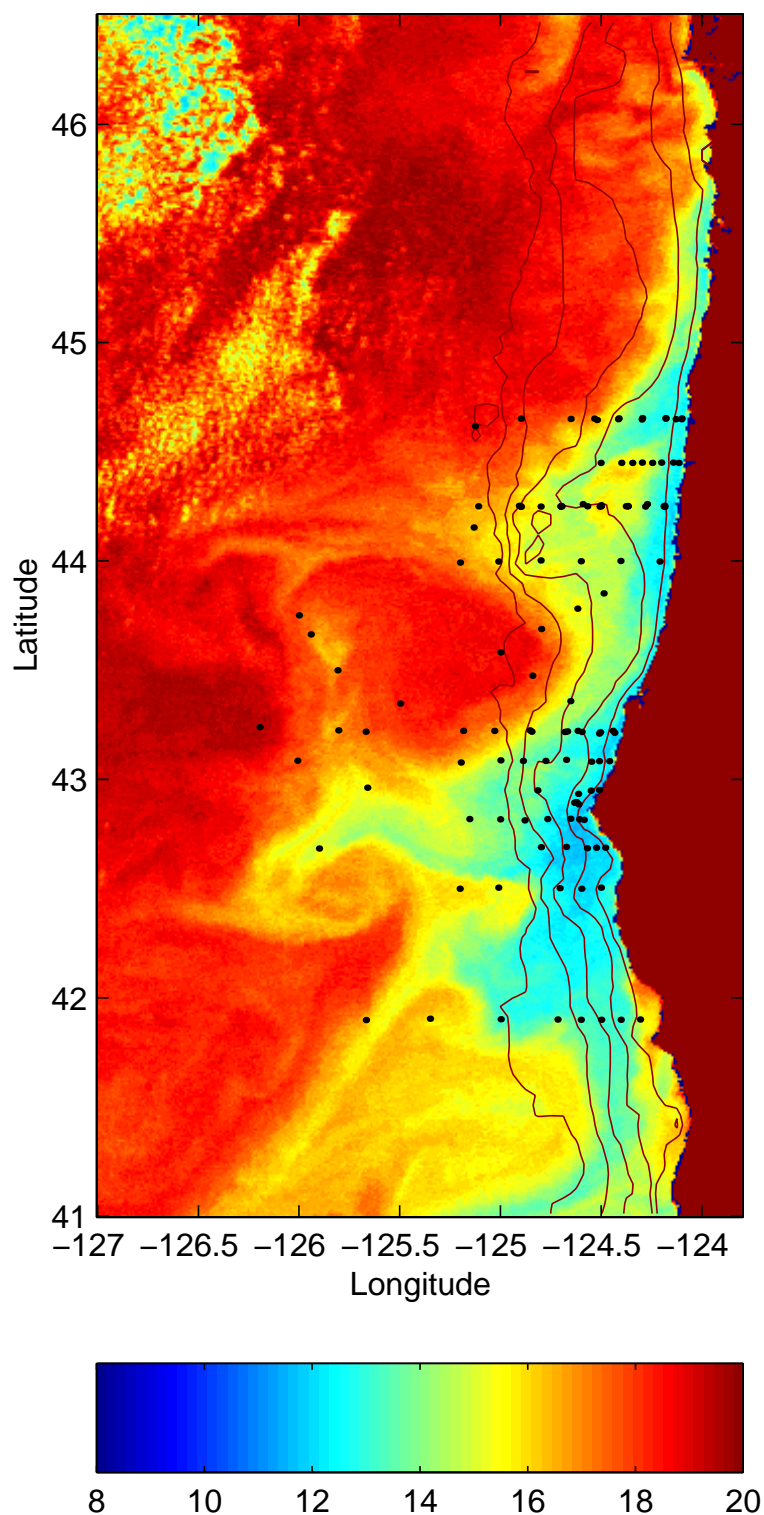


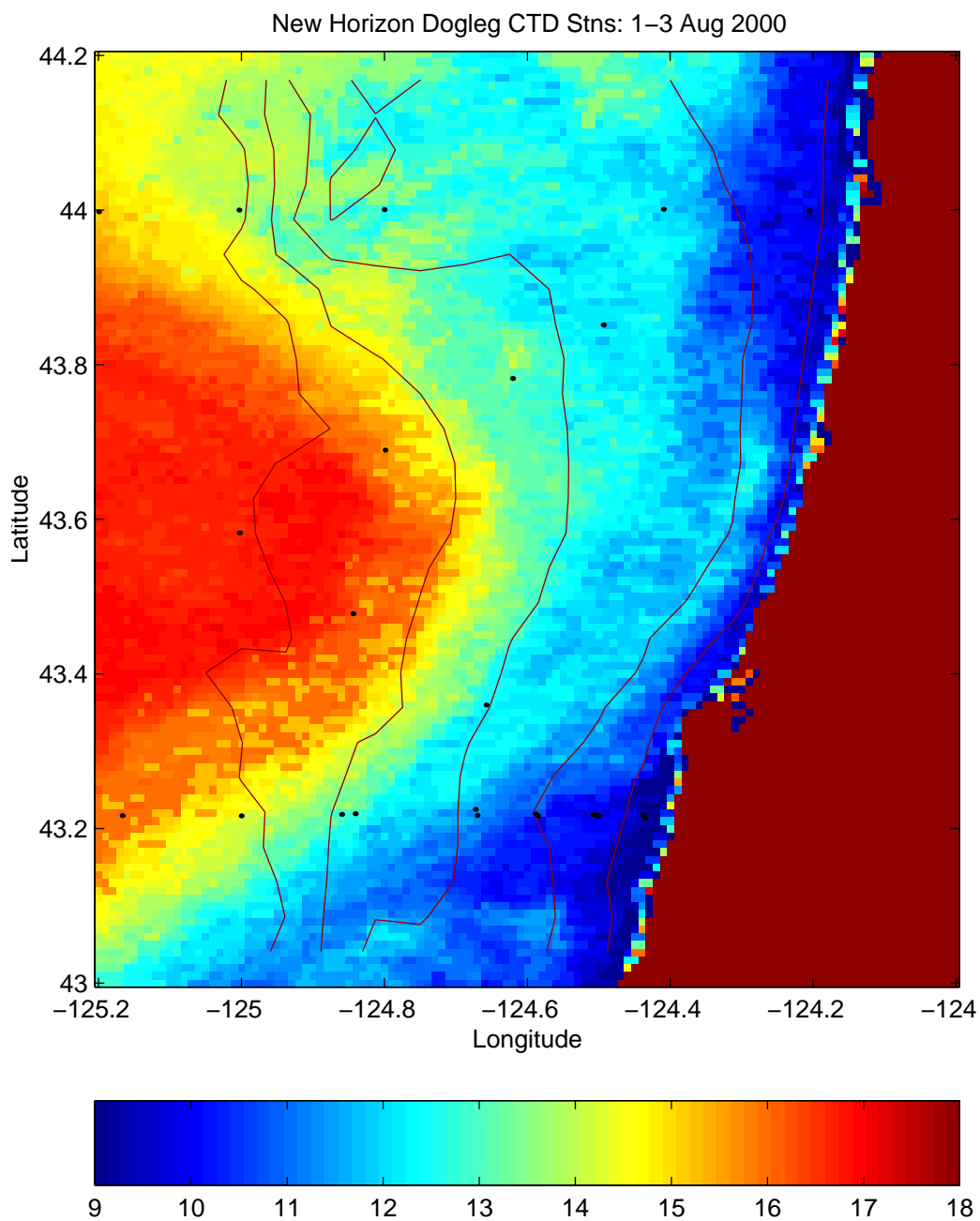
Figure 3. Locations of VPT Stations, July - August, 2000, GLOBEC Cruise, NH0007, Satellite Image of SST from 2 August, 2000

Table 6: Collection of Live Animals for Shipboard Experiments

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21200.01	LiveNet1	1	13		30	7	0100	s	41.8991	-124.5005	142	20	A-Team	Line12	
NH21200.02	LiveNet1	1	13		30	7	0110	e	41.8993	-124.5050	144	nd	A-Team	Line12	
NH21200.03	LiveNet1	2	13		30	7	0120	s	41.8993	-124.5058	147	nd	A-Team	Line12	
NH21200.04	LiveNet1	2	13		30	7	0128	e	41.8989	-124.5088	147	nd	A-Team	Line12	
NH21200.05	LiveNet1	3	13		30	7	0145	s	41.8974	-124.5114	nd	20	A-Team	Line12	
NH21200.06	LiveNet1	3	13		30	7	0150	e	41.8971	-124.5128	62	nd	A-Team	Line12	
NH21200.09	LiveNet1	4	14		30	7	0451	s	41.8967	-124.5899	486	20	A-Team	Line12	
NH21200.10	LiveNet1	4	14		30	7	0456	e	41.8973	-124.5913	nd	20	A-Team	Line12	
NH21200.52	LiveNet1	5	19		30	7	1933	s	42.5067	-124.5043	39	25	B-Team	Line10	8 min tow
NH21200.61	LiveNet1	6	21		30	7	2245	s	42.5027	-124.7061	168	40	B-Team	Line10	8 min tow
NH21300.01	LiveNet1	7	21		31	7	0118	s	42.4997	-124.7033	144	40	A-Team	Line10	6 min tow
NH21300.02	LiveNet1	8	21		31	7	0215	s	42.4968	-124.7199	146	30	A-Team	Line10	8 min tow
NH21300.07	LiveNet1	9	23		31	7	0715	s	42.4934	-124.6000	90	40	A-Team	Line10	
NH21300.20	LiveNet1	10	25		31	7	1042	s	42.5011	-124.7703	620	40	A-Team	Line10	
NH21300.27	LiveNet1	11	26		31	7	1322	s	42.5618	-125.0079	nd	nd	B-Team	Line10	
NH21300.59	LiveNet1	12	29		31	7	2211	s	43.2199	-124.6088	110	30	B-Team	Line7	
NH21400.01	LiveNet1	13	30		1	8	0008	s	43.2220	-124.6827	175	40	A-Team;	B-Te	
NH21400.02	LiveNet1	14	30		1	8	0020	s	43.2241	-124.6907	182	40	A-Team	Line7	
NH21400.03	LiveNet1	15	31		1	8	0130	s	43.2169	-124.8371	344	40	A-Team	Line7	
NH21400.09	LiveNet1	16	32		1	8	0413	s	43.2223	-125.0204	1106	40	A-Team	Line7	
NH21400.11	LiveNet1	17	32		1	8	0442	s	43.2259	-125.0310	1100	40	A-Team	Line7	
NH21400.22	LiveNet1	18	34		1	8	0900	s	43.2216	-125.6718	1491	40	A-Team	Line7	
NH21400.41	LiveNet1	19	36		1	8	2239	s	43.2286	-124.8643	349	40	B-Team	Line7	
NH21500.02	LiveNet1	20	37		2	8	0035	s	43.2218	-124.6737	168	40	A-Team	Line7	
NH21500.07	LiveNet1	21	38		2	8	0249	s	43.2212	-124.5951	104	60	A-Team	Line7	Aiming for Wecoma target = copepods
NH21500.09	LiveNet1	22	39		2	8	0405	s	43.2156	-124.4998	69	40	A-Team	Line7	
NH21500.15	LiveNet1	23	40		2	8	0558	s	43.2195	-124.4410	41	40	A-Team	Line7	
NH21500.66	LiveNet1	24	47		2	8	2132	s	43.9981	-124.2119	58	40	B-Team	Line4	
NH21700.06	LiveNet1	25	56		4	8	0418	s	44.6525	-124.8979	508	40	A-Team	Line1	Yuck!
NH21700.64	LiveNet1	26	63		4	8	2025	s	44.2508	-124.1895	55	50	B-Team	BOB	50 m wire out
NH21700.65	LiveNet1	27	63		4	8	2036	s	44.2508	-124.1895	55	65	B-Team	BOB	65 m wire out
NH21700.68	LiveNet1	28	64		4	8	2155	s	44.2522	-124.3696	89	50	B-Team	BOB	50 m wire out; ca. 45 angle
NH21700.70	LiveNet1	29	65		4	8	2300	s	44.2511	-124.5010	104	50	B-Team	BOB	50 m wire out; ca 45 angle
NH21800.02	LiveNet1	30	66		5	8	0026	s	44.2509	-124.7011	100	50	A-Team	BOB	50 m wire out
NH21800.03	LiveNet1	31	66		5	8	0041	s	44.2547	-124.7061	98	50	A-Team	BOB	50 m wire out; 2-3 min
NH21800.04	LiveNet1	32	66		5	8	0107	s	44.2561	-124.7088	101	30	A-Team	BOB	30 m wire out; 3 min
NH21800.05	LiveNet1	33	67		5	8	0240	s	44.2534	-124.4139	95	40	A-Team	BOB	40 m wire out; 5 min
NH21800.52	LiveNet1	34	77		5	8	2240	s	44.0010	-125.0080	950	50	B-Team	BOB	Net twisted; aborted
NH21800.53	LiveNet1	35	77		5	8	2250	s	44.0017	-125.0097	1005	55	B-Team	BOB	Red larvae in surface bucketed water
NH21900.13	LiveNet1	36	80		6	8	1232	s	44.1578	-125.1377	1595	50	B-Team	BK	50 m wire out
NH21900.27	LiveNet1	37	82		6	8	2214	s	44.1681	-125.1707	1577	55	B-Team	BK	55 m wire out
NH22000.36	LiveNet1	38	88		7	8	2204	s	43.5040	-125.8069	nd	55	B-Team	Zag	55 m of wire out
NH22100.06	LiveNet1	39	90		8	8	0659	s	43.2198	-125.8007	3121	60	A-Team	Zag	
NH22100.24	LiveNet1	40	92		8	8	1316	s	42.9658	-125.6660	3088	60	B-Team	Zag	60 m of wire out
NH22100.36	LiveNet1	41	93		8	8	1953	s	42.8195	-125.1572	2250	55	B-Team	Zag	55 m of wire out
NH22100.40	LiveNet1	42	94		8	8	2303	s	42.9501	-124.8203	154	57	B-Team	Zag	57 m wire out
NH22200.02	LiveNet1	43	95		9	8	0128	s	43.0849	-124.9994	1112	50	A-Team	Blanco	Line 7a = Line C in bridge log
NH22200.07	LiveNet1	44	98		9	8	0424	s	43.0887	-124.6760	163	50	A-Team	Blanco	50 m wire out

Table 6: Collection of Live Animals for Shipboard Experiments (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22200.09	LiveNetl	45	100	7A-2	9	8	0543	s	43.0830	-124.5081	64	40	A-Team	Blanco	40 m wire out
NH22200.60	LiveNetl	46	108	8A-1	9	8	1946	s	42.8137	-124.5954	28	20	B-Team	Blanco	20 m wire out
NH22200.66	LiveNetl	47	111	8A-4	9	8	2218	s	42.8224	-124.7738	210	60	B-Team	Blanco	60 m wire out
NH22300.03	LiveNetl	48	113	8A-6	10	8	0127	s	42.8175	-125.0035	1449	40	A-Team	Blanco	40 m wire out
NH22300.09	LiveNetl	49	115	9-5	10	8	0455	s	42.6871	-124.7948	658	40	A-Team	Blanco	
NH22300.12	LiveNetl	50	116	9-4	10	8	0612	s	42.6840	-124.6740	152	40	A-Team	Blanco	
NH22300.28	LiveNetl	51	118	9-2	10	8	0918	s	42.6851	-124.5207	75	40	A-Team	Blanco	
NH22300.61	LiveNetl	52	123	FR-1	10	8	1600	s	42.8935	-124.6250	75	57	B-Team	Blanco	Bird front/slick; 30 wire angle; 57 m wire out
NH22400.01	LiveNetl	53	126	BOB-3	11	8	0350	s	44.2502	-124.5070	105	40	A-Team	BOB	Purple female euphausiids
NH22400.03	LiveNetl	54	126	BOB-3	11	8	0410	s	44.2500	-124.5082	103	40	A-Team	BOB	Purple female euphausiids
NH22400.04	LiveNetl	55	127	BOB-2	11	8	0506	s	44.2501	-124.3705	175	40	A-Team	BOB	Purple female euphausiids
NH22400.05	LiveNetl	56	128	BOB-1	11	8	0610	s	44.2497	-124.1820	53	40	A-Team	BOB	
NH22400.83	LiveNetl	57	144	AB-2_5	11	8	2102	s	44.4500	-124.2508	72	55	B-Team	LineAB	Wire angle 30
NH22400.88	LiveNetl	58	146	AB-3_5	11	8	2302	s	44.4493	-124.3490	74	60	B-Team	LineAB	Wire angle 30
NH22500.02	LiveNetl	59	149	AB-6	12	8	0220	s	44.4496	-124.6701	127	40	A-Team	LineAB	
NH22500.06	LiveNetl	60	150	NH-20	12	8	0515	s	44.6483	-124.5245	139	40	A-Team	Line1	
NH22500.18	LiveNetl	61	152	NH-10B	12	8	0745	s	44.6487	-124.2993	82	40	A-Team	Line1	
NH22500.30	LiveNetl	62	153	NH-5B	12	8	0945	s	44.6557	-124.1815	64	50	A-Team	Line1	



**Figure 4. Locations of CTD Stations during
DOGLEG, 1-3 August, 2000.
Satellite SST from 2 August, 2000.**

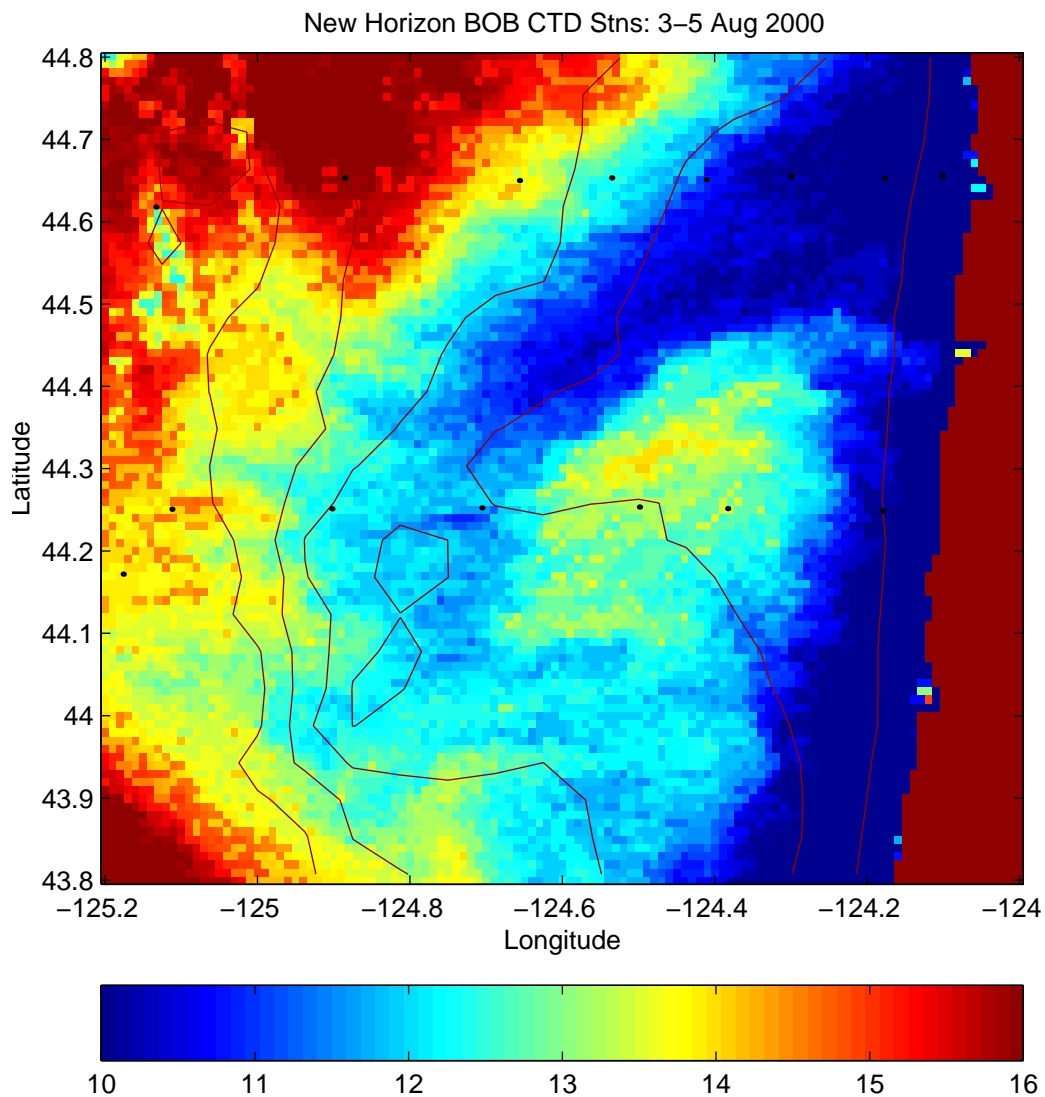
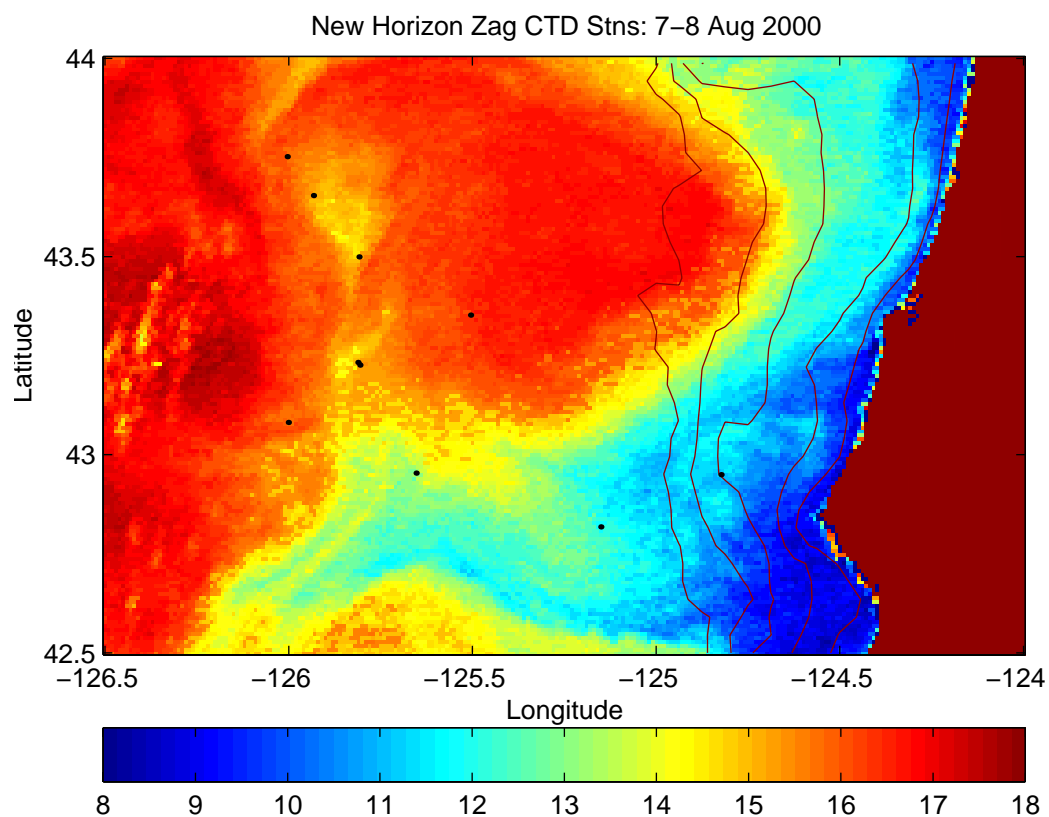
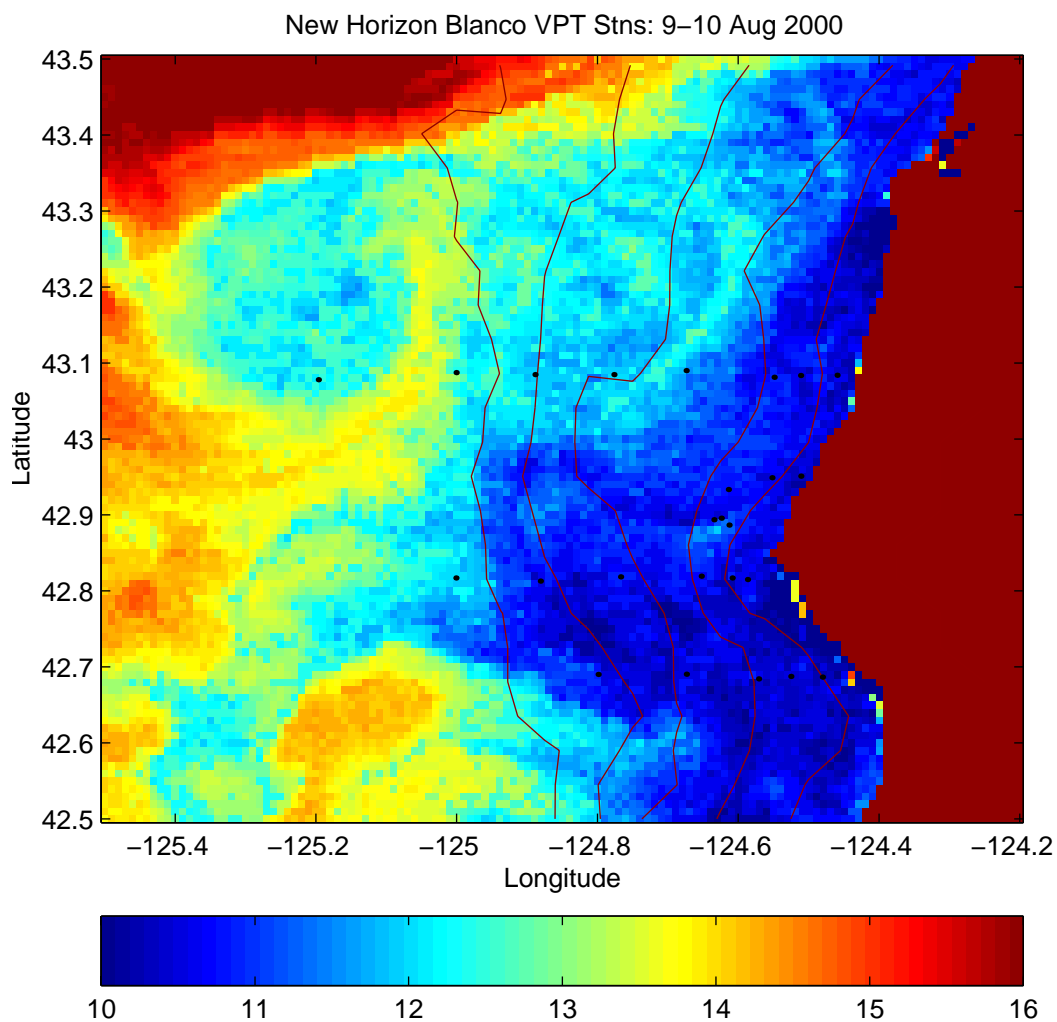


Figure 5. Locations of CTD Stations in nearshore region--Line BOB, 5 August, 2000. Satellite SST from 3 August, 2000.



**Figure 6. Stations in cold tongue/filament, Zag,
7-8 August, 2000.
Satellite SST from 2 August, 2000.**



**Figure 7. VPT sampling locations near Cape Blanco, 9-10 August, 2000.
Satellite SST from 12 August, 2000.**

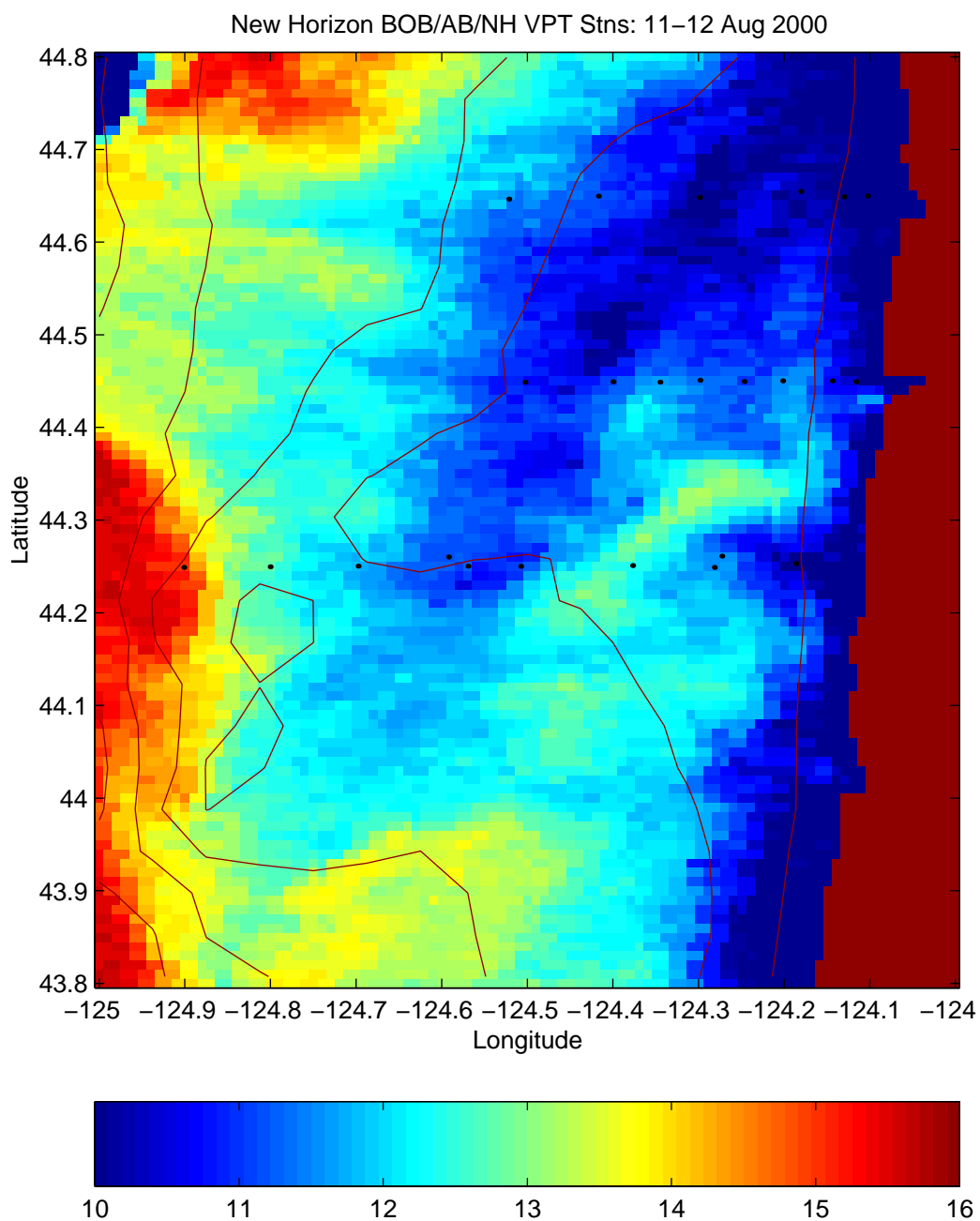


Figure 8. VPT sampling locations from region near Newport, OR, 11-12 August, 2000. Satellite SST from 12 August, 2000.

APPENDIX I

NH0007 EVENT LOG

EVENT LOG CONTENTS

Column Label	Description
Event#	Unique identifier for each line of event log
Instrument (Instr)	H. Binocs: Handheld binoculars (birds, sometimes mammals); BigEyes: Big eye binoculars (mammals); VPT: Vertical Plankton Tow; CTD: Conductivity Temperature Depth profile collected with Seabird SBE; MOC: 1m ² MOCNESS, 333 mm mesh; LiveNet1: 1m diameter net towed for live animal experiments.
Cast	Sequence # for a particular instrument
Station (Sta)	
Station Standard (Sta std)	
Day	Local time basis
Month (Mos)	Local time basis
Time	Local time
Start/End (S/E) flag	S=Start of event; E=End of event
Latitude (Lat)	Decimal degrees; north is positive
Longitude (Long)	Decimal degrees; east is positive
Water Depth	Depth of bottom
Cast Depth	Maximum depth of deployment
Scientific Investigator (SI)	
Region (Reg)	Numbers 1-12 indicate transect line numbers. Regions are: Transit - ship underway between major study lines, regions; Line1, Line2...Line12 - CCS mesoscale study lines (1 is Newport Line; 12 is Crescent City); Dogleg - stations occupied between FM and HH lines during mesoscale survey; BOB - line of stations along 44 15.2 N passing through a hi SST feature on Heceta Bank; HH5Diel - repeated sampling at HH-5 throughout a diel cycle; BK - bird sampling site; Zag - also called "Cold Tongue"; sampling along axis of cold tongue at 42.5-44N latitude; Blanco - sampling of Cape Blanco region (lines 7A, 8, 8A, 9); LineAB - sampling along a line extending westward from Alsea Bay (44 26.9N).
Comments	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH20900.01	Depart RC	nd	nd	nd	27	7	0800	s	nd	nd	nd	nd	Peterson	nd	Depart Redwood City
NH20900.02	BigEyes	nd	nd	nd	27	7	1316	s	37.8725	-122.8847	nd	nd	Tynan	Transit	Transit north; course 304
NH20900.03	BigEyes	nd	nd	nd	27	7	1355	e	37.9385	-122.0032	nd	nd	Tynan	Transit	Transit N; Beaufort 7
NH20900.04	MamBinocs	nd	nd	nd	27	7	1545	s	38.1768	-123.2193	nd	nd	Tynan	Transit	
NH20900.05	MamBinocs	nd	nd	nd	27	7	1655	e	38.3000	-123.3220	124	nd	Tynan	Transit	
NH20900.06	CTD	1	1	G-1	27	7	2113	s	38.7976	-123.6919	102	90	B-Team	Transit	
NH20900.07	CTD	1	1	G-1	27	7	2133	e	38.7971	-123.6949	104	nd	B-Team	Transit	
NH20900.08	VPT	1	1	G-1	27	7	2146	s	38.7971	-123.6949	104	95	B-Team	Transit	
NH20900.09	PhytoNet	1	1	G-1	27	7	2220	s	38.8000	-123.7063	104	8	King	Transit	
NH21000.01	CTD	2	2	G-2	28	7	0540	s	39.7721	-123.8932	90	85	A-Team	Transit	
NH21000.02	VPT	2	2	G-2	28	7	0600	s	39.7717	-123.8967	90	85	A-Team	Transit	
NH21000.03	MamBinocs	nd	nd	nd	28	7	0950	s	40.2019	-124.4160	130	nd	Tynan	Transit	N transit; course 332
NH21000.04	MamBinocs	nd	nd	nd	28	7	1128	e	40.4245	-124.5622	nd	nd	Tynan	Transit	To EEL1
NH21000.05	BigEyes	nd	nd	nd	28	7	1214	s	40.5353	-124.5077	nd	nd	Tynan	Transit	At EEL1
NH21000.06	BigEyes	nd	nd	nd	28	7	1241	e	40.5998	-124.4702	nd	nd	Tynan	Transit	
NH21000.07	VPT	3	3	EEL-1	28	7	1250	s	40.6070	-124.4668	190	100	B-Team	Transit	
NH21000.08	CTD	3	3	EEL-1	28	7	1310	s	40.6063	-124.4731	265	150	B-Team	Transit	
NH21000.09	CTD	3	3	EEL-1	28	7	1345	e	40.6006	-124.4822	354	nd	B-Team	Transit	
NH21000.10	PhytoNet	2	3	EEL-1	28	7	1400	s	40.6006	-124.4834	350	5	King	Transit	
NH21000.11	BigEyes	nd	nd	nd	28	7	1420	s	40.6350	-124.4897	nd	nd	Tynan	Transit	N transit
NH21000.12	BigEyes	nd	nd	nd	28	7	1608	e	40.9112	-124.4448	nd	nd	Tynan	Transit	N transit; course 000; divert for dead sea lion
NH21000.13	BigEyes	nd	nd	nd	28	7	1630	s	40.9753	-124.4353	nd	nd	Tynan	Transit	
NH21000.14	BigEyes	nd	nd	nd	28	7	1637	e	41.0130	-124.4327	nd	nd	Tynan	Transit	Course 000
NH21000.15	BigEyes	nd	nd	nd	28	7	1657	s	41.0453	-124.4517	nd	nd	Tynan	Transit	Course 000
NH21000.16	BigEyes	nd	nd	nd	28	7	1706	e	41.0705	-124.4490	nd	nd	Tynan	Transit	
NH21000.17	BigEyes	nd	nd	nd	28	7	1804	s	41.2257	-124.4435	nd	nd	Tynan	Transit	
NH21000.18	BigEyes	nd	nd	nd	28	7	2032	e	41.5993	-124.4625	nd	nd	Tynan	Transit	
NH21000.19	CTD	4	4	CR-1	28	7	2302	s	41.9001	-124.3044	45	40	B-Team	Line12	
NH21000.20	CTD	4	4	CR-1	28	7	2311	e	41.9006	-124.3068	45	35	B-Team	Line12	
NH21000.21	VPT	4	4	CR-1	28	7	2320	s	41.9007	-124.3075	45	35	B-Team	Line12	
NH21100.01	VPT	5	5	CR-2	29	7	0010	s	41.8990	-124.4034	71	66	A-Team	Line12	Very near bottom
NH21100.02	CTD	5	5	CR-2	29	7	0025	s	41.8972	-124.4005	70	70	A-Team	Line12	Hit bottom
NH21100.03	CTD	5	5	CR-2	29	7	0041	e	41.8950	-124.4054	71	nd	A-Team	Line12	
NH21100.04	CTD	6	6	CR-3	29	7	0124	s	41.8996	-124.5016	139	130	A-Team	Line12	
NH21100.05	CTD	6	6	CR-3	29	7	0145	e	41.8981	-124.5019	140	nd	A-Team	Line12	
NH21100.06	VPT	6	6	CR-3	29	7	0150	s	41.8989	-124.5003	140	100	A-Team	Line12	
NH21100.07	VPT	7	7	CR-4	29	7	0238	s	41.8997	-124.6012	512	100	A-Team	Line12	
NH21100.08	CTD	7	7	CR-4	29	7	0300	s	41.8995	-124.6003	509	200	A-Team	Line12	
NH21100.09	CTD	7	7	CR-4	29	7	0325	e	41.8995	-124.5960	498	nd	A-Team	Line12	
NH21100.10	CTD	8	8	CR-5	29	7	0410	s	41.9017	-124.7000	666	nd	A-Team	Line12	
NH21100.11	CTD	8	8	CR-5	29	7	0435	e	41.8993	-124.7088	669	nd	A-Team	Line12	
NH21100.12	VPT	8	8	CR-5	29	7	0447	s	41.9003	-124.7165	688	100	A-Team	Line12	
NH21100.13	VPT	9	9	CR-7	29	7	0617	s	41.9018	-124.9985	839	100	A-Team	Line12	No ending record
NH21100.14	CTD	9	9	CR-7	29	7	0634	s	41.9023	-125.0039	852	200	A-Team	Line12	
NH21100.15	Birds	nd	nd	nd	29	7	0705	s	41.9033	-125.0117	905	nd	Ainley	Line12	Between sta. CR7 - CR9
NH21100.16	BigEyes	nd	nd	nd	29	7	0756	s	41.9040	-125.1907	nd	nd	Tynan	Line12	At CR9
NH21100.17	Birds	nd	nd	nd	29	7	0830	e	41.9000	-125.3333	3111	nd	Ainley	Line12	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21100.18	BigEyes	nd	nd	nd	29	7	0835	e	41.8995	-125.3327	3111	nd	Tynan	Line12	End on sta. CR9
NH21100.19	CTD	10	10	CR-9	29	7	0833	s	41.8999	-125.3340	3120	200	A-Team	Line12	
NH21100.20	CTD	10	10	CR-9	29	7	0906	e	41.9027	-125.3464	3122	nd	A-Team	Line12	
NH21100.21	VPT	10	10	CR-9	29	7	0915	s	41.9038	-125.3506	3122	100	A-Team	Line12	
NH21100.22	Birds	nd	nd	nd	29	7	0935	s	41.9000	-125.3333	3111	nd	Ainley	Line12	
NH21100.23	BigEyes	nd	nd	nd	29	7	0935	s	41.9057	-125.3630	3111	nd	Tynan	Line12	Lv. sta. CR9
NH21100.24	Birds	nd	nd	nd	29	7	1056	e	41.8967	-125.6667	2910	nd	Ainley	Line12	At CR10
NH21100.25	BigEyes	nd	nd	nd	29	7	1101	e	41.8970	-125.6657	2910	nd	Tynan	Line12	Arr. sta. CR10
NH21100.26	VPT	11	11	CR-10	29	7	1103	s	41.8976	-125.6678	2948	100	A-Team	Line12	
NH21100.27	CTD	11	11	CR-10	29	7	1120	s	41.8956	-125.6700	2948	200	A-Team	Line12	
NH21100.28	CTD	11	11	CR-10	29	7	1120	e	41.8929	-125.6704	2948	nd	A-Team	Line12	
NH21100.29	nd	nd	nd	nd	29	7	1200	s	41.8930	-125.6704	2948	nd	Peterson	Line12	Begin transit to CR1 along Line12
NH21100.30	BigEyes	nd	nd	nd	29	7	1421	s	41.9078	-125.2780	3111	nd	Tynan	Line12	East along Line12
NH21100.31	Birds	nd	nd	nd	29	7	1540	s	41.9000	-125.0117	905	nd	Ainley	Line12	
NH21100.32	BigEyes	nd	nd	nd	29	7	1700	e	41.8938	-124.7238	695	nd	Tynan	Line12	
NH21100.33	BigEyes	nd	nd	nd	29	7	1735	s	41.8952	-124.5943	457	nd	Tynan	Line12	East along Line12
NH21100.34	Birds	nd	nd	nd	29	7	1850	e	41.9000	-124.3067	37	nd	Ainley	Line12	At CR1
NH21100.35	BigEyes	nd	nd	nd	29	7	1856	e	41.9003	-124.2972	37	nd	Tynan	Line12	Arr. CR1
NH21100.36	nd	nd	nd	nd	29	7	1856	e	41.9003	-124.2972	37	nd	Peterson	Line12	Arr. CR1
NH21100.37	MOC	1	12	CR-1	29	7	2005	s	41.9016	-124.4050	75	60	B-Team	Line12	
NH21100.38	MOC	1	12	CR-1	29	7	2026	e	41.9135	-124.4167	75	nd	B-Team	Line12	
NH21100.39	MOC	2	13	CR-3	29	7	2225	s	41.8992	-124.4971	135	120	B-Team	Line12	
NH21100.40	MOC	2	13	CR-3	29	7	2302	e	41.9160	-124.5117	145	nd	B-Team	Line12	
NH21200.01	LiveNetl	1	13	CR-3	30	7	0100	s	41.8991	-124.5005	142	20	A-Team	Line12	
NH21200.02	LiveNetl	1	13	CR-3	30	7	0110	e	41.8993	-124.5050	144	nd	A-Team	Line12	
NH21200.03	LiveNetl	2	13	CR-3	30	7	0120	s	41.8993	-124.5058	147	nd	A-Team	Line12	
NH21200.04	LiveNetl	2	13	CR-3	30	7	0128	e	41.8989	-124.5088	147	nd	A-Team	Line12	
NH21200.05	LiveNetl	3	13	CR-3	30	7	0145	s	41.8974	-124.5114	nd	20	A-Team	Line12	
NH21200.06	LiveNetl	3	13	CR-3	30	7	0150	e	41.8971	-124.5128	62	nd	A-Team	Line12	
NH21200.07	MOC	3	14	CR-4	30	7	0245	s	41.9060	-124.5967	nd	nd	A-Team	Line12	
NH21200.08	MOC	3	14	CR-4	30	7	0341	e	41.9342	-124.5883	nd	nd	A-Team	Line12	
NH21200.09	LiveNetl	4	14	CR-4	30	7	0451	s	41.8967	-124.5899	486	20	A-Team	Line12	
NH21200.10	LiveNetl	4	14	CR-4	30	7	0456	e	41.8973	-124.5913	nd	20	A-Team	Line12	
NH21200.11	MOC	4	15	CR-5	30	7	0548	s	41.8898	-124.6933	664	350	A-Team	Line12	
NH21200.12	MOC	4	15	CR-5	30	7	0654	e	41.9224	-124.7150	nd	nd	A-Team	Line12	
NH21200.13	Birds	nd	nd	nd	30	7	0740	s	41.9133	-124.7100	695	nd	Ainley	Transit	Transit CR5 to RR7
NH21200.14	MamBinocs	nd	nd	nd	30	7	0755	s	41.9350	-124.7375	695	nd	Tynan	Transit	Transit Line CR12 to RR10
NH21200.15	Birds	nd	nd	nd	30	7	0925	e	42.1417	-124.9317	1006	nd	Ainley	Transit	
NH21200.16	MamBinocs	nd	nd	nd	30	7	0930	e	42.1538	-124.9408	1025	nd	Tynan	Transit	Transit to Line10
NH21200.17	BigEyes	nd	nd	nd	30	7	0949	s	42.1815	-124.9662	nd	nd	Tynan	Transit	
NH21200.18	Birds	nd	nd	nd	30	7	1015	s	42.2450	-125.0250	1647	nd	Ainley	Transit	Off for radar check
NH21200.19	BigEyes	nd	nd	nd	30	7	1051	e	42.3425	-125.1010	2745	nd	Tynan	Transit	Transit course 325 to RR7
NH21200.20	BigEyes	nd	nd	nd	30	7	1105	s	42.3675	-125.1210	nd	nd	Tynan	Transit	Arr. RR7
NH21200.21	BigEyes	nd	nd	nd	30	7	1143	e	42.4565	-125.1728	2763	nd	Tynan	Transit	Arr. RR7
NH21200.22	Birds	nd	nd	nd	30	7	1145	e	42.4767	-125.1850	2763	nd	Ainley	Transit	
NH21200.23	VPT	12	16	RR-7	30	7	1207	s	42.4999	-125.2027	3013	100	B-Team	Line10	
NH21200.24	CTD	12	16	RR-7	30	7	1230	s	42.5016	-125.2080	3026	200	B-Team	Line10	
NH21200.25	CTD	12	16	RR-7	30	7	1302	e	42.5056	-125.2173	3037	nd	B-Team	Line10	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21200.26	Birds	nd	nd	nd	30	7	1310	s	42.5067	-125.2183	2745	nd	Ainley	Line10	
NH21200.27	BigEyes	nd	nd	nd	30	7	1330	s	42.5140	-125.2178	2745	nd	Tynan	Line10	
NH21200.28	Birds	nd	nd	nd	30	7	1423	e	42.5000	-125.0000	1812	nd	Ainley	Line10	Arr. RR6
NH21200.29	BigEyes	nd	nd	nd	30	7	1430	e	42.5013	-125.0003	1812	nd	Tynan	Line10	Arr. RR6
NH21200.30	CTD	13	17	RR-6	30	7	1440	s	42.5009	-125.0032	1797	nd	B-Team	Line10	
NH21200.31	CTD	13	17	RR-6	30	7	1511	e	42.5036	-125.0083	nd	nd	B-Team	Line10	
NH21200.32	VPT	13	17	RR-6	30	7	1523	s	42.5046	-125.0113	1866	100	B-Team	Line10	
NH21200.33	BigEyes	nd	nd	nd	30	7	1540	s	42.5085	-125.0042	1812	nd	Tynan	Line10	
NH21200.34	Birds	nd	nd	nd	30	7	1540	s	42.5000	-125.0150	1812	nd	Ainley	Line10	
NH21200.35	Birds	nd	nd	nd	30	7	1610	e	42.4967	-124.9000	1098	nd	Ainley	Line10	Arr. RR5
NH21200.36	BigEyes	nd	nd	nd	30	7	1618	e	42.4978	-124.8990	1098	nd	Tynan	Line10	Arr. RR5
NH21200.37	CTD	14	18	RR-5	30	7	1620	s	42.4996	-124.9005	1174	200	B-Team	Line10	
NH21200.38	CTD	14	18	RR-5	30	7	1635	e	42.5044	-124.9036	1250	nd	B-Team	Line10	
NH21200.39	Birds	nd	nd	nd	30	7	1640	s	42.5000	-124.9000	1098	nd	Ainley	Line10	
NH21200.40	BigEyes	nd	nd	nd	30	7	1645	s	42.5062	-124.8895	1098	nd	Tynan	Line10	
NH21200.41	Birds	nd	nd	nd	30	7	1710	e	42.4967	-124.7983	586	nd	Ainley	Line10	Arr. RR4
NH21200.42	BigEyes	nd	nd	nd	30	7	1710	e	42.4968	-124.7995	586	nd	Tynan	Line10	Arr. RR4
NH21200.43	BigEyes	nd	nd	nd	30	7	1740	s	42.5033	-124.8050	580	nd	Tynan	Line10	
NH21200.44	Birds	nd	nd	nd	30	7	1740	s	42.5033	-124.8050	580	nd	Ainley	Line10	
NH21200.45	BigEyes	nd	nd	nd	30	7	1830	e	42.4992	-124.6317	nd	nd	Tynan	Line10	
NH21200.46	MamBinocs	nd	nd	nd	30	7	1830	s	42.4992	-124.6317	nd	nd	Tynan	Line10	
NH21200.47	Birds	nd	nd	nd	30	7	1900	e	42.4983	-124.4983	35	nd	Ainley	Line10	Arr. RR1
NH21200.48	MamBinocs	nd	nd	nd	30	7	1900	e	42.4985	-124.4992	35	nd	Tynan	Line10	Arr. RR1
NH21200.49	CTD	15	19	RR-1	30	7	1905	s	42.5007	-124.4995	37	32	B-Team	Line10	
NH21200.50	CTD	15	19	RR-1	30	7	1920	e	42.5032	-124.5010	38	nd	B-Team	Line10	
NH21200.51	VPT	14	19	RR-1	30	7	1924	s	42.5039	-124.5019	38	30	B-Team	Line10	
NH21200.52	LiveNetl	5	19	RR-1	30	7	1933	s	42.5067	-124.5043	39	25	B-Team	Line10	
NH21200.53	VPT	15	20	RR-2	30	7	2020	s	42.5000	-124.5986	88	80	B-Team	Line10	
NH21200.54	CTD	16	20	RR-2	30	7	2039	s	42.5029	-124.6028	90	80	B-Team	Line10	
NH21200.55	CTD	16	20	RR-2	30	7	2053	e	42.5055	-124.6054	90	nd	B-Team	Line10	
NH21200.56	CTD	17	20	RR-2B	30	7	2117	s	42.5007	-124.6018	90	80	B-Team	Line10	
NH21200.57	CTD	17	20	RR-2B	30	7	2127	e	42.5021	-124.6034	nd	nd	B-Team	Line10	
NH21200.58	CTD	18	21	RR-3	30	7	2207	s	42.5003	-124.7011	141	135	B-Team	Line10	
NH21200.59	CTD	18	21	RR-3	30	7	2224	e	42.5008	-124.7048	145	nd	B-Team	Line10	
NH21200.60	VPT	16	21	RR-3	30	7	2230	s	42.5018	-124.7058	160	100	B-Team	Line10	
NH21200.61	LiveNetl	6	21	RR-3	30	7	2245	s	42.5027	-124.7061	168	40	B-Team	Line10	8 min tow
NH21200.62	MOC	5	21	RR-3	30	7	2312	s	42.5025	-124.7033	190	161	B-Team	Line10	
NH21300.63	MOC	5	21	RR-3	30	7	2349	e	42.5167	-124.7167	nd	nd	B-Team	Line10	
NH21300.01	LiveNetl	7	21	RR-3	31	7	0118	s	42.4997	-124.7033	144	40	A-Team	Line10	8 min tow
NH21300.02	LiveNetl	8	21	RR-3	31	7	0215	s	42.4968	-124.7199	146	30	A-Team	Line10	6 min tow
NH21300.03	MOC	6	22	RR-4	31	7	0310	s	42.5011	-124.8017	544	350	A-Team	Line10	
NH21300.04	MOC	6	22	RR-4	31	7	0410	e	42.5329	-124.8245	528	nd	A-Team	Line10	
NH21300.05	MOC	7	23	RR-2	31	7	0616	s	42.4934	-124.6000	90	75	A-Team	Line10	
NH21300.06	MOC	7	23	RR-2	31	7	nd	e	nd	nd	nd	nd	A-Team	Line10	
NH21300.07	LiveNetl	9	23	RR-2	31	7	0715	s	42.4934	-124.6000	90	40	A-Team	Line10	8 min tow
NH21300.08	Birds	nd	nd	nd	31	7	0715	s	42.5050	-124.6267	98	nd	Ainley	Line10	
NH21300.09	BigEyes	nd	nd	nd	31	7	0727	s	42.5050	-124.6490	98	nd	Tynan	Line10	
NH21300.10	Birds	nd	nd	nd	31	7	0730	e	42.4950	-124.6983	128	nd	Ainley	Line10	Arr. RR3

Bottle 9 hung up; no sample
Up and dn fluor traces very different
Labeled RR2B; no nisks

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21300.11	BigEyes	nd	nd	nd	31	7	0741	e	42.4947	-124.6978	128	nd	Tynan	Line10	Arr. RR3
NH21300.12	MOC	8	24	RR-3B	31	7	0802	s	42.4998	-124.7050	nd	150	A-Team	Line10	
NH21300.13	MOC	8	24	RR-3B	31	7	0829	e	42.5105	-124.7167	nd	nd	A-Team	Line10	
NH21300.14	Birds	nd	nd	nd	31	7	0840	s	42.5133	-124.7250	128	nd	Ainley	Line10	
NH21300.15	BigEyes	nd	nd	nd	31	7	0845	s	42.5105	-124.7323	128	nd	Tynan	Line10	
NH21300.16	Birds	nd	nd	nd	31	7	0900	e	42.4983	-124.7967	586	nd	Ainley	Line10	Arr. RR4
NH21300.17	BigEyes	nd	nd	nd	31	7	0905	e	42.4985	-124.7982	586	nd	Tynan	Line10	Arr. RR4; Wecoma nearby
NH21300.18	MOC	9	25	RR-4	31	7	0919	s	42.5010	-124.8017	621	350	A-Team	Line10	
NH21300.19	MOC	9	25	RR-4	31	7	1014	e	42.5248	-124.8267	590	nd	A-Team	Line10	
NH21300.20	LiveNet1	10	25	RR-4	31	7	1042	s	42.5011	-124.7703	620	40	A-Team	Line10	
NH21300.21	BigEyes	nd	nd	nd	31	7	1055	s	42.5032	-124.8065	586	nd	Tynan	Line10	
NH21300.22	Birds	nd	nd	nd	31	7	1055	s	42.5033	-124.8067	586	nd	Ainley	Line10	
NH21300.23	Birds	nd	nd	nd	31	7	1145	e	42.5000	-124.9750	1804	nd	Ainley	Line10	Arr. RR6
NH21300.24	BigEyes	nd	nd	nd	31	7	1159	e	42.5000	-125.0002	1811	nd	Tynan	Line10	Arr. RR6
NH21300.25	MOC	10	26	RR-6	31	7	1205	s	42.5020	-125.0007	1800	350	B-Team	Line10	
NH21300.26	MOC	10	26	RR-6	31	7	1313	e	42.5406	-125.0088	nd	nd	B-Team	Line10	
NH21300.27	LiveNet1	11	26	RR-6	31	7	1322	s	42.5618	-125.0079	nd	nd	B-Team	Line10	From RR to FM line
NH21300.28	Birds	nd	nd	nd	31	7	1340	s	42.5467	-125.0117	1738	nd	Ainley	Transit	From RR6 to FM line; course 021 to cross
NH21300.29	BigEyes	nd	nd	nd	31	7	1345	s	42.5470	-125.0115	1464	nd	Tynan	Transit	Coquille Bank
NH21300.30	Birds	nd	nd	nd	31	7	1440	e	42.7033	-124.9517	900	nd	Ainley	Transit	
NH21300.31	Birds	nd	nd	nd	31	7	1500	s	42.7350	-124.9367	750	nd	Ainley	Transit	
NH21300.32	BigEyes	nd	nd	nd	31	7	1500	e	42.7443	-124.9323	626	nd	Tynan	Transit	
NH21300.33	BigEyes	nd	nd	nd	31	7	1530	s	42.8173	-124.8933	403	nd	Tynan	Transit	Course 054 from Coquille to FM1
NH21300.34	Birds	nd	nd	nd	31	7	1700	e	43.0183	-124.7817	120	nd	Ainley	Transit	
NH21300.35	BigEyes	nd	nd	nd	31	7	1700	e	43.0183	-124.7817	120	nd	Tynan	Transit	
NH21300.36	Birds	nd	nd	nd	31	7	1730	s	43.0650	-124.7000	159	nd	Ainley	Transit	
NH21300.37	BigEyes	nd	nd	nd	31	7	1740	s	43.0787	-124.6768	159	nd	Tynan	Transit	Course 052 to FM1
NH21300.38	BigEyes	nd	nd	nd	31	7	1803	e	43.1073	-124.6247	110	nd	Tynan	Transit	Off for radar check
NH21300.39	BigEyes	nd	nd	nd	31	7	1817	s	43.1302	-124.5830	110	nd	Tynan	Transit	Resume to FM1
NH21300.40	BigEyes	nd	nd	nd	31	7	1835	e	43.1627	-124.5297	63	nd	Tynan	Transit	Down to bridge; fog
NH21300.41	MamBinocs	nd	nd	nd	31	7	1836	s	43.1627	-124.5297	63	nd	Tynan	Transit	To FM1
NH21300.42	Birds	nd	nd	nd	31	7	1907	e	43.2133	-124.4333	32	nd	Ainley	Transit	Arr. FM1
NH21300.43	MamBinocs	nd	nd	nd	31	7	1908	e	43.2145	-124.4328	32	nd	Tynan	Transit	Arr. FM1
NH21300.44	VPT	17	27	FM-1	31	7	1914	s	43.2132	-124.4351	36	30	B-Team	Line7	
NH21300.45	CTD	18	27	FM-1	31	7	1926	s	43.2132	-124.4351	38	30	B-Team	Line7	
NH21300.46	CTD	18	27	FM-1	31	7	1937	e	43.2069	-124.4421	38	nd	B-Team	Line7	
NH21300.47	Birds	nd	nd	nd	31	7	1945	s	43.2050	-124.4483	33	nd	Ainley	Line7	
NH21300.48	MamBinocs	nd	nd	nd	31	7	1947	s	43.2053	-124.4512	32	nd	Tynan	Line7	Transit between FM1 and FM3
NH21300.49	Birds	nd	nd	nd	31	7	2000	e	43.2167	-124.5000	57	nd	Ainley	Line7	Arr. FM3
NH21300.50	MamBinocs	nd	nd	nd	31	7	2003	e	43.2160	-124.5000	57	nd	Tynan	Line7	Arr. FM3
NH21300.51	CTD	19	28	FM-3	31	7	2007	s	43.2163	-124.5012	60	55	B-Team	Line7	Bottles no good; cast aborted
NH21300.52	CTD	19	28	FM-3	31	7	2022	e	43.2119	-124.5083	nd	nd	B-Team	Line7	
NH21300.53	VPT	18	28	FM-3	31	7	2030	s	43.2097	-124.5108	60	55	B-Team	Line7	
NH21300.54	CTD	20	28	FM-3B	31	7	2048	s	43.2164	-124.5019	64	55	B-Team	Line7	
NH21300.55	CTD	20	28	FM-3B	31	7	2102	e	43.2150	-124.5082	64	55	B-Team	Line7	
NH21300.56	CTD	21	29	FM-4	31	7	2134	s	43.2165	-124.5853	87	80	B-Team	Line7	
NH21300.57	CTD	21	29	FM-4	31	7	2153	e	43.2163	-124.5938	98	nd	B-Team	Line7	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21300.58	VPT	19	29	FM-4	31	7	2202	s	43.2169	-124.5974	106	90	B-Team	Line7	Wire angle >45; sample discarded
NH21300.59	LiveNet1	12	29	FM-4	31	7	2211	s	43.2199	-124.6088	110	30	B-Team	Line7	
NH21300.60	VPT	nd	30	FM-5	31	7	2254	s	43.2176	-124.6732	170	100	B-Team	Line7	
NH21300.61	VPT	20	30	FM-5	31	7	2307	s	43.2177	-124.6818	175	100	B-Team	Line7	
NH21300.62	CTD	22	30	FM-5	31	7	2330	s	43.2171	-124.6702	175	150	B-Team	Line7	Wire angle >45; sample discarded
NH21300.63	CTD	22	30	FM-5	31	7	2353	e	43.2197	-124.6792	nd	nd	B-Team	Line7	
NH21400.01	LiveNet1	13	30	FM-5	1	8	0008	s	43.2220	-124.6827	175	40	A-Team;	B-Te	
NH21400.02	LiveNet1	14	30	FM-5	1	8	0020	s	43.2241	-124.6907	182	40	A-Team	Line7	
NH21400.03	LiveNet1	15	31	FM-7	1	8	0130	s	43.2169	-124.8371	344	40	A-Team	Line7	Wire angle >45; sample discarded
NH21400.04	VPT	21	31	FM-7	1	8	0150	s	43.2185	-124.8457	344	100	A-Team	Line7	
NH21400.05	CTD	23	31	FM-7	1	8	0209	s	43.2185	-124.8596	348	200	A-Team	Line7	
NH21400.06	CTD	23	31	FM-7	1	8	0242	e	43.2196	-124.8725	nd	nd	A-Team	Line7	
NH21400.07	CTD	24	32	FM-8	1	8	0335	s	43.2166	-125.0003	1093	200	A-Team	Line7	Wire angle >45; sample discarded
NH21400.08	CTD	24	32	FM-8	1	8	0400	e	43.2203	-125.0161	1104	nd	A-Team	Line7	
NH21400.09	LiveNet1	16	32	FM-8	1	8	0413	s	43.2223	-125.0204	1106	40	A-Team	Line7	
NH21400.10	VPT	22	32	FM-8	1	8	0430	s	43.2226	-125.0310	1100	100	A-Team	Line7	
NH21400.11	LiveNet1	17	32	FM-8	1	8	0442	s	43.2259	-125.0310	1100	40	A-Team	Line7	Wire angle >45; sample discarded
NH21400.12	CTD	25	33	FM-9	1	8	0540	s	43.2167	-125.1668	1695	200	A-Team	Line7	
NH21400.13	CTD	25	33	FM-9	1	8	0612	e	43.2207	-125.1819	1732	nd	A-Team	Line7	
NH21400.14	VPT	23	33	FM-9	1	8	0619	s	43.2218	-125.1850	1704	100	A-Team	Line7	
NH21400.15	Birds	nd	nd	nd	1	8	0635	s	43.2217	-125.1883	1793	nd	Ainley	Line7	Leave FM9
NH21400.16	BigEyes	nd	nd	nd	1	8	0655	s	43.2263	-125.2505	2013	nd	Tynan	Line7	
NH21400.17	BigEyes	nd	nd	nd	1	8	0738	e	43.2210	-125.4197	3052	nd	Tynan	Line7	
NH21400.18	MamBinocs	nd	nd	nd	1	8	0805	s	43.2167	-125.5500	3056	nd	Tynan	Line7	
NH21400.19	Birds	nd	nd	nd	1	8	0837	e	43.2167	-125.6650	3056	nd	Ainley	Line7	Gps out flying bridge
NH21400.20	MamBinocs	nd	nd	nd	1	8	0839	e	43.2163	-125.6650	3056	nd	Tynan	Line7	
NH21400.21	VPT	24	34	FM-10	1	8	0847	s	43.2188	-125.6688	1499	100	A-Team	Line7	
NH21400.22	LiveNet1	18	34	FM-10	1	8	0900	s	43.2216	-125.6718	1491	40	A-Team	Line7	
NH21400.23	CTD	26	34	FM-10	1	8	0918	s	43.2301	-125.6796	1445	200	A-Team	Line7	Arr. FM10
NH21400.24	CTD	26	34	FM-10	1	8	0947	e	43.2360	-125.6854	1438	nd	A-Team	Line7	
NH21400.25	Birds	nd	nd	nd	1	8	1000	s	43.2417	-125.6883	3050	nd	Ainley	Line7	
NH21400.26	MamBinocs	nd	nd	nd	1	8	1007	s	43.2433	-125.7017	3056	nd	Tynan	Line7	
NH21400.27	MamBinocs	nd	nd	nd	1	8	1133	e	43.2073	-126.0080	3037	nd	Tynan	Line7	Lv. FM10 Off effort for FAX
NH21400.28	MamBinocs	nd	nd	nd	1	8	1207	s	43.2092	-126.0818	3052	nd	Tynan	Line7	
NH21400.29	Birds	nd	nd	nd	1	8	1226	e	43.2150	-126.1617	3020	nd	Ainley	Line7	
NH21400.30	MamBinocs	nd	nd	nd	1	8	1228	e	43.2145	-126.1623	3020	nd	Tynan	Line7	
NH21400.31	CTD	27	35	FM-11	1	8	1246	s	43.2222	-126.1733	1397	200	B-Team	Line7	Arr. FM11; warm, 18.2-18.5C; 30.298 psu plume
NH21400.32	CTD	27	35	FM-11	1	8	1327	e	43.2336	-126.1962	1395	nd	B-Team	Line7	
NH21400.33	VPT	25	35	FM-11	1	8	1343	s	43.2392	-126.1962	1395	100	B-Team	Line7	
NH21400.34	MamBinocs	nd	nd	nd	1	8	1901	s	43.2298	-125.2573	2288	nd	Tynan	Line7	
NH21400.35	Birds	nd	nd	nd	1	8	1915	s	43.2267	-125.2217	1850	nd	Ainley	Line7	Arr. FM11; warm, 18.2-18.5C; 30.298 psu plume
NH21400.36	MamBinocs	nd	nd	nd	1	8	2035	e	43.2078	-124.9810	800	nd	Tynan	Line7	
NH21400.37	Birds	nd	nd	nd	1	8	2040	e	43.2167	-124.9400	800	nd	Ainley	Line7	
NH21400.38	CTD	28	36	FM-7B	1	8	2201	s	43.2192	-124.8407	341	200	B-Team	Line7	
NH21400.39	CTD	28	36	FM-7B	1	8	2227	e	43.2230	-124.8502	346	nd	B-Team	Line7	Arr. FM11; warm, 18.2-18.5C; 30.298 psu plume
NH21400.40	VPT	26	36	FM-7B	1	8	2234	s	43.2249	-124.8551	349	100	B-Team	Line7	
NH21400.41	LiveNet1	19	36	FM-7B	1	8	2239	s	43.2286	-124.8643	349	40	B-Team	Line7	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21500.01	VPT	27	37	FM-5B	2	8	0017	s	43.2196	-124.6688	167	100	A-Team	Line7	Aiming for Wecoma target = copepods
NH21500.02	LiveNet1	20	37	FM-5B	2	8	0035	s	43.2218	-124.6737	168	40	A-Team	Line7	
NH21500.03	CTD	29	37	FM-5B	2	8	0055	s	43.2249	-124.6729	172	163	A-Team	Line7	
NH21500.04	CTD	29	37	FM-5B	2	8	0121	e	43.2270	-124.6928	172	nd	A-Team	Line7	
NH21500.05	CTD	30	38	FM-4B	2	8	0220	s	43.2189	-124.5888	94	82	A-Team	Line7	
NH21500.06	CTD	30	38	FM-4B	2	8	0242	e	43.2193	-124.5915	94	nd	A-Team	Line7	
NH21500.07	LiveNet1	21	38	FM-4B	2	8	0249	s	43.2212	-124.5951	104	60	A-Team	Line7	
NH21500.08	VPT	28	38	FM-4B	2	8	0304	s	43.2228	-124.6166	106	95	A-Team	Line7	
NH21500.09	LiveNet1	22	39	FM-3C	2	8	0405	s	43.2156	-124.4998	69	40	A-Team	Line7	
NH21500.10	VPT	29	39	FM-3C	2	8	0419	s	43.2167	-124.5048	60	54	A-Team	Line7	
NH21500.11	CTD	31	39	FM-3C	2	8	0434	s	43.2182	-124.5080	62	52	A-Team	Line7	Lv FM10
NH21500.12	CTD	31	39	FM-3C	2	8	0449	e	43.2028	-124.5096	64	nd	A-Team	Line7	
NH21500.13	CTD	32	40	FM-1B	2	8	0540	s	43.2178	-124.4380	39	30	A-Team	Line7	
NH21500.14	CTD	32	40	FM-1B	2	8	0550	e	43.2194	-124.4404	42	nd	A-Team	Line7	
NH21500.15	LiveNet1	23	40	FM-1B	2	8	0558	s	43.2195	-124.4410	41	40	A-Team	Line7	
NH21500.16	VPT	30	40	FM-1B	2	8	0607	s	43.2223	-124.4422	40	35	A-Team	Line7	
NH21500.17	BigEyes	nd	nd	nd	2	8	0627	s	43.2222	-124.4432	27	nd	Tynan	Dogleg	
NH21500.18	Birds	nd	nd	nd	2	8	0630	s	43.2217	-124.4417	30	nd	Ainley	Dogleg	
NH21500.19	BigEyes	nd	nd	nd	2	8	0745	e	43.3580	-124.6520	180	nd	Tynan	Dogleg	
NH21500.20	Birds	nd	nd	nd	2	8	0746	e	43.3550	-124.6517	183	nd	Ainley	Dogleg	
NH21500.21	VPT	31	41	DL-1	2	8	0755	s	43.3589	-124.6527	185	100	A-Team	Dogleg	Lv FM10
NH21500.22	CTD	33	41	DL-1	2	8	0812	s	43.3599	-124.6575	192	181	A-Team	Dogleg	
NH21500.23	CTD	33	41	DL-1	2	8	0850	e	43.3635	-124.6718	215	nd	A-Team	Dogleg	
NH21500.24	Birds	nd	nd	nd	2	8	0855	s	43.3650	-124.6733	219	nd	Ainley	Dogleg	
NH21500.25	MamBinocs	nd	nd	nd	2	8	nd	s	nd	nd	nd	nd	Tynan	Dogleg	
NH21500.26	Birds	nd	nd	nd	2	8	1005	e	43.4750	-124.8400	540	nd	Ainley	Dogleg	
NH21500.27	MamBinocs	nd	nd	nd	2	8	1010	e	43.4743	-124.8403	540	nd	Tynan	Dogleg	
NH21500.28	VPT	32	42	DL-2	2	8	1012	s	43.4755	-124.8413	546	100	A-Team	Dogleg	
NH21500.29	CTD	34	42	DL-2	2	8	1030	s	43.4780	-124.8440	546	200	A-Team	Dogleg	
NH21500.30	CTD	34	42	DL-2	2	8	1104	e	43.4864	-124.8512	568	nd	A-Team	Dogleg	
NH21500.31	Birds	nd	nd	nd	2	8	1115	s	43.4900	-124.8517	540	nd	Ainley	Dogleg	Lv FM10
NH21500.32	MamBinocs	nd	nd	nd	2	8	1117	s	43.4953	-124.8598	540	nd	Tynan	Dogleg	
NH21500.33	MamBinocs	nd	nd	nd	2	8	1215	e	43.5813	-124.9990	970	nd	Ainley	Dogleg	
NH21500.34	Birds	nd	nd	nd	2	8	1215	e	43.5817	-125.0000	970	nd	Ainley	Dogleg	
NH21500.35	VPT	33	43	DL-3	2	8	1221	s	43.5824	-125.0002	1106	100	B-Team	Dogleg	
NH21500.36	CTD	35	43	DL-3	2	8	1236	s	43.5826	-125.0028	1093	200	B-Team	Dogleg	
NH21500.37	CTD	35	43	DL-3	2	8	1312	e	43.5828	-125.0093	nd	nd	B-Team	Dogleg	
NH21500.38	Birds	nd	nd	nd	2	8	1320	s	43.5817	-125.0000	740	nd	Ainley	Dogleg	
NH21500.39	MamBinocs	nd	nd	nd	2	8	1321	s	43.5843	-125.0103	970	nd	Tynan	Dogleg	
NH21500.40	Birds	nd	nd	nd	2	8	1431	e	43.6867	-124.7983	695	nd	Ainley	Dogleg	
NH21500.41	MamBinocs	nd	nd	nd	2	8	1434	e	43.6858	-124.7985	695	nd	Tynan	Dogleg	Lv FM10
NH21500.42	VPT	34	44	DL-4	2	8	1440	s	43.6886	-124.7983	664	100	B-Team	Dogleg	
NH21500.43	CTD	36	44	DL-4	2	8	1455	s	43.6894	-124.7992	665	200	B-Team	Dogleg	
NH21500.44	CTD	36	44	DL-4	2	8	1533	e	43.6902	-124.8042	nd	nd	B-Team	Dogleg	
NH21500.45	Birds	nd	nd	nd	2	8	1540	s	43.6817	-124.7950	695	nd	Ainley	Dogleg	
NH21500.46	MamBinocs	nd	nd	nd	2	8	1540	s	43.6817	-124.7950	695	nd	Tynan	Dogleg	
NH21500.47	MamBinocs	nd	nd	nd	2	8	1645	e	43.7823	-124.6172	282	nd	Tynan	Dogleg	
NH21500.48	Birds	nd	nd	nd	2	8	1645	e	43.7817	-124.6167	275	nd	Ainley	Dogleg	

Comments

Reg

SI

Cast
Depth

Water
Depth

Long

Lat

Time S/E
flag

Day

Mos

Sta

std

Sta

Cast

Instr

Event#

NH21500.49	VPT	35	45	DL-5	2	8	1650	s	43.7818	-124.6188	296	100	B-Team	Dogleg
NH21500.50	CTD	37	45	DL-5	2	8	1705	s	43.7821	-124.6207	300	200	B-Team	Dogleg
NH21500.51	CTD	37	45	DL-5	2	8	1730	e	43.7800	-124.6217	nd	nd	B-Team	Dogleg
NH21500.52	Birds	nd	nd	nd	2	8	1740	s	43.7850	-124.6233	281	nd	Ainley	Dogleg
NH21500.53	BigEyes	nd	nd	nd	2	8	1742	s	43.7885	-124.6170	382	nd	Tynan	Dogleg
NH21500.54	Birds	nd	nd	nd	2	8	1827	e	43.8517	-124.4867	124	nd	Ainley	Dogleg
NH21500.55	BigEyes	nd	nd	nd	2	8	1828	e	43.8522	-124.4862	124	nd	Tynan	Dogleg
NH21500.56	VPT	36	46	DL-6	2	8	1833	s	43.8520	-124.4877	158	100	B-Team	Dogleg
NH21500.57	CTD	38	46	DL-6	2	8	1845	s	43.8515	-124.4937	158	124	B-Team	Dogleg
NH21500.58	CTD	38	46	DL-6	2	8	1907	e	43.8519	-124.4978	134	nd	B-Team	Dogleg
NH21500.59	Birds	nd	nd	nd	2	8	1827	s	43.8517	-124.4967	124	nd	Ainley	Dogleg
NH21500.60	BigEyes	nd	nd	nd	2	8	1915	s	43.8522	-124.4967	124	nd	Tynan	Dogleg
NH21500.61	BigEyes	nd	nd	nd	2	8	2027	e	43.9495	-124.2860	92	nd	Tynan	Dogleg
NH21500.62	Birds	nd	nd	nd	2	8	2045	e	43.9767	-124.2317	64	nd	Ainley	Dogleg
NH21500.63	CTD	39	47	HH-1	2	8	2108	s	43.9991	-124.2060	56	50	B-Team	Line4
NH21500.64	CTD	39	47	HH-1	2	8	2116	e	43.9988	-124.2081	nd	nd	B-Team	Line4
NH21500.65	VPT	37	47	HH-1	2	8	2124	s	43.9985	-124.2100	56	45	B-Team	Line4
NH21500.66	LiveNet1	24	47	HH-1	2	8	2132	s	43.9981	-124.2119	58	40	B-Team	Line4
NH21500.67	VPT	38	48	HH-2	2	8	2259	s	44.0002	-124.4042	122	100	B-Team	Line4
NH21500.68	CTD	40	48	HH-2	2	8	2314	s	44.0010	-124.4095	124	115	B-Team	Line4
NH21500.69	CTD	40	48	HH-2	2	8	2330	e	44.0027	-124.4139	nd	nd	B-Team	Line4
NH21500.70	MOC	11	48	HH-2	2	8	2357	s	44.0035	-124.4067	123	105	B-Team/ A-Team	Line4
NH21600.01	MOC	11	48	HH-2	3	8	0027	e	44.0138	-124.4183	nd	nd	A-Team	Line4
NH21600.02	CTD	41	49	HH-4	3	8	0307	s	44.0005	-124.8003	114	100	A-Team	Line4
NH21600.03	CTD	41	49	HH-4	3	8	0328	e	44.0012	-124.8005	110	nd	A-Team	Line4
NH21600.04	VPT	38	49	HH-4	3	8	0335	s	44.0027	-124.8007	107	100	A-Team	Line4
NH21600.05	MOC	12	49	HH-4	3	8	0355	s	44.0041	-124.8100	103	90	A-Team	Line4
NH21600.06	MOC	12	49	HH-4	3	8	0419	e	44.0170	-124.8167	103	nd	A-Team	Line4
NH21600.07	VPT	39	50	HH-3	3	8	0536	s	43.9995	-124.6009	155	100	A-Team	Line4
NH21600.08	Birds	nd	nd	nd	3	8	0750	s	43.9983	-124.1983	49	nd	Ainley	Line4
NH21600.09	BigEyes	nd	nd	nd	3	8	0750	s	43.9978	-124.1977	49	nd	Tynan	Line4
NH21600.10	Birds	nd	nd	nd	3	8	0841	e	43.9967	-124.3933	116	nd	Ainley	Line4
NH21600.11	BigEyes	nd	nd	nd	3	8	0843	e	43.9975	-124.3948	115	nd	Tynan	Line4
NH21600.12	MOC	13	51	HH-2B	3	8	0926	s	44.0143	-124.4050	121	110	A-Team	Line4
NH21600.13	MOC	13	51	HH-2B	3	8	1008	e	44.0275	-124.4150	nd	nd	A-Team	Line4
NH21600.14	Birds	nd	nd	nd	3	8	1030	s	44.0050	-124.3983	116	nd	Ainley	Line4
NH21600.15	BigEyes	nd	nd	nd	3	8	1030	s	43.9998	-124.3990	115	nd	Tynan	Line4
NH21600.16	BigEyes	nd	nd	nd	3	8	1131	e	43.9993	-124.6343	146	nd	Tynan	Line4
NH21600.17	BigEyes	nd	nd	nd	3	8	1207	s	43.9993	-124.7703	115	nd	Tynan	Line4
NH21600.18	Birds	nd	nd	nd	3	8	1214	e	44.0000	-124.7967	114	nd	Ainley	Line4
NH21600.19	BigEyes	nd	nd	nd	3	8	1215	e	43.9998	-124.7973	115	nd	Tynan	Line4
NH21600.20	MOC	14	52	HH-4B	3	8	1235	s	44.0034	-124.8300	110	100	B-Team	Line4
NH21600.21	MOC	14	52	HH-4B	3	8	1319	e	44.0277	-124.8050	nd	nd	B-Team	Line4
NH21600.22	Birds	nd	nd	nd	3	8	1325	s	44.0283	-124.8067	98	nd	Ainley	Line4
NH21600.23	BigEyes	nd	nd	nd	3	8	nd	s	44.0308	-124.8082	98	nd	Tynan	Line4
NH21600.24	Birds	nd	nd	nd	3	8	1419	e	44.0000	-124.9967	1098	nd	Ainley	Line4

B-Team started; A-Team finished

Arr. HH2
Wecoma circled NH during cast; peak
scatterers at 90-100m

Wecoma nearby during cast

Ly after MOCNESS

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21600.25	BigEyes	nd	nd	nd	3	8	1420	e	43.9985	-124.9967	915	nd	Tynan	Line4	Arr. HH5
NH21600.26	CTD	42	53	HH-5	3	8	1440	s	43.9999	-125.0034	960	200	B-Team	Line4	
NH21600.27	CTD	42	53	HH-5	3	8	1516	e	43.9988	-125.0093	994	nd	B-Team	Line4	
NH21600.28	VPT	40	53	HH-5	3	8	1518	s	43.9984	-125.0109	1005	100	B-Team	Line4	13.97 SST
NH21600.29	MOC	15	53	HH-5	3	8	1535	s	44.0014	-125.0156	1051	350	B-Team	Line4	
NH21600.30	MOC	15	53	HH-5	3	8	1639	e	44.0268	-124.4150	nd	nd	B-Team	Line4	
NH21600.31	Birds	nd	nd	nd	3	8	1645	s	44.0300	-125.0450	1080	nd	Ainley	Line4	Lv after MOCNESS
NH21600.32	BigEyes	nd	nd	nd	3	8	1648	s	44.0265	-125.0615	1080	nd	Tynan	Line4	Red patches in N-S fronts; red
NH21600.33	MiscObs	nd	nd	nd	3	8	1716	s	44.0042	-125.1555	nd	nd	Tynan	Line4	Oikopleura(eggs? food?)
NH21600.34	Birds	nd	nd	nd	3	8	1726	e	43.9983	-125.1983	1756	nd	Ainley	Line4	
NH21600.35	BigEyes	nd	nd	nd	3	8	1728	e	44.0042	-125.1967	1756	nd	Tynan	Line4	Arr. HH7
NH21600.36	CTD	43	54	HH-7	3	8	1824	s	43.9977	-125.1997	1734	200	B-Team	Line4	
NH21600.37	CTD	43	54	HH-7	3	8	1842	e	43.9948	-125.2015	nd	nd	B-Team	Line4	
NH21600.38	VPT	41	54	HH-7	3	8	1845	s	43.9933	-125.2016	1846	100	B-Team	Line4	
NH21600.39	BigEyes	nd	nd	nd	3	8	1903	s	43.9945	-125.2025	1756	nd	Tynan	Transit	Transit to NH45
NH21600.40	Birds	nd	nd	nd	3	8	1905	s	44.0017	-125.2017	1647	nd	Ainley	Transit	
NH21600.41	BigEyes	nd	nd	nd	3	8	2010	e	44.1630	-125.1872	1500	nd	Tynan	Transit	
NH21600.42	Birds	nd	nd	nd	3	8	2020	e	44.1883	-125.1833	1500	nd	Tynan	Transit	
NH21600.43	VPT	42	55	NH-45	3	8	2321	s	44.6174	-125.1266	886	100	B-Team	Line1	Sta. 2 mi S of NH45; AtlantisII at NH45
NH21600.44	CTD	44	55	NH-45	3	8	2337	s	44.6178	-125.1334	895	200	B-Team	Line1	
NH21700.01	CTD	44	55	NH-45	4	8	0003	e	44.6187	-125.1435	954	200	B-Team	Line1	
NH21700.02	MOC	16	55	NH-45	4	8	0018	s	44.6241	-125.1502	925	350	A-Team	Line1	
NH21700.03	MOC	16	55	NH-45	4	8	0120	e	44.6570	-125.1750	nd	nd	A-Team	Line1	
NH21700.04	CTD	45	56	NH-35	4	8	0346	s	44.6531	-124.8856	460	200	A-Team	Line1	
NH21700.05	CTD	45	56	NH-35	4	8	0410	e	44.6519	-124.8922	482	nd	A-Team	Line1	
NH21700.06	LiveNet1	25	56	NH-35	4	8	0418	s	44.6525	-124.8979	508	40	A-Team	Line1	Shark
NH21700.07	VPT	43	56	NH-35	4	8	0430	s	44.6523	-124.8996	532	100	A-Team	Line1	Yuck!
NH21700.08	MOC	17	56	NH-35	4	8	0453	s	44.6533	-124.9050	581	350	A-Team	Line1	
NH21700.09	MOC	17	56	NH-35	4	8	0553	e	44.6750	-124.9433	nd	nd	A-Team	Line1	
NH21700.10	Birds	nd	nd	nd	4	8	0605	s	44.6750	-124.9367	824	nd	Ainley	Line1	
NH21700.11	BigEyes	nd	nd	nd	4	8	0612	s	44.6712	-124.8935	457	nd	Tynan	Line1	
NH21700.12	Birds	nd	nd	nd	4	8	0716	e	44.6500	-124.6500	238	nd	Ainley	Line1	
NH21700.13	BigEyes	nd	nd	nd	4	8	0717	e	44.6502	-124.6515	238	nd	Tynan	Line1	
NH21700.14	VPT	44	57	NH-25	4	8	0719	s	44.6506	-124.6511	296	100	A-Team	Line1	
NH21700.15	CTD	46	57	NH-25	4	8	0730	s	44.6501	-124.6562	282	200	A-Team	Line1	
NH21700.16	CTD	46	57	NH-25	4	8	0813	e	44.6480	-124.6675	248	nd	A-Team	Line1	
NH21700.17	MOC	18	57	NH-25	4	8	0823	s	44.6499	-124.6717	245	200	A-Team	Line1	
NH21700.18	MOC	18	57	NH-25	4	8	0851	e	44.6571	-124.6883	nd	nd	A-Team	Line1	
NH21700.19	Birds	nd	nd	nd	4	8	0900	s	44.6583	-124.6500	238	nd	Ainley	Line1	
NH21700.20	BigEyes	nd	nd	nd	4	8	0910	s	44.6502	-124.6515	238	nd	Tynan	Line1	
NH21700.21	Birds	nd	nd	nd	4	8	0946	e	44.6517	-124.5283	139	nd	Ainley	Line1	
NH21700.22	BigEyes	nd	nd	nd	4	8	0947	e	44.6527	-124.5302	132	nd	Tynan	Line1	
NH21700.23	VPT	45	58	NH-20	4	8	0957	s	44.6518	-124.5343	148	100	A-Team	Line1	
NH21700.24	CTD	47	58	NH-20	4	8	1011	s	44.6532	-124.5352	150	140	A-Team	Line1	
NH21700.25	CTD	47	58	NH-20	4	8	1036	e	44.6543	-124.5417	150	nd	A-Team	Line1	
NH21700.26	Birds	nd	nd	nd	4	8	1045	s	44.6633	-124.5283	139	nd	Ainley	Line1	
NH21700.27	BigEyes	nd	nd	nd	4	8	1047	s	44.6548	-124.5195	132	nd	Tynan	Line1	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21700.28	BigEyes	nd	nd	nd	4	8	1109	e	44.6505	-124.4337	92	nd	Tynan	Line1	Off for fax; 100 m visibility
NH21700.29	Birds	nd	nd	nd	4	8	1115	e	44.6483	-124.4083	90	nd	Ainley	Line1	
NH21700.30	CTD	48	59	NH-15	4	8	1120	s	44.6512	-124.4107	95	90	A-Team	Line1	Sea Eagle sampling NH15 simultaneously
NH21700.31	CTD	48	59	NH-15	4	8	1140	e	44.6526	-124.4139	94	nd	A-Team	Line1	
NH21700.32	VPT	46	59	NH-15	4	8	1150	s	44.6526	-124.4139	95	90	A-Team	Line1	
NH21700.33	MOC	19	59	NH-15	4	8	1210	s	44.6537	-124.4317	100	87.5	B-Team	Line1	
NH21700.34	MOC	19	59	NH-15	4	8	1243	e	44.6663	-124.4333	106	nd	B-Team	Line1	
NH21700.35	Birds	nd	nd	nd	4	8	1250	s	44.6683	-124.4367	100	nd	Ainley	Line1	Fog
NH21700.36	MamBinocs	nd	nd	nd	4	8	1301	s	44.6645	-124.4168	92	nd	Tynan	Line1	Arr. NH10; fog
NH21700.37	MamBinocs	nd	nd	nd	4	8	1342	e	44.6497	-124.3017	81	nd	Tynan	Line1	
NH21700.38	Birds	nd	nd	nd	4	8	1342	e	44.6500	-124.2983	80	nd	Ainley	Line1	
NH21700.39	VPT	47	60	NH-10	4	8	1352	s	44.6543	-124.2972	84	75	B-Team	Line1	
NH21700.40	CTD	49	60	NH-10	4	8	1407	s	44.6553	-124.3002	84	78	B-Team	Line1	
NH21700.41	CTD	49	60	NH-10	4	8	1429	e	44.6565	-124.3035	84	nd	B-Team	Line1	
NH21700.42	MamBinocs	nd	nd	nd	4	8	1441	s	44.6588	-124.3032	81	nd	Tynan	Line1	Lv NH10; fog
NH21700.43	Birds	nd	nd	nd	4	8	1445	s	44.6583	-124.2983	81	nd	Tynan	Line1	
NH21700.44	Birds	nd	nd	nd	4	8	1515	e	44.6517	-124.1733	56	nd	Ainley	Line1	
NH21700.45	MamBinocs	nd	nd	nd	4	8	1518	e	44.6525	-124.1768	56	nd	Tynan	Line1	
NH21700.46	CTD	50	61	NH-5	4	8	1524	s	44.6524	-124.1771	59	nd	B-Team	Line1	
NH21700.47	CTD	50	61	NH-5	4	8	1541	e	44.6520	-124.1805	60	nd	B-Team	Line1	
NH21700.48	VPT	48	61	NH-5	4	8	1545	s	44.6517	-124.1813	63	55	B-Team	Line1	
NH21700.49	Secchi	1	61	NH-5	4	8	1552	s	44.6512	-124.1831	63	nd	B-Team	Line1	9.5m Secchi Depth; slight wind; calm seas
NH21700.50	MOC	20	61	NH-5	4	8	1601	s	44.6520	-124.1863	64	55	B-Team	Line1	Sharp turns to avoid crabpots
NH21700.51	MOC	20	61	NH-5	4	8	1624	e	44.6587	-124.2000	66	nd	B-Team	Line1	
NH21700.52	MiscObs	nd	61	NH-5	4	8	1632	s	44.6611	-124.2080	nd	nd	Peterson	Line1	RV Sacajawea passed us color satellite Imagery/other data
NH21700.53	MamBinocs	nd	nd	nd	4	8	1644	s	44.6602	-124.1792	55	nd	Tynan	Line1	Lv NH5; fog
NH21700.54	Birds	nd	nd	nd	4	8	1645	s	44.6600	-124.1767	59	nd	Ainley	Line1	
NH21700.55	Birds	nd	nd	nd	4	8	1705	e	44.6533	-124.1117	40	nd	Ainley	Line1	
NH21700.56	VPT	49	62	NH-1	4	8	1708	s	44.6535	-124.1008	31	25	B-Team	Line1	
NH21700.57	MamBinocs	nd	nd	nd	4	8	1711	e	44.6530	-124.1005	24	nd	Tynan	Line1	At NH1; 10.9C
NH21700.58	CTD	51	62	NH-1	4	8	1718	s	44.6554	-124.1012	31	20	B-Team	Line1	
NH21700.59	CTD	51	62	NH-1	4	8	1731	e	44.6565	-124.1028	33	nd	B-Team	Line1	
NH21700.60	MamBinocs	nd	nd	nd	4	8	1737	s	44.6567	-124.1173	45	nd	Tynan	Transit	Transit to fine-scale line3; fog
NH21700.61	MiscObs	nd	nd	nd	4	8	1738	s	44.6565	-124.1028	nd	nd	Peterson	nd	Mesoscale survey complete; begin transit to BOB1
NH21700.62	Birds	nd	nd	nd	4	8	1745	s	44.6450	-124.1300	47	nd	Ainley	Transit	Arr. BOB1
NH21700.63	Birds	nd	nd	nd	4	8	2000	e	44.2500	-124.1800	40	nd	Ainley	Transit	50 m wire out
NH21700.64	LiveNet1	26	63	BOB-1	4	8	2025	s	44.2508	-124.1895	55	50	B-Team	BOB	65 m wire out
NH21700.65	LiveNet1	27	63	BOB-1	4	8	2036	s	44.2508	-124.1895	55	65	B-Team	BOB	
NH21700.66	VPT	50	63	BOB-1	4	8	2018	s	44.2508	-124.1895	55	nd	B-Team	BOB	May have hit bottom with weight
NH21700.67	VPT	51	64	BOB-2	4	8	2144	s	44.2522	-124.3696	89	80	B-Team	BOB	50 m wire out; ca. 45 angle
NH21700.68	LiveNet1	28	64	BOB-2	4	8	2155	s	44.2522	-124.3696	89	50	B-Team	BOB	
NH21700.69	VPT	52	65	BOB-3	4	8	2246	s	44.2511	-124.5010	104	95	B-Team	BOB	50 m wire out; ca 45 angle
NH21700.70	LiveNet1	29	65	BOB-3	4	8	2300	s	44.2511	-124.5010	104	50	B-Team	BOB	
NH21800.01	VPT	53	66	BOB-4	5	8	0012	s	44.2501	-124.7004	99	90	A-Team	BOB	50 m wire out
NH21800.02	LiveNet1	30	66	BOB-4	5	8	0026	s	44.2509	-124.7011	100	50	A-Team	BOB	50 m wire out; 2-3 min
NH21800.03	LiveNet1	31	66	BOB-4	5	8	0041	s	44.2547	-124.7061	98	50	A-Team	BOB	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21800.04	LiveNet1	32	66	BOB-4	5	8	0107	s	44.2561	-124.7088	101	30	A-Team	BOB	30 m wire out; 3 min
NH21800.05	LiveNet1	33	67	BOB-2B	5	8	0240	s	44.2534	-124.4139	95	40	A-Team	BOB	40 m wire out; 5 min
NH21800.06	VPT	54	68	BOB-5	5	8	0506	s	44.2490	-124.8992	153	100	A-Team	BOB	14.6 SST
NH21800.07	LiveNet2	1	69	BOB-6	5	8	0640	s	44.2499	-125.1090	1200	50	A-Team	BOB	Live tow using VPT net (=LiveNet2)
NH21800.08	VPT	55	69	BOB-6	5	8	0642	s	44.2511	-125.1100	1220	100	A-Team	BOB	
NH21800.09	CTD	52	69	BOB-6	5	8	0658	s	44.2507	-125.1121	1224	200	A-Team	BOB	
NH21800.10	CTD	52	69	BOB-6	5	8	0722	e	44.2501	-125.1158	1247	nd	A-Team	BOB	
NH21800.11	Birds	nd	nd	nd	5	8	0745	s	44.2517	-125.1100	1281	nd	Ainley	BOB	
NH21800.12	BigEyes	nd	nd	nd	5	8	0745	s	44.2537	-125.1025	1209	nd	Tynan	BOB	
NH21800.13	BigEyes	nd	nd	nd	5	8	0843	e	44.2500	-124.8333	183	nd	Tynan	BOB	
NH21800.14	Birds	nd	nd	nd	5	8	0843	e	44.2500	-124.8333	183	nd	Ainley	BOB	
NH21800.15	CTD	53	70	BOB-5	5	8	0915	s	44.2514	-124.9023	150	150	A-Team	BOB	
NH21800.16	CTD	53	70	BOB-5	5	8	0940	e	44.2528	-124.9090	157	nd	A-Team	BOB	
NH21800.17	VPT	56	70	BOB-5B	5	8	0954	s	44.2532	-124.9088	158	100	A-Team	BOB	
NH21800.18	Birds	nd	nd	nd	5	8	1000	s	44.2533	-124.9150	200	nd	Ainley	BOB	
NH21800.19	BigEyes	nd	nd	nd	5	8	1002	s	44.2533	-124.9123	200	nd	Tynan	BOB	
NH21800.20	Birds	nd	nd	nd	5	8	1057	e	44.2500	-124.7017	95	nd	Ainley	BOB	
NH21800.21	BigEyes	nd	nd	nd	5	8	1058	e	44.2508	-124.7010	97	nd	Tynan	BOB	
NH21800.22	VPT	57	71	BOB-4B	5	8	1108	s	44.2512	-124.7025	98	90	A-Team	BOB	
NH21800.23	CTD	54	71	BOB-4	5	8	1122	s	44.2522	-124.7054	100	89	A-Team	BOB	
NH21800.24	CTD	54	71	BOB-4	5	8	1138	e	44.2537	-124.7096	102	nd	A-Team	BOB	
NH21800.25	MamBinocs	nd	nd	nd	5	8	1147	s	44.2568	-124.7088	1147	nd	Tynan	BOB	Inmarsat On
NH21800.26	Birds	nd	nd	nd	5	8	1150	s	44.2567	-124.7117	92	nd	Ainley	BOB	
NH21800.27	MamBinocs	nd	nd	nd	5	8	1200	e	44.2573	-124.6650	92	nd	Tynan	BOB	Inmarsat Off
NH21800.28	BigEyes	nd	nd	nd	5	8	1200	s	44.2573	-124.6650	92	nd	Tynan	BOB	
NH21800.29	Birds	nd	nd	nd	5	8	1242	e	44.2500	-124.5000	100	nd	Ainley	BOB	
NH21800.30	BigEyes	nd	nd	nd	5	8	1244	e	44.2508	-124.5002	104	nd	Tynan	BOB	
NH21800.31	CTD	55	72	BOB-3	5	8	1255	s	44.2534	-124.4986	104	nd	B-Team	BOB	Lots of flotsam on the surface; wood, eelgrass, leaves
NH21800.32	CTD	55	72	BOB-3	5	8	1317	e	44.2548	-124.5007	105	nd	B-Team	BOB	
NH21800.33	VPT	58	72	BOB-3B	5	8	1320	s	44.2552	-124.5012	105	100	B-Team	BOB	
NH21800.34	Birds	nd	nd	nd	5	8	1340	s	44.2550	-124.5017	100	nd	Ainley	BOB	
NH21800.35	BigEyes	nd	nd	nd	5	8	1340	s	44.2557	-124.5025	100	nd	Tynan	BOB	
NH21800.36	Birds	nd	nd	nd	5	8	1418	e	44.2500	-124.3733	88	nd	Ainley	BOB	
NH21800.37	BigEyes	nd	nd	nd	5	8	1421	e	44.2503	-124.3688	90	nd	Tynan	BOB	
NH21800.38	VPT	59	73	BOB-2B	5	8	1429	s	44.2511	-124.3689	89	75	B-Team	BOB	
NH21800.39	CTD	56	73	BOB-2	5	8	1442	s	44.2515	-124.3830	91	80	B-Team	BOB	
NH21800.40	CTD	56	73	BOB-2	5	8	1503	e	44.2527	-124.3745	nd	nd	B-Team	BOB	
NH21800.41	BigEyes	nd	nd	nd	5	8	1508	s	44.2552	-124.3757	90	nd	Tynan	BOB	
NH21800.42	Birds	nd	nd	nd	5	8	1515	s	44.2567	-124.3700	80	nd	Ainley	BOB	
NH21800.43	Birds	nd	nd	nd	5	8	1602	e	44.2483	-124.1783	51	nd	Ainley	BOB	
NH21800.44	BigEyes	nd	nd	nd	5	8	1603	e	44.2482	-124.1790	49	nd	Tynan	BOB	
NH21800.45	CTD	57	74	BOB-1	5	8	1607	s	44.2486	-124.1800	54	45	B-Team	BOB	Wecoma at BOB1 simultaneously
NH21800.46	CTD	57	74	BOB-1	5	8	1621	e	44.2487	-124.1844	nd	nd	B-Team	BOB	
NH21800.47	VPT	60	74	BOB-1B	5	8	1626	s	44.2488	-124.1859	55	45	B-Team	BOB	
NH21800.48	MOC	21	75	BOB-2	5	8	1721	s	44.2494	-124.3644	90	88	B-Team	BOB	Wecoma steamed by; real close to bottom
NH21800.49	MOC	21	75	BOB-2	5	8	1748	e	44.2570	-124.3815	90	88	B-Team	BOB	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH21800.50	MOC	22	76	BOB-4	5	8	1945	s	44.2483	-124.7000	100	90	BOB	Wecoma steamed by while on station
NH21800.51	MOC	22	76	BOB-4	5	8	2014	e	44.2582	-124.7150	nd	nd	BOB	
NH21800.52	LiveNet1	34	77	HH-5	5	8	2240	s	44.0010	-125.0080	950	50	BOB	Net twisted; aborted
NH21800.53	MOC	35	77	HH-5	5	8	2250	s	44.0017	-125.0097	1005	55	BOB	Red larvaeans in surface bucketed water
NH21800.54	LiveNet1	23	77	HH-5B	5	8	2320	s	44.0010	-125.0088	1000	350	BOB	
NH21800.55	MiscObs	nd	77	HH-5	5	8	2345	s	44.0085	-125.0167	1000	0	BPeterson	ca. 100 fish by J-frame (Jack mackerel?)
NH21900.01	MOC	23	77	HH-5B	6	8	0028	e	44.0260	-125.0565	nd	nd	HH5Diel	A-Team relieved B-Team on MOC
NH21900.02	MOC	24	78	HH-5C	6	8	0303	s	44.0034	-125.0025	900	350	HH5Diel	
NH21900.03	MOC	24	78	HH-5C	6	8	0355	e	44.0280	-125.0463	nd	nd	HH5Diel	
NH21900.04	MOC	25	79	HH-5D	6	8	0600	s	43.9933	-124.9894	862	350	HH5Diel	
NH21900.05	MOC	25	79	HH-5D	6	8	0656	e	44.0148	-125.0243	nd	nd	HH5Diel	
NH21900.06	BigEyes	nd	nd	nd	6	8	0710	s	44.0202	-125.0300	915	nd	Transit	
NH21900.07	Birds	nd	nd	nd	6	8	0710	s	44.0200	-125.0300	915	nd	Transit	
NH21900.08	Birds	nd	nd	nd	6	8	0900	e	44.2633	-125.2350	3500	nd	Transit	At red streak station
NH21900.09	BigEyes	nd	nd	nd	6	8	0943	e	44.1812	-125.1698	1540	nd	Transit	
NH21900.10	SmallBoat	nd	nd	nd	6	8	1005	s	44.1845	-125.1808	1540	nd	Transit	Small boat ops; bird collection
NH21900.11	SmallBoat	nd	nd	nd	6	8	1210	e	44.1500	-125.1293	1540	nd	Transit	Small boat recovered onboard
NH21900.12	VPT	61	80	BK	6	8	1221	s	44.1538	-125.1337	1533	100	BK	
NH21900.13	LiveNet1	36	80	BK	6	8	1232	s	44.1578	-125.1377	1595	50	BK	50 m wire out
NH21900.14	MOC	26	80	BK	6	8	1302	s	44.1620	-125.1418	1555	350	BK	At birdkill site; 4 Cassins Auklets shot
NH21900.15	MOC	26	80	BK	6	8	1400	e	44.1885	-125.1717	nd	nd	BK	
NH21900.16	BigEyes	nd	nd	nd	6	8	1415	s	44.1848	-125.1655	1540	nd	Transit	
NH21900.17	BigEyes	nd	nd	nd	6	8	1532	e	44.0035	-124.9963	915	nd	Transit	
NH21900.18	MOC	27	81	HH-5E	6	8	1550	s	44.0067	-125.0016	950	350	HH5Diel	
NH21900.19	MOC	27	81	HH-5E	6	8	1656	e	44.0421	-125.0371	1149	nd	HH5Diel	
NH21900.20	Birds	nd	nd	nd	6	8	1735	s	44.0367	-125.0317	915	nd	Transit	
NH21900.21	BigEyes	nd	nd	nd	6	8	1735	s	44.0303	-125.0273	915	nd	Transit	
NH21900.22	Birds	nd	nd	nd	6	8	1905	e	43.8200	-125.2317	2500	nd	Transit	
NH21900.23	Birds	nd	nd	nd	6	8	1925	s	43.7867	-125.2767	1830	nd	Transit	
NH21900.24	BigEyes	nd	nd	nd	6	8	1926	nd	43.7832	-125.2837	1830	nd	Transit	
NH21900.25	BigEyes	nd	nd	nd	6	8	1956	e	43.8480	-125.2673	1830	nd	Transit	
NH21900.26	Birds	nd	nd	nd	6	8	2010	e	43.8983	-125.2533	1900	nd	Transit	
NH21900.27	LiveNet1	37	82	BKB	6	8	2214	s	44.1681	-125.1707	1577	55	BK	Change course to 012
NH21900.28	CTD	58	82	BK	6	8	2230	s	44.1719	-125.1760	1509	200	BK	Transit to BK site
NH21900.29	CTD	58	82	BK	6	8	2256	e	44.1767	-125.1829	1509	200	BK	55 m wire out
NH21900.30	MOC	28	82	BKB	6	8	2314	s	44.1759	-125.1700	1509	350	BK	
NH22000.01	MOC	28	82	BKB	7	8	0020	e	44.2109	-125.1900	nd	nd	BK	
NH22000.02	MOC	29	83	HH-5F	7	8	0303	s	44.1305	-125.0091	970	350	HH5Diel	
NH22000.03	MOC	29	83	HH-5F	7	8	0415	e	44.0481	-125.0253	nd	nd	HH5Diel	
NH22000.04	MOC	30	84	HH-5G	7	8	0613	s	44.0080	-125.0100	1162	350	HH5Diel	
NH22000.05	MOC	30	84	HH-5G	7	8	0700	e	44.0306	-125.0113	nd	nd	HH5Diel	
NH22000.06	Birds	nd	nd	nd	7	8	0740	s	44.0533	-125.0233	1140	nd	Transit	
NH22000.07	BigEyes	nd	nd	nd	7	8	0740	s	44.0565	-125.0273	1144	nd	Transit	On course 230
NH22000.08	Birds	nd	nd	nd	7	8	0925	e	43.8950	-125.3533	2900	nd	Transit	
NH22000.09	BigEyes	nd	nd	nd	7	8	0935	e	43.8798	-125.3852	2700	nd	Transit	
NH22000.10	Birds	nd	nd	nd	7	8	0945	s	43.8633	-125.4183	2900	nd	Transit	
NH22000.11	BigEyes	nd	nd	nd	7	8	1015	s	43.8257	-125.4993	nd	nd	Transit	On course 230
NH22000.12	BigEyes	nd	nd	nd	7	8	1130	e	43.7317	-125.7430	3020	nd	Transit	Off for Fax/Inmarsat

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22000.13	BigEyes	nd	nd	nd	7	8	1240	s	43.6678	-125.9508	nd	nd	Tynan	Transit	
NH22000.14	Birds	nd	nd	nd	7	8	1318	e	43.7500	-126.0000	3019	nd	Ainley	Transit	
NH22000.15	BigEyes	nd	nd	nd	7	8	1325	e	43.7508	-126.0015	3027	nd	Tynan	Transit	Arr. Z2; 5 fin whales nearby
NH22000.16	VPT	62	85	Z-2	7	8	1323	s	43.7508	-126.0008	3057	100	B-Team	Zag	Zag = Cold Tongue; fish caught 2.7nm SSW of this station
NH22000.17	CTD	59	85	Z-2	7	8	1341	s	43.7523	-126.0042	3053	200	B-Team	Zag	Finwhales lunge feeding 40 R of ship on sta.
NH22000.18	MiscObs	nd	nd	nd	7	8	1406	s	43.7547	-126.0102	nd	nd	nd	Zag	
NH22000.19	CTD	59	85	Z-2	7	8	1407	e	43.7548	-126.0106	3055	nd	B-Team	Zag	
NH22000.20	CTD	60	86	Z-1	7	8	1611	s	43.6542	-125.9328	3068	200	B-Team	Zag	
NH22000.21	CTD	60	86	Z-1	7	8	1642	e	43.6640	-125.9423	nd	nd	B-Team	Zag	
NH22000.22	VPT	63	86	Z-1	7	8	1646	s	43.6640	-125.9423	3068	100	B-Team	Zag	
NH22000.23	MiscObs	nd	nd	nd	7	8	nd	s	43.7115	-125.9817	nd	nd	Tynan	Zag	Finwhale sighted enroute to W1
NH22000.24	MOC	31	87	W-1	7	8	1745	s	43.7417	-126.0024	2580	350	B-Team	Zag	Group of fin whales nearby
NH22000.25	MiscObs	nd	nd	nd	7	8	1843	s	43.7707	-126.0172	nd	nd	Tynan	Zag	Finwhales alongside during MOCNESS
NH22000.26	MOC	31	87	W-1	7	8	1847	e	43.7708	-126.0172	nd	nd	B-Team	Zag	
NH22000.27	Birds	nd	nd	nd	7	8	1905	s	43.7767	-126.0167	3019	nd	Ainley	Zag	
NH22000.28	BigEyes	nd	nd	nd	7	8	1905	s	43.7708	-126.0127	3019	nd	Tynan	Zag	
NH22000.29	BigEyes	nd	nd	nd	7	8	1930	e	43.7070	-125.9635	nd	nd	Tynan	Zag	
NH22000.30	MamBinocs	nd	nd	nd	7	8	1930	s	43.7070	-125.9635	nd	nd	Tynan	Zag	
NH22000.31	MamBinocs	nd	nd	nd	7	8	2013	e	43.6055	-125.8863	nd	nd	Tynan	Zag	
NH22000.32	Birds	nd	nd	nd	7	8	2035	e	43.7217	-125.8450	3000	nd	Ainley	Zag	
NH22000.33	CTD	61	88	Z-3	7	8	2115	s	43.4992	-125.8087	3079	200	B-Team	Zag	14.4SST
NH22000.34	CTD	61	88	Z-3	7	8	2140	e	43.5040	-125.8069	nd	nd	B-Team	Zag	
NH22000.35	VPT	64	88	Z-3	7	8	2140	s	43.5040	-125.8069	nd	100	B-Team	Zag	
NH22000.36	LiveNet1	38	88	Z-3	7	8	2204	s	43.5040	-125.8069	nd	55	B-Team	Zag	55 m of wire out
NH22000.37	MOC	32	88	Z-3	7	8	2226	s	43.5150	-125.8433	3079	350	B-Team	Zag	
NH22000.38	MOC	32	88	Z-3	7	8	2338	e	43.5431	-125.8800	3079	nd	B-Team	Zag	
NH22100.01	VPT	65	89	Z-4	8	8	0215	s	43.3480	-125.4977	3097	100	A-Team	Zag	
NH22100.02	CTD	62	89	Z-4	8	8	0235	s	43.3526	-125.5050	3097	200	A-Team	Zag	
NH22100.03	CTD	62	89	Z-4	8	8	0309	e	43.3622	-125.5180	3100	nd	A-Team	Zag	
NH22100.04	MOC	33	90	Z-5	8	8	0505	s	43.2211	-125.8127	3079	350	A-Team	Zag	
NH22100.05	MOC	33	90	Z-5	8	8	0617	e	43.2654	-125.8267	nd	nd	A-Team	Zag	
NH22100.06	LiveNet1	39	90	Z-5	8	8	0659	s	43.2198	-125.8007	3121	60	A-Team	Zag	
NH22100.07	VPT	66	90	Z-5	8	8	0717	s	43.2247	-125.8045	3081	100	A-Team	Zag	
NH22100.08	CTD	63	90	Z-5	8	8	0733	s	43.2263	-125.8064	3081	200	A-Team	Zag	
NH22100.09	CTD	63	90	Z-5	8	8	0800	s	43.2328	-125.8115	nd	nd	A-Team	Zag	
NH22100.10	Birds	nd	nd	nd	8	8	0810	s	43.2333	-125.8150	3056	nd	Ainley	Zag	
NH22100.11	BigEyes	nd	nd	nd	8	8	0812	s	43.2340	-125.8137	3056	nd	Tynan	Zag	
NH22100.12	Birds	nd	nd	nd	8	8	0920	e	43.0800	-126.0000	3000	nd	Ainley	Zag	
NH22100.13	BigEyes	nd	nd	nd	8	8	0924	e	43.0793	-125.9995	3000	nd	Tynan	Zag	
NH22100.14	CTD	64	91	Z-6	8	8	0934	s	43.0815	-126.0012	3082	200	A-Team	Zag	
NH22100.15	CTD	64	91	Z-6	8	8	1003	e	43.0842	-126.0068	3082	nd	A-Team	Zag	
NH22100.16	VPT	67	91	Z-6	8	8	1005	s	43.0861	-126.0092	3079	100	A-Team	Zag	
NH22100.17	BigEyes	nd	nd	nd	8	8	1023	s	43.0850	-126.0035	3000	nd	Tynan	Zag	
NH22100.18	Birds	nd	nd	nd	8	8	1040	s	43.0617	-125.9450	3000	nd	Ainley	Zag	
NH22100.19	BigEyes	nd	nd	nd	8	8	1126	e	43.0040	-125.7975	3000	nd	Tynan	Zag	
NH22100.20	Birds	nd	nd	nd	8	8	1212	e	42.9500	-125.6550	3008	nd	Ainley	Zag	

Lv Z5; 13.4C on sta.

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22100.21	CTD	65	92	Z-7	8	8	1227	s	42.9535	-125.6533	3088	200	B-Team	Zag	
NH22100.22	CTD	65	92	Z-7	8	8	1255	e	42.9604	-125.6600	nd	nd	B-Team	Zag	
NH22100.23	VPT	68	92	Z-7	8	8	1300	s	42.9618	-125.6618	3088	100	B-Team	Zag	
NH22100.24	LiveNetl	40	92	Z-7	8	8	1316	s	42.9658	-125.6660	3088	60	B-Team	Zag	60 m of wire out
NH22100.25	MOC	34	92	Z-7	8	8	1338	s	42.9730	-125.6700	3086	350	B-Team	Zag	
NH22100.26	MOC	34	92	Z-7	8	8	1437	e	43.0115	-125.6900	nd	nd	B-Team	Zag	
NH22100.27	BigEyes	nd	nd	nd	8	8	1447	s	43.0173	-125.6862	nd	nd	Tynan	Zag	
NH22100.28	Birds	nd	nd	nd	8	8	1505	s	43.0000	-125.6333	3000	nd	Ainley	Zag	
NH22100.29	Birds	nd	nd	nd	8	8	1728	e	42.8183	-125.1550	2013	nd	Ainley	Zag	
NH22100.30	BigEyes	nd	nd	nd	8	8	1728	e	42.8145	-125.1507	2181	nd	Tynan	Zag	
NH22100.31	MOC	35	93	Z-8	8	8	1745	s	42.8175	-125.1527	2250	350	B-Team	Zag	
NH22100.32	MOC	35	93	Z-8	8	8	1847	e	42.8382	-125.1867	nd	nd	B-Team	Zag	
NH22100.33	CTD	66	93	Z-8	8	8	1916	s	42.8180	-125.1505	2250	350	B-Team	Zag	
NH22100.34	CTD	66	93	Z-8	8	8	1938	e	42.8185	-125.1550	nd	nd	B-Team	Zag	
NH22100.35	VPT	69	93	Z-8	8	8	1942	s	42.8184	-125.1545	2250	100	B-Team	Zag	
NH22100.36	LiveNetl	41	93	Z-8	8	8	1953	s	42.8195	-125.1572	2250	55	B-Team	Zag	55 m of wire out =sta 8-9
NH22100.37	CTD	67	94	Z-9	8	8	2200	s	42.9495	-124.8231	149	140	B-Team	Zag	
NH22100.38	CTD	67	94	Z-9	8	8	2222	e	42.9493	-124.8265	145	140	B-Team	Zag	
NH22100.39	VPT	70	94	Z-9	8	8	2249	s	42.9499	-124.8172	159	100	B-Team	Zag	57 m wire out
NH22100.40	LiveNetl	42	94	Z-9	8	8	2303	s	42.9501	-124.8203	154	57	B-Team	Zag	
NH22100.41	MOC	36	94	Z-9	8	8	2331	s	42.8383	-125.1867	136	120	B-Team	Zag	
NH22200.01	MOC	36	94	Z-9	9	8	0013	e	42.9744	-124.8467	136	nd	A-Team	Zag	
NH22200.02	LiveNetl	43	95	7A-7	9	8	0128	s	43.0849	-124.9994	1112	50	A-Team	Blanco	Line 7a = Line C in bridge log
NH22200.03	VPT	71	95	7A-7	9	8	0143	s	43.0873	-125.0009	1114	100	A-Team	Blanco	
NH22200.04	VPT	72	96	7A-6	9	8	0234	s	43.0846	-124.8886	399	100	A-Team	Blanco	
NH22200.05	VPT	73	97	7A-5	9	8	0322	s	43.0847	-124.7767	230	100	A-Team	Blanco	
NH22200.06	VPT	74	98	7A-4	9	8	0410	s	43.0901	-124.6739	164	100	A-Team	Blanco	
NH22200.07	LiveNetl	44	98	7A-4	9	8	0424	s	43.0887	-124.6760	163	50	A-Team	Blanco	50 m wire out
NH22200.08	VPT	75	99	7A-3	9	8	0515	s	43.0812	-124.5490	93	85	A-Team	Blanco	40 m wire out
NH22200.09	LiveNetl	45	100	7A-2	9	8	0543	s	43.0830	-124.5081	64	40	A-Team	Blanco	
NH22200.10	VPT	76	100	7A-2	9	8	0553	s	43.0835	-124.5113	66	59	A-Team	Blanco	
NH22200.11	VPT	77	101	7A-1	9	8	0620	s	43.0838	-124.4596	30	22	A-Team	Blanco	
NH22200.12	CTD	68	101	7A-1	9	8	0633	s	43.0837	-124.4597	31	25	A-Team	Blanco	
NH22200.13	CTD	68	101	7A-1	9	8	0646	e	43.0813	-124.4603	33	nd	A-Team	Blanco	
NH22200.14	SmallBoat	nd	nd	nd	9	8	0715	s	43.0867	-124.4700	30	nd	Ainley	Blanco	Near 7A1; collect birds
NH22200.15	Birds	nd	nd	nd	9	8	0735	s	43.0867	-124.4700	30	nd	Spear	Blanco	
NH22200.16	MamBinocs	nd	nd	nd	9	8	0800	s	nd	nd	59	nd	Tynan	Blanco	Intense fog; 10 C
NH22200.17	SmallBoat	nd	nd	nd	9	8	0805	e	43.0833	-124.5183	64	nd	Ainley	Blanco	Most of way to 7A2
NH22200.18	Birds	nd	nd	nd	9	8	0813	e	43.0852	-124.5108	64	nd	Spear	Blanco	
NH22200.19	MamBinocs	nd	nd	nd	9	8	0815	s	43.0841	-124.5099	67	55	Tynan	Blanco	10.1 C
NH22200.20	CTD	69	102	7A-2	9	8	0853	s	43.0827	-124.5152	69	nd	A-Team	Blanco	
NH22200.21	CTD	69	102	7A-2	9	8	0910	e	43.0827	-124.5152	69	nd	A-Team	Blanco	
NH22200.22	Birds	nd	nd	nd	9	8	0914	s	43.0833	-124.5183	64	nd	Ainley	Blanco	
NH22200.23	MamBinocs	nd	nd	nd	9	8	0914	s	43.0825	-124.5197	64	nd	Tynan	Blanco	10.1 SST
NH22200.24	Birds	nd	nd	nd	9	8	0924	e	43.0833	-124.5483	86	nd	Ainley	Blanco	
NH22200.25	MamBinocs	nd	nd	nd	9	8	0925	e	43.0835	-124.5483	89	nd	Tynan	Blanco	10.2 SST
NH22200.26	CTD	70	103	7A-3	9	8	0930	s	43.0835	-124.5493	93	80	A-Team	Blanco	
NH22200.27	CTD	70	103	7A-3	9	8	0950	e	43.0863	-124.5540	95	nd	A-Team	Blanco	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22200.28	MamBinocs	nd	nd	nd	9	8	0953	s	43.0863	-124.5540	91	nd	Tynan	Blanco	11.7 SST
NH22200.29	Birds	nd	nd	nd	9	8	0955	s	43.0833	-124.5483	86	nd	Ainley	Blanco	
NH22200.30	Birds	nd	nd	nd	9	8	1028	e	43.0833	-124.6617	152	nd	Ainley	Blanco	
NH22200.31	MamBinocs	nd	nd	nd	9	8	1028	e	43.0817	-124.6593	152	nd	Tynan	Blanco	
NH22200.32	CTD	71	104	7A-4	9	8	1037	s	43.0842	-124.6640	157	140	A-Team	Blanco	
NH22200.33	CTD	71	104	7A-4	9	8	1103	e	43.0841	-124.6723	161	nd	A-Team	Blanco	
NH22200.34	BigEyes	nd	nd	nd	9	8	1109	s	43.0863	-124.6858	152	nd	Tynan	Blanco	
NH22200.35	Birds	nd	nd	nd	9	8	1110	s	43.0833	-124.6617	152	nd	Ainley	Blanco	
NH22200.36	Birds	nd	nd	nd	9	8	1135	e	43.0833	-124.7717	220	nd	Ainley	Blanco	
NH22200.37	BigEyes	nd	nd	nd	9	8	1135	e	43.0833	-124.7717	223	nd	Ainley	Blanco	
NH22200.38	CTD	72	105	7A-5	9	8	1147	s	43.0855	-124.7780	232	200	A-Team	Blanco	12.1 SST
NH22200.39	CTD	72	105	7A-5	9	8	1218	e	43.0890	-124.7808	nd	nd	B-Team	Blanco	Finished by B-Team
NH22200.40	Birds	nd	nd	nd	9	8	1220	s	43.0833	-124.7717	220	nd	Ainley	Blanco	
NH22200.41	BigEyes	nd	nd	nd	9	8	1220	s	43.0897	-124.7813	233	nd	Tynan	Blanco	
NH22200.42	Birds	nd	nd	nd	9	8	1251	e	43.0833	-124.8833	402	nd	Ainley	Blanco	
NH22200.43	BigEyes	nd	nd	nd	9	8	1253	e	43.0838	-124.8837	403	nd	Tynan	Blanco	
NH22200.44	CTD	73	106	7A-6	9	8	1303	s	43.0853	-124.8902	417	200	B-Team	Blanco	
NH22200.45	CTD	73	106	7A-6	9	8	1336	e	43.0898	-124.8898	nd	nd	B-Team	Blanco	
NH22200.46	Birds	nd	nd	nd	9	8	1345	s	43.0833	-124.8833	402	nd	Ainley	Blanco	
NH22200.47	BigEyes	nd	nd	nd	9	8	1350	s	43.0905	-124.9177	403	nd	Tynan	Blanco	
NH22200.48	Birds	nd	nd	nd	9	8	1507	e	43.0817	-125.2000	1830	nd	Ainley	Blanco	
NH22200.49	BigEyes	nd	nd	nd	9	8	1509	e	43.0825	-125.2008	1830	nd	Tynan	Blanco	
NH22200.50	CTD	74	107	7A-8	9	8	1521	s	43.0818	-125.2000	2028	200	B-Team	Blanco	
NH22200.51	CTD	74	107	7A-8	9	8	1555	e	43.0780	-125.1965	nd	nd	B-Team	Blanco	
NH22200.52	VPT	78	107	7A-8	9	8	1600	s	43.0780	-125.1965	2028	100	B-Team	Blanco	
NH22200.53	BigEyes	nd	nd	nd	9	8	1610	s	43.0742	-125.1967	1830	nd	Tynan	Blanco	
NH22200.54	Birds	nd	nd	nd	9	8	1615	s	43.0700	-125.1967	1830	nd	Ainley	Blanco	
NH22200.55	BigEyes	nd	nd	nd	9	8	1715	e	42.9615	-125.0365	1182	nd	Tynan	Blanco	
NH22200.56	BigEyes	nd	nd	nd	9	8	1730	s	42.9388	-124.9738	732	nd	Tynan	Blanco	
NH22200.57	BigEyes	nd	nd	nd	9	8	1928	e	42.8145	-124.5882	24	nd	Tynan	Blanco	
NH22200.58	Birds	nd	nd	nd	9	8	1928	e	42.8167	-124.5833	24	nd	Ainley	Blanco	
NH22200.59	VPT	79	108	8A-1	9	8	1936	s	42.8151	-124.5869	28	20	B-Team	Blanco	12.2 SST
NH22200.60	LiveNet1	46	108	8A-1	9	8	1946	s	42.8137	-124.5954	28	20	B-Team	Blanco	20 m wire out
NH22200.61	VPT	80	109	8A-2	9	8	2009	s	42.8169	-124.6085	38	30	B-Team	Blanco	11.8 SST
NH22200.62	VPT	81	110	8A-3	9	8	2037	s	42.8193	-124.6525	67	60	B-Team	Blanco	
NH22200.63	MOC	37	110	8A-3	9	8	2053	s	42.8257	-124.6550	76	nd	B-Team	Blanco	
NH22200.64	MOC	37	110	8A-3	9	8	2120	e	42.8394	-124.6633	nd	nd	B-Team	Blanco	
NH22200.65	VPT	82	111	8A-4	9	8	2200	s	42.8184	-124.7672	210	100	B-Team	Blanco	10.7 SST
NH22200.66	LiveNet1	47	111	8A-4	9	8	2218	s	42.8224	-124.7738	210	60	B-Team	Blanco	60 m wire out
NH22200.67	VPT	83	112	8A-5	9	8	2300	s	42.8128	-124.8810	348	100	B-Team	Blanco	
NH22200.68	MOC	38	112	8A-5	9	8	2325	s	42.8153	-124.8850	363	335	B-Team	Blanco	
NH22300.01	MOC	38	112	8A-5	10	8	0032	e	42.8361	-124.9117	453	nd	A-Team	Blanco	
NH22300.02	VPT	84	113	8A-6	10	8	0114	s	42.8171	-125.0011	1449	100	A-Team	Blanco	
NH22300.03	LiveNet1	48	113	8A-6	10	8	0127	s	42.8175	-125.0035	1449	40	A-Team	Blanco	40 m wire out
NH22300.04	VPT	85	114	9-6	10	8	0252	s	42.6831	-125.9012	720	100	A-Team	Blanco	
NH22300.05	CTD	75	114	9-6	10	8	0306	s	42.6829	-124.9042	761	200	A-Team	Blanco	
NH22300.06	CTD	75	114	9-6	10	8	0331	e	42.6830	-124.9101	800	nd	A-Team	Blanco	
NH22300.07	CTD	76	115	9-5	10	8	0427	s	42.6845	-124.7873	650	200	A-Team	Blanco	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22300.08	CTD	76	115	9-5	10	8	0454	e	42.6871	-124.7948	655	nd	A-Team	Blanco	
NH22300.09	LiveNetl	49	115	9-5	10	8	0455	s	42.6871	-124.7948	658	40	A-Team	Blanco	
NH22300.10	VPT	86	115	9-5	10	8	0510	s	42.6902	-124.7991	649	100	A-Team	Blanco	
NH22300.11	VPT	87	116	9-4	10	8	0600	s	42.6904	-124.6737	152	100	A-Team	Blanco	
NH22300.12	LiveNetl	50	116	9-4	10	8	0612	s	42.6840	-124.6740	152	40	A-Team	Blanco	
NH22300.13	CTD	77	116	9-4	10	8	0626	s	42.6875	-124.6760	153	150	A-Team	Blanco	
NH22300.14	CTD	77	116	9-4	10	8	0647	e	42.6915	-124.6779	155	nd	A-Team	Blanco	
NH22300.15	Birds	nd	nd	nd	10	8	0650	s	42.6983	-124.6767	150	nd	Ainley	Blanco	
NH22300.16	BigEyes	nd	nd	nd	10	8	0653	s	42.6912	-124.6628	150	nd	Tynan	Blanco	Lv H4 (9-4); 10.6C
NH22300.17	BigEyes	nd	nd	nd	10	8	0719	e	42.6817	-124.5638	86	nd	Tynan	Blanco	Arr. H3 (9-3); 10.5C; so. of Cape Blanco
NH22300.18	Birds	nd	nd	nd	10	8	0722	e	42.6767	-124.5600	86	nd	Ainley	Blanco	
NH22300.19	MOC	39	117	9-3	10	8	0736	s	42.6775	-124.5600	90	80	A-Team	Blanco	
NH22300.20	MOC	39	117	9-3	10	8	0754	e	43.6879	-124.5717	91	nd	A-Team	Blanco	
NH22300.21	CTD	78	117	9-3	10	8	0815	s	42.6833	-124.5643	93	83	A-Team	Blanco	
NH22300.22	CTD	78	117	9-3	10	8	0834	e	42.6843	-124.5708	96	nd	A-Team	Blanco	
NH22300.23	VPT	88	117	9-3	10	8	0840	s	42.6843	-124.5712	97	85	A-Team	Blanco	
NH22300.24	Birds	nd	nd	nd	10	8	0850	s	42.6767	-124.5600	86	nd	Ainley	Blanco	
NH22300.25	MamBinocs	nd	nd	nd	10	8	0853	s	42.6873	-124.5742	86	nd	Tynan	Blanco	
NH22300.26	MamBinocs	nd	nd	nd	10	8	0911	e	42.6843	-124.5187	70	nd	Tynan	Blanco	Radar on
NH22300.27	Birds	nd	nd	nd	10	8	0911	e	42.6850	-124.5183	70	nd	Ainley	Blanco	
NH22300.28	LiveNetl	51	118	9-2	10	8	0918	s	42.6851	-124.5207	75	40	A-Team	Blanco	
NH22300.29	VPT	89	118	9-2	10	8	0928	s	42.6874	-124.5252	76	65	A-Team	Blanco	
NH22300.30	CTD	79	118	9-2	10	8	0941	s	42.6892	-124.5285	76	65	A-Team	Blanco	
NH22300.31	CTD	79	118	9-2	10	8	0956	e	42.6902	-124.5348	76	nd	A-Team	Blanco	
NH22300.32	Birds	nd	nd	nd	10	8	1000	s	42.6917	-124.5367	70	nd	Ainley	Blanco	
NH22300.33	MamBinocs	nd	nd	nd	10	8	1001	s	42.6917	-124.5350	70	nd	Tynan	Blanco	
NH22300.34	MamBinocs	nd	nd	nd	10	8	1023	e	42.6828	-124.4742	31	nd	Tynan	Blanco	
NH22300.35	CTD	80	119	9-1	10	8	1025	s	42.6833	-124.4760	36	20	A-Team	Blanco	
NH22300.36	Birds	nd	nd	nd	10	8	1028	e	42.6917	-124.4750	31	nd	Ainley	Blanco	
NH22300.37	CTD	80	119	9-1	10	8	1038	e	42.6852	-124.4797	nd	nd	A-Team	Blanco	
NH22300.38	VPT	90	119	9-1	10	8	1039	s	42.6867	-124.4805	40	25	A-Team	Blanco	
NH22300.39	MamBinocs	nd	nd	nd	10	8	1054	s	42.6885	-124.5067	48	nd	Tynan	Blanco	
NH22300.40	Birds	nd	nd	nd	10	8	1055	s	42.6883	-124.4917	48	nd	Ainley	Blanco	
NH22300.41	MamBinocs	nd	nd	nd	10	8	1130	e	42.7290	-124.6393	103	nd	Tynan	Blanco	
NH22300.42	BigEyes	nd	nd	nd	10	8	1202	s	42.7997	-124.6577	nd	nd	Tynan	Blanco	Course 010
NH22300.43	BigEyes	nd	nd	nd	10	8	1307	e	42.9433	-124.5838	44	nd	Tynan	Blanco	Transit to R1; off for radar
NH22300.44	Birds	nd	nd	nd	10	8	1320	e	42.9500	-124.5100	29	nd	Ainley	Blanco	
NH22300.45	VPT	91	120	8-1	10	8	1326	s	42.9510	-124.5110	34	25	B-Team	Blanco	
NH22300.46	Birds	nd	nd	nd	10	8	1340	s	42.9517	-124.5100	29	nd	Ainley	Blanco	
NH22300.47	MamBinocs	nd	nd	nd	10	8	1340	s	42.9510	-124.5307	48	nd	Tynan	Blanco	Radar on
NH22300.48	MamBinocs	nd	nd	nd	10	8	1345	e	42.9490	-124.5517	58	nd	Tynan	Blanco	
NH22300.49	Birds	nd	nd	nd	10	8	1345	e	42.9483	-124.5517	58	nd	Tynan	Blanco	
NH22300.50	VPT	92	121	8-2	10	8	1350	s	42.9490	-124.5520	62	55	B-Team	Blanco	
NH22300.51	BigEyes	nd	nd	nd	10	8	1403	s	42.9500	-124.5638	58	nd	Tynan	Blanco	
NH22300.52	BigEyes	nd	nd	nd	10	8	1403	e	42.9482	-124.5872	nd	nd	Tynan	Blanco	Off for man overboard drill
NH22300.53	Birds	nd	nd	nd	10	8	1405	s	42.9483	-124.5517	58	nd	Ainley	Blanco	
NH22300.54	Birds	nd	nd	nd	10	8	1410	e	42.9483	-124.5983	78	nd	Ainley	Blanco	
NH22300.55	VPT	93	122	8-3	10	8	1450	s	nd	nd	nd	nd	B-Team	Blanco	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22300.56	Birds	nd	nd	nd	10	8	1510	s	42.9483	-124.5983	78	nd	Ainley	Blanco	Steam toward Cassins Auklet hotspot
NH22300.57	BigEyes	nd	nd	nd	10	8	1512	s	42.9333	-124.6138	78	nd	Tynan	Blanco	Arr. Auklet hotspot
NH22300.58	BigEyes	nd	nd	nd	10	8	1522	e	42.8978	-124.6243	72	nd	Tynan	Blanco	
NH22300.59	Birds	nd	nd	nd	10	8	1522	e	42.9000	-124.6233	78	nd	Ainley	Blanco	Front with Cassins Auklets and Phalaropes
NH22300.60	VPT	94	123	FR-1	10	8	1545	s	42.8958	-124.6240	75	65	B-Team	Blanco	Bird front/slick; 30 wire angle; 57 m wire
NH22300.61	LiveNet1	52	123	FR-1	10	8	1600	s	42.8935	-124.6250	75	57	B-Team	Blanco	out
NH22300.62	VPT	95	123	FR-1B	10	8	1645	s	42.8866	-124.6130	61	55	B-Team	Blanco	Brown side of front/slick
NH22300.63	CTD	81	123	FR-1	10	8	1700	s	42.8873	-124.6177	65	50	B-Team	Blanco	Brown side of front/slick
NH22300.64	CTD	81	123	FR-1	10	8	1717	s	42.8882	-124.6193	68	nd	B-Team	Blanco	
NH22300.65	CTD	82	124	FR-2	10	8	1725	s	42.8940	-124.6305	79	60	B-Team	Blanco	Blue side of front/slick
NH22300.66	CTD	82	124	FR-2	10	8	1755	e	42.8937	-124.6335	nd	nd	B-Team	Blanco	
NH22300.67	VPT	96	124	FR-2	10	8	1802	s	42.8937	-124.6345	79	60	B-Team	Blanco	Blue side of front/slick; stn orig. labeled
NH22300.68	MOC	40	125	FR-1	10	8	1825	s	42.8927	-124.6227	71	60	B-Team	Blanco	FR-1
NH22300.69	MOC	40	125	FR-1	10	8	1902	e	42.8993	-124.6050	nd	nd	B-Team	Blanco	Towed along slick; towed in trough
NH22300.70	MiscObs	nd	nd	nd	10	8	1910	s	nd	nd	nd	nd	BPeterson	Transit	Lost software on descent; reacquired later
NH22300.71	Birds	nd	nd	nd	10	8	1910	s	42.8950	-124.5950	51	nd	Ainley	Transit	Started steaming to BOB line
NH22300.72	BigEyes	nd	nd	nd	10	8	1915	s	42.9113	-124.5952	62	nd	Tynan	Transit	Departed for BOB
NH22300.73	BigEyes	nd	nd	nd	10	8	2018	e	43.0783	-124.5992	114	nd	Tynan	Transit	
NH22300.74	Birds	nd	nd	nd	10	8	2030	e	43.1217	-124.6000	105	40	Ainley	Transit	
NH22400.01	LiveNet1	53	126	BOB-3	11	8	0350	s	44.2502	-124.5070	105	40	A-Team	BOB	
NH22400.02	VPT	97	126	BOB-3	11	8	0358	s	44.2501	-124.5078	105	95	A-Team	BOB	
NH22400.03	LiveNet1	54	126	BOB-3	11	8	0410	s	44.2500	-124.5082	103	40	A-Team	BOB	Purple female euphausiids
NH22400.04	LiveNet1	55	127	BOB-2	11	8	0506	s	44.2501	-124.3705	175	40	A-Team	BOB	Purple female euphausiids
NH22400.05	LiveNet1	56	128	BOB-1	11	8	0610	s	44.2497	-124.1820	53	40	A-Team	BOB	
NH22400.06	VPT	98	128	BOB-1	11	8	0624	s	44.2533	-124.1864	54	40	A-Team	BOB	
NH22400.07	BigEyes	nd	nd	nd	11	8	0630	s	44.2535	-124.1892	50	nd	Tynan	BOB	
NH22400.08	Birds	nd	nd	nd	11	8	0630	s	44.2533	-124.1900	50	nd	Ainley	BOB	
NH22400.09	Birds	nd	nd	nd	11	8	0654	e	44.2500	-124.2817	73	nd	Ainley	BOB	Lv BOB1; 10.6C
NH22400.10	BigEyes	nd	nd	nd	11	8	0656	e	44.2492	-124.2817	73	nd	Tynan	BOB	Arr. BOB1F
NH22400.11	VPT	99	129	BOB-1F	11	8	0700	s	44.2490	-124.2815	76	65	A-Team	BOB	Many humpbacks; 12.5C; plankton tows
NH22400.12	VPT	100	130	BOB-1W	11	8	0722	s	44.2611	-124.2726	74	65	A-Team	BOB	done near whales
NH22400.13	MOC	41	130	BOB-1FW	11	8	0730	s	44.2659	-124.2750	75	65	A-Team	BOB	Front station
NH22400.14	BigEyes	nd	nd	nd	11	8	0814	s	44.2760	-124.2922	74	nd	Tynan	BOB	Near whales
NH22400.15	Birds	nd	nd	nd	11	8	0815	s	44.2500	-124.2817	73	nd	Ainley	BOB	MOCNESS messed up; nonquantitative
NH22400.16	Birds	nd	nd	nd	11	8	0838	e	44.2500	-124.3683	86	nd	Ainley	BOB	
NH22400.17	BigEyes	nd	nd	nd	11	8	0839	e	44.2503	-124.3697	86	nd	Tynan	BOB	
NH22400.18	VPT	101	131	BOB-2	11	8	0846	s	44.2508	-124.3771	90	80	A-Team	BOB	Humpbacks
NH22400.19	BigEyes	nd	nd	nd	11	8	0855	s	44.2513	-124.3728	86	nd	Tynan	BOB	
NH22400.20	Birds	nd	nd	nd	11	8	0855	s	44.2500	-124.3683	86	nd	Ainley	BOB	
NH22400.21	Birds	nd	nd	nd	11	8	0930	e	44.2500	-124.5000	101	nd	Ainley	BOB	Arr BOB3
NH22400.22	BigEyes	nd	nd	nd	11	8	0930	e	44.2490	-124.4980	101	nd	Tynan	BOB	Salmon jumping at 0923
NH22400.23	VPT	102	132	BOB-3B	11	8	0937	s	44.2601	-124.5919	105	99	A-Team	BOB	Hit bottom
NH22400.24	BigEyes	nd	nd	nd	11	8	0947	s	44.2495	-124.5043	101	nd	Tynan	BOB	Lv BOB3; 12.7C
NH22400.25	Birds	nd	nd	nd	11	8	0950	s	44.2500	-124.5017	101	nd	Ainley	BOB	
NH22400.26	Birds	nd	nd	nd	11	8	1002	e	44.2483	-124.5650	103	nd	Ainley	BOB	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22400.27	BigEyes	nd	nd	nd	11	8	1002	e	44.2500	-124.5678	103	nd	Tynan	BOB	BOB3C is a new station; not a resample of BOB3
NH22400.28	VPT	103	133	BOB-3C	11	8	1010	s	44.2504	-124.5693	106	97	A-Team	BOB	
NH22400.29	Birds	nd	nd	nd	11	8	1020	s	44.2483	-124.5650	103	nd	Ainley	BOB	Lv BOB3C
NH22400.30	BigEyes	nd	nd	nd	11	8	1022	s	44.2500	-124.5720	102	nd	Tynan	BOB	Arr BOB4
NH22400.31	Birds	nd	nd	nd	11	8	1052	e	44.2500	-124.6900	92	nd	Ainley	BOB	Slick line; front just before BOB4
NH22400.32	MiscObs	nd	nd	nd	11	8	1053	s	44.2497	-124.6940	nd	nd	Tynan	BOB	Arr: BOB4; 13.4C
NH22400.33	BigEyes	nd	nd	nd	11	8	1054	e	44.2497	-124.6960	94	nd	Tynan	BOB	Cold side of front?
NH22400.34	VPT	104	134	BOB-4C	11	8	1057	s	44.2504	-124.6976	101	90	A-Team	BOB	Warm side of front? Immarsat on 1130-1215
NH22400.35	Birds	nd	nd	nd	11	8	1135	s	44.2500	-124.6900	92	nd	Ainley	BOB	
NH22400.36	Birds	nd	nd	nd	11	8	1150	e	44.2500	-124.7950	123	nd	Ainley	BOB	Begin transit to AB (Alsea Bay Line) at 4427.00N
NH22400.37	VPT	105	135	BOB-4W	11	8	1200	s	44.2495	-124.8004	121	100	B-Team	BOB	
NH22400.38	BigEyes	nd	nd	nd	11	8	1215	s	44.2493	-124.8147	nd	nd	Tynan	BOB	Arr AB5; 11.9C Arr AB5 AB=Alsea Bay; satellite shows intermixing waters
NH22400.39	Birds	nd	nd	nd	11	8	1215	s	44.2500	-124.8000	123	nd	Ainley	BOB	
NH22400.40	Birds	nd	nd	nd	11	8	1238	e	44.2500	-124.9000	145	nd	Ainley	BOB	Lv AB5 Arr AB4; 12.0C; CTD done
NH22400.41	BigEyes	nd	nd	nd	11	8	1240	e	44.2488	-124.9005	nd	nd	Tynan	BOB	
NH22400.42	VPT	106	136	BOB-5	11	8	1244	s	44.2488	-124.9010	152	100	B-Team	BOB	Lv AB4
NH22400.43	BigEyes	nd	nd	nd	11	8	1301	s	44.2543	-124.9008	149	nd	Tynan	Transit	
NH22400.44	Birds	nd	nd	nd	11	8	1305	s	44.2500	-124.9000	145	nd	Ainley	Transit	Arr AB3; 12.6C
NH22400.45	Birds	nd	nd	nd	11	8	1335	e	44.3033	-124.8050	149	nd	Ainley	Transit	
NH22400.46	BigEyes	nd	nd	nd	11	8	1350	e	44.3223	-124.7703	108	nd	Tynan	Transit	Lv AB3
NH22400.47	BigEyes	nd	nd	nd	11	8	1430	s	44.3845	-124.6405	110	nd	Tynan	Transit	
NH22400.48	Birds	nd	nd	nd	11	8	1435	s	44.3917	-124.6250	106	nd	Ainley	Transit	Arr AB2 Arr AB2; 12.1C
NH22400.49	BigEyes	nd	nd	nd	11	8	1512	e	44.4455	-124.4972	82	nd	Tynan	Transit	
NH22400.50	Birds	nd	nd	nd	11	8	1513	e	44.4467	-124.4967	82	nd	Ainley	Transit	Lv AB2
NH22400.51	CTD	83	137	AB-5	11	8	1524	s	44.4471	-124.5010	88	80	B-Team	LineAB	
NH22400.52	CTD	83	137	AB-5	11	8	1545	e	44.4468	-124.5052	nd	nd	B-Team	LineAB	Lv AB5
NH22400.53	BigEyes	nd	nd	nd	11	8	1548	s	44.4482	-124.5053	82	nd	Tynan	LineAB	
NH22400.54	Birds	nd	nd	nd	11	8	1550	s	44.4467	-124.4967	82	nd	Ainley	LineAB	Arr AB4; 12.0C; CTD done
NH22400.55	BigEyes	nd	nd	nd	11	8	1614	e	44.4492	-124.3995	72	nd	Tynan	LineAB	
NH22400.56	Birds	nd	nd	nd	11	8	1617	e	44.4500	-124.4000	72	nd	Ainley	LineAB	Lv AB4
NH22400.57	CTD	84	138	AB-4	11	8	1622	s	44.4492	-124.4001	76	60	B-Team	LineAB	
NH22400.58	BigEyes	nd	nd	nd	11	8	1640	s	44.4487	-124.4050	72	nd	Tynan	LineAB	Arr AB3; 12.6C
NH22400.59	Birds	nd	nd	nd	11	8	1640	s	44.4500	-124.4000	72	nd	Ainley	LineAB	
NH22400.60	CTD	84	138	AB-4	11	8	1641	e	44.4487	-124.4048	78	nd	B-Team	LineAB	Lv AB3
NH22400.61	BigEyes	nd	nd	nd	11	8	1707	e	44.4488	-124.3035	70	nd	Tynan	LineAB	
NH22400.62	Birds	nd	nd	nd	11	8	1710	e	44.4483	-124.3017	71	nd	Ainley	LineAB	Arr AB2 Arr AB2; 12.1C
NH22400.63	CTD	85	139	AB-3	11	8	1717	s	44.4497	-124.3012	74	60	B-Team	LineAB	
NH22400.64	CTD	85	139	AB-3	11	8	1736	e	44.4505	-124.3058	nd	nd	B-Team	LineAB	Lv AB2
NH22400.65	BigEyes	nd	nd	nd	11	8	1740	s	44.4517	-124.2997	71	nd	Tynan	LineAB	
NH22400.66	Birds	nd	nd	nd	11	8	1740	s	44.4483	-124.3017	71	nd	Ainley	LineAB	Arr AB2 Arr AB2; 12.1C
NH22400.67	Birds	nd	nd	nd	11	8	1805	e	44.4483	-124.2000	57	nd	Ainley	LineAB	
NH22400.68	BigEyes	nd	nd	nd	11	8	1805	e	44.4483	-124.2002	56	nd	Tynan	LineAB	Lv AB2
NH22400.69	CTD	86	140	AB-2	11	8	1813	s	44.4492	-124.2015	60	50	B-Team	LineAB	
NH22400.70	CTD	86	140	AB-2	11	8	1828	e	44.4490	-124.2057	nd	nd	B-Team	LineAB	Lv AB2
NH22400.71	BigEyes	nd	nd	nd	11	8	1830	s	44.4503	-124.2042	56	nd	Tynan	LineAB	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22400.72	Birds	nd	nd	nd	11	8	1830	s	44.4483	-124.2000	57	nd	Ainley	LineAB	
NH22400.73	Birds	nd	nd	nd	11	8	1845	e	44.4500	-124.1400	43	nd	Ainley	LineAB	
NH22400.74	BigEyes	nd	nd	nd	11	8	1845	e	44.4500	-124.1400	43	nd	Tynan	LineAB	Arr AB1; 12.5C
NH22400.75	CTD	87	141	AB-1	11	8	1850	s	44.4505	-124.1408	46	35	B-Team	LineAB	
NH22400.76	CTD	87	141	AB-1	11	8	1905	e	44.4503	-124.1438	nd	nd	B-Team	LineAB	
NH22400.77	VPT	107	141	AB-1	11	8	1905	s	44.4503	-124.1438	46	37	B-Team	LineAB	
NH22400.78	Birds	nd	nd	nd	11	8	1915	s	44.4467	-124.1500	43	nd	Ainley	LineAB	
NH22400.79	Birds	nd	nd	nd	11	8	1930	e	44.4500	-124.0983	13	nd	Ainley	LineAB	Arr AB0 LoopSST=11.04; Bucket SST=11.2; Bucket Nutrients taken
NH22400.80	VPT	108	142	AB-0	11	8	1941	s	44.4493	-124.1160	12	12	B-Team	LineAB	
NH22400.81	VPT	109	143	AB-2	11	8	2032	s	44.4503	-124.2017	60	50	B-Team	LineAB	
NH22400.82	VPT	110	144	AB-2_5	11	8	2055	s	44.4497	-124.2467	70	60	B-Team	LineAB	
NH22400.83	LiveNet1	57	144	AB-2_5	11	8	2102	s	44.4500	-124.2508	72	55	B-Team	LineAB	Wire angle 30
NH22400.84	MOC	42	144	AB-2_5	11	8	2124	s	44.4522	-124.2600	75	60	B-Team	LineAB	M2A2_5.pro MOC filename nd B-Team LineAB
NH22400.85	MOC	42	144	AB-2	5	11	8	2203		0.0000	44.4613	124.27500		nd	
NH22400.86	VPT	111	145	AB-3	11	8	2225	s	44.4508	-124.2983	75	65	B-Team	LineAB	
NH22400.87	VPT	112	146	AB-3_5	11	8	2251	s	44.4490	-124.3452	75	65	B-Team	LineAB	
NH22400.88	LiveNet1	58	146	AB-3_5	11	8	2302	s	44.4493	-124.3490	74	60	B-Team	LineAB	Wire angle 30
NH22400.89	CTD	88	146	AB-3_5	11	8	2315	s	44.4517	-124.3567	72	65	B-Team	LineAB	
NH22400.90	CTD	88	146	AB-3_5	11	8	2336	e	44.4521	-124.3593	nd	nd	B-Team	LineAB	
NH22400.91	VPT	113	147	AB-4	11	8	2358	s	44.4493	-124.3999	78	69	B-Team	LineAB	
NH22500.01	VPT	114	148	AB-5	12	8	0052	s	44.4490	-124.5027	88	80	A-Team	LineAB	
NH22500.02	LiveNet1	59	149	AB-6	12	8	0220	s	44.4496	-124.6701	127	40	A-Team	LineAB	
NH22500.03	MOC	43	149	AB-6	12	8	0300	s	44.4599	-124.6833	135	120	A-Team	LineAB	Wecoma targets
NH22500.04	MOC	43	149	AB-6	12	8	0331	e	44.4714	-124.6883	135	nd	A-Team	LineAB	
NH22500.05	VPT	115	150	NH-20B	12	8	0505	s	44.6464	-124.5216	136	100	A-Team	Line1	
NH22500.06	LiveNet1	60	150	NH-20	12	8	0515	s	44.6483	-124.5245	139	40	A-Team	Line1	
NH22500.07	CTD	89	150	NH-20B	12	8	0529	s	44.6499	-124.5276	143	130	A-Team	Line1	
NH22500.08	CTD	89	150	NH-20B	12	8	0547	e	44.6551	-124.5328	nd	nd	A-Team	Line1	
NH22500.09	CTD	90	151	NH-15B	12	8	0630	s	44.6494	-124.4120	89	80	A-Team	Line1	
NH22500.10	CTD	90	151	NH-15B	12	8	0641	e	44.6491	-124.4152	89	nd	A-Team	Line1	
NH22500.11	Secchi	2	151	NH-15	12	8	0643	s	44.6493	-124.4163	88	6.5	A-Team	Line1	Secchi depth=6.5m
NH22500.12	VPT	116	151	NH-15B	12	8	0647	s	44.6496	-124.4167	88	80	A-Team	Line1	
NH22500.13	Birds	nd	nd	nd	12	8	0655	s	44.6483	-124.4067	90	nd	Ainley	Line1	
NH22500.14	BigEyes	nd	nd	nd	12	8	0657	s	44.6493	-124.4113	92	nd	Tynan	Line1	
NH22500.15	BigEyes	nd	nd	nd	12	8	0727	e	44.6500	-124.2950	78	nd	Tynan	Line1	
NH22500.16	Birds	nd	nd	nd	12	8	0727	e	44.6500	-124.2950	78	nd	Ainley	Line1	
NH22500.17	VPT	117	152	NH-10B	12	8	0738	s	44.6483	-124.2989	82	72	A-Team	Line1	Arr NH10
NH22500.18	LiveNet1	61	152	NH-10B	12	8	0745	s	44.6487	-124.2993	82	40	A-Team	Line1	
NH22500.19	Secchi	3	152	NH-10B	12	8	0800	s	44.6510	-124.3019	84	6	A-Team	Line1	Secchi depth=6.0m
NH22500.20	CTD	91	152	NH-10B	12	8	0805	s	44.6511	-125.3021	84	70	A-Team	Line1	
NH22500.21	CTD	91	152	NH-10B	12	8	0828	e	44.6535	-124.3072	84	nd	A-Team	Line1	
NH22500.22	Birds	nd	nd	nd	12	8	0830	s	44.6517	-124.3033	78	nd	Ainley	Line1	
NH22500.23	BigEyes	nd	nd	nd	12	8	0836	s	44.6515	-124.2770	81	nd	Tynan	Line1	Lv NH10; 10.4C
NH22500.24	BigEyes	nd	nd	nd	12	8	0907	e	44.6512	-124.1750	55	nd	Tynan	Line1	Arr NH5
NH22500.25	Birds	nd	nd	nd	12	8	0907	e	44.6517	-124.1750	55	nd	Ainley	Line1	Arr NH05
NH22500.26	CTD	92	153	NH-5B	12	8	0910	s	44.6516	-124.1761	59	50	A-Team	Line1	
NH22500.27	CTD	92	153	NH-5B	12	8	0932	e	44.6546	-124.1804	59	nd	A-Team	Line1	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time S/E flag	Lat	Long	Water Depth	Cast Depth	SI	Reg	Comments
NH22500.28	VPT	118	153	NH-5B	12	8	0936	s	44.6546	-124.1805	59	A-Team	Line1	Secchi depth=4.0m
NH22500.29	Secchi	4	153	NH-5B	12	8	0940	s	44.6556	-124.1813	62	A-Team	Line1	
NH22500.30	LiveNet1	62	153	NH-5B	12	8	0945	s	44.6557	-124.1815	64	A-Team	Line1	
NH22500.31	BigEyes	nd	nd	nd	12	8	1005	s	44.6610	-124.1852	61	Tynan	Line1	Lv NH05
NH22500.32	Birds	nd	nd	nd	12	8	1005	s	44.6517	-124.1750	55	Ainley	Line1	
NH22500.33	Birds	nd	nd	nd	12	8	1022	e	44.6483	-124.1300	48	Ainley	Line1	Arr NH03
NH22500.34	BigEyes	nd	nd	nd	12	8	1023	e	44.6482	-124.1295	48	Tynan	Line1	Arr NH03
NH22500.35	VPT	119	154	NH-3B	12	8	1026	s	44.6490	-124.1301	48	A-Team	Line1	
NH22500.36	Secchi	5	154	NH-3B	12	8	1035	s	44.6501	-124.1320	49	A-Team	Line1	Secchi depth=3.5m
NH22500.37	CTD	93	154	NH-3B	12	8	1039	s	44.6506	-124.1329	50	A-Team	Line1	
NH22500.38	CTD	93	154	NH-3B	12	8	1051	e	44.6519	-124.1354	50	A-Team	Line1	
NH22500.39	MamBinocs	nd	nd	nd	12	8	1058	s	44.6523	-124.1333	48	Tynan	Line1	Lv NH03; radar on
NH22500.40	Birds	nd	nd	nd	12	8	1100	s	44.6483	-124.1300	48	Ainley	Line1	
NH22500.41	MamBinocs	nd	nd	nd	12	8	1107	e	44.6512	-124.0998	28	Tynan	Line1	Arr NH1
NH22500.42	Birds	nd	nd	nd	12	8	1110	e	44.6517	-124.1000	26	Ainley	Line1	Arr NH01
NH22500.43	CTD	94	155	NH-1B	12	8	1110	s	44.6517	-124.0996	30	A-Team	Line1	
NH22500.44	CTD	94	155	NH-1B	12	8	1120	e	44.6500	-124.1000	nd	A-Team	Line1	
NH22500.45	VPT	120	155	NH-1B	12	8	1125	s	44.6499	-124.1025	34	A-Team	Line1	
NH22500.46	Secchi	6	155	NH-1B	12	8	1126	s	44.6498	-124.1050	34	A-Team	Line1	Secchi depth=4.0m
NH22500.47	Birds	nd	nd	nd	12	8	1140	s	44.6467	-124.1100	36	Ainley	Transit	Lv NH01
NH22500.48	MamBinocs	nd	nd	nd	12	8	1144	s	44.6400	-124.1107	28	Tynan	Transit	Arr C-Buoy
NH22500.49	Birds	nd	nd	nd	12	8	1155	e	44.6083	-124.1150	30	Ainley	Transit	Arr just N of Newport Sea Buoy
NH22500.50	MamBinocs	nd	nd	nd	12	8	1156	e	44.6082	-124.1152	30	Tynan	Transit	Ship arrives in Newport, OR
NH22500.51	Arr Newport	nd	nd	nd	12	8	1300	e	nd	nd	nd	Peterson	nd	

APPENDIX II

PLOTS OF IMET DATA FROM NH0007

Plots of Along-Track IMET Data - NH0007 - 27 July - 12 August 2000

(Data for each Day of the Cruise (GMT) are plotted individually)

Page 1 for each day has six plots per page in the following format:

Panel 1: True Wind Speed (m/s)

Panel 2: True Wind Direction (compass degrees, relative to true North); convention is oceanographic (e.g., winds blowing TO; 180 = winds blowing FROM North TO South)

Panel 3: Latitude (degrees)

Panel 4: Longitude (degrees; East is positive; West is Negative)

Panel 5: Atmospheric Pressure (mb)

Panel 6: Air Temperature (deg Celsius)

Page 2 for each day has six plots per page in the following format:

Panel 1: Long Wave Radiation (W/m²)

Panel 2: Short Wave Radiation (W/m²)

Panel 3: Relative Humidity (%)

Panel 4: Sea Surface Temperature (deg Celsius) from two independent sensors

Panel 5: Surface Salinity (psu)

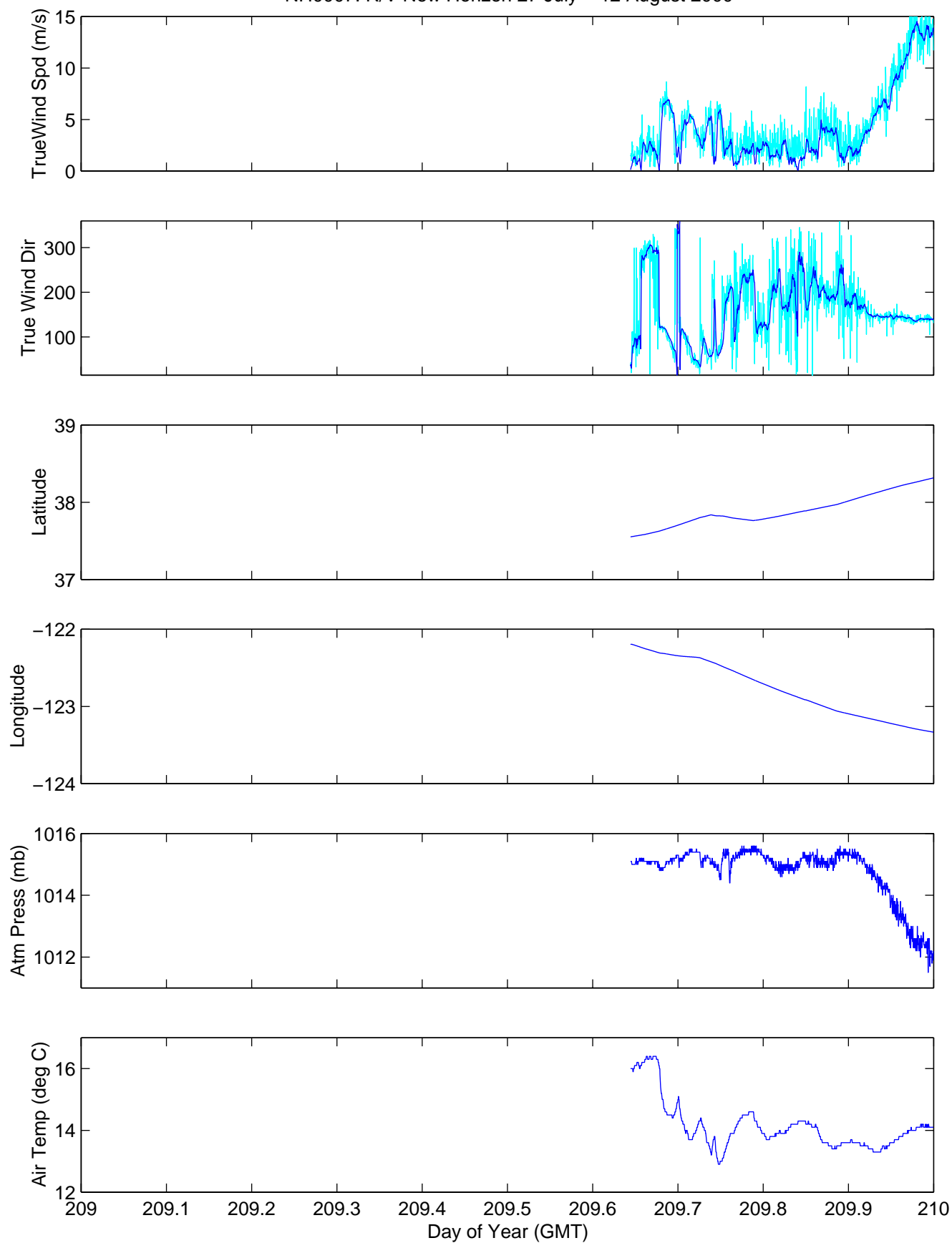
Panel 6: Fluorescence (volts)

Notes:

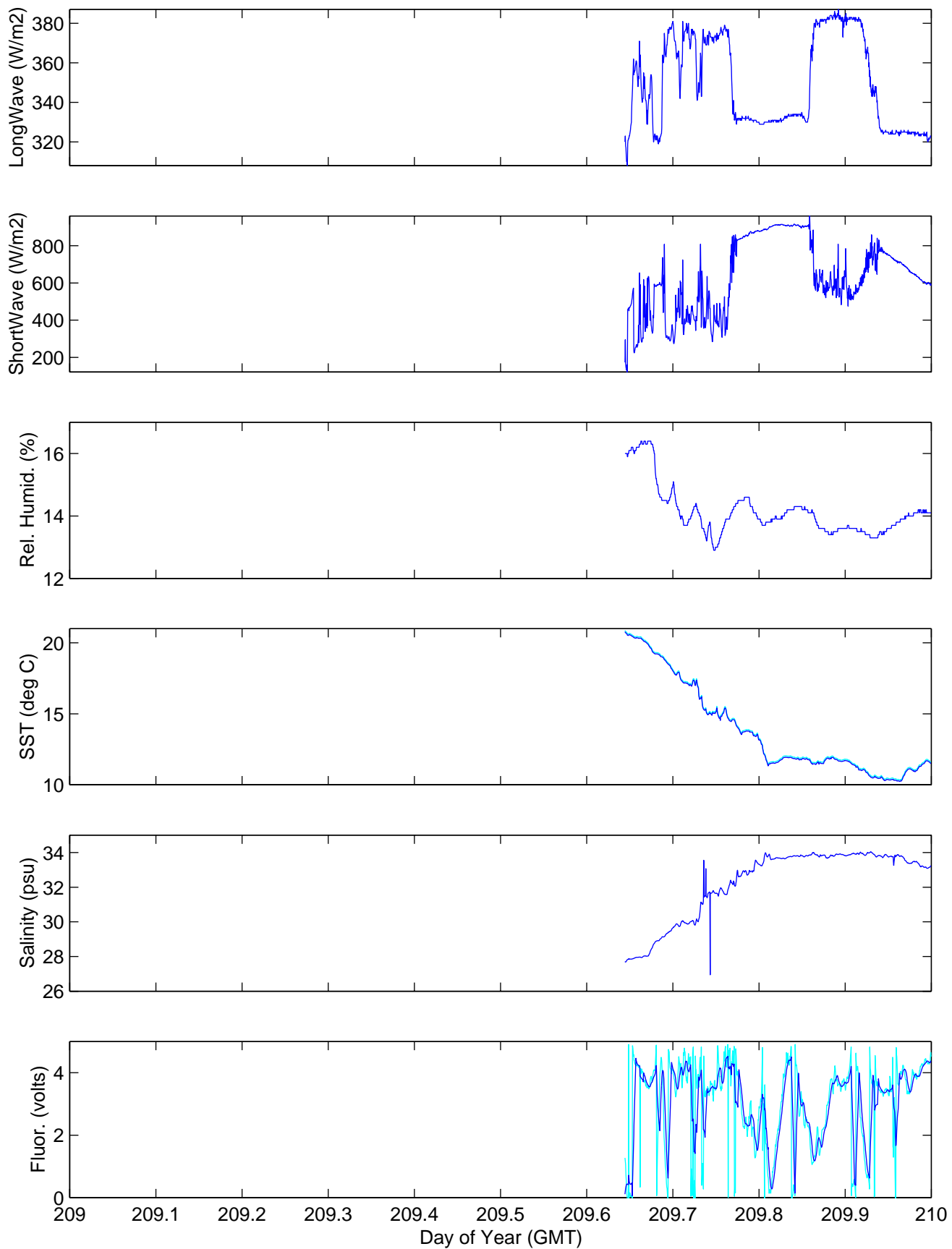
- a) Sample logging onboard done at 15 second intervals
- b) Data are plotted at 15 second intervals
- c) True Wind Speed and Direction and Fluorescence also have overplotted a 3-minute average. Because there was significant loss of data (particularly, position information) in the data stream, the averaging was done for a 3-minute interval centered on the observed data point. Thus, the number of points in the average (dark blue lines) may range from 1 (no averaging) to 12 (all observations from a 3-minute window good). Fluorescence sensor was extremely noisy. Averaging of Wind data done to minimize effects of high frequency ship motion from record.
- d) Plots are available as Encapsulated Postscript Files (eps) on the U.S. GLOBEC NEP website at http://globec.oce.orst.edu/groups/nep/reports/ccs_cruises/.

Alongtrack Sensor Descriptions		
Location	Unit	Sensors
Flying Bridge	Coastal Environmental WeatherPak	Air temp; barometric pressure; wind speed and direction; short wave radiation; long wave radiation; humidity.
Aft Lab	Seabird SBE21 Thermosalinograph Wetlabs Wetstar	Temperature, conductivity, fluorescence.
Engine Room	Dual temperature unit	Sea surface temperature.
Chart Room	Trimble Differential GPS Pcode GPS receiver	Latitude, longitude.
Bridge	Gyroscope compass	Ship's heading.

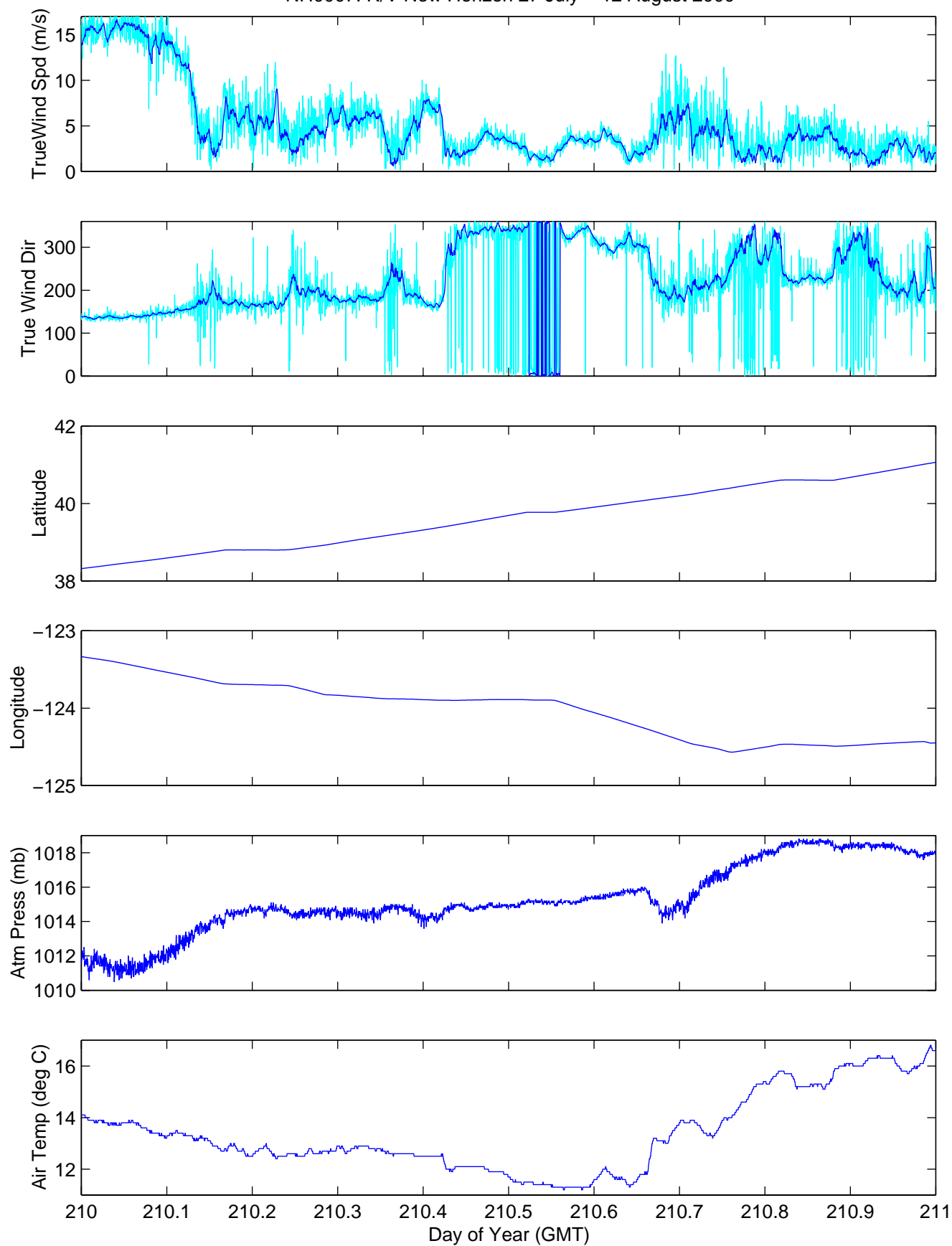
NH0007: R/V New Horizon 27 July – 12 August 2000



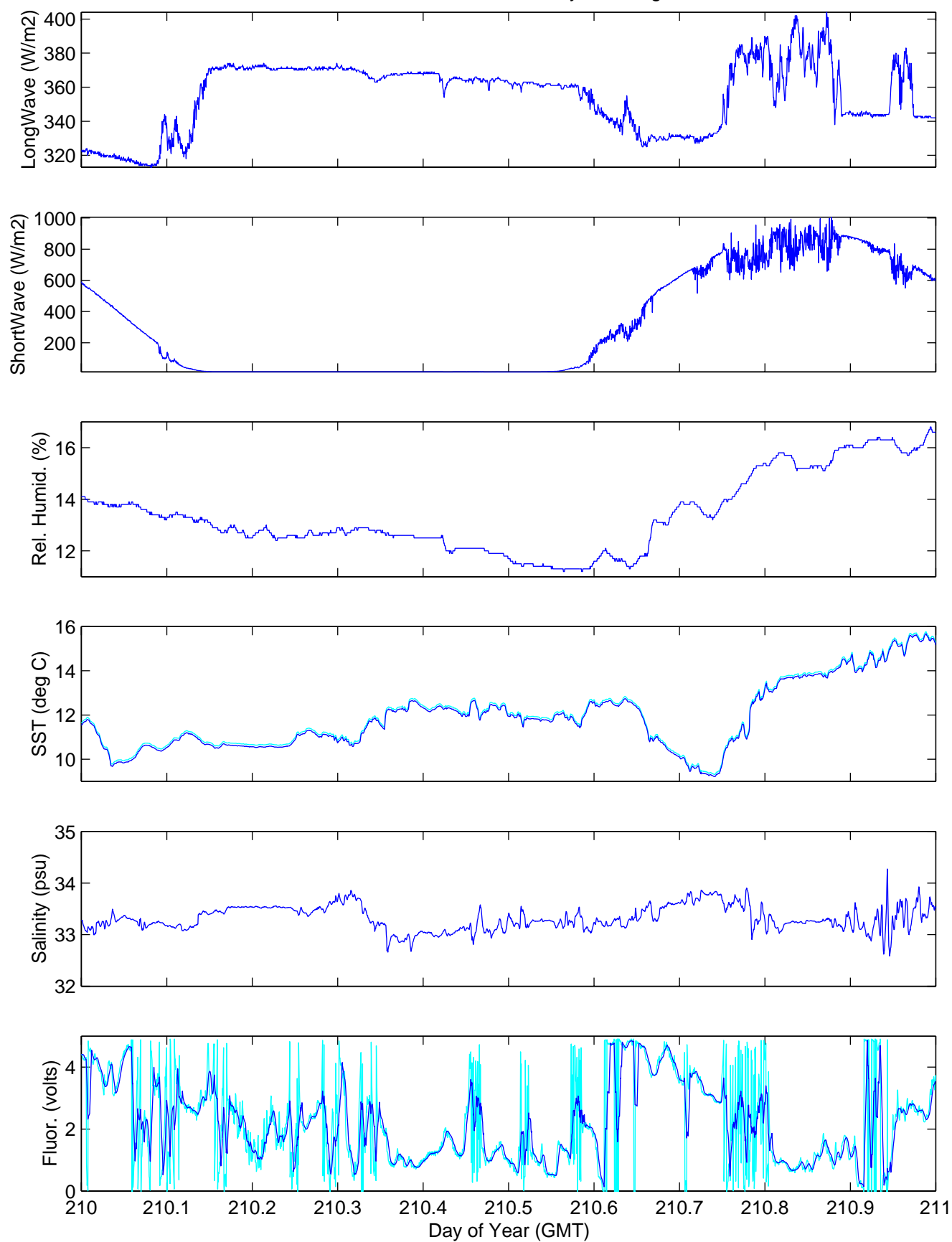
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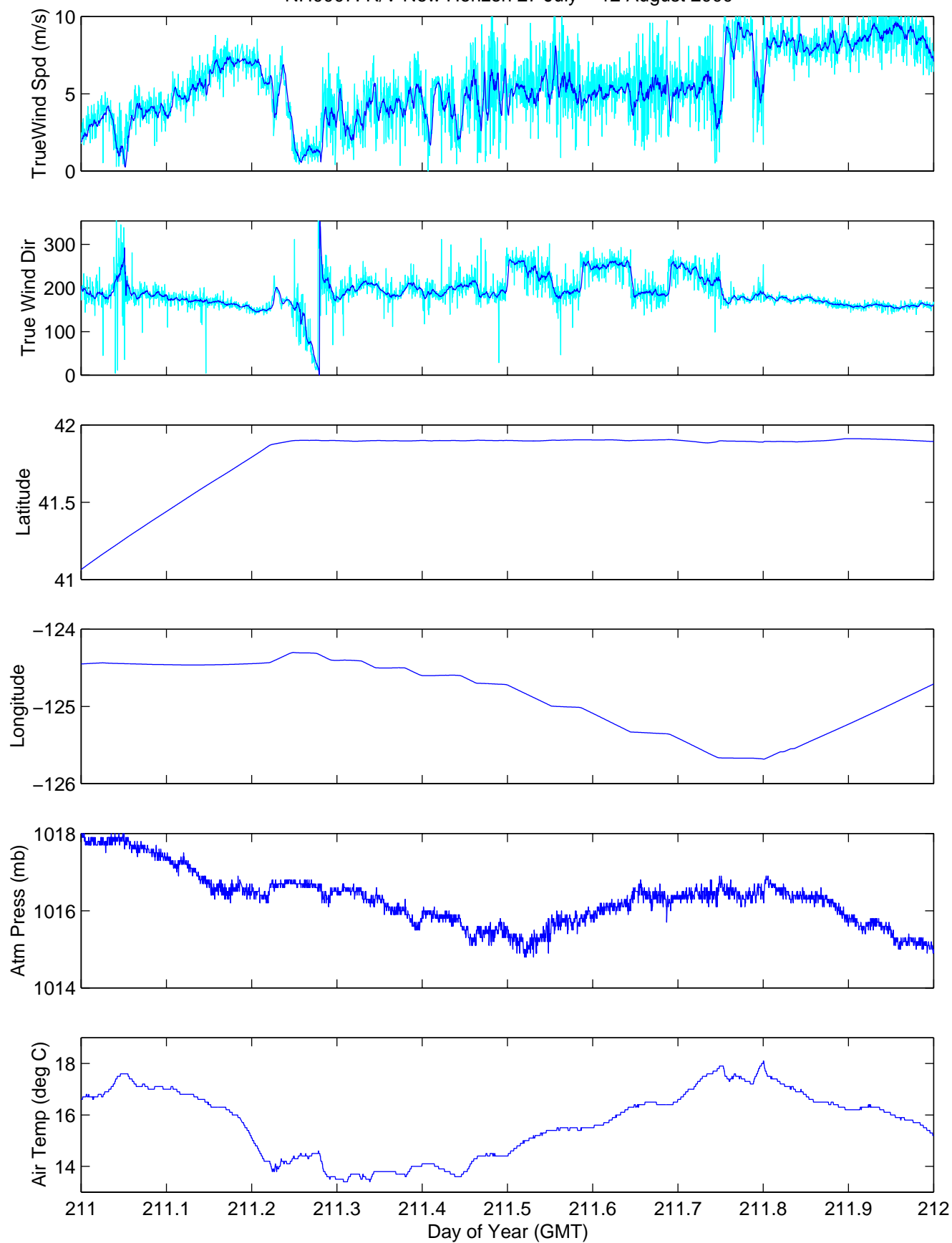
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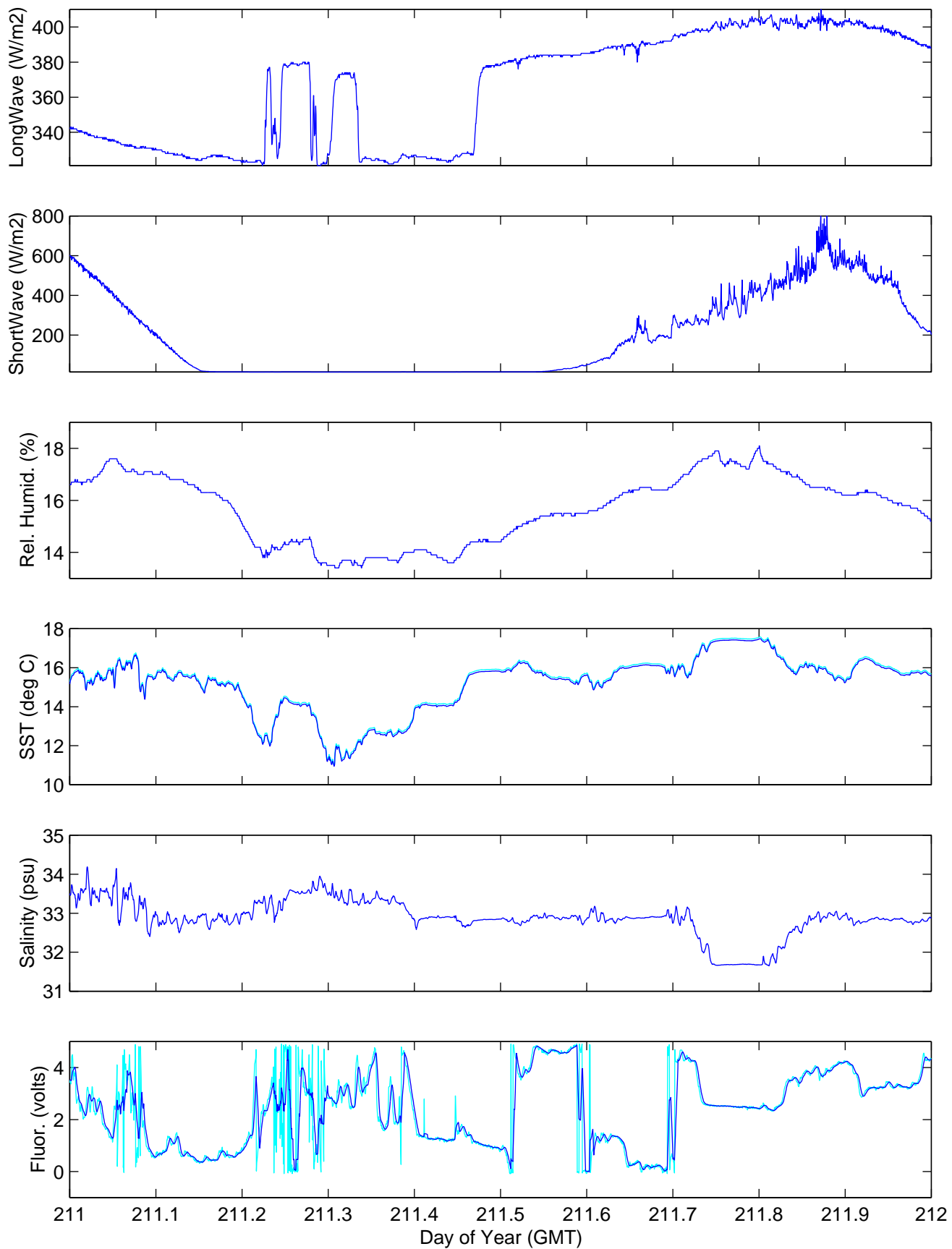
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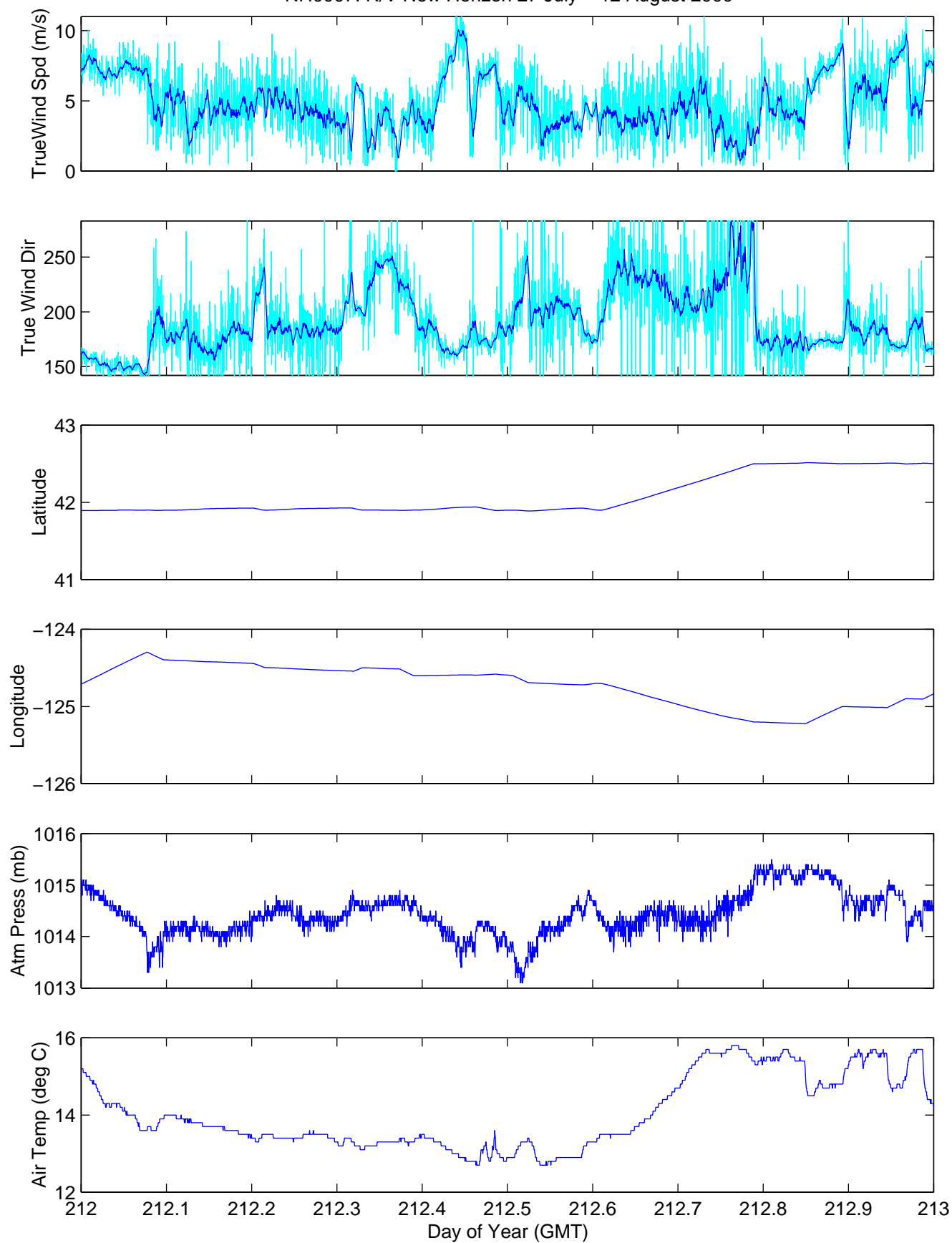
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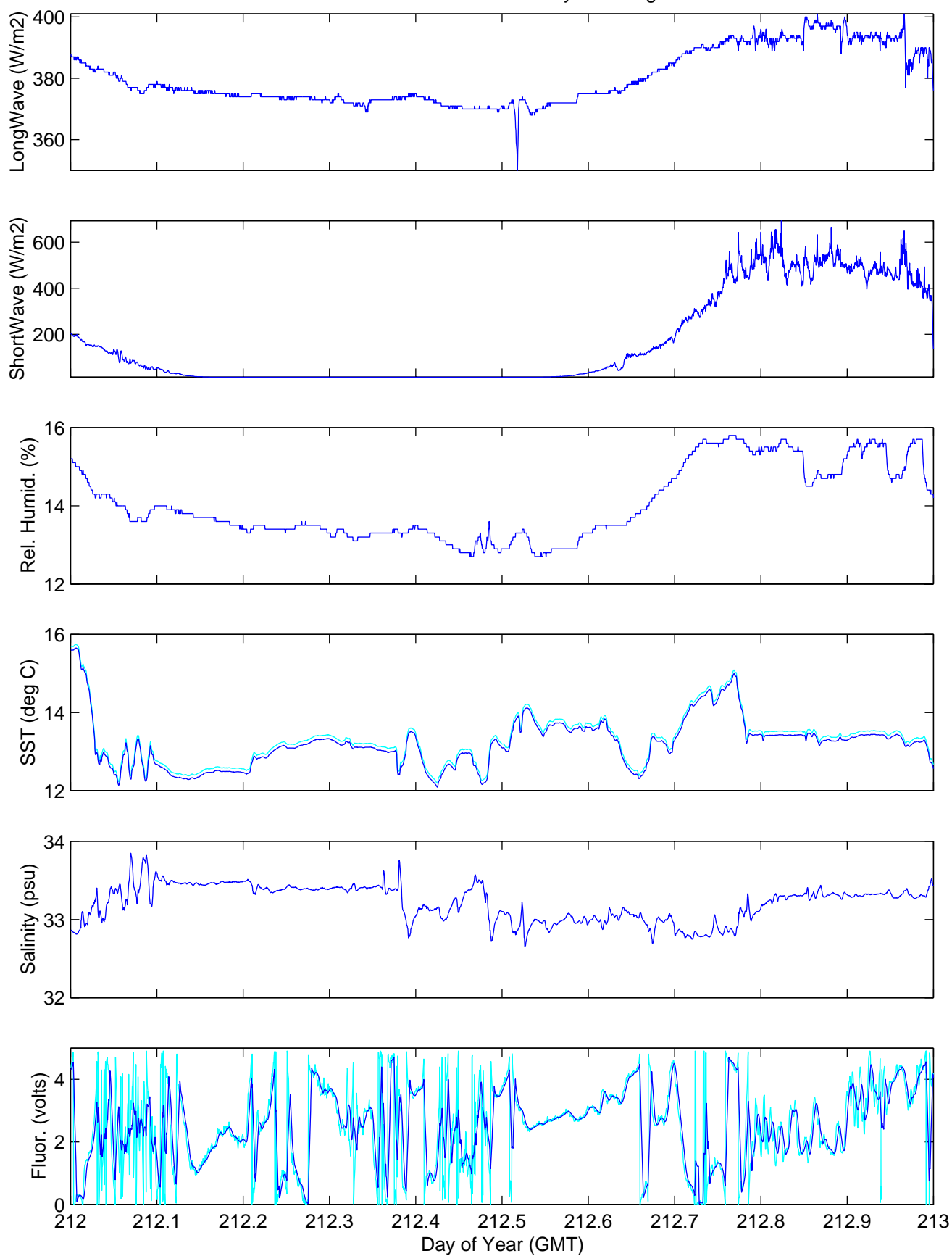
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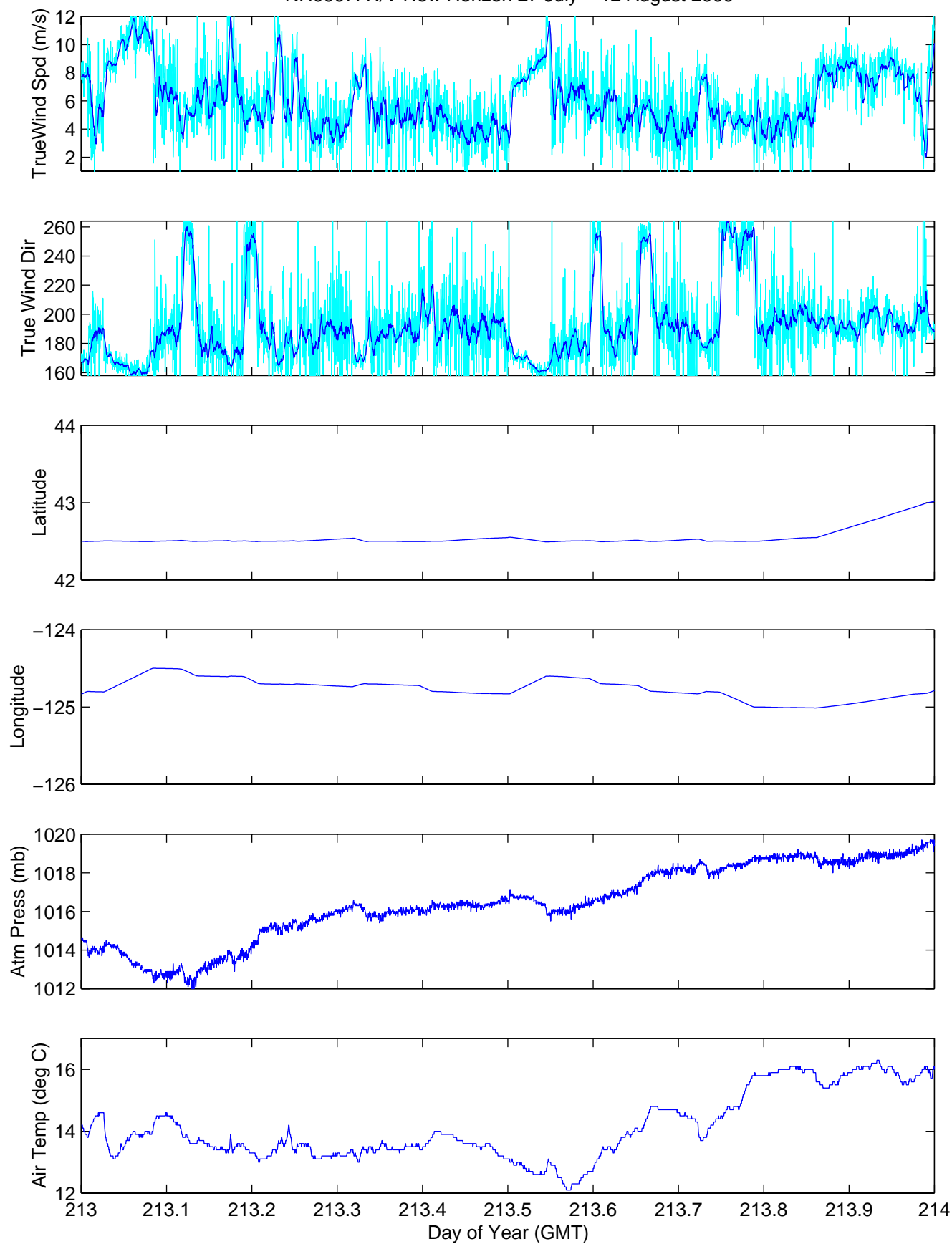
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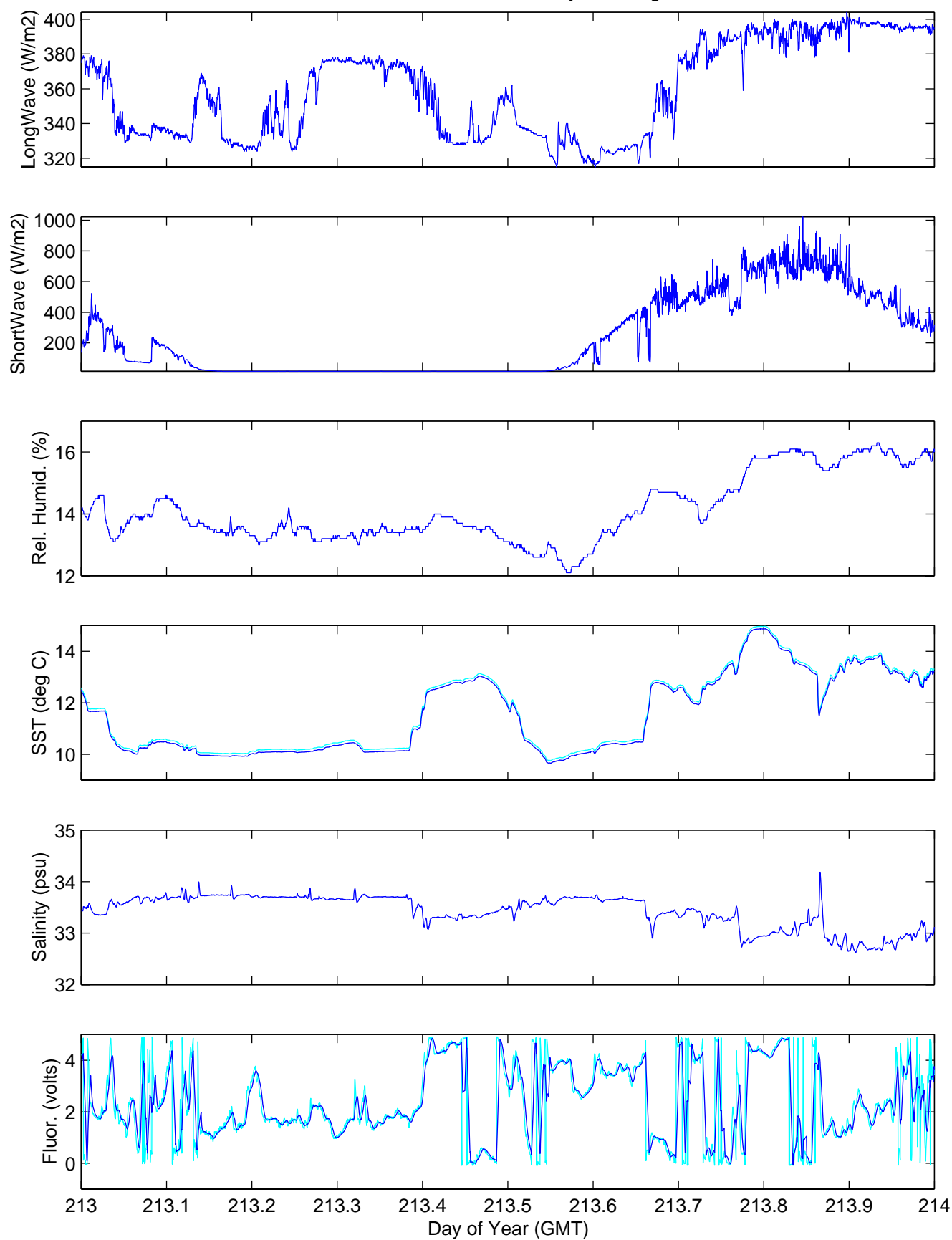
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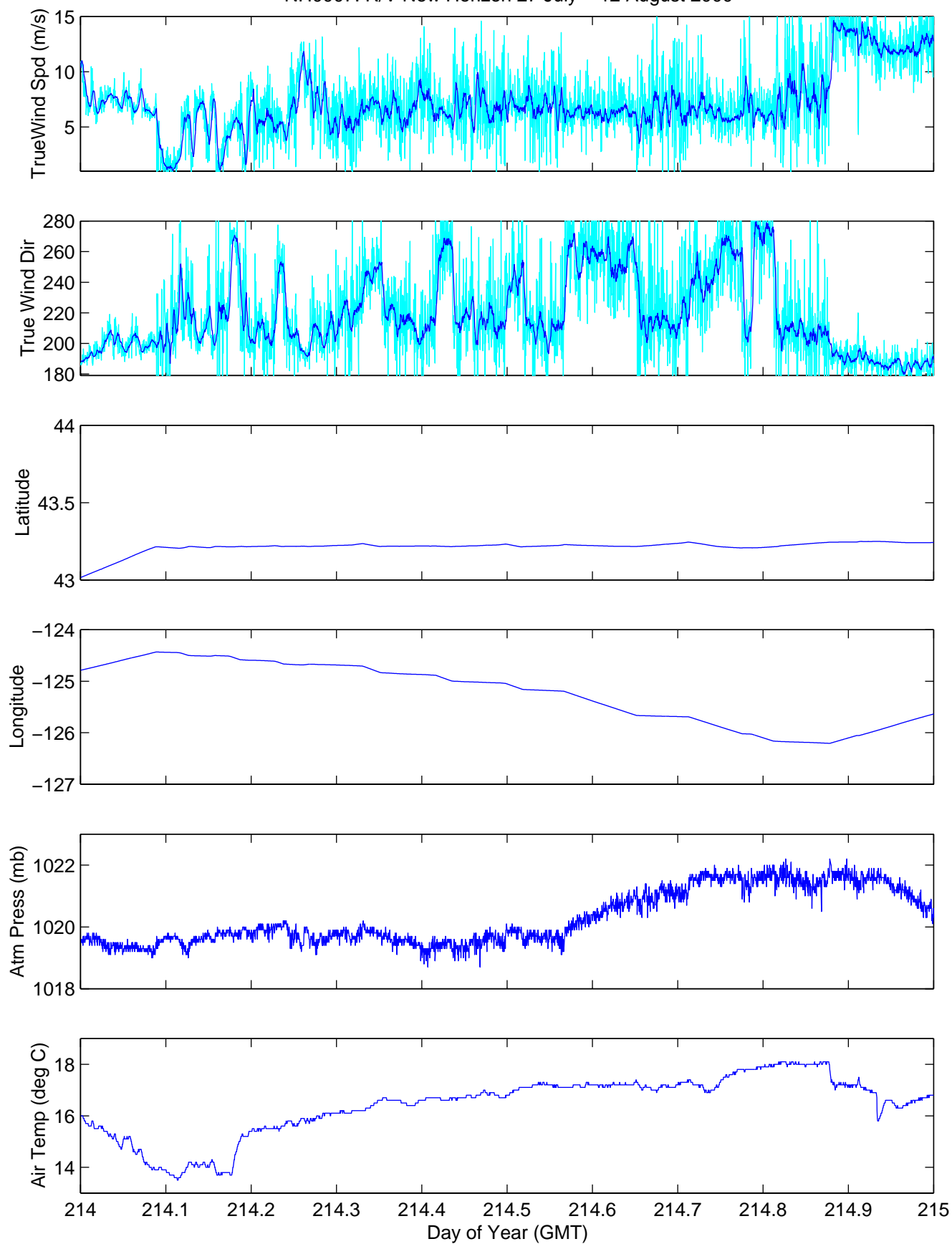
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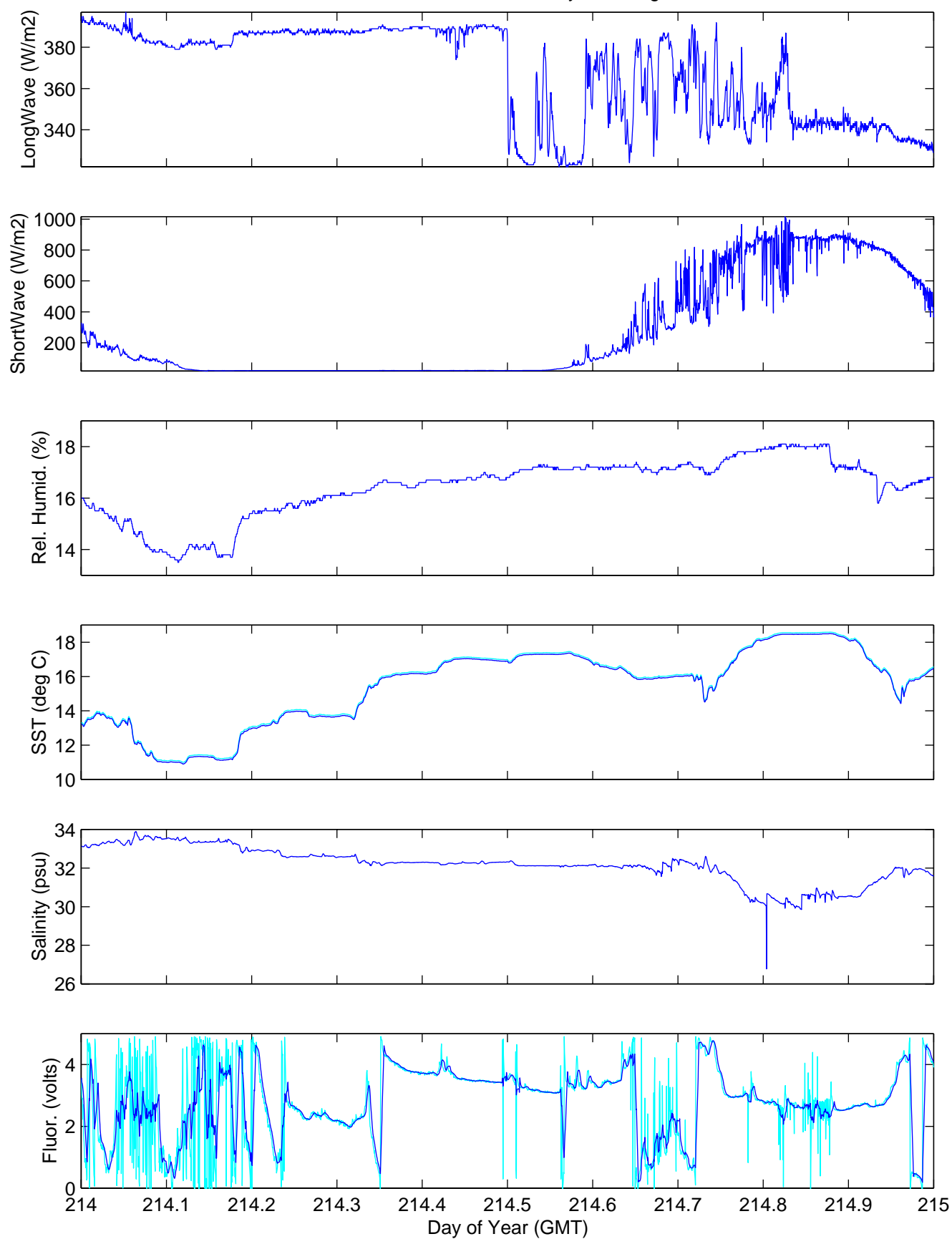
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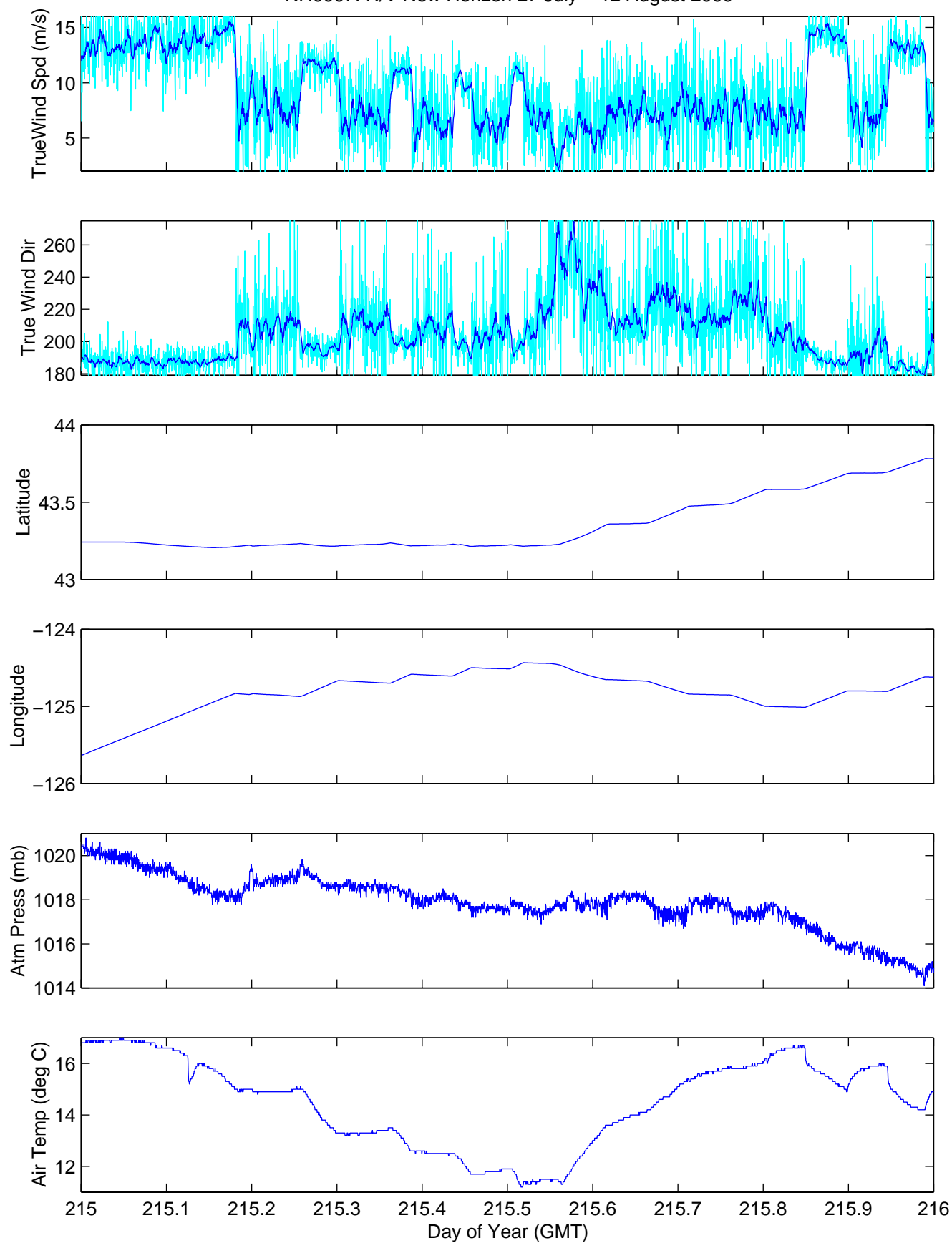
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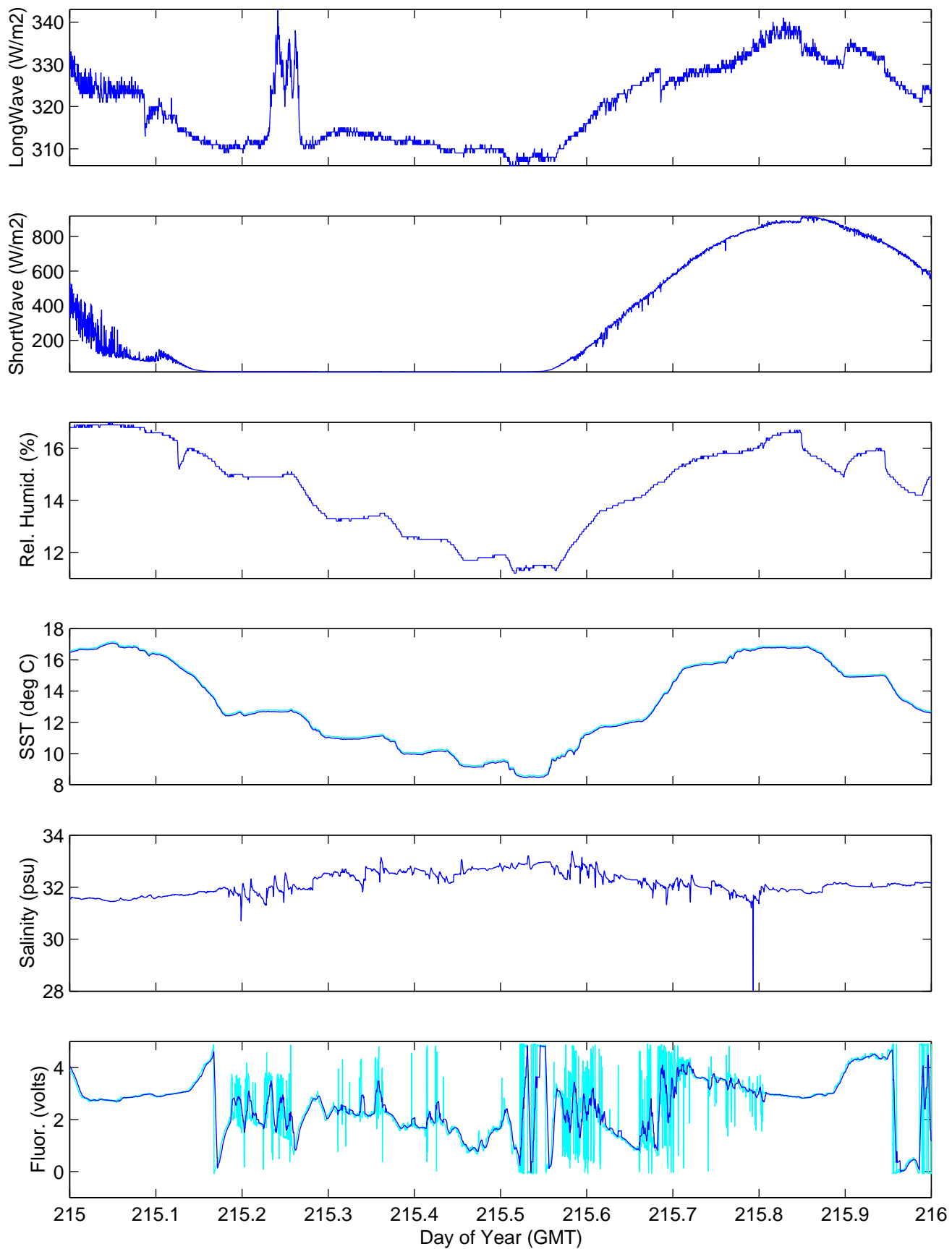
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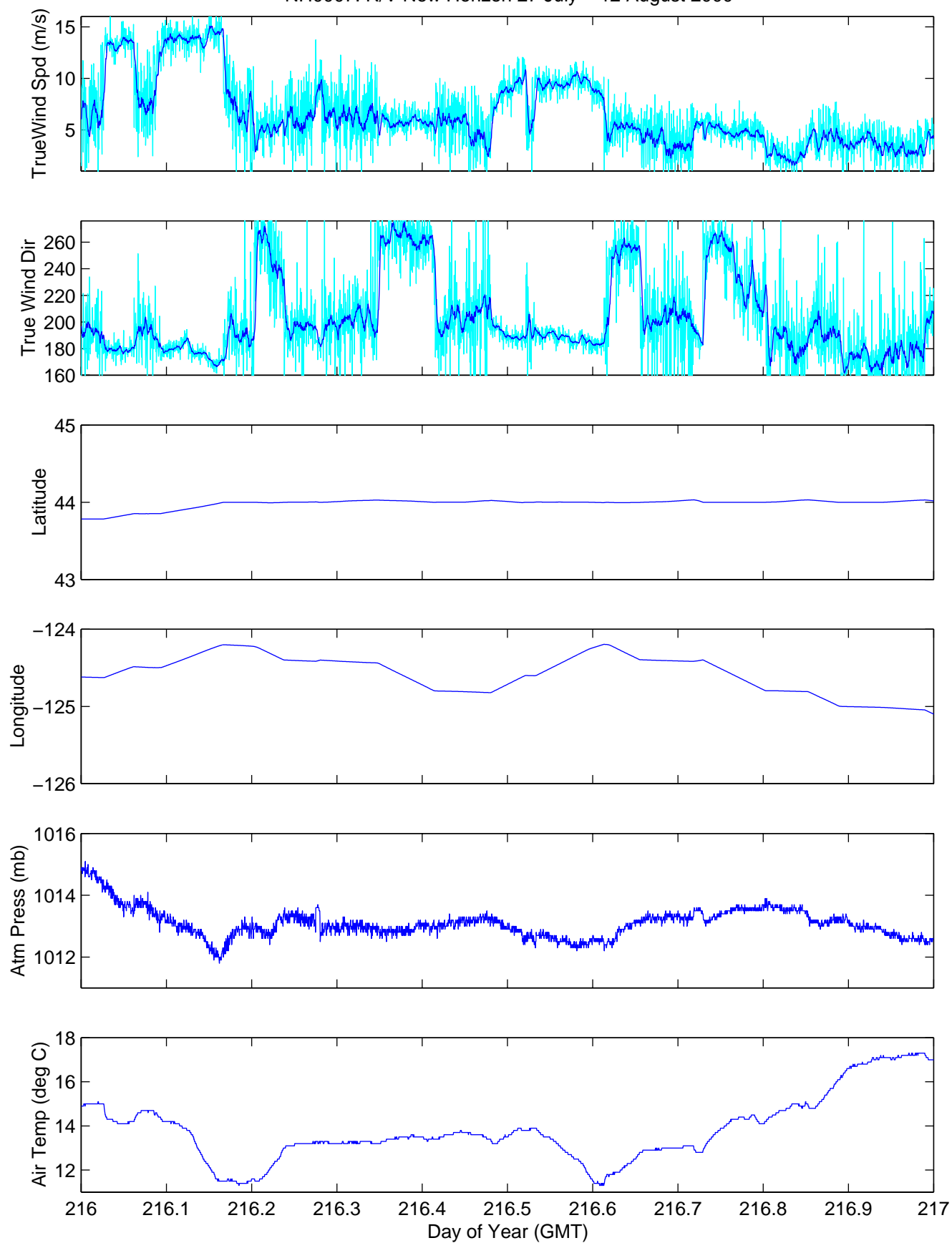
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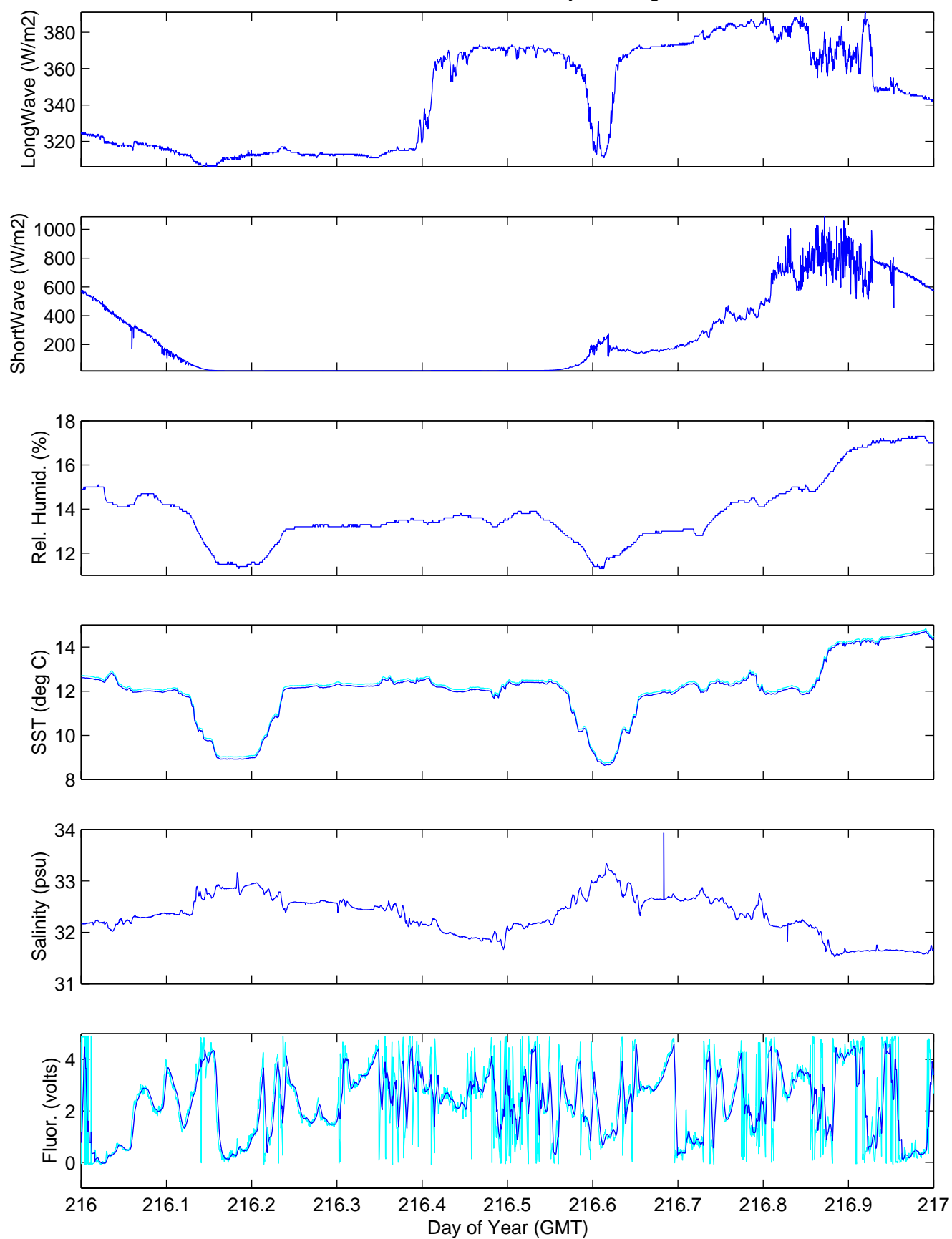
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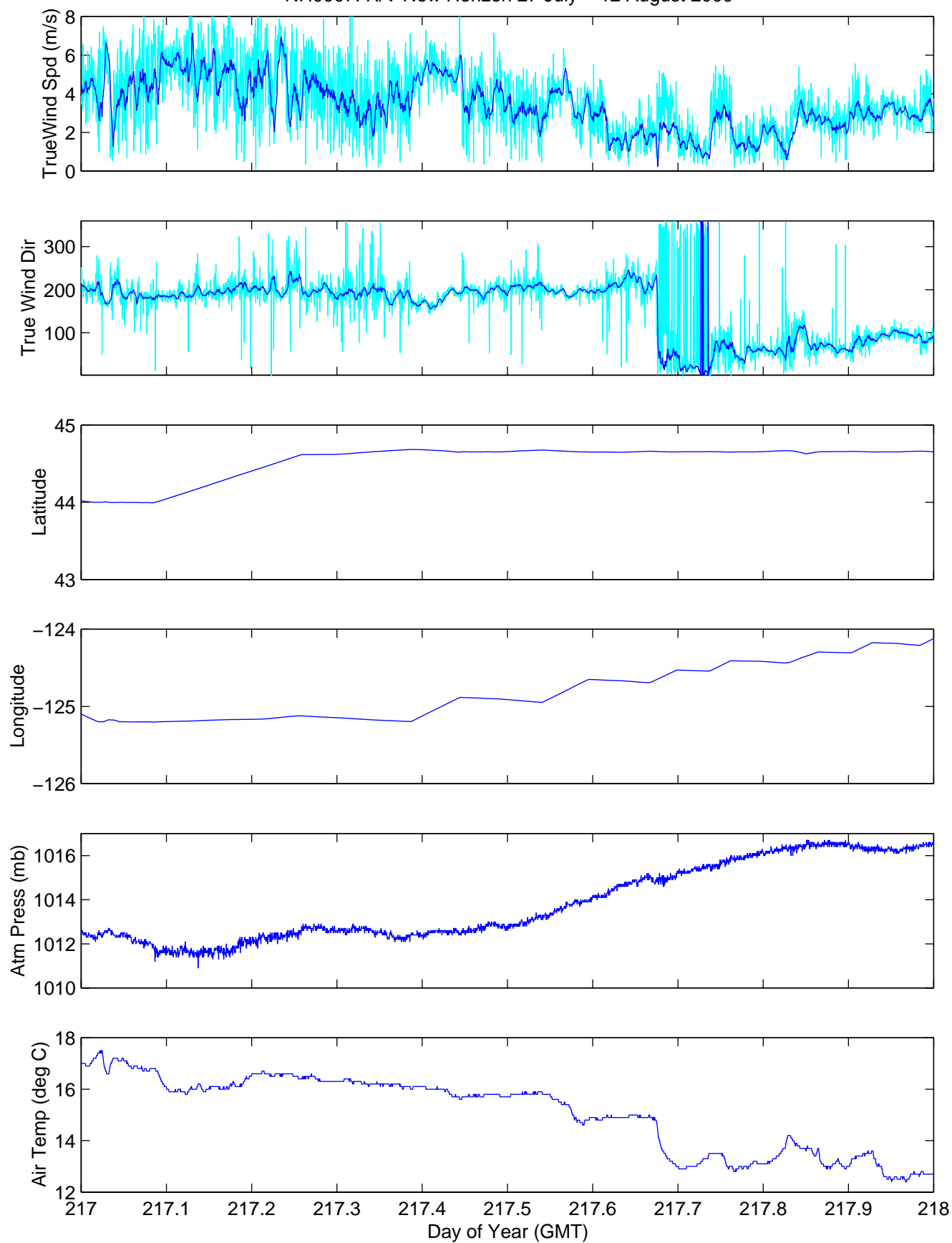
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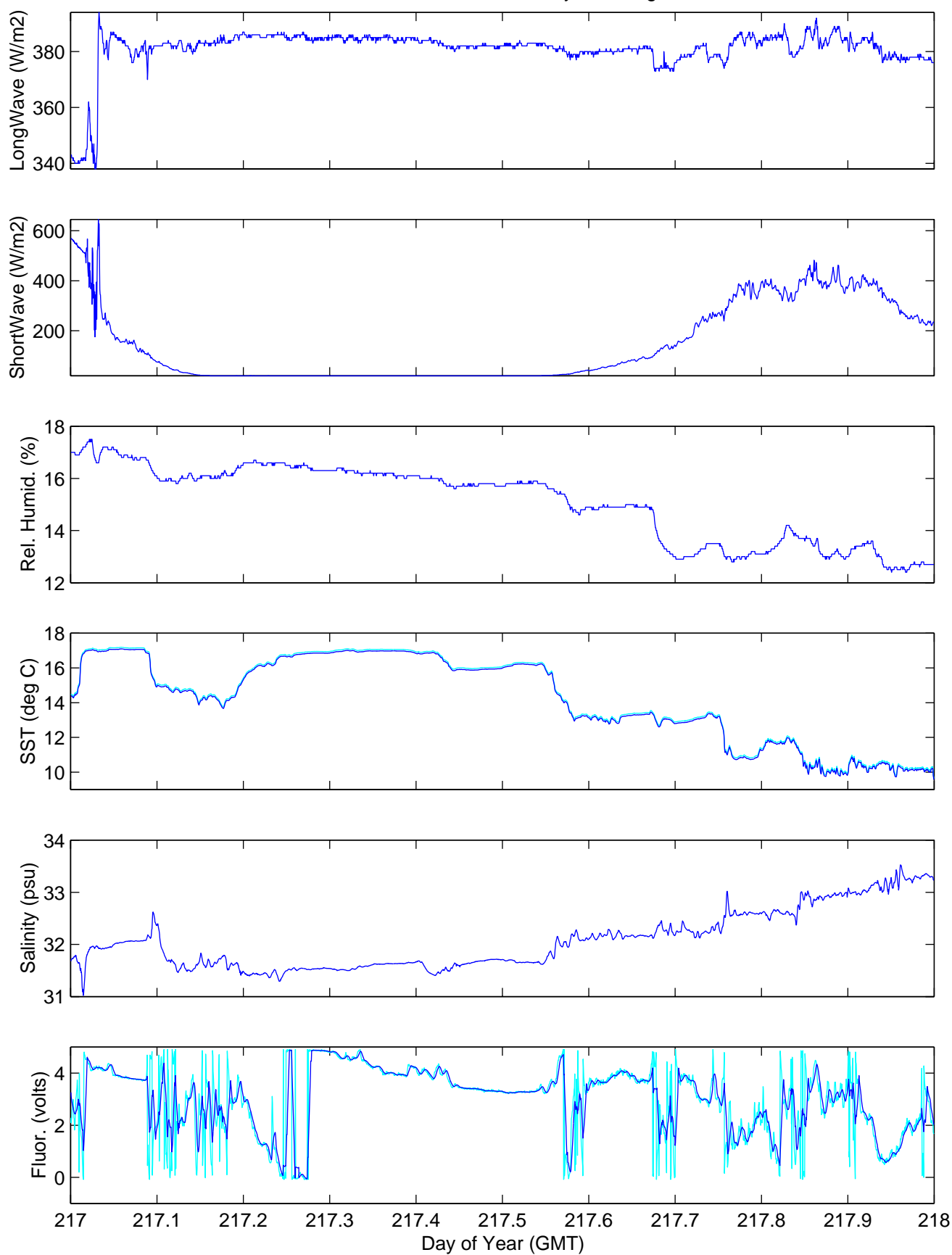
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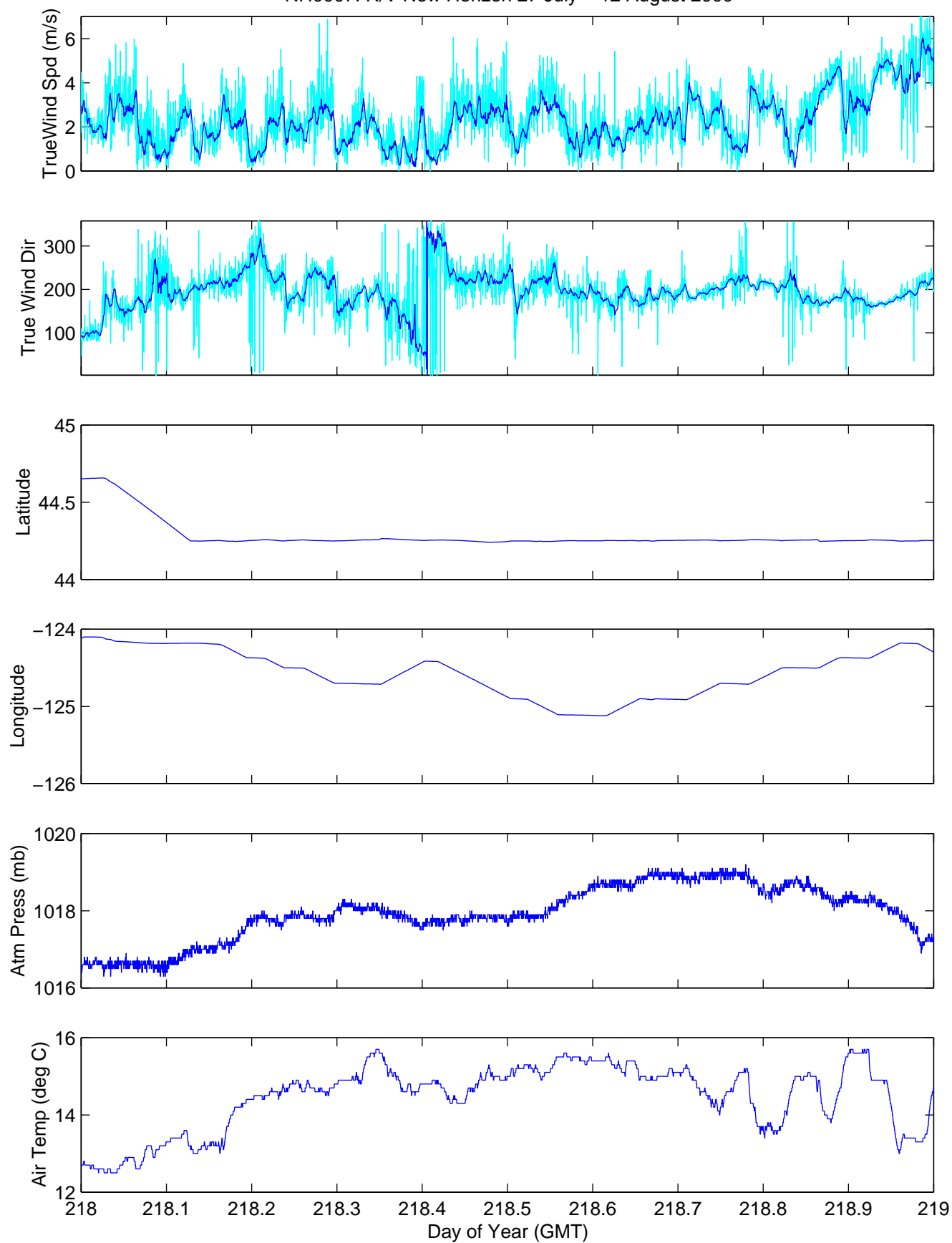
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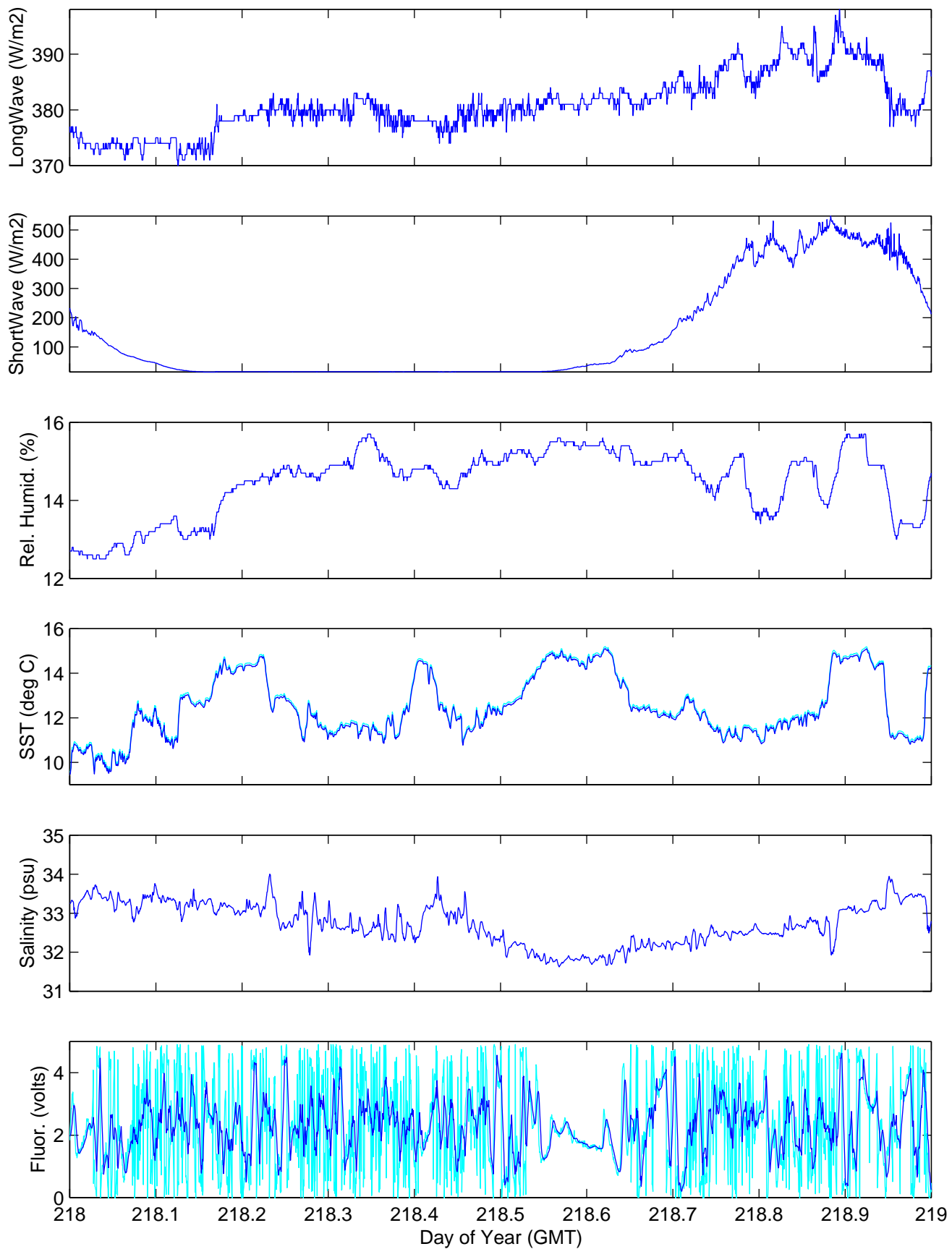
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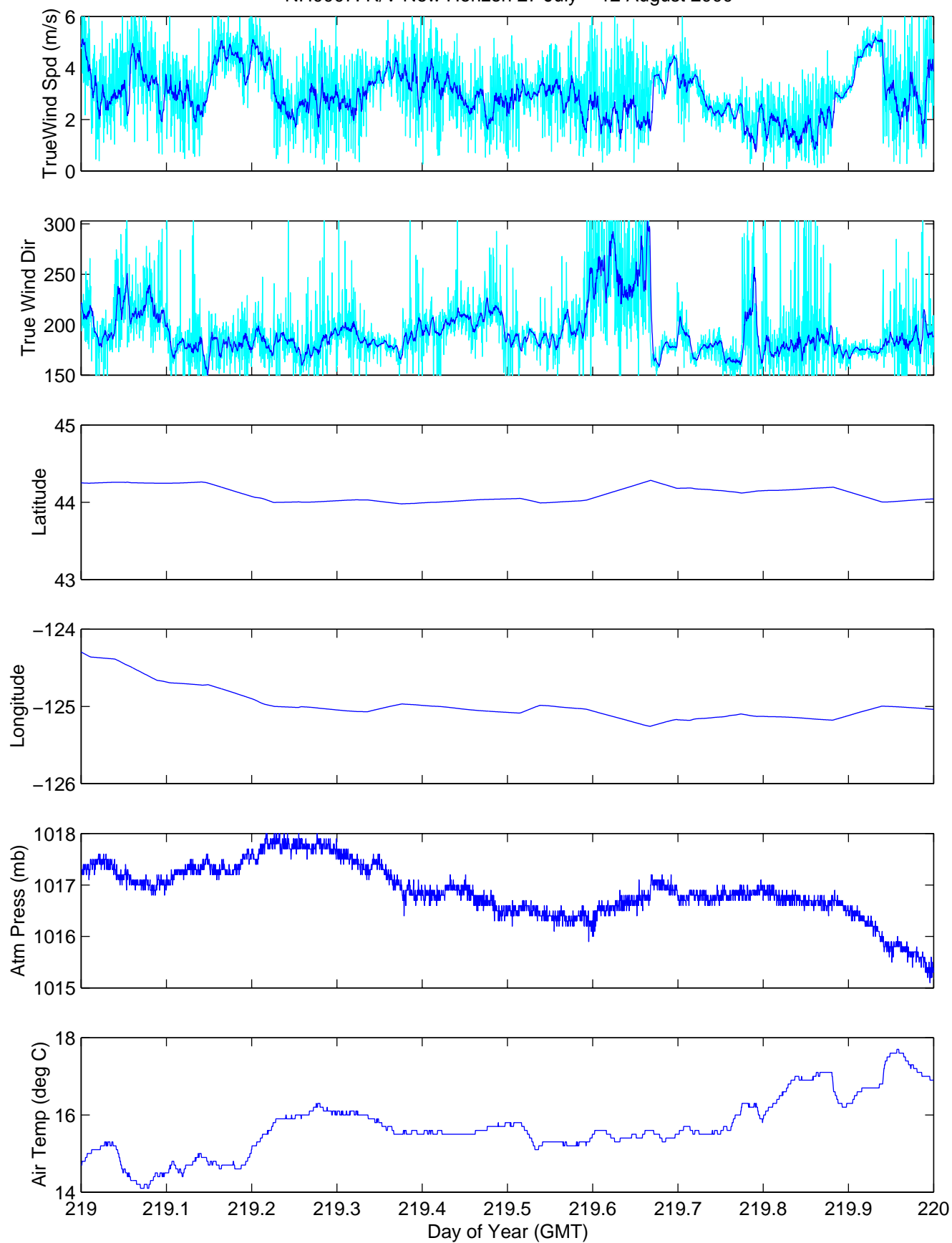
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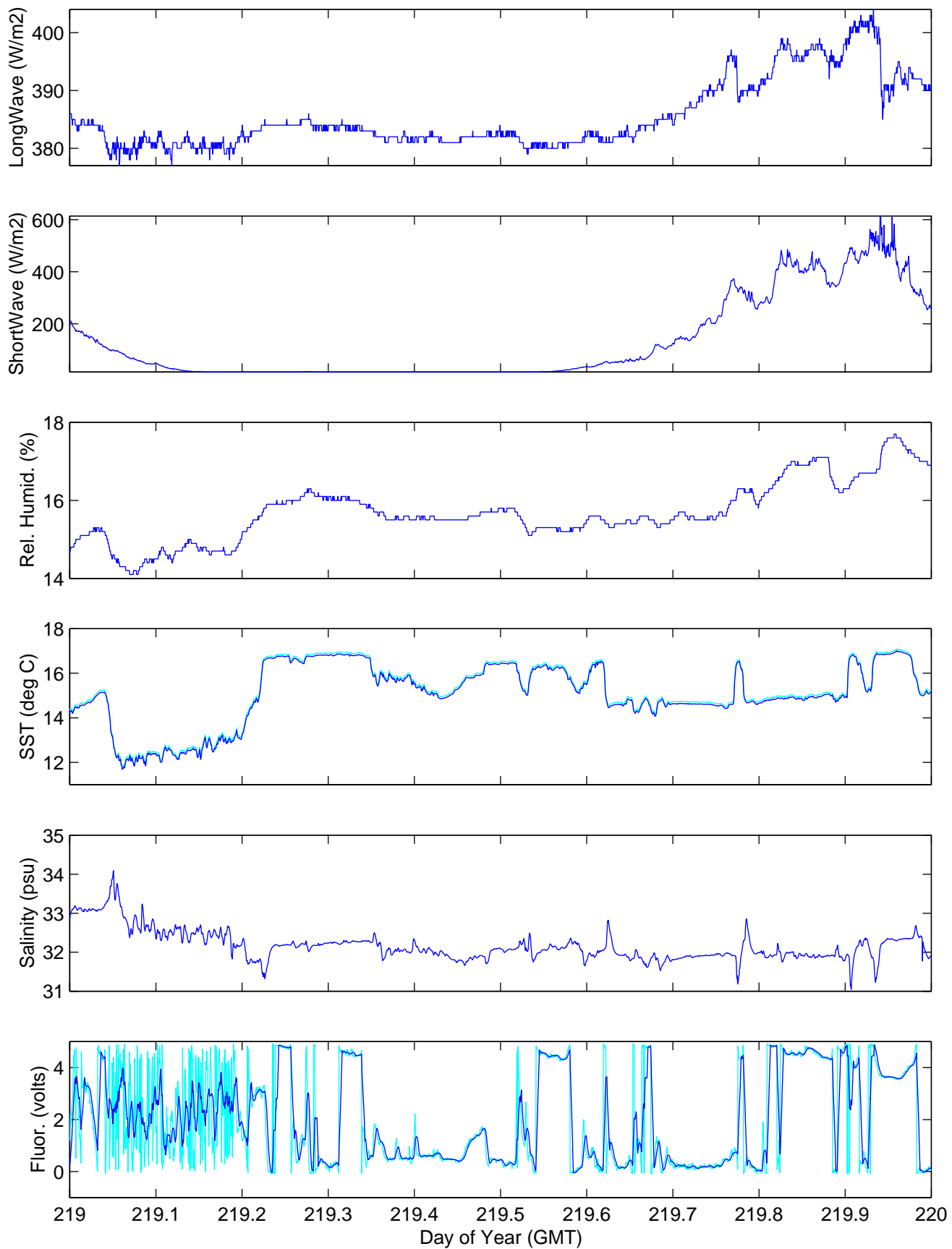
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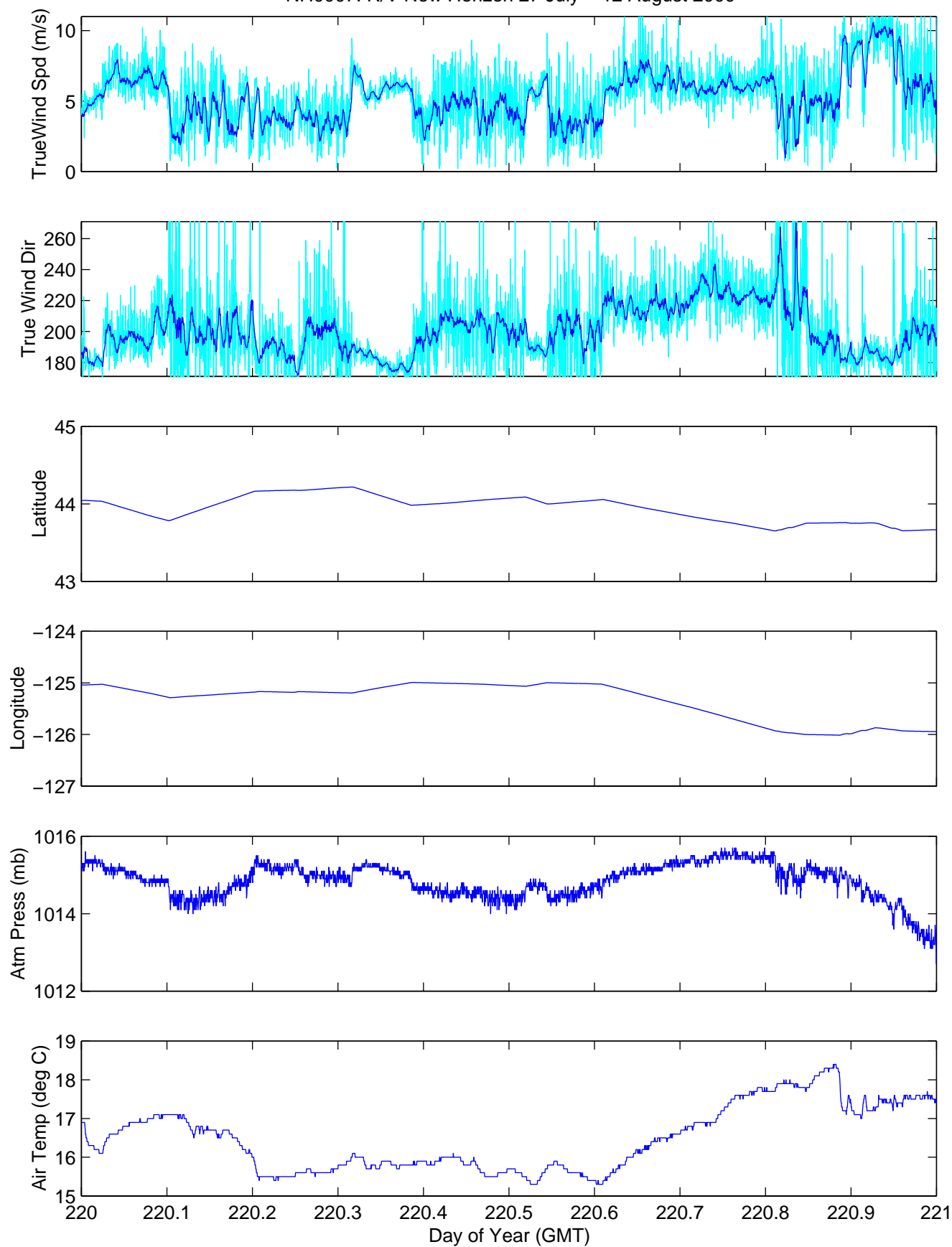
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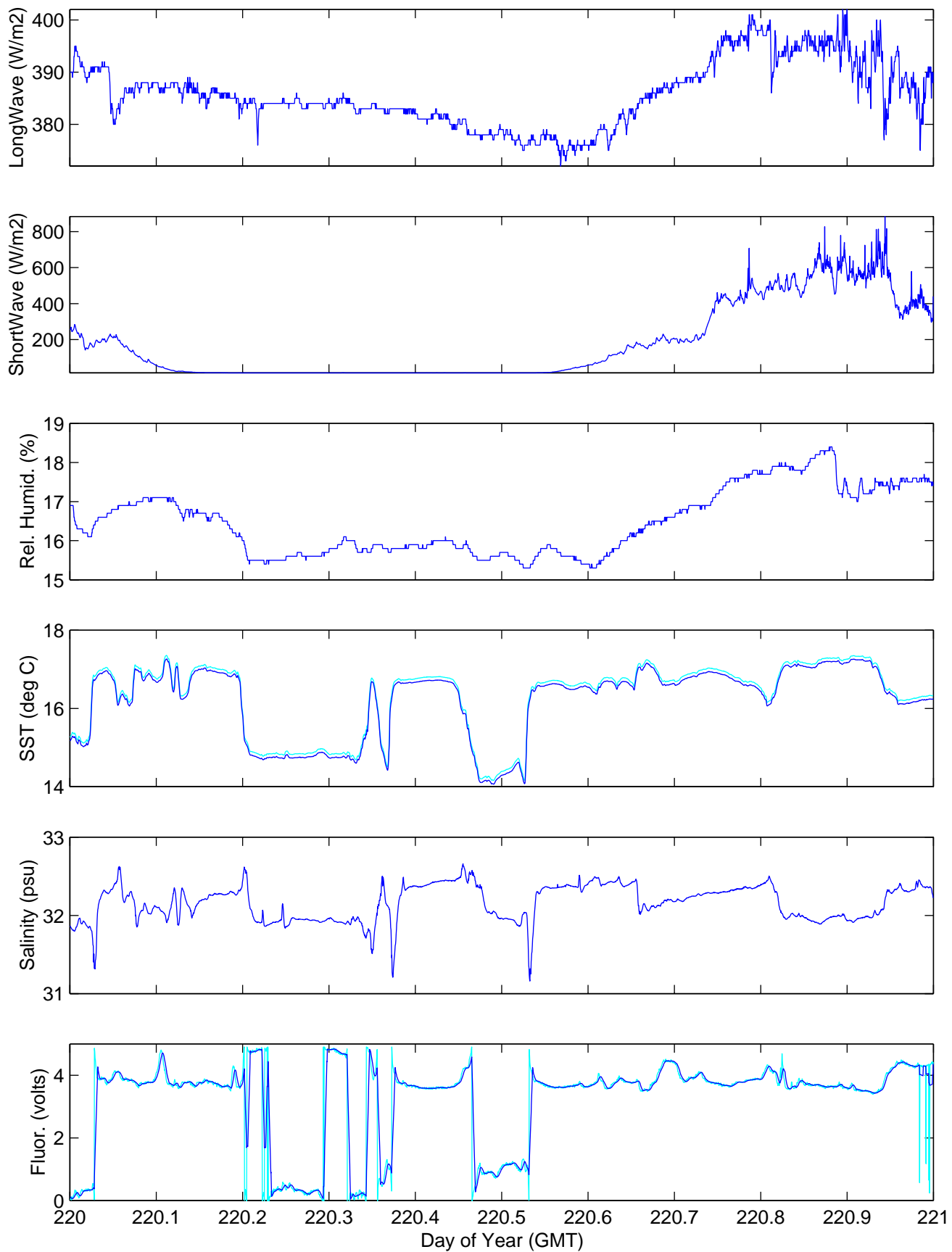
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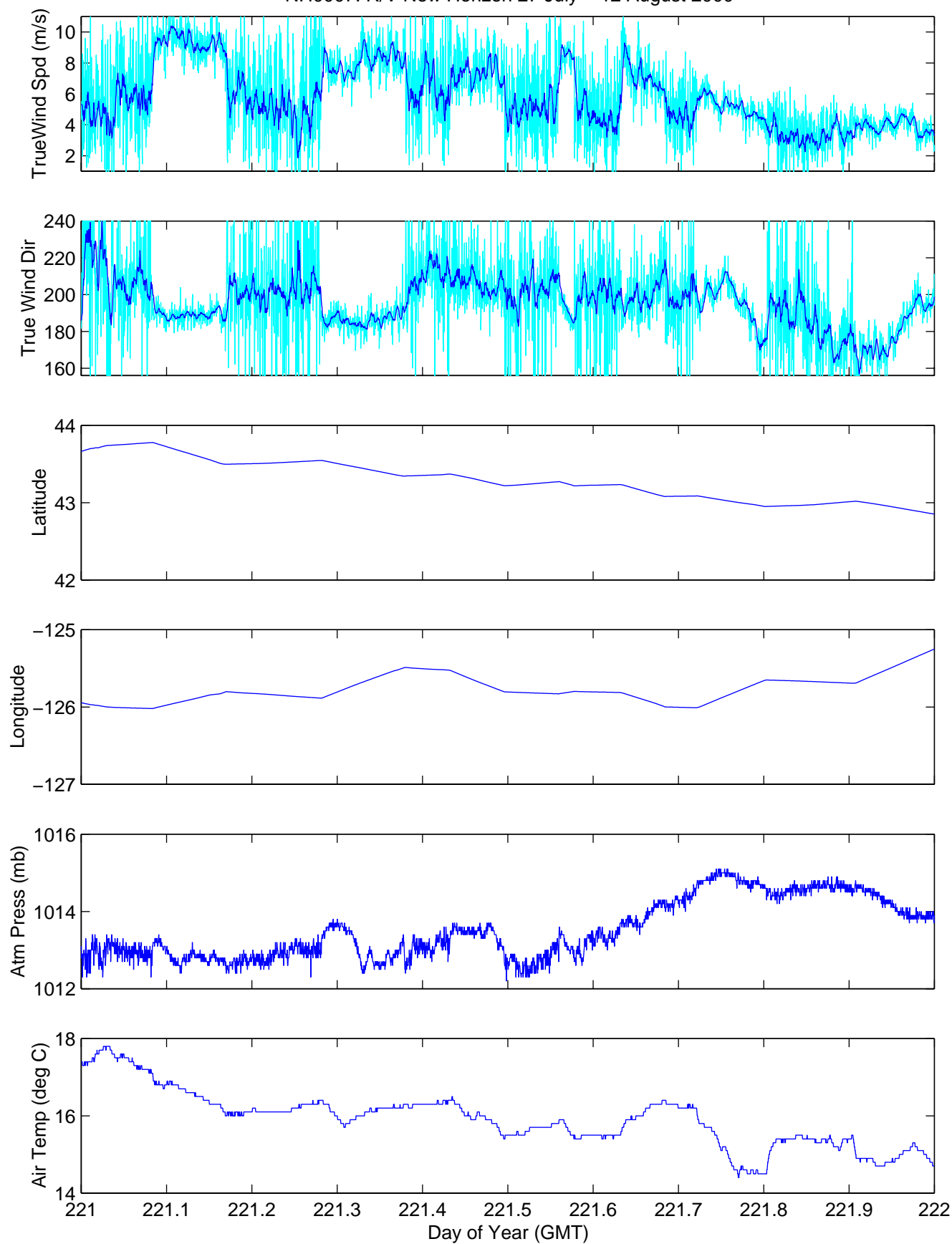
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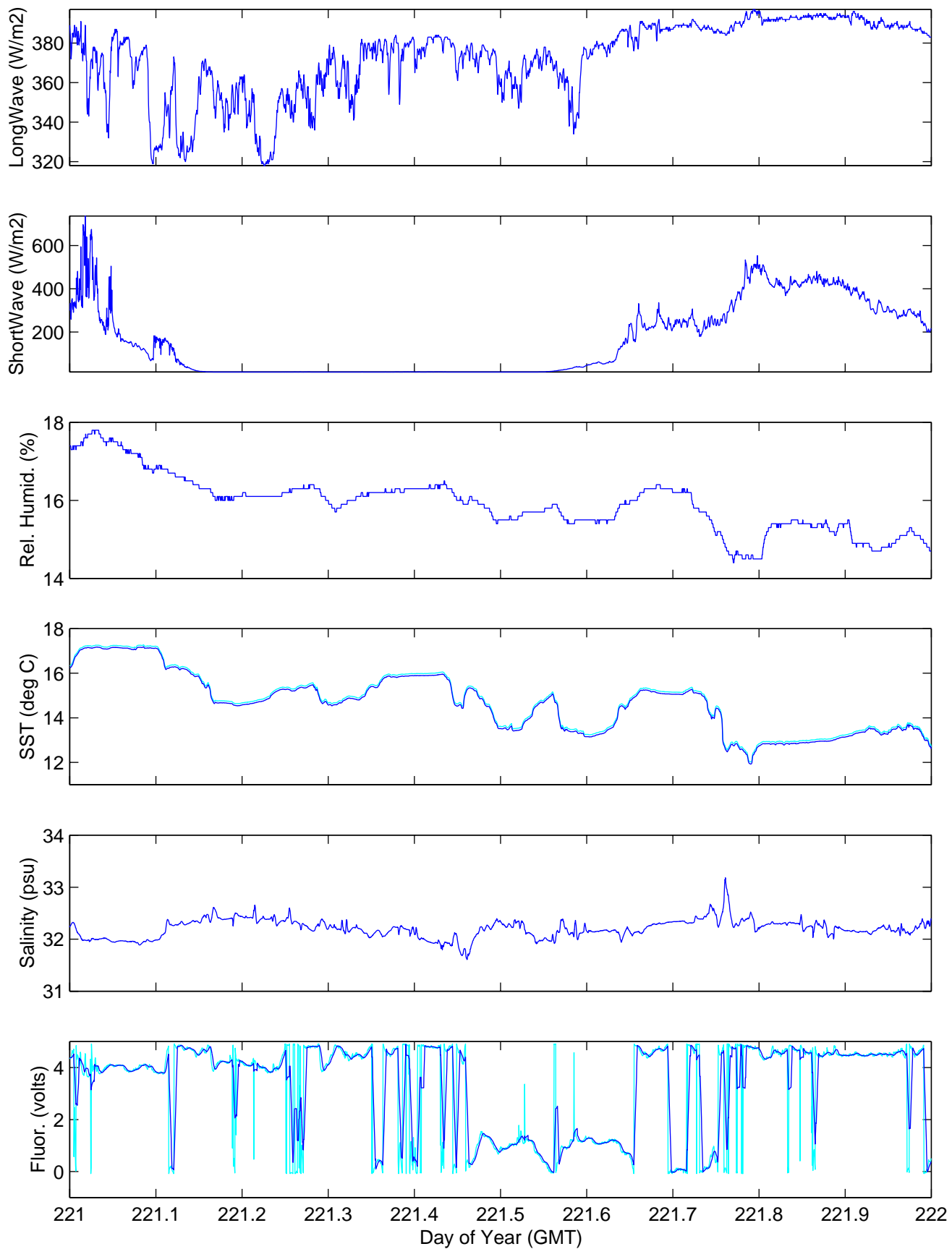
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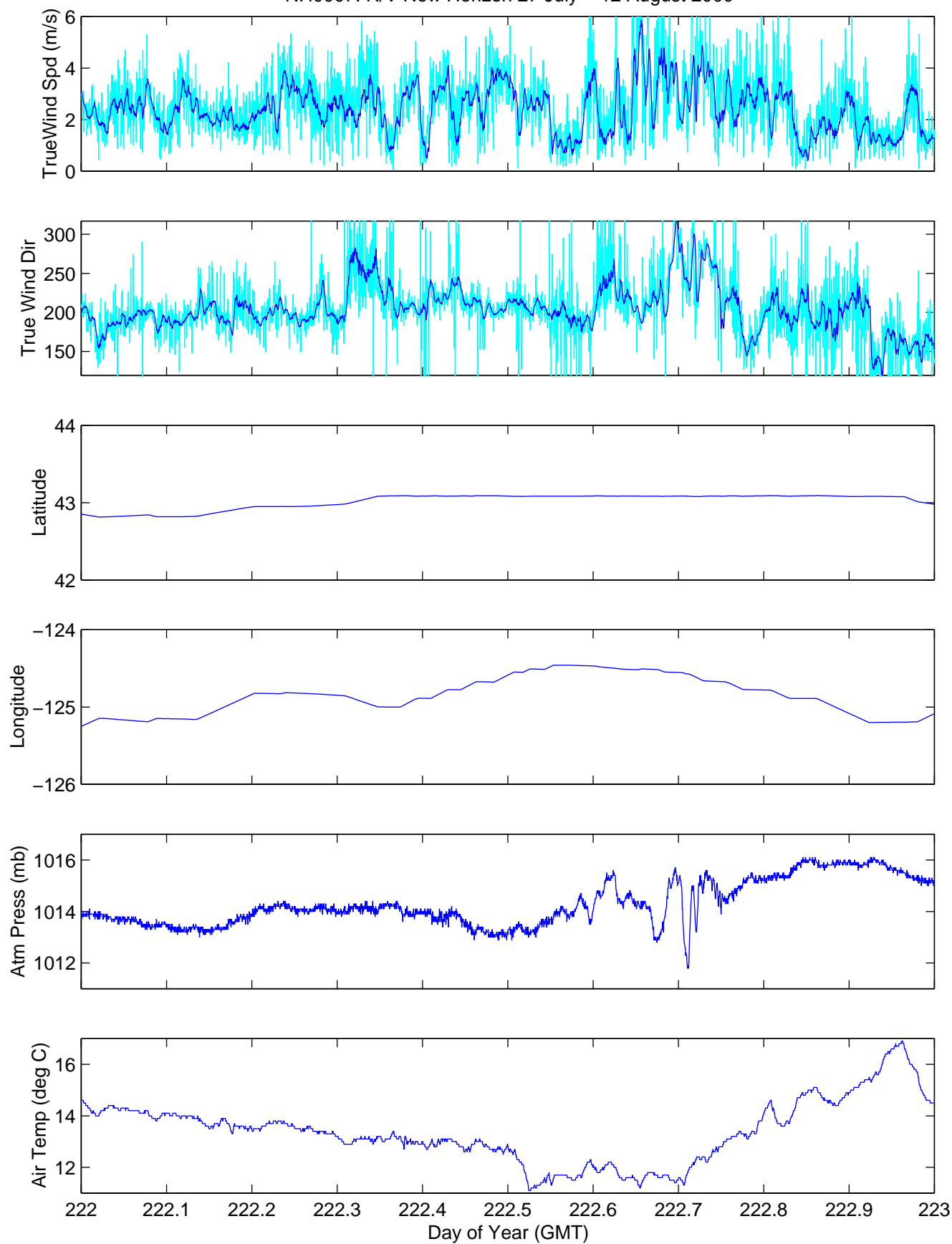
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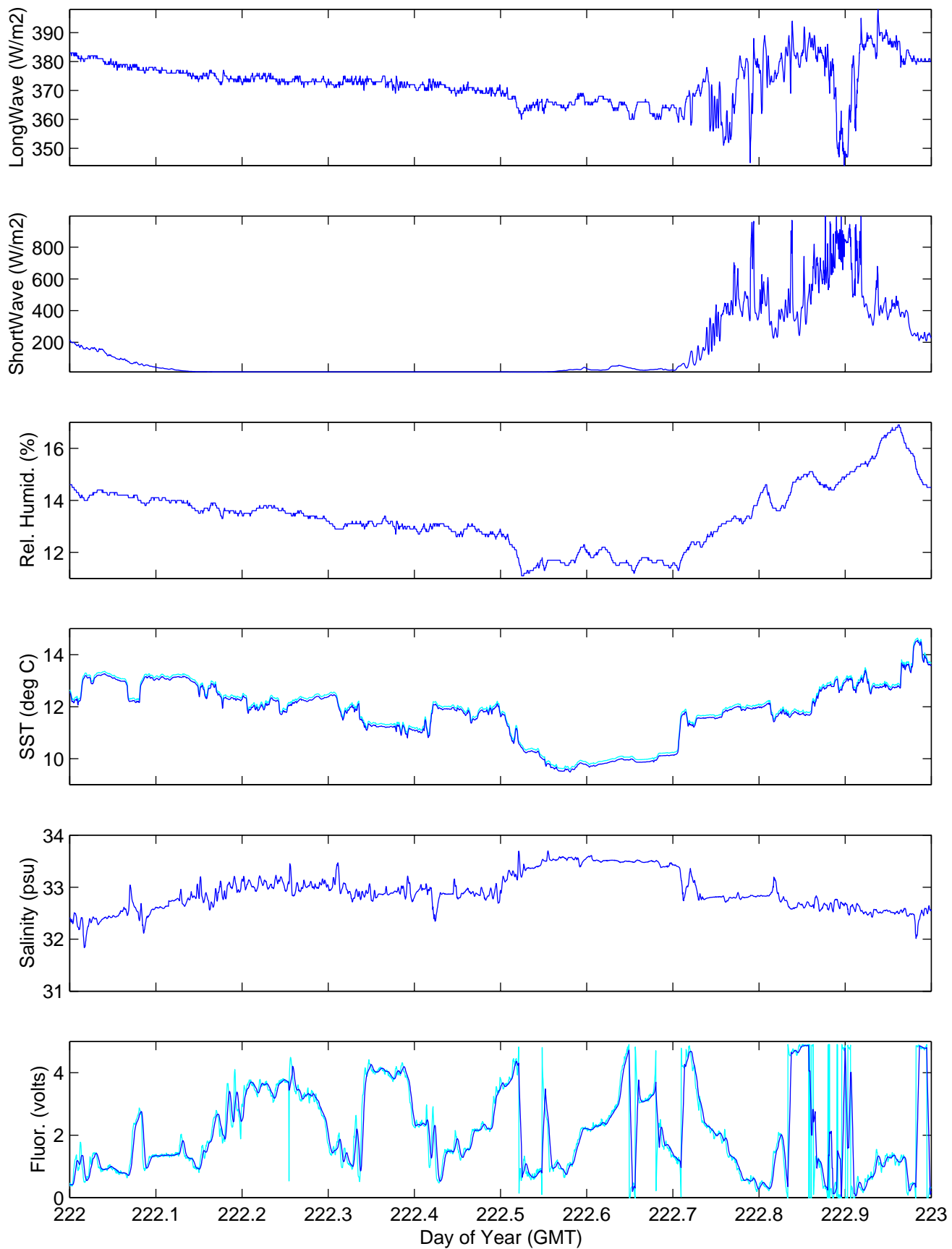
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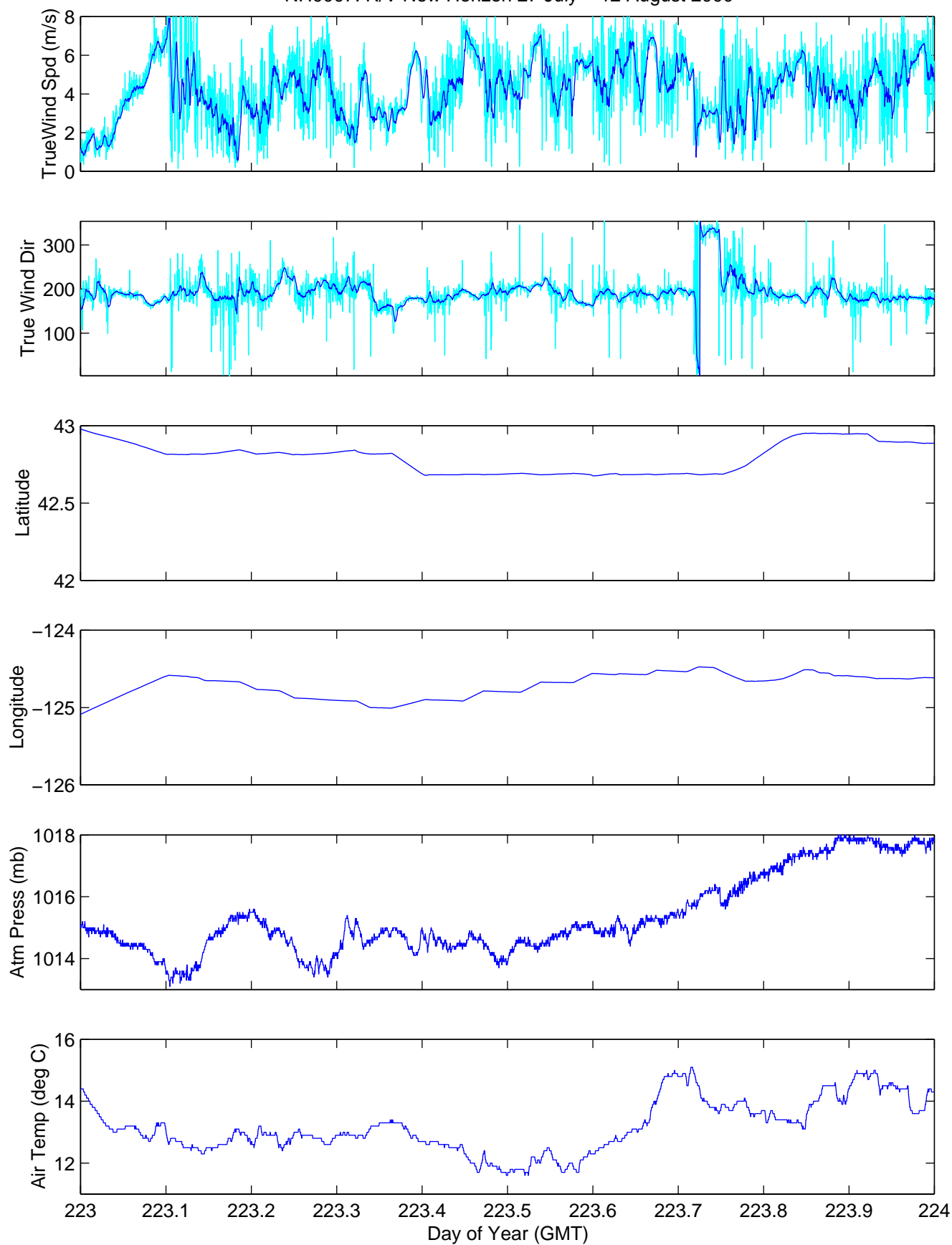
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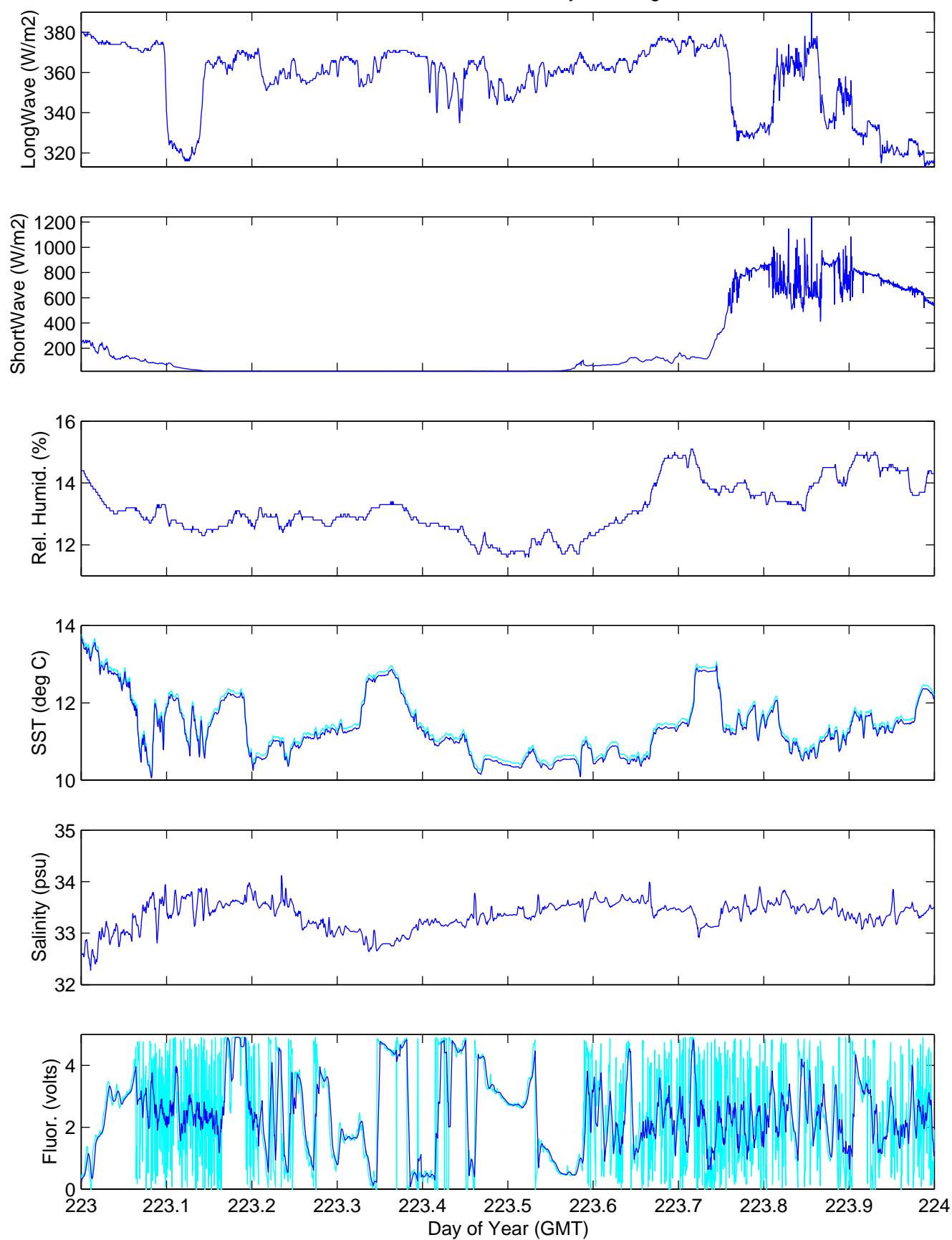
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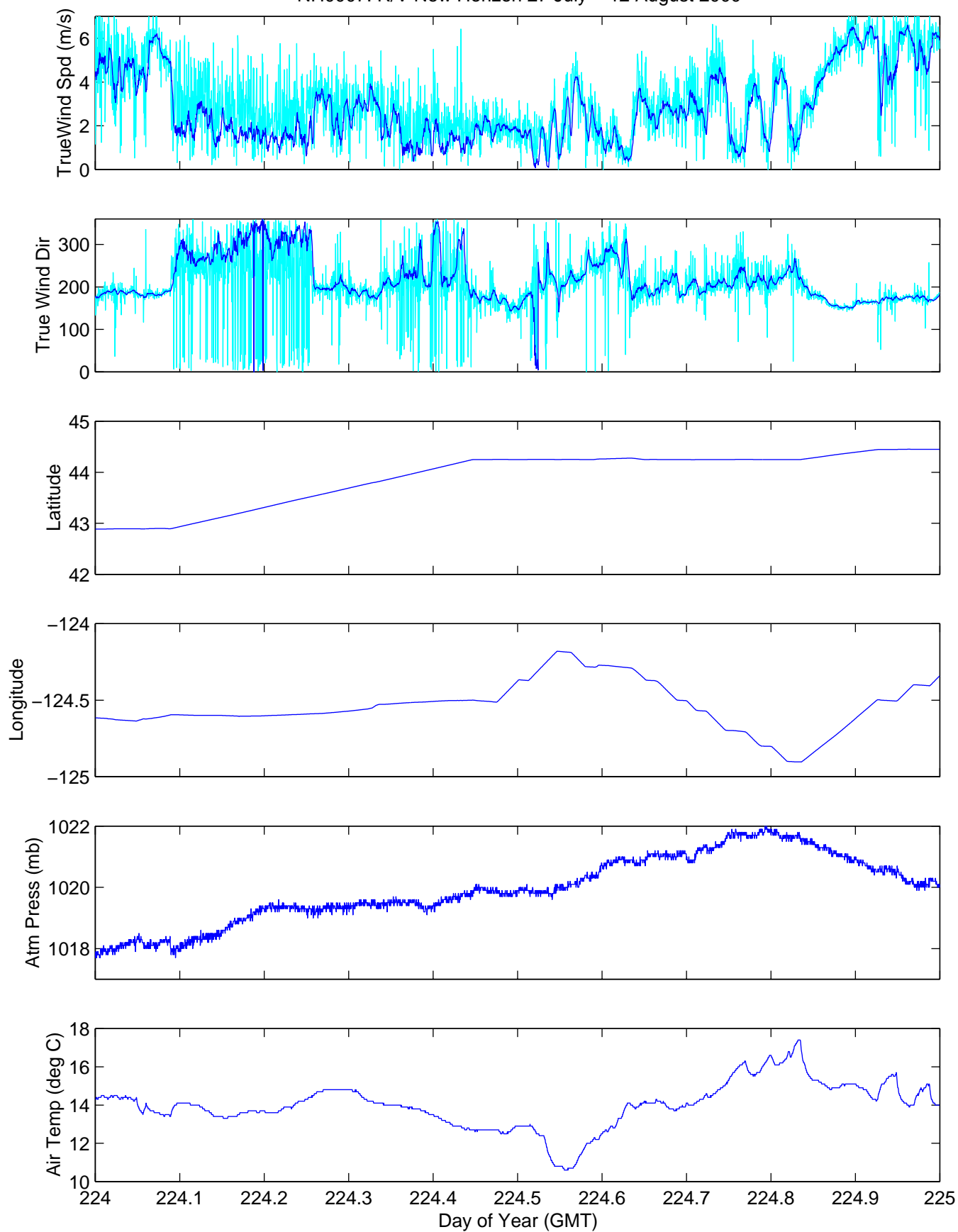
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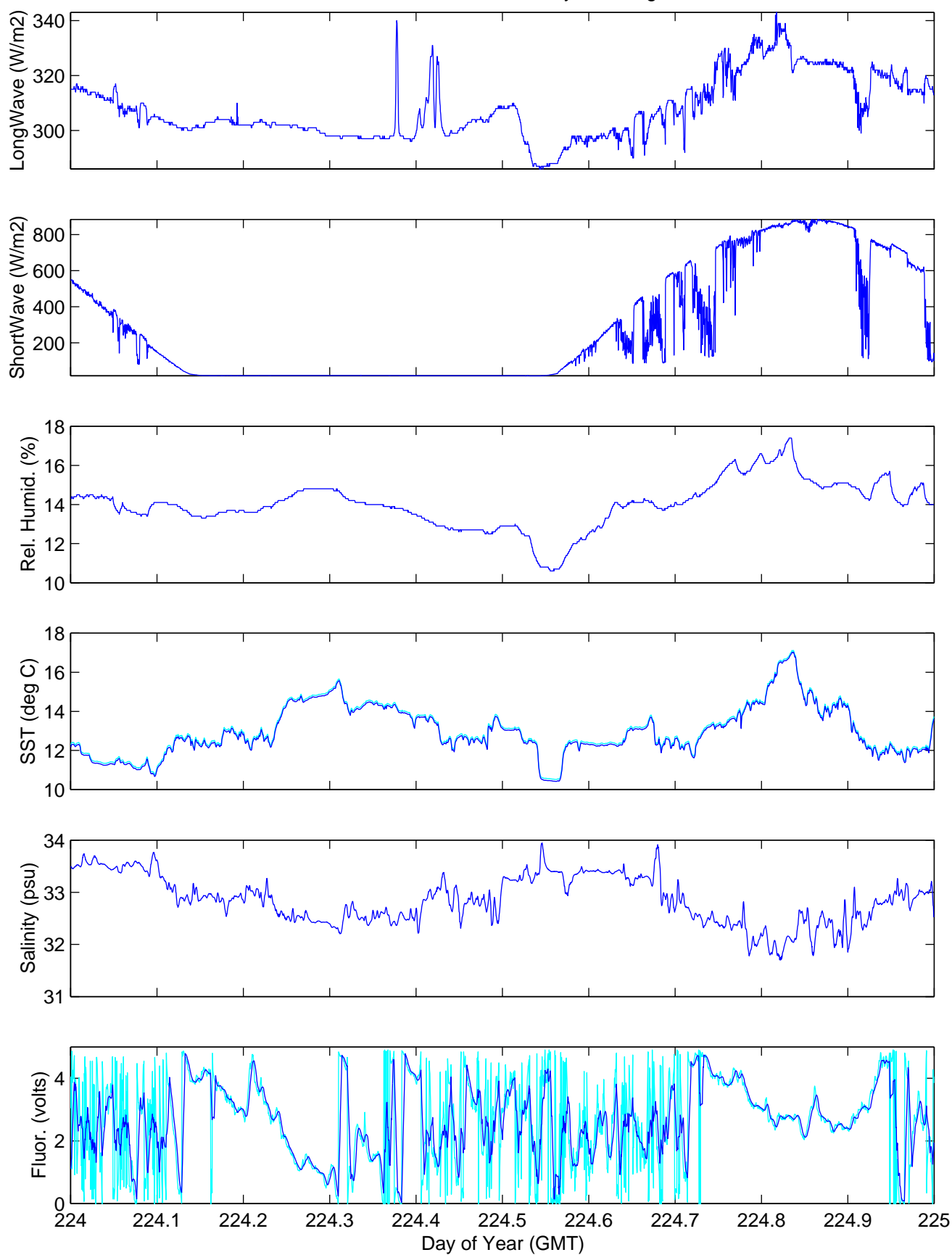
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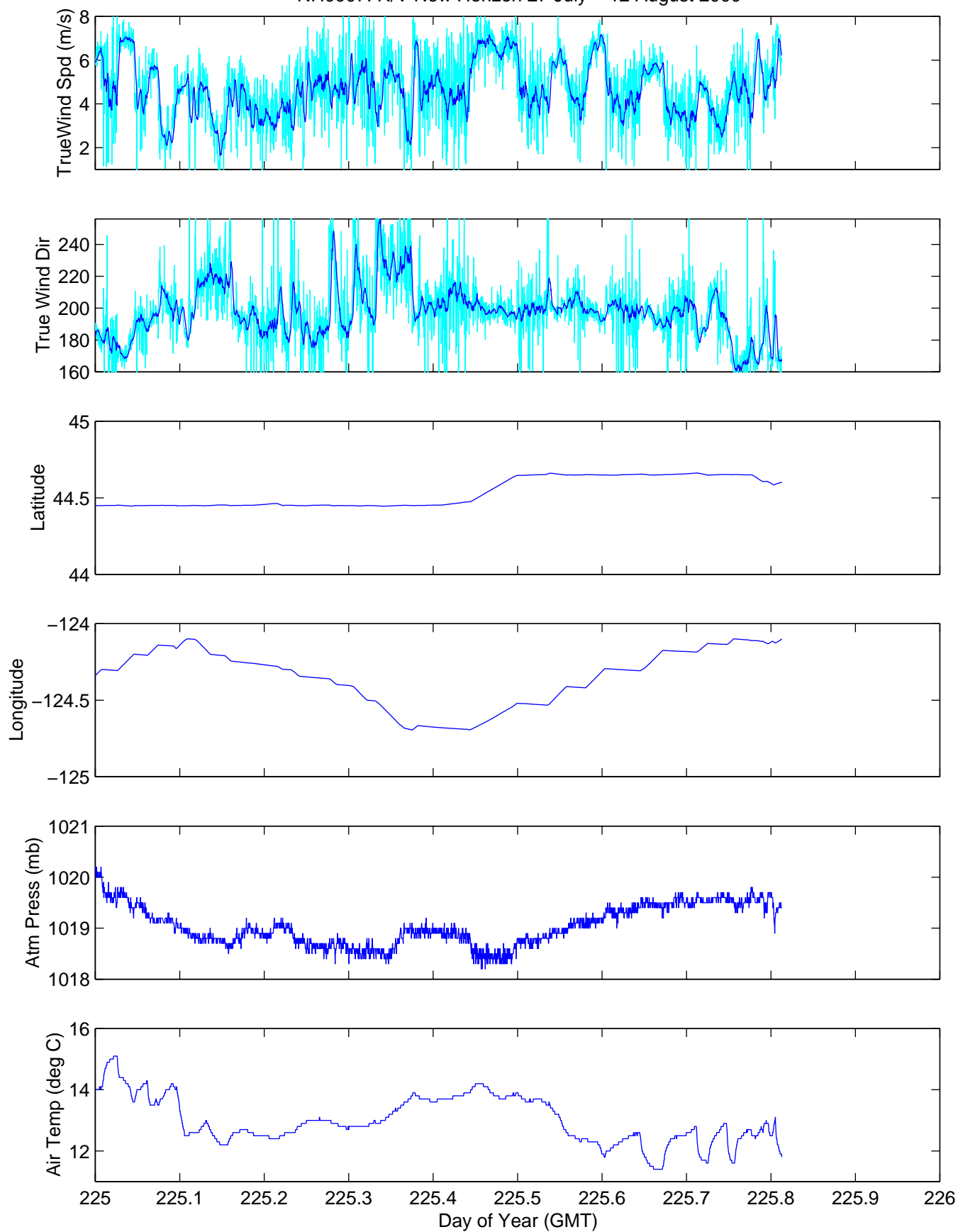
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