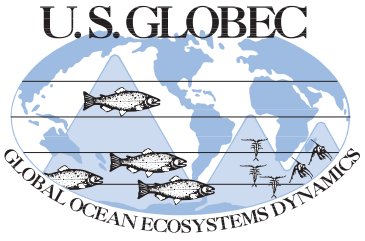
# GLOBEC Northeast Pacific, Northern California Current

## Cruise Report, R/V *New Horizon* (NH0207A)

## 31 July – 19 August 2002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## 31 July - 19 August 2002

**Chief Scientist:**
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**Port of Departure:** Newport, OR
**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.

H. R. Harvey – GLOBEC: The use of molecular organic tracers to determine age structure, nutritional status and potential for trophic transfer in the euphausiids *Euphausia pacifica* and *Thysanoessa spinifera*.

M. Zhou and M. E. Huntley – U.S. GLOBEC Northeast Pacific Study: Mesocale zooplankton distribution and productivity.

Summaries of each of the GLOBEC projects may be found at the web site: http://globec.coas.oregonstate.edu/groups/nep/projs.html.

**Table 1. GLOBEC Cruise Participants**

| | |
|---|---|
| William Peterson (Chief Scientist) | NOAA Fisheries, Hatfield Science Center, Newport |
| Julie Keister (first half; Leg 1) | Oregon State University, Newport |
| Leah Feinberg | Oregon State University, Newport |
| Jaime Gomez-Gutiérrez | Oregon State University, Corvallis |
| Paul Mitch Vance | Oregon State University, Newport |
| Jesse Lamb (second half; Leg 2) | Oregon State University, Newport |
| Caroline Tracy Shaw | Oregon State University, Newport |
| Anders Roestad | Oregon State University, Newport |
| Cynthia Suchman | National Research Council Post-Doc, Newport |
| Scott Maguire | University of Maryland, Solomons |
| Kim Philips | University of Maryland, Solomons |
| Delphine Thibault-Botha | University of Hawaii, Honolulu |
| Terra Bowen | Hawaii Institute of Marine Biology, Kaneohe |
| Christina Vann (Leg 1) | Western Oregon College, Monmouth |
| Elizabeth Jones | Oregon State University, Corvallis |
| Jennifer Menkel (Leg 2) | Pacific States Marine Fisheries Commission |
| Carl Mattson | Electronics Technician, Scripps Institute of Oceanography |

**Cruise Narrative (by Bill Peterson, Chief Scientist)**

**30 July**. Early on the morning of Tuesday the 30th of July, I was driving to work in an expectant and cheery mood. As I was about to cross over the bay on the Yaquina Bay Bridge, I looked towards the sea and saw a familiar ship come sailing in. I quickly pulled off the road and....yes...no mistaking the blue hull and white superstructure...it was the R/V *New Horizon* (also known as the Lost Horizon and No Horizon based on her behavior during rough seas). It was 0700 (Note: times in the narrative are local), and they were here and another GLOBEC Mesoscale Cruise was about to begin. I could hardy wait for liftoff. Seems hard to believe that plans for this day were informally hatched in September 1991 at a meeting in Bodega and were formally (written) laid down as a draft GLOBEC Science Plan at a meeting at the downtown Ramada Inn in Portland in August of 1995. Now, seven years later, we are about to complete our final multi-ship mesoscale survey in the Oregon/ Northern California upwelling zone.

The Newport-based crew was packed and ready. Scott and Kim arrived from the University of Maryland the evening before; Delphine and Terra were due to arrive from the University of Hawaii at 1305 on the Greyhound Bus from Portland; our crew was anxiously awaiting the R/V *New Horizon*. We were uncertain about the ease of loading, since there were to be three ships tied up at the OSU dock, but it wasn't so bad after all. No one was predicting that it would be easy to prepare three ships for sailing from a dock built for two, but thanks to a lot of hard work from the Scripps res-tech group, loading went smoothly. The R/V *Wecoma* was loading and fueling for a four-month effort near Hawaii; the R/V *Roger Revelle* was outfitting for the 21-day GLOBEC trip, as was the R/V *New Horizon*. The R/V *New Horizon* was the last one to the dock so had to settle for tying up outside the R/V *Revelle*. This meant transferring all gear from pallets and cargo nets on the dock first to the R/V *Revelle* then to the R/V *New Horizon*. But Bob Wilson pulled it off and for that we were very thankful. Much of Tuesday was spent bringing gear to the dock and loading; the early evening and next day were spent setting up our gear. Anders and Bob got the MOCNESS all set up, so we were ready. We decided on a departure time of somewhere between 1400 and 1600, and did leave 'on schedule', at around 1430.

First item of business was drills. This was followed by all of us donning our survival suits, always a comic event when watching those who have never even seen one in their life. The first station of course took hours since we had to train our new people and train the R/V *New Horizon* crew. What with working out how best to deploy the CTD, and figuring out how to launch/retrieve the squirrelly vertical net, we spent nearly two hours at the nearshore station. We trained up the night shift first, then at the next station the day shift.

The first day or two is when everything will fail that is destined to fail. Our first incident came at NH10 when the winch wire jumped the sheave. This damaged the wire and meant time lost for cutting the wire and attaching a new thimble. NH10 is also where we noticed that the Niskins weren't firing properly--we figured out that pin 12 was firing rather than pin 13 thus bottle 7 was not tripping. That is all that I'm going to say about that! We worked our way out the Newport Line through the night. Plans for MOCNESS work were cancelled due to failure of something. Anders, and then Julie, spent hours trying this and that. In the end, it looked like the termination was the part of the problem as was our modem. While troubleshooting the MOCNESS, we continued the station work, finishing up the Newport line by 1400 Thursday. We headed south to the BOB Line (Line 3 of SeaSoar Survey plan), arriving around 1700. MOCs were scheduled for BOB5, BOB3 and BOB2, but at about the time that we were ready to launch at BOB5, the MOC quit again. Anders and Carl traced that problem to the termination, fixed it, then we were good to go. The winch certainly wanted to go, in fact we couldn't stop it! Holy cow. What next? Slammed on the brakes, called the Chief Engineer, and he worked his magic. Something about a stuck valve or low pressure in the hydraulic lines. Apparently, this winch had not been used in some time. Not sure what that meant, but once it got warmed up, it was fine.

Did our first set of experiments last night and caught gobs of *Thysanoessa spinifera* at BOB4. Lots of purple females for egg production measurements, lots of juveniles for molting rate determinations, and we even caught four females infested with the dreaded 'krillbola' (Jaime's word for the females infested with the ciliate, *Colinia* sp. nov.). The krillbola story is too long to discuss here, but the discovery of this parasite has us all excited as it represents a significant new source of mortality hitherto unnoticed by any but us yet. We first discovered it on the July 2000 LTOP, then observed it again during MESO-2 in August 2000. Now that we are looking for it, we see it all the time. This discovery will represent our latest attempt at a paper in *Science* or *Nature*. So, far I'm batting 2 for 4 this year in getting published in one those journals. Three for five would be nice (and is nice: the paper will appear in the 18 July 2003 issue of *Science*).

**Saturday (3 August) Morning Report.** Heceta Line (Line 4) was uneventful. We occupied 7 stations (HH1-HH9) getting as far offshore as 125º24'W. Did MOCNESS tows at HH3 and HH5, one of which was an acoustics calibration station with the R/V *Revelle* (HH3). I have not looked at those samples yet to learn what kinds of bugs were in each of the strata. After HH9, we deviated from our original plan. That decision was based on study of the SeaWiFS image of Thursday morning (Fig. 1). It showed high chlorophyll water directly west of HH, along 44ºN with a "backwards comma"-shaped mass of water just to the south. So we steamed southwest from HH9 to stations at 43º48'N 125º36'W and 43º30'N 125º52'W. We then turned west and are now sampling inbound, along a line of stations approximately on Line 6, on latitude 43º30'N. Station locations are 125º52'W, 125º38'W, 125º20'W and 125º10'W. Then we will move south to FM Line (Line 7) and will sample inbound from FM9 to FM1, hitting the normal LTOP stations. At stations along the "comma", we found phytoplankton rich water; the vertical net caught gobs of phytoplankton. *Pseudocalanus* and other coastal copepod species, along with very large numbers of euphausiid eggs. Samples looked like those from BOB1, BOB2, and BOB3 and HH3-HH5. The station at 43º30'N 125º52'W (offshore of the comma) was warm water (15.5ºC) and was dominated by doliolids. Tried for tuna but got skunked. The station at 125º38'W (lower part of the comma) had cool water (12ºC) and was a mixture of gloppy phytoplankton, doliolids and both warm water and cold water copepod species.

We are hopeful of meeting up with the R/V *Revelle* again this afternoon for another acoustics calibration MOCNESS tow along the inner part of the FM Line (Line 7). After Line 7 is finished, I'm tempted to do my own version of a fine scale survey, sampling along lines 8, 9 and 10 within the various chlorophyll-rich streamers that are positioned zonally just north of Blanco and off Blanco itself. We would sample out to 125º25'W on Line 8, 126º along Line 9, 125º25'W on Line 10, then jump down and finish off the survey with Line 12 (Crescent City). We will sample in-bound on the CR line, beginning at 126ºW. If I have got this all worked out correctly, we and the R/V *Revelle* will be finished with the first survey at 1800 on Tuesday.

Saturday was good. We wrapped up the FM line, had several good chats with the R/V *Revelle* and planned (and completed) another acoustics calibration run. In order to make the schedule work, we ran the FM line with vertical net tows only, met up with the R/V *Revelle* towards early evening at FM 4, then repeated some of the FM stations with CTD (for chlorophyll and nutrients). The night crew focused on experimental work and setup experiments on euphausiid molting and egg production rates at both FM5 and FM7. The tow at FM5, in Leah's words, had "nothing.....nothing but euphausiids!" More animals than we knew what to do with. FM7 was the same. We had even caught large numbers of euphausiids in the vertical nets in the daytime at FM7. After that, we steamed down towards Line 9 with a dawn arrival planned. Along the way we sampled on Line 8 at 124º40'W. Both this station and the first two along Line 9 so far have been very cold and very salty water (<9ºC and nearly 34 psu salinity). Our plan for this day is to sample along Line 9, out to, through, and beyond the "eddy" or "meander" (not sure what it is yet so will call it a "meddy") that sits out at 125º45'W. We will do a few MOCNESS tows as well with the hope of getting at least three tows in with one by day, two by night or vice versa, depending upon when we arrive. Yesterday's SeaWiFS image confirms that the "meddy" is still there, but that it has moved towards shore a little bit. Otherwise it has been fairly stationary for the past four days, at least. We also plan a little experimental work if the zooplankton cooperate. We are hopeful of finding coastal bugs and hope to learn if they prosper or perish in such features. We are expecting that they will prosper.

After completing this survey, we will drop down to the RR line (Line 10), working shoreward. My best guess for a starting time on this line is 0600 Monday. Final line for us will be Crescent City which we will run from nearshore out. Not sure how far offshore to go because the cold water appears to extend beyond 127ºW (150 miles from shore). The decision to keep going out beyond 126ºW (which is CR-11) will depend upon what we decide to do for the first fine-scale survey. I'm tempted to stay here in the south for a couple of days since the weather is nice, we have excellent satellite images to guide sampling, and there are lots of interesting features to examine (the eddy at 125º45'W, the chl-rich water at and north of Blanco, and the very cold chl-poor water along the Crescent City line. We'll see.

**Monday (August 5) Morning Report.** We are in the groove and spirits are high. We've done 45 CTD and vertical net tows so far, 10 MOCNESS, and have set up euphausiid egg production and molting rate experiments almost every night. Delphine's work on ctenophore feeding rates and copepod gut pigments seems to be going fine and the chemists from Maryland are getting plenty of data on lipids and phytoplankton in water samples and in euphausiids, and samples of euphausiids for lipofuscein analysis.

Yesterday we worked Line 9 out to 125ºW, with emphasis on sampling the "meddy" centered at about 125.6ºW. We plotted up the CTD casts in realtime, and found that the feature was cyclonic, with isohalines displaced upward by 60

m as compared to water to the east, and isohaline depths in the "feature" were at about the same depth as at the shelf break. Got two MOCNESS tows in the feature by day and two by night. The dominant plankton were doliolids and euphausiid larvae in the upper layers and adult euphausiids down to about 150 m (by day). Saw the same thing by night except that the adult euphausiids were spread throughout most of the upper 100-150 m of the water column. Hence, there was no strong migration.

Today we are working towards shore on the Rogue River Line (Line 10). We are doing a MOC now (0830) at RR7, and should have it aboard and be underway by 1000. The plan is to be at the beach before nightfall so that we can navigate around crab pots if necessary. We'll then steam down to Crescent City line (Line 12), probably sampling at a nearshore station on Line 11 on the way if there is enough daylight. Crescent City line will take about 20 h to complete (with no MOCNESS tows) and probably 30 h with MOCNESS tows. We are considering CR3, CR4, and CR6 by day (Tuesday morning), then returning to repeat them Tuesday night/Wednesday early morning after we have completed the line. Still don't know how far offshore we might go, but certainly to 126ºW.

Hey! One last note...food has been nothing short of terrific on this trip. We had an exquisite meal last night: shrimp, beef, lamb and chicken kebabs prepared on the barbeque on the oh-one deck. Corn on the cob , baked potatoes, green salad. Where else would you want to be than on the R/V *New Horizon*? Life doesn't get much better than this.

Here are some details on the eddy: we had station spacing of 10 miles along Line 9 (42º41'N). Running from inshore to offshore, we saw the normal upwelling signature out to about 125º00'W. The deepest depression of isolines was at 125º12'W. Beginning at 125º12'W, the isolines began to dome upwards in the offshore direction. The 33.5 isohaline sat at about 80 m at 125º12'W, but 40 m at 125º36'W. The 32.5 isohaline was at the surface at approximately 124º55'W, 50 m at 125º12'W, then back at the surface at 125º24'W. Between 126º and 125º48'W isolines were sloped upward toward the coast again. We did not go beyond 126º due to time constraints because we wanted to have time to get in some nighttime MOCNESS tows.

Fluorescence signals were wild. Inshore on Line 9 there was no chlorophyll at all, due to freshly upwelled water, but we were offscale at 125º24'W and 125º48'W! At 125º48'W, we had extremely high values from the surface all the way down to 80 m, and at 125º24'W down to 50 m. At 126º00'W, there was very little chlorophyll, only a small subsurface max at 35 m. The signals are very patchy because when we returned to 125º24'W for a nighttime MOC, the maxima only reached as deep as 30 m. The profile that we just finished at 42º30'N 125º12'W also had very small levels of chlorophyll. Thus, the center of action included a band from 125º24'W-125º48'W.

MOC locations were 42º41' N 125º24'W and 42º41'N 125º36'W (both daytime), 42º41'N 125º24'W (night) and 42º41'N 125º12'W (night) and 42º30'N 125º12'W (daytime). The latter tow is being done right now (1030), on Line 10, just to the SE of the eddy. As I had mentioned in the note above, animals did seem to spread out over the upper 100-150 m both by day and by night. Doliolids (those little reddish-purple coloured gelatinous zooplankton) dominated the upper 10 m and are the dominant grazers. There aren't all that many copepods, but lots of euphausiid larvae and ctenophores. Samples are very gooey with phytoplankton, as well.

Upon our return to the eddy, we will want to sample a station that has the very high chlorophyll down to 80 m (if we can find the spot again) and a station offshore of 126ºW (with the low chlorophyll, with subsurface max). Also, we will want to collect animals for more experimental work, especially from inside and outside of the feature.

**Wednesday (August 7) Report.** Yesterday, I was too busy to write a report and today is looking no different, thus an abbreviated summary. Yesterday, we completed the Crescent City Line–11 stations with CTD's, vertical nets, live tows and 5 MOCNESS tows (day-night pairs at CR3 and CR4, and a day tow in deep water at CR7). Since the weather was so nice, I looked at all of the vertical tows with the microscope yesterday so now have a good feel for distributions of the dominant species. The most interesting result is that the western edge of the eddy that is situated offshore on Line 11 is filled with *Pseudocalanus* (coastal copepod) and very high numbers of euphausiid eggs. These facts show that the water is clearly of coastal origin, and that high chlorophyll concentrations lead to high egg production rates by the euphausiids. We don't know if the euphausiids have been residents of the eddy for an extended period. The eddy is deep (>200 m) so it is possible that the euphausiids have been advected offshore with the eddy. We think this is the case because their normal daytime depth is 150-200 m so they could have been with this eddy for days.

The most interesting observation came in the wee hours of Tuesday morning. The night crew encountered a dense swarm of euphausiids at CR2. Jaime took some pictures with his digital camera and the flash actually caused the euphausiids to leap out of the water! They did this on no less than six occasions. We are thinking of writing a paper to *Science*: "Spy hopping behavior of krill – is it rill?"

Today will be devoted to eddy mapping with the R/V *Revelle*, so Jack Barth (Chief Scientist aboard the R/V *Revelle*) and I will be busy coordinating our sampling. I'll write a lengthy report this evening.

**Thursday (8 August) Report.** Yesterday was spent surveying the eddy. R/V *Revelle* cut across the feature from SW to NW and we followed at nearly the same time, cutting across from South to North. Thus, we have about as synoptic picture of the feature as you could ask. On the western edge, Jack reported a significant chlorophyll max at 80-110 m depth, indicating subduction. We launched the MOCNESS at that station, and targeted the chl-max with nets at 80-90 m, 90-100 m and 100-110 m, in addition to standard depths of 0-10,10-20, 20-50, 50-80, 110-150, and 150-300m. Zooplankton within the deep chl-max were highly stratified, with small medusae, ctenophores and *Limacina* (pteropods) in the 80-90 m strata, small medusae, ctenophores and *Clione* (another species of pteropod) in the 90-100m strata, and euphausiids in the 100-110 m strata.

The vertical nets confirmed what we learned the other day from the eddy: it is definitely of coastal origin (being dominated by coastal copepods, mostly *Pseudocalanus*) and is productive, as indicated by extraordinarily high numbers of euphausiid eggs. We are hopeful of being able to find the eddy next week, and sampling it to determine if older larval stages of euphausiids are present. We should be able to use age of larvae as an indicator of age of the eddy. Based on nearly a week of SeaWiFS imagery, the eddy is nearly stationary. Its shape changes on a day-to-day basis from a circle to an ellipse and back again, but the center remains more-or-less at 42º36'N, 125º36'W.

We finished up the day with a transect across the eddy along 42º43'N. Our last station along this line was at 124º56'W, at which point we found very cold water (8.8ºC) with very high chlorophyll from the surface down to 50 m. If you look at the SeaWiFS image of 7 August (Fig. 2), you see a high chlorophyll tongue extending south, parallel to the coast, about 25 miles off Blanco, and that is the tongue that we sampled. Such high chl at great depth suggests sinking at the outer edge of this tongue, somewhat similar to the sinking that we saw at the outer edge of the eddy. We'll not be back in this area until the middle of next week, but if these features hold, we should have a most interesting fine scale survey in the south. Also, from the same image, note the filament that is streaming SW beginning at 42ºN 125ºW. It looks like it might be continuous with the feature mentioned above. Give this feature a few more days and it should be a well developed feature worthy of intense study by the *Revelle-New Horizon-Frosti* team.

We are now steaming north toward the Newport Line, and will sample from NH45 in to the beach. Will arrive at NH45 at 1400. We will sample inbound with CTD and vertical nets. We plan day-night MOCNESS tows at NH20 and NH25 along with experimental work. We hope to link up with the R/V *Frosti* on Friday morning in the vicinity of Newport, but if not, we might do some more acoustics calibration tows with the R/V *Revelle*. Jack and I will talk later today or tomorrow morning about plans for the fine scale survey. Based on results of our plankton sampling, the most interesting places for fine scale seem to be along Line 4 (the Heceta Line). Salmon are there, whales are there, and there was lots of zooplankton when we were last there. Line 4 is the better choice (as opposed to Line 3, which has thick pea soup phytoplankton, much less fun to sample since it clogs the nets badly). The other advantage of Line 4 is that we can sample along the southern edge of the Bank, looking at retention-loss of coastal bugs from the Bank.

So....this cruise is shaping up to be as interesting as the one in August 2000. But it is far better in other regards: it has been easier on the crew and we have gotten more work done due to great weather. The greatest difference is the clear skies. There is nothing like daily SeaWiFS images to allow one to prepare and modify daily sampling plans! Thanks to all on land who are helping to make this trip a success.

**Friday (9 August) Report.** Arrived at NH45 at 1500. Did the usual sampling (CTD, chlorophyll and nutrients, and vertical net), then on to NH35, NH25, etc. Did MOCNESS tows by night at NH25, NH20 and NH15, and live tows for experimental work at the same stations. Everybody got good data last night because there was an abundance of euphausiids. There were adult euphausiids at all stations, and as close inshore as NH10. We don't usually catch adults that close inshore. This morning we are working outbound on the NH line in order to get a repeat hydro and plankton section, and to pick up MOCNESS tows by day at NH15, NH20 and NH25. We hope to meet up with the R/V *Frosti* sometime today, but at this time I do not know their status—they returned to port last night to exchange personnel and to get the compass fixed. Perhaps we will meet up with the CritterCam folks from the National Geo-

graphic, but we don't know their plans either. A phone call to Hal is on the schedule later this morning.

Tonight will be more experimental work, with grazing work on euphausiids and copepods planned. We are also considering a MOCNESS tow at dusk whereby we sample a single strata for 1.5 hours to test the hypothesis that younger and smaller euphausiid migrate earlier than older, larger stages. We will probably sample at 75 m. Saturday morning we make a quick stop at Newport to pick up more sample jars, more formalin, and a few odds and ends. Also, we are doing a personnel swap – two old hands off and two new hands on. Tomorrow (Saturday) we will head south to Heceta Head region for more sampling and more experimental work. This is the only line where we found high numbers of *Calanus*, so Delphine is pumped about getting some grazing work done on them.

Weather is beautiful, seas are reasonably calm, so we expect to link up with the CritterCam folks if not today, either tomorrow, Sunday or Monday. After that we head south again. [Aside: The National Geographic CritterCam effort was plagued by inclement weather—too rough for the small inflatable work required to deploy, follow and retrieve the camera from the humpback whales.]

Thanks again to all responsible for all the shore-side support and especially for the Iridium phone. We make twice-daily downloads from the website to grab the Seasoar, OPC and acoustics data from the R/V *Revelle*, and SeaWiFS and AVHRR data that Corrine (Corrine James from Ted Strub's lab) posts. Also, the radar data are extremely useful to us when we are working up here in the northern region. I think back to the communications problems experienced during the June and August 2000 trips and groan. I hope someone saved all those faxed messages and e-mails. Remember your messages Ted: ".....well Bill, there is a narrow filament of water, comma-shaped, extending from the coast at 42º30'N 124º45'W trending towards the SW, then hooking around towards the north at 42 43'N 125º34'W....., or ,...."what appears to be a warm meander is centered at 43º45'N 125ºW and it may have its origins on the Bank.....". We did all we could back then (including a cessation of operations on two occasions so that I could ride the Zodiak over to the R/V *Wecoma* to pick up data from Jack). Those were the days. But, my, how things have changed. With near-real time data, we are out of control. So much to do.... time is running short... gotta run and do more sampling...

**Sunday (11 August) Morning Report.** Port stop was good. Exchanged personnel, picked up more sample jars and formalin and few odds and end that we had forgotten to pack, and got fresh fruit and veggies. The port stop also gave us an opportunity to re-terminate the MOCNESS. It had been performing poorly at most stations, with the modem losing communications several times during each cast. We never suffered loss of data, but it was annoying. Anders and Carl had time to look at the termination, found it suspect, and re-did it. Now the MOC is working well (we've done three since leaving Newport), with no loss of comms. Good news!

We left port and turned left at the whistler. Sampled BOB1 (mostly to check out the jellyfish situation for Cynthia), then proceeded to HH1. Met up with the R/V *Frosti* at BOB1. They looked good. Nice boat. Wind came up in the late afternoon and we thought we had had it. Blew a gale (35 knots) for a while there, but the winds were not sustained for more than ½ hour. Seas got sloppy, but by the time we pulled into HH3 at 2100, winds had dropped to 20 knots so we were able to MOC at this station. Finished up the HH line by dawn, with MOC by night at HH3 and a day-night pair at HH5. We are now heading for Line 4A, southern end of the northern fine scale and are scheduled to complete it at 1800. Then it is on to FM1 with sampling at nearshore stations along the way (5-1 and 6-1). We expect to begin running outbound along FM line (Line 7) at around midnight.

Whoops....just talked with Jack so the above mentioned plans have all changed. A huge concentration of humpback whales have been sited near HH4 so we are headed up there for an afternoon rendezvous with the R/V *Revelle* and R/V *Frosti*. Looks like a couple of MOCNESS and pelagic trawls are in order. Too bad that it is almost certainly going to be too windy for the folks from National Geographic to come out and join us.

**Monday (12 August) Report.** Started the day with a day-night pair of MOCNESS tows at HH5 (1000 m depth), then headed south to sample Line 4A. This line is the southern limit of the northern fine scale box. Our chief interest in this box is to see if we are experiencing any Heceta Bank overflow. It is an interesting line to sample because Line 4A is just south of the bank, in deeper water than the bank, thus if coastal currents track the bathymetry, then as you move off the Bank to the south, the hydrographic properties and the plankton should look the same as if you moved off the Bank to the west. Thus, if there is NO overflow, then one should see deep water zooplankton species and fewer coastal species at stations along Line 4A than if you were on Line 4 but at the same longitude. If there is significant overflow, then we should find that coastal species are the dominant forms along all stations on Line 4A. So that is the hypothesis. We sampled only three stations before breaking off to head north to sample near the whales on Line 4. Met the R/V *Frosti* at around 1600; saw lots of whales; hung out waiting for the R/V *Revelle*. They

arrived at around 5 pm and we did a MOC and fish trawl along with acoustics. All zooplankton were packed into the lower 10 m of the water column and the dominant critters were euphausiids and C5 *Calanus marshallae*. We then waited until dark for a repeat MOC. R/V *Frosti* and R/V *New Horizon* towed nets side by side, spaced by about 1 mile, while the R/V *Revelle* steamed between us, towing the acoustics and reporting the depth of various layers. Worked out extremely nicely! Upon completion, we did a live tow at the same station and set up euphausiid egg production and juvenile euphausiid molting rate experiments. Then it was back to Line 4A. Finished it up at 0600. Did one more live tow for experiments and also found large numbers of jellyfish for Cynthia. We don't see them at the surface when it is windy. Not sure if this is because of visibility or because the animals actively avoid the surface layers when winds blow in excess of 15 knots.

We are now heading for the FM line and will be there momentarily. Will work it offshore to FM9 or FM10, then will steam to Coquille Bank (124º50'W on Line 8). Will work in that area tonight. Not sure yet if we will work Line 8 as a transect or just remain on/near the Bank to collect animals for experiments during the night. Depends on what we catch. After that, we will sample along Line 9, likely beginning at the outer end at 125º12'W and working eastward. We will then work the RR Line Tuesday night/Wednesday day. Next stop is the eddy and we will be there Wednesday night, chiefly for experimental work but we will probably do another day-night MOCNESS pair. Thursday night and Friday will be spent working Line 11 eastward. After that, our schedule is open. We would like to do a diel study somewhere (either Line 11 or Line 12) to look at euphausiid vertical distributions. This is the region where the animals appear to not vertically migrate very much, if at all. We will finish off the cruise with another run of the Newport Line beginning at the offshore end (NH65) at around 1000 Sunday. We will be finished by 0600 Monday the 19th and then dockside by 0730 or so. I plan to put together a more detailed plan later today, but what I have outlined above sums up the results of our scientific meeting last night.

**Tuesday (13 August) Morning Report.** FM Line was under the influence of coastal upwelling. We found low temperature-high salinity-low chlorophyll water all the way out to FM7 (66 km from shore, water depths of 350 m). The zooplankton community was dominated by a coastal assemblage of copepods and chaetognaths. The waters at FM9 were high in chlorophyll, reflecting their origin from Heceta Bank. The R/V *Revelle* worked the same line as us with CTDs so we were able to save a bit of time by not having to do the CTDs at the outer stations. Thanks Jack. Next we headed down to Line 8, reported to be the home of many birds and mammals. We began at a station just seaward of the Coquille Bank (124º52'W, followed by 124º49'W, 124º40'W and 124º35'W). There were euphausiids everywhere and moderate-to-high concentrations of phytoplankton. I suppose Coquille Bank must be somewhat retentive given that euphausiid numbers were high there. If so, this could explain the high numbers of birds and mammals. We worked all of that line in the night so have no idea about where and how many birds and mammals there may have been.

Steamed south from the inshore end of Line 8 to Line 9. The eastern end of Line 9 sits at Cape Blanco and Port Orford. Lovely part of the coast. And a beautiful sunrise to boot, so they tell me. The vertical net tow from the first station on Line 9 was a deep green color indicating thick phytoplankton—just in the lee of the Cape—an upwelling shadow. Water is very cold here as well, but with higher chlorophyll than Line 7. If you have been checking the daily SeaWiFS images, we can confirm that the ocean looks just like the SeaWiFS image of 12 August (our most recent picture, Fig. 3). The big green spot along 43º13'N is the FM line, and the rich chlorophyll regions were well sampled on Lines 8 and again on Line 9.

We sample today out to 125º20'W on Line 9, at which point we will turn toward south of west to intersect the eddy for one final visit. Along the way, we will stop within and on either side of the high chlorophyll filament that appears to be connected to the blob of high chlorophyll water centered at 43ºN 124º50'W (Fig. 3a). Will watch the underway chlorophyll data to pick the stations. This trip to the eddy is meant to learn if the euphausiids have gotten older. Also, we may be able to derive a mortality estimate of euphausiid eggs–>larvae. And we need another night of experimental work to determine if this eddy is moderately productive vs. highly productive. We know that the euphausiids like it (based on high concentrations of eggs) but we do not know the rate at which eggs are laid. We will know more about that tomorrow.

After the eddy, we will steam a bit farther offshore in search of oligotrophic waters. We need some data points that are outside of the nearshore, highly productive region. With the massive amounts of upwelling that we have observed this year, the system has been so broadly dispersed that we've only sampled the "deep blue sea" once. After we find it, we return to the coast, coming in on Line 11 tomorrow (Wednesday) morning. The schedule calls for experimental work Wednesday night/Thursday morning at coastal stations on Lines 11 and 10. Thursday, during the

day, we will repeat Line 10 (RR) with a couple more MOCNESS stations for the Harvey group. This will leave us Friday night/Saturday for an abbreviated diel study somewhere, if we have time. We know that we want to run the Newport Line one final time and that activity must begin by Sunday at noon in order for us to make it in to Newport by Monday morning. Therefore, there may be no time for a diel study.

**Wednesday (14 August) Morning Report.** Sampled the eddy last night but missed the center. Just nicked the SE edge. Nonetheless, the transect did show lots of phytoplankton and coastal zooplankton (but in lower numbers than we saw last week). The euphausiids had in fact developed to calyptopis stage. There were no new euphausiid eggs. Set up experiments last night at the eddy stations for euphausiid egg production and molting rates. Massive numbers of doliolids were found along the southern and eastern sides of the eddy. On the way to the eddy from the end of Line 9, we sampled one of those high chlorophyll streamers and found it to be full of coastal zooplankton species. So, I think we have confirmed from this cruise that those high-chlorophyll streamers that project off the coast contain coastal species, and as such, must maintain their integrity for a period of days to weeks. This is in opposition to August 2000 when we sampled a streamer that extended from Cape Blanco north and west to 126ºW, 44ºN. That feature, though moderately rich in phytoplankton, had entrained oceanic warm water species.

**Friday (16 August) Report.** Wednesday night was spent finishing up Line 11 with CTDs, vertical net tows and MOCNESS. We then proceeded up to Line 10 (Rogue River Line) in the early hours of Thursday, but ran into high winds. It blew a gale (> 35 knots sustained winds) starting at about 0100 on Thursday. The seas built very quickly and we had to shut down operations. We hove to for six hours, then steamed north to Line 9 and things improved a bit, so thinking that things had improved everywhere, we returned to RR once again, but encountered even higher winds. Tried a station, but then the Vertical Tow winch broke down. Got that fixed after three hours and the winds were even stronger by then. So, I accepted defeat and steamed north to Line 8. As you might guess, we no sooner rounded Cape Blanco than the wind speed dropped by half. Sampled a couple of stations on Line 8 (over Coquille Bank) to find a good spot to do a diel feeding study and selected station 8-4 which is near the southern end of the Bank. Did a CTD and Live Tows every hour or so for gut pigment content of euphausiids (Peterson) and copepods (Delphine). Did a MOCNESS beginning at dusk, sampling along a single depth strata (75 m) for more than one hour. We tripped a net at the same depth every 7-8 minutes, to test the hypothesis that younger stages of euphausiids and copepods begin to migrate earlier than older stages. Hypothesis was confirmed for euphausiids: the first two time points contained furcilia, the next two both furcilia and juveniles, then the adults showed up. The only disappointment was that even the final net, which was tripped well past dark, still had lots of adult euphausiids. This shows that not all animals move to the surface at dark. We plan to repeat this type of MOCNESS tow tonight and tomorrow night as well.

S**aturday (17 August) Morning Report.** The diel study on Coquille Bank went well. The MOCNESS tow that we did Friday night in which we sampled one depth strata (75 m) for 60 minutes confirmed our hypothesis that younger stages begin to vertically migrate before older stages. We also found a tremendous increase in euphausiid biomass as the sky darkened. For experimental work, zooplankton was sampled every hour or so for gut pigment content. Jaime also set up some euphausiid egg productions. The day shift continued with euphausiid and copepod gut pigment work until 1000 at which time we then resampled Line 8 with vertical nets and CTDs. We returned to the same station as last night (125º50'W) for repeat sampling of bugs during the crepuscular hours. The study also included a daytime and nighttime MOCNESS. We found Coquille Bank to be fascinating in that there were buckets of euphausiids. No surprise that birds and mammals like this place. Last night we threw a bucket in to gather some seawater and actually caught 40 euphausiids! We confirmed from the MOCNESS what was so nicely shown on the HTI—that euphausiids are present throughout the water column both by day and by night.

Steamed to Heceta Line in the night and are presently working out that line as far as HH5. Will work HH5 tonight for an abbreviated diel study (we will occupy that station for 12 hours, from 1800 to 0600). Fog is very thick here which means that there will no data on birds and mammals from this rich and productive line.

**Sunday (18 August) Morning Report.** First to answer Jack's question yesterday about bird and mammal sightings on Coquille Bank: we spent a day and a half there (mostly at night, though) but did not see any whales. The birds were mostly black-footed albatrosses. I had asked the bridge to keep an eye out for whales and they saw only one (probable) humpback. Maybe they ate all the herring that were there? We certainly found large numbers of euphausiids.

Second, yesterday we ran the HH line out to HH5, then did another diel study (though for only 12 hours between 1800-0600, so did get the dusk and dawn periods sampled). Got another day-night MOCNESS pair. And did another of those tows where we leave the net at one depth and sample at dusk for 75 minutes to see the progression of animals migrating to the surface. The results were similar to the tow at Coquille Bank—smaller euphausiids were present in the first samples, larger ones in the latter samples, along with the larger mesopelagic fishes and sergestid shrimps. Also, biomass increased 500% between the first and last samples.

One troubling thing that we have learned from this cruise is that we are now convinced that the MOCNESS does not sample euphausiids adequately during daylight hours. We always catch far more of them by night than by day. We've seen it in the acoustics as well, in our comparisons of sample volumes vs. volume backscatter. Anders will show this result at the November 2002 Scientific Investigator meeting. During this cruise, we had about a dozen opportunities to take day and night MOCNESS tows at the same station within a few hours of each other, and in every case, we caught far more euphausiids in the nets at night than by day. Possibly even an order of magnitude more. One might argue that 'spatial heterogeneity' can explain the disparity in some of the samples, but when every tow comes up with the same result, you have to start believing that euphausiids are very capable of avoiding towed nets during the day. This finding underscores the great importance of our acoustics program because it is only these data that will give us reliable estimates of euphausiid biomass. And it makes the acoustics data analysis all that more challenging, especially the daytime data, because all of our day-time MOCNESS net tows will be of limited value for calibration as Anders and Steve struggle to interpret the persistent high biomass that we see in surface layers. MOCNESS does catch euphausiid eggs and larvae, copepods and chaetognaths, and a host of other weaker swimming critters, but the euphausiid adults are another story. They are strong swimmers, they can see, and they are smart. Any animal that can leap out of the sea by several body lengths, as we know euphausiids can do, should easily be able to avoid a towed net. Imagine a humpback whale jumping a hundred feet into the air! Euphausiids have the equivalent ability as Jaime, Anders and Leah found the other night when they took flash pictures of a euphausiid swarm.

We are headed for NH45 at present and are due to arrive at 0915. Will sample inbound during the day with a final day-night MOCNESS pair at either NH25 or NH20. We then will repeat stations NH10, NH15, NH20 and NH25 at night for net tows for euphausiid abundance, and one last night of euphausiid and copepod egg production measurements.

**Monday (19 August) Report.** The final hours passed without incident. The Newport Line was completed as planned and we even took advantage of a final opportunity of an acoustics calibration at NH25 during the nighttime MOCNESS tow. Set up some final copepod egg production incubations at both NH15 and NH5; collected some more jellyfish. Arrived dockside at 0800 and began the offloading process. This took most of the day. After offloading, sweeping, mopping and vacuuming our labs and rooms, we looked forward to the BIG PARTY at the Rogue Brewery organized by our way cool captain, Wes Hill. Had a great turnout—officers and crew members from both theR/V *New Horizon* and R/V *Roger Revelle* partied along with most of the scientists from the R/V *New Horizon*, and the OSU Marine Techs and Chief Scientist (Jack Barth) from the R/V *Roger Revelle*. (Note: all you party poopers from the *Revelle* missed a fabulous party). Party ended at 2100, some of us went home and that ended the odyssey. I understand that others (not to be named) partied until the wee hours.

**Preliminary Synopsis of Cruise Results**

53 Live Tows to collect animals for grazing, egg production and molting rate measurements (Table 4)
156 CTD casts with nutrients and chlorophylls sampled from 6-8 depths (Table 5)
44 MOCNESS Tows (including at least six acoustics calibration runs) (Table 6)
18 Secchi depth determinations (Table 7)
172 vertical net tows (Table 8)

We tried really hard not to take fewer MOCNESS tows this year but failed in this endeavour. Despite the net's problems, we continue to enjoy using it, in part because we seem to learn something interesting in almost every tow.

**Report from Zooplankton Sampling Team**

Comments on apparent differences in zooplankton community structure from north to south and inshore to offshore.

Euphausiids live shallower in the water column at CR, RR and Line 9 (the only lines from which we have daytime MOCs in the south), than along the NH or FM lines further to the north. We are not sure what this means yet but the observation has been made on LTOP cruises, as well.

During this cruise, there seemed to be a greater abundance of coastal species in offshore waters south of Heceta Bank, particularly along Lines 7 through 10 and this "maps" onto the SeaWiFS data which showed high chlorophyll water coming off the coast between Lines 7 and 9. In terms of copepod species composition, preliminary notes of the vertical net tow contents made at sea suggest that *Pseudocalanus* is the only coastal species that successfully populates offshore waters. *Acartia longiremis* also fairs well. But *Calanus marshallae* are uncommon in samples collected south of Heceta Bank (we noticed this in the August 2000 surveys and in all summer LTOP cruises, as well). *Centropages abdominalis* is rare in samples south of Heceta Bank whereas *Eucalanus* spp. are quite common in the south, less so in the north.

Doliolids have captured my interest and I reckon that I must educate myself on their biology and ecology very soon so as to write a paper on their occurrence off Oregon. They are in offshore waters but not the "blue oligotrophic" water, rather at the outer edge of the "upwelling zone". To what degree we can define that "edge" is not clear at the moment but we certainly have the data to test the notion of them being associated with some defineable "edge" (i.e., the Seasoar sections of T, S, $F_t$, and chlorophyll). Doliolids are always abundant in offshore samples collected in summer, so deserve attention as they must consume a large proportion of the phytoplankton standing crop.

I think there may be some meaningful data in the species composition of the "net diatoms". We catch more phytoplankton than we might like in our plankton nets and it is clear from a cursory examination that species composition of samples from Heceta Bank are very different from that in "coastal waters" that have been swept offshore by the jet. Diatom genera caught in coastal waters are *Thalassiosira* whereas offshore species are colonial *Chaetoceros* species. Another thing that is different this year is the lack of radiolarians.

We also saw, for the first time, a real swarm of euphausiids at night (Station CR3). Flash pictures caused them to jump out of the water. Euphausiid swarms were also observed at night on Line 8. Jaime is also documenting the occurrence of the dreaded krillbola problem.

Hydrography along Lines 7, 8 and 9 interesting. Moving offshore, the coastal upwelling band meets low salinity water then farther from shore we see higher salinity water and perhaps a divergence, then low salinity water again. Phytoplankton are in the surface mixed layer in the upwelling zone, subsurface in low salinity downwelling zone, then upper mixed layer again in the upwelling zone. The dynamics responsible for this complex pattern are unclear to me.

**Table 2. Euphausiid Molting Rate Experiments**

| Station | Date | Time | #animals | | | Life Stage |
|---|---|---|---|---|---|---|
| NH20 | 8/9/02 | 0010 | 30 | x | x | adults |
| BOB4 | 8/2/02 | 0215 | 30 | x | x | adults |
| FM5 | 8/3/02 | 2309 | 30 | x | x | adults |
| FM7 | 8/4/02 | 0130 | 30 | x | x | adults |
| FM7 | 8/4/02 | 0130 | 30 | x | x | furcilia |
| 9-7b | 8/5/02 | 0200 | 31 | x | x | adults |
| CR4 | 8/6/02 | 0030 | 30 | x | x | adults |
| CR3 | 8/6/02 | 0400 | 30 | x | x | adults |
| CR2 | 8/6/02 | 0545 | 20 | | x | adults |
| EN3 | 8/7/02 | 0530 | 22 | x | x | adults |
| 2-5 | 8/9/02 | 2145 | 30 | x | x | adults |
| 2-4 | 8/9/02 | 2330 | 30 | x | x | adults |
| 2-4 | 8/9/02 | 2330 | 30 | | | furcilia |
| HH3 | 8/10/02 | 2245 | 30 | x | | adults |
| 4a-3 | 8/12/02 | 0145 | 30 | x | x | furcilia |
| HH4Hb | 8/11/02 | 2300 | 30 | x | x | furcilia |
| 8-4 | 8/13/02 | 0030 | 30 | | | furcilia |
| ED3 | 8/14/02 | 0145 | 30 | x | x | calyptopis |
| ED3 | 8/14/02 | 0145 | 30 | | | furcilia |
| ED4 | 8/14/02 | 0300 | 28 | | | furcilia |
| 11-2 | 8/14/02 | 2200 | 30 | x | x | furcilia |

**Table 3. Euphausiid Egg Production Measurement Experiments**

| Station | Initial Date | Final Date | Collect Time | *Euphausia pacifica* | *Thysanoessa spinifera* | *Nematocelis difficilis* | *Thysanoessa inspinata* | Total |
|---|---|---|---|---|---|---|---|---|
| BOB4 | 2-Aug-02 | 4-Aug-02 | 0215 | 0 | 4 | 0 | 0 | 4 |
| BOB3 | 2-Aug-02 | 4-Aug-02 | 0530 | 0 | 38 | 0 | 0 | 38 |
| HH5 | 2-Aug-02 | 4-Aug-02 | 2100 | 0 | 0 | 2 | 0 | 2 |
| FM5 | 3-Aug-02 | 5-Aug-02 | 2309 | 14 | 0 | 0 | 0 | 14 |
| FM7 | 4-Aug-02 | 6-Aug-02 | 0130 | 18 | 13 | 0 | 0 | 31 |
| 9-7B | 5-Aug-02 | 6-Aug-02 | 0310 | 7 | 0 | 0 | 0 | 7 |
| CR4 | 6-Aug-02 | 8-Aug-02 | 0030 | 20 | 1 | 3 | 0 | 24 |
| CR3 | 6-Aug-02 | 8-Aug-02 | 0400 | 9 | 1 | 0 | 0 | 10 |
| CR2 | 6-Aug-02 | 8-Aug-02 | 0545 | 0 | 11 | 0 | 0 | 11 |
| NH25 | 9-Aug-02 | 11-Aug-02 | 2000 | 0 | 0 | 0 | 0 | 0 |
| NH20 | 9-Aug-02 | 11-Aug-02 | 0100 | 8 | 4 | 0 | 0 | 12 |
| NH15 | 9-Aug-02 | 11-Aug-02 | 0300 | 12 | 18 | 0 | 0 | 30 |
| 2-4 | 9-Aug-02 | 11-Aug-02 | 2330 | 14 | 0 | 0 | 0 | 14 |
| 2-3 | 10-Aug-02 | 12-Aug-02 | 0145 | 6 | 17 | 0 | 0 | 23 |
| HH3 | 10-Aug-02 | 12-Aug-02 | 2315 | 34 | 30 | 0 | 0 | 64 |
| HH4HB | 11-Aug-02 | 13-Aug-02 | 2300 | 0 | 6 | 0 | 0 | 6 |
| HH5 | 11-Aug-02 | 13-Aug-02 | 0510 | 11 | 4 | 1 | 0 | 16 |
| 4A-3 | 12-Aug-02 | 14-Aug-02 | 0145 | 9 | 21 | 0 | 0 | 30 |
| 8-4 | 13-Aug-02 | 15-Aug-02 | 0030 | 1 | 8 | 0 | 0 | 9 |
| 8-3 | 13-Aug-02 | 15-Aug-02 | 0230 | 0 | 10 | 0 | 0 | 10 |
| ED3 | 14-Aug-02 | 14-Aug-02 | 0145 | 0 | 0 | 1 | 0 | 1 |
| ED4 | 14-Aug-02 | 16-Aug-02 | 0300 | 7 | 0 | 0 | 0 | 7 |
| ED5 | 15-Aug-02 | 14-Aug-02 | 0500 | 3 | 0 | 0 | 0 | 3 |
| 8-4A | 15-Aug-02 | 17-Aug-02 | 2200 | 3 | 7 | 0 | 0 | 10 |
| 8-4D | 16-Aug-02 | 18-Aug-02 | 0130 | 9 | 3 | 0 | 2 | 14 |
| 8-4 | 16-Aug-02 | 18-Aug-02 | 2300 | 1 | 9 | 0 | 0 | 10 |
| HH5 | 17-Aug-02 | 19-Aug-02 | 1830 | 0 | 0 | 5 | 0 | 5 |

**Report on Copepod Egg Production & Molting Rate Measurements**

| | | | |
|---|---|---|---|
| 17 Aug 02 | 8-4 | Egg production: Pm, Cm, Rhincal. | Molting Rates Cm $C_4$, $C_5$ |
| 17 Aug 02 | HH3 | Egg production: Pm, Cm, Cent, Eucal. | Molting Rates Cm $C_4$, $C_5$ |
| 18 Aug 02 | HH5 | Egg production: Pm, Cm, Cent, Eucal | |

Pm = *Pseudocalanus mimus*; Cm = *Calanus marshallae*; Rhincal = *Rhincalanus nasutus*; Eucal = *Eucalanus californicus*; Cent = *Centropages abdominalis*

**Report from Rodger Harvey (University of Maryland Group)**

For the July-August 2002 Mesoscale NEP cruise, our primary goal of this project was to determine the population age structure and nutritional condition of the two major euphausiid species *E. pacifica* and *T. spinifera* using cellular peroxidation products (collectively called lipofuscins) and organic biomarkers (i.e., fatty acids, sterols, algal pigments). Our field group consisted of Scott Maguire and Kim Philips. Euphausiids were collected using 1m MOCNESS or vertical tows at selected stations along the cruise track (19 stations total). Different size classes of krill were sorted and more than 100 individuals sampled for lipofuscin analysis, providing an unbiased and adequate number for statistical analysis. These individuals were immediately frozen at -20º C. For lipid analysis, animals were also sorted with different life stages (i.e. furcilia, sub-adult, and adult) and immediately frozen. To understand in-situ phytoplankton community composition (considered potential diets for krill), particles were collected on GF/F (pore size-0.7mm) from 3 different depths (surface and chlorophyll maximum) at 29 different stations. Collected particle samples were immediately frozen for analysis in the shore-based laboratory. These particle samples will be analyzed for lipid, photosynthetic pigments, and total particulate carbon and nitrogen. Several samples (animals and particles) were collected from inside observed eddies (station 9-7a, 9-7b, 9-8a, and EW1) to examine the interaction between biology (krill, algal composition, etc.) and dynamic physical features in this study area.

**Report from Delphine Thibault-Botha (University of Hawaii Group)**

Our process studies focused on understanding zooplankton *in situ* population dynamics processes and the interaction between physical and biological processes. We use the **gut fluorescence technique** on different stages and sizes of target species (*Calanus marshallae*, *Pseudocalanus* sp.) as a direct index of feeding activity. Spatial variability of gut fluorescence reflects variability in nutritional state, and may be positively correlated with other proxies of high growth rate. Sub-samples from Bongo net catches were immediately filtered through 200-mm mesh, and then frozen in liquid nitrogen. **Gut evacuation rates** were also measured on other sub-samples from the bongo. This sub-sample was filtered through 200-mm mesh and placed in filtered sea water (GGF) and placed in fridge set at in situ temperature. Sub samples are collected at 5, 10, 15, 30, 45, 60, 90 and 120 min and frozen in liquid nitrogen. Samples will then be sorted under the microscope using a dim light in the lab. Animals sorted by species and stages will be placed in absolute methanol. Pigments will be extracted in dark at 4°C for 24 h, and measured fluorometrically following standard procedures. When enough copepods where available, sub-samples for DNA and RNA samples (growth rates) were also taken. Gelatinous zooplankton were very common. Experiments on feeding rates by ctenophores (*Pleurobrachia*) were conducted whenever possible. Siphonophores were also collected using buckets or large non-filtering cod end nets.

**<u>August 2002 cruise Meso4</u>**

| | |
|---|---|
| Team: | Delphine Thibault-Botha and Terra Bowen (University of Hawaii). |
| Stations sampled: | 35 |
| Samples collected for gut fluorescence: | 50 samples |
| Gut evacuation rates experiments: | 15 experiments |
| Others samples collected for DNA/RNA measurements: | 46 |

A general low abundance of copepods was observed over most of the study area, and large number of gelatinous zooplankton (medusae, siphonophores, ctenophores) were observed. We focused then on ctenophore and siphonophores, by collected specimen for gut contents, feeding rates, biomass in order to measure their importance on the local food web and the potential threat to local fisheries, by reducing the amount of copepods available to the euphausiids and fish larvae.

*Pleurobrachia* feeding rates = 5 experiments
*Pleurobrachia* length/weight measurements
*Pleurobrachia* length and weight loss due to preservation with formalin solution
Siphonophores samples = 25

**Report from Cynthia Suchman (NRC Post-Doc, Hatfield Science Center)**

Large medusae were collected from surface waters at selected stations using a dip net. Individuals were immediately preserved in formalin, with all samples brought back to HMSC for gastric content analysis. The goal was to use diet information in conjunction with zooplankton data (from vertical hauls on station), to estimate feeding rates and prey selection by the large medusae commonly found in the GLOBEC NEP CCS study region.

The following samples were obtained during Meso-4 (date, station, number of individuals and species):

| | | |
|---|---|---|
| 4 August | 8-2 | Small numbers of *Mitrocoma cellularia* and *Eutonina indicans* |
| 5 August | RR-3.5 | 9 *Aurelia labiata* |
| 5 August | CR-4 | 10 *Aurelia labiata* |
| 12 August | 4A-1 | 11 *Chrysaora fuscescens* |
| 13 August | 9-0 | 12 *Phacellophora camtschatica* |
| 17 August | HH-1 | 2 *Chrysaora fuscescens* |
| | | 5 *Aequorea* sp. |

**Acknowledgements**

We thank Captain Wes Hill and the crew of the R/V *New Horizon* for their hard work and helpful attitude during the cruise.

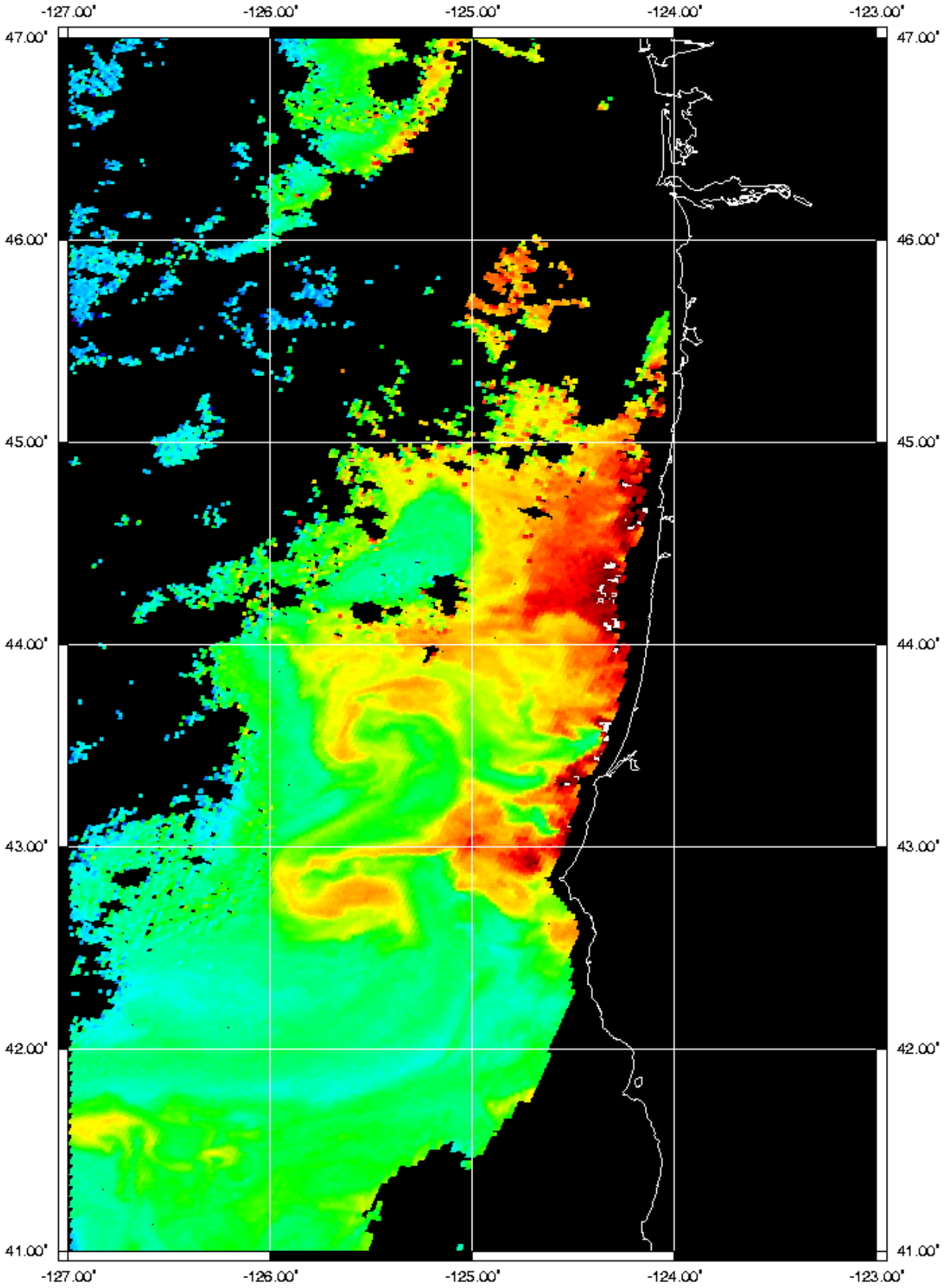


Figure 1a: August 1 SeaWiFS Image

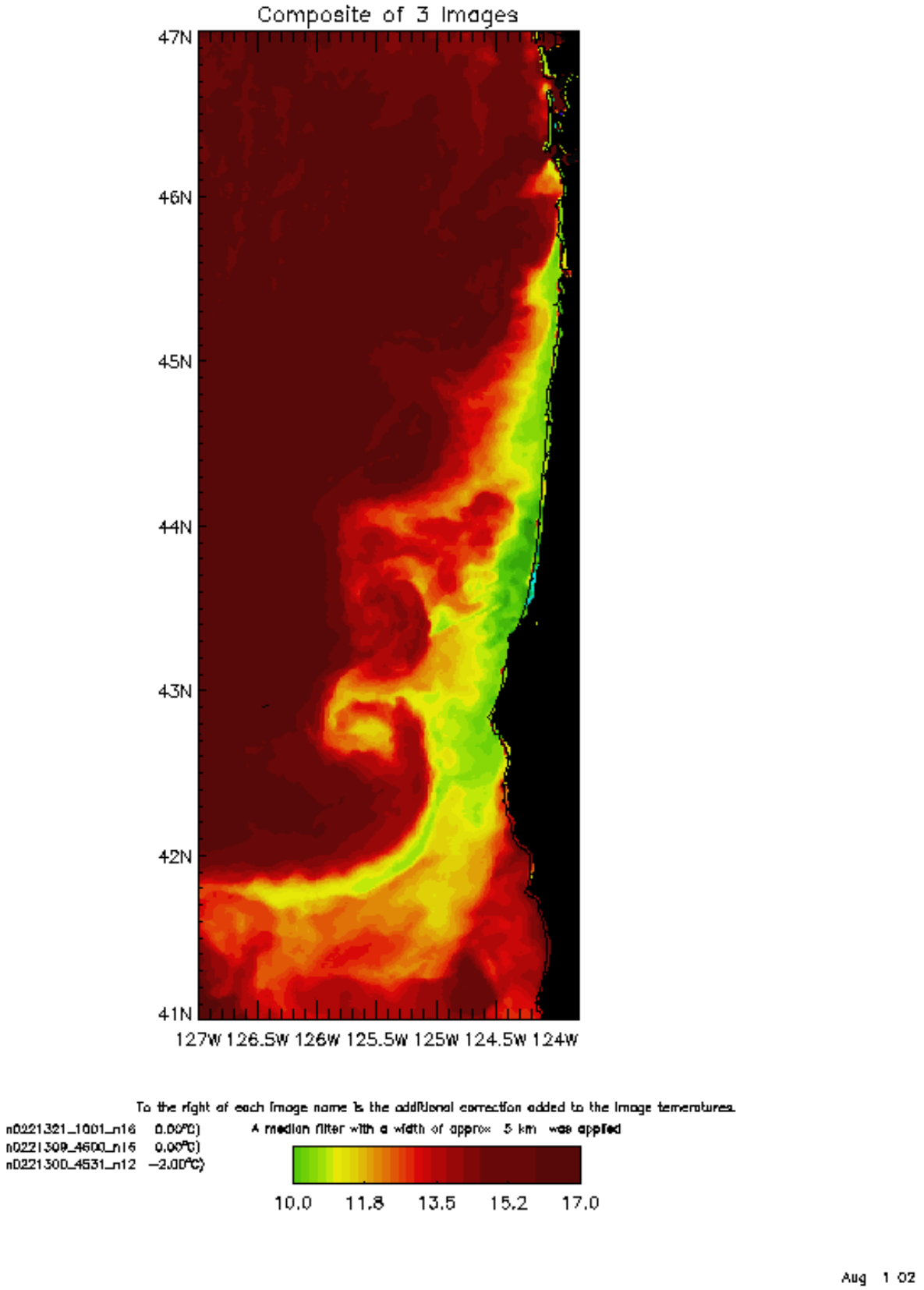


Figure 1b: August 1, 2002 AVHRR SST.

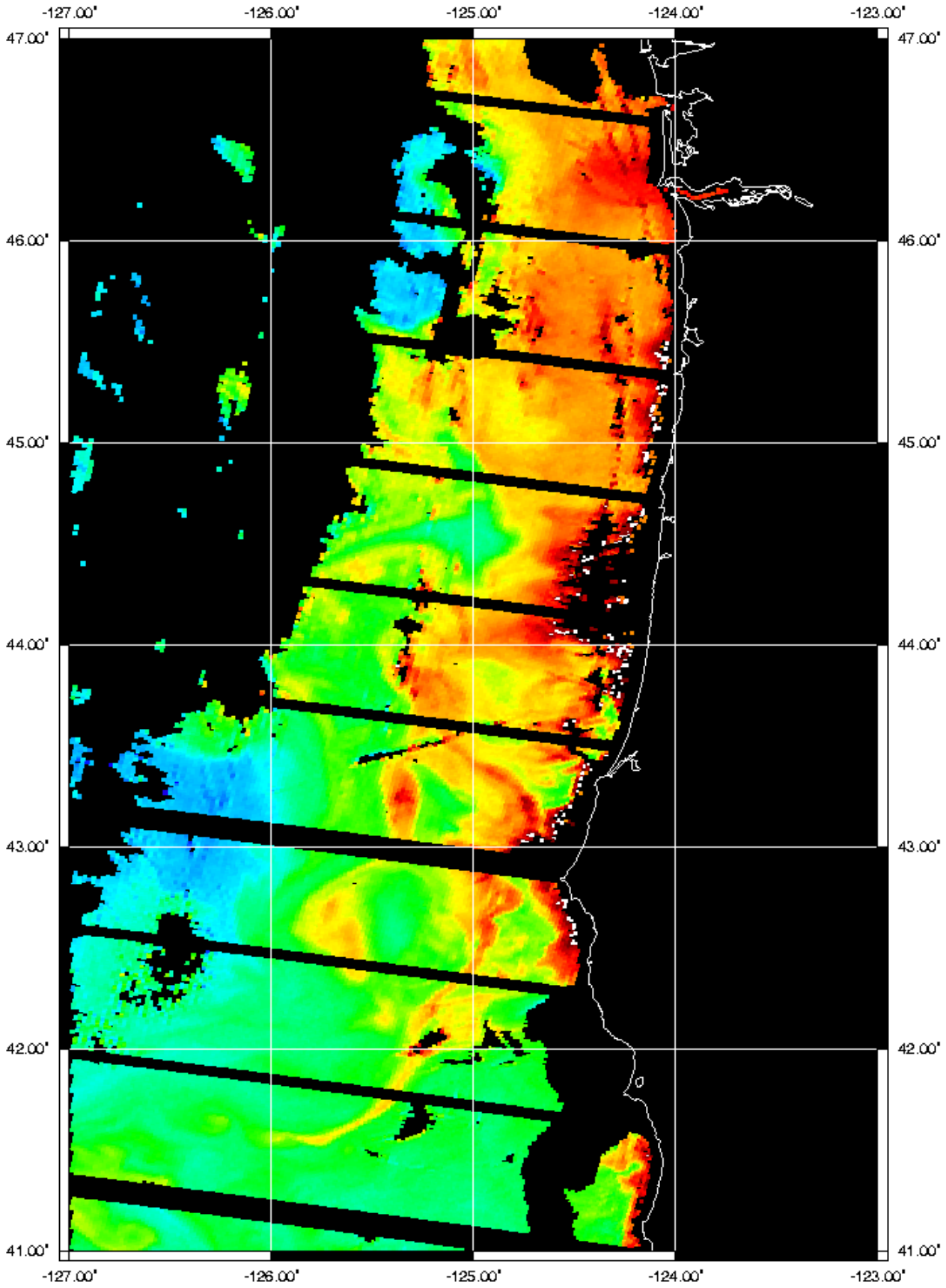


Figure 2a: August 7, 2002 SeaWiFS Image

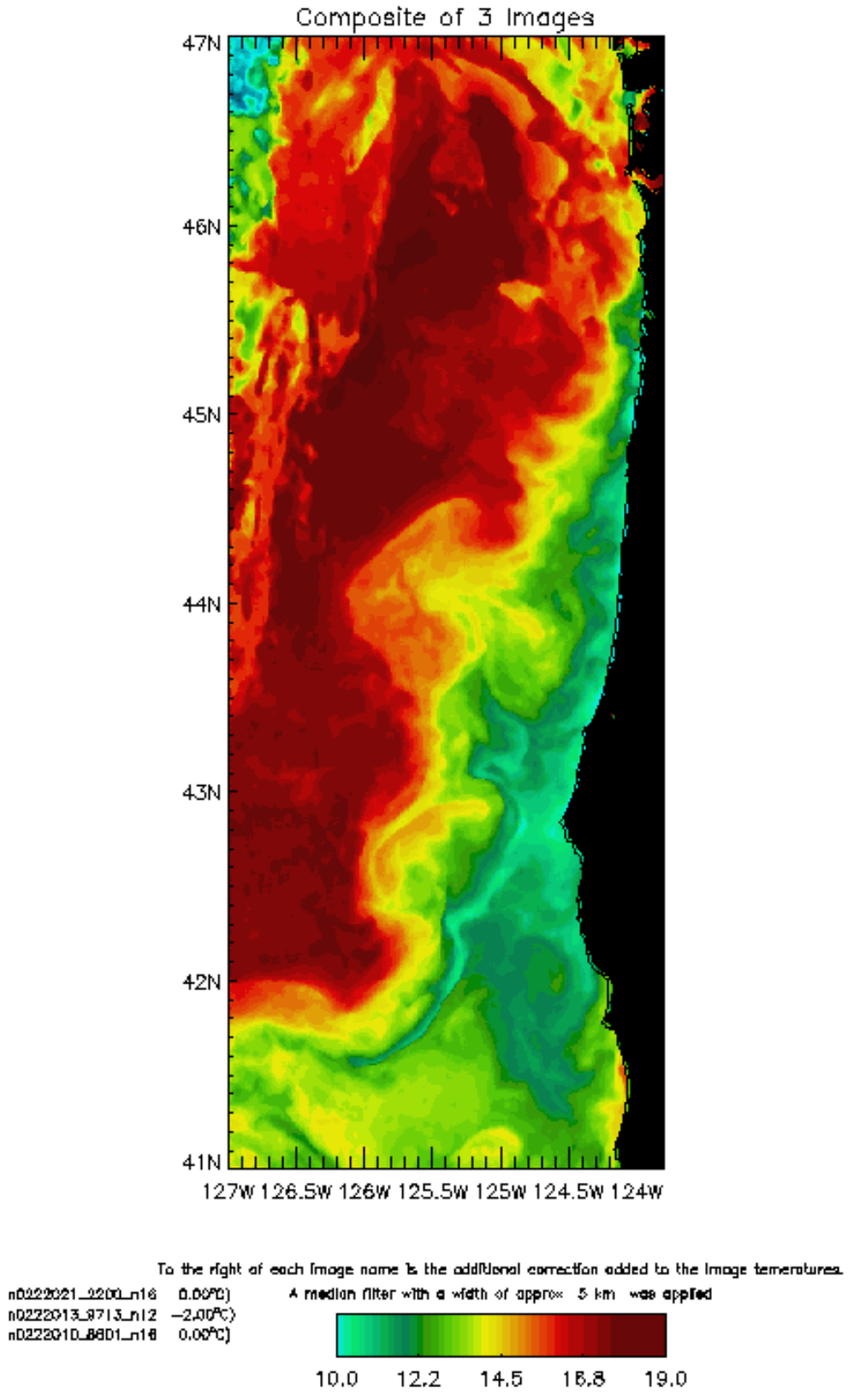


Figure 2b: August 8, 2002 AVHRR SST.

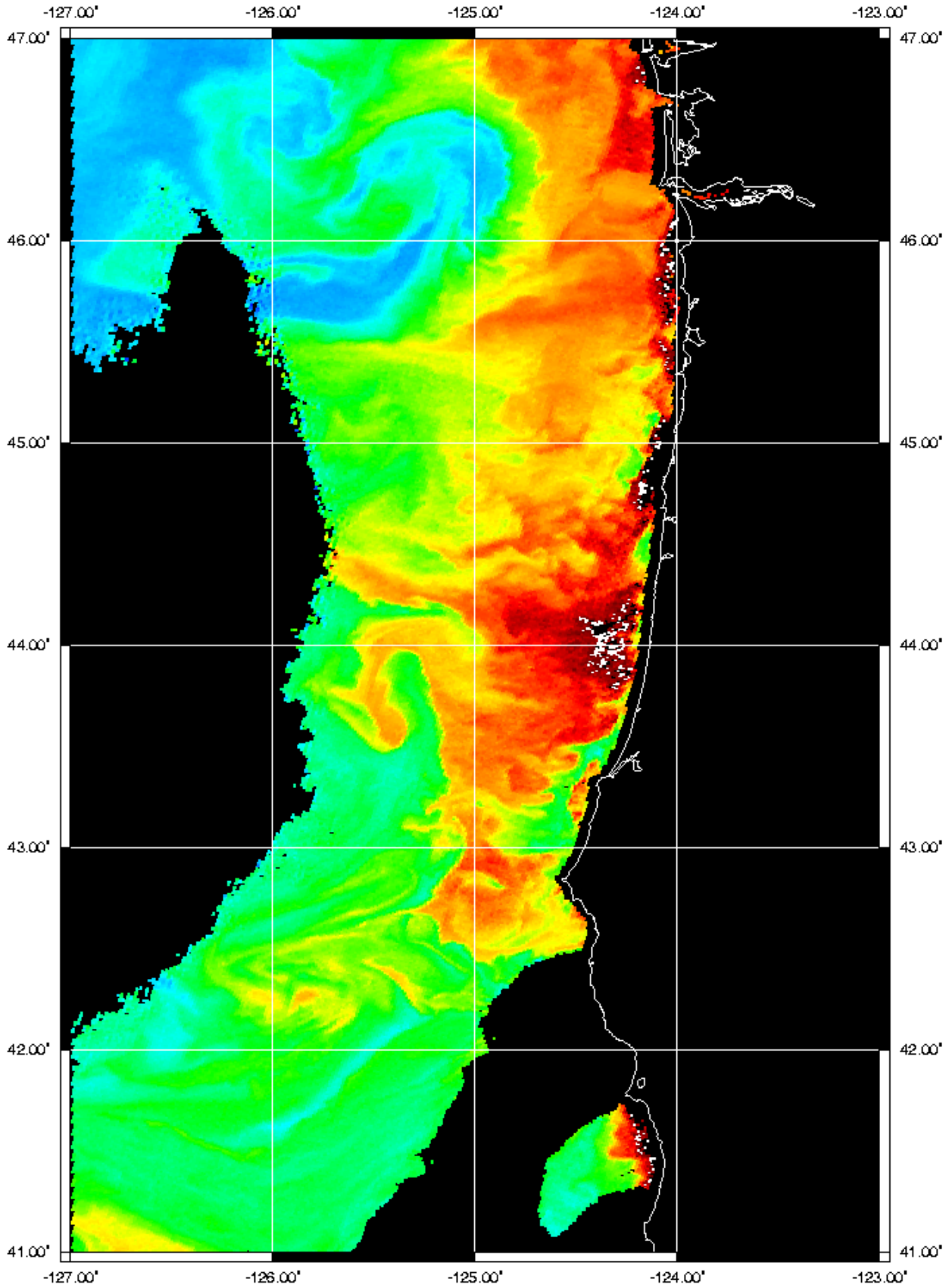


Figure 3a: August 12, 2002 SeaWiFS Image

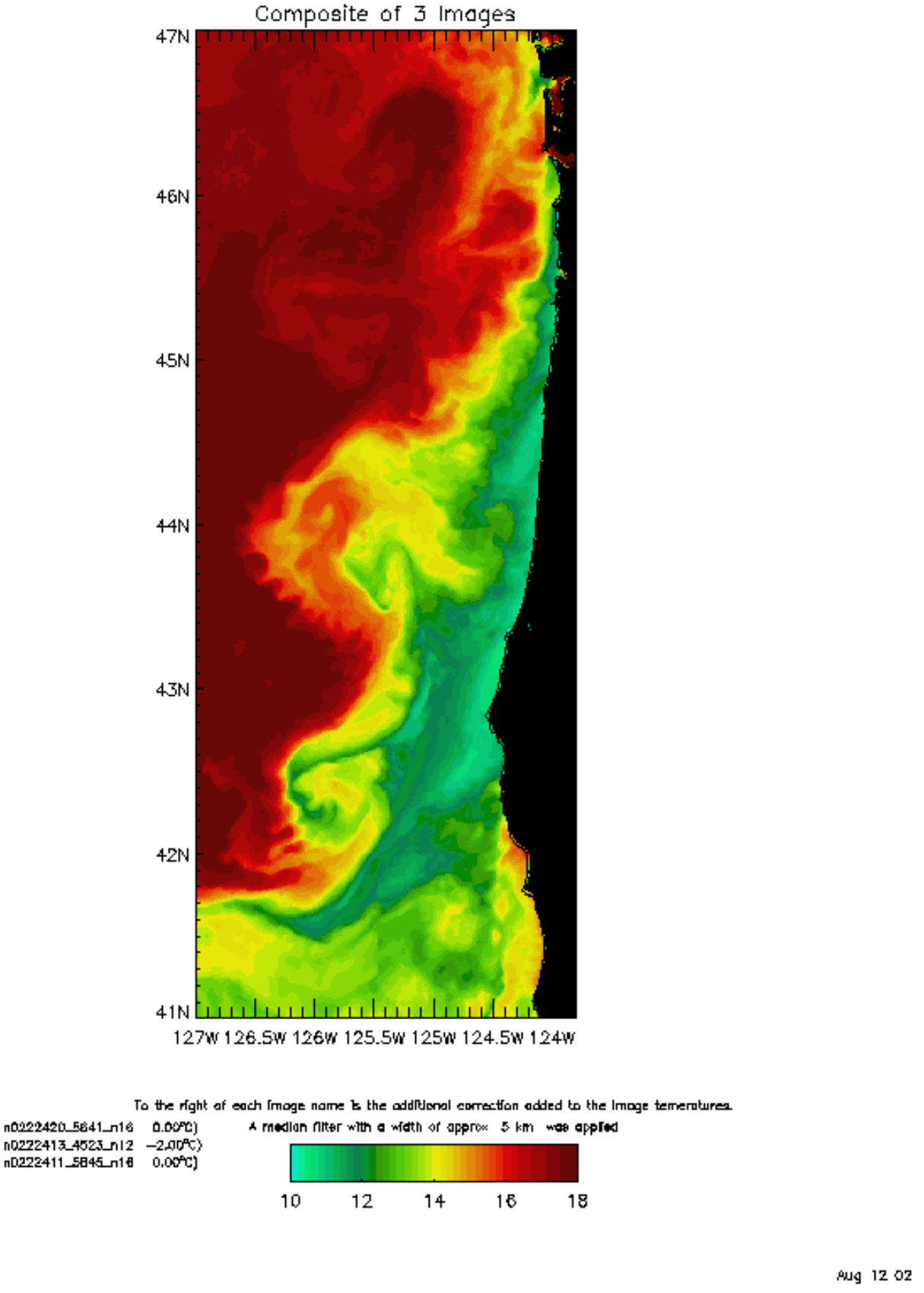


Figure 3b: August 12, 2002 AVHRR SST.

**Table 4: 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 | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21402.04 | LiveNet1 | 1 | 14 | BOB4 | 2 | 8 | 0152 | S | 44.2552 | -124.7015 | 97 | 30 | |
| NH21502.33 | LiveNet1 | 2 | 39 | FM5 | 3 | 8 | 2234 | S | 43.2232 | -124.6710 | 165 | 40 | |
| NH21602.03 | LiveNet1 | 3 | 40 | FM7 | 4 | 8 | 0047 | S | 43.2198 | -124.8414 | 340 | 20 | Surface swarm euphausiids+siphonophores |
| NH21702.03 | LiveNet1 | 4 | 50 | L9-7 | 5 | 8 | 0038 | S | 42.7015 | -125.3950 | 3100 | 40 | |
| NH21702.37 | LiveNet1 | 5 | 59 | CR4 | 5 | 8 | 2338 | S | 41.9089 | -124.6119 | 531 | 40 | |
| NH21802.06 | LiveNet1 | 6 | 60 | CR3 | 6 | 8 | 0315 | S | 41.9060 | -124.5048 | 139 | 20-40 | |
| NH21902.08 | LiveNet1 | 7 | 73 | EN3 | 7 | 8 | 0504 | S | 42.3328 | -125.5975 | 3080 | 20-40 | |
| NH22002.14 | LiveNet1 | 8 | 86 | NH25 | 8 | 8 | 1933 | S | 44.6549 | -125.6520 | 301 | 60 | |
| NH22002.20 | LiveNet1 | 9 | 87 | NH20 | 8 | 8 | 2342 | S | 44.6572 | -125.5322 | 149 | 20 | |
| NH22102.08 | LiveNet1 | 10 | 88 | NH15 | 9 | 8 | 0330 | S | 44.6551 | -124.4125 | 96 | 20-40 | |
| NH22102.41 | LiveNet1 | 11 | 98 | L2-6 | 9 | 8 | 1901 | S | 44.4774 | -125.0420 | 901 | 20 | |
| NH22102.45 | LiveNet1 | 12 | 99 | L2-5 | 9 | 8 | 2111 | S | 44.4788 | -124.8389 | nd | 20-40 | |
| NH22102.49 | LiveNet1 | 13 | 100 | L2-4 | 9 | 8 | 2315 | S | 44.6431 | -124.6357 | 149 | 20-40 | |
| NH22202.04 | LiveNet1 | 14 | 101 | L2-3 | 10 | 8 | 0117 | S | 44.4813 | -124.4286 | 76 | 20-40 | |
| NH22202.23 | LiveNet1 | 15 | 107 | HH3 | 10 | 8 | 2140 | S | 44.0058 | -124.6103 | 152 | 25 | |
| NH22302.09 | LiveNet1 | 16 | 109 | HH5 | 11 | 8 | 0442 | S | 44.0762 | -125.0148 | nd | 20 | |
| NH22302.26 | LiveNet1 | 17 | 113 | HH4H | 11 | 8 | 2243 | S | 43.9913 | -124.6984 | 121 | 20-40 | |
| NH22402.04 | LiveNet1 | 18 | 114 | L4A-3 | 12 | 8 | 0058 | S | 43.8727 | -124.4969 | 127 | 20-40 | End of sheet #17 |
| NH22502.01 | LiveNet1 | 19 | 124 | L8-4 | 13 | 8 | 0001 | S | 42.9580 | -124.8268 | 130 | 20 | |
| NH22502.05 | LiveNet1 | 20 | 125 | L8-3 | 13 | 8 | 0137 | S | 42.9606 | -124.6653 | 116 | 20-40 | |
| NH22602.03 | LiveNet1 | 21 | 136 | ED3 | 14 | 8 | 0022 | S | 42.2597 | -125.6482 | 3046 | 20-40 | |
| NH22602.07 | LiveNet1 | 22 | 137 | ED4 | 14 | 8 | 0228 | S | 42.1644 | -125.6527 | 2911 | 20-40 | |
| NH22602.11 | LiveNet1 | 23 | 138 | ED5 | 14 | 8 | 0409 | S | 42.0853 | -125.6566 | 2848 | 20-40 | |
| NH22602.40 | LiveNet1 | 24 | 146 | L11-2 | 14 | 8 | 2128 | S | 42.2055 | -124.4785 | 112 | 20-40 | |
| NH22602.44 | LiveNet1 | 25 | 147 | L11-1 | 14 | 8 | 2240 | S | 42.2051 | -124.4247 | 65 | 20-40 | |
| NH22702.13 | LiveNet1 | 26 | 150 | L8-4 | 15 | 8 | 1925 | S | 42.9493 | -124.8188 | 158 | nd | |
| NH22702.16 | LiveNet1 | 27 | 150 | L8-4 | 15 | 8 | 2202 | S | 42.9500 | -124.8185 | 156 | 20-40 | End of sheet #23 |
| NH22702.19 | LiveNet1 | 28 | 150 | L8-4 | 15 | 8 | 2335 | S | 42.9478 | -124.8187 | 160 | 20 | |
| NH22802.03 | LiveNet1 | 29 | 150 | L8-4 | 16 | 8 | 0112 | S | 42.9533 | -124.8211 | 144 | 20-40 | |
| NH22802.04 | LiveNet1 | 30 | 150 | L8-4 | 16 | 8 | 0230 | S | 42.9526 | -124.8190 | nd | nd | |
| NH22802.07 | LiveNet1 | 31 | 150 | L8-4 | 16 | 8 | 0405 | S | 42.9525 | -124.8194 | 148 | 20-40 | |
| NH22802.08 | LiveNet1 | 32 | 150 | L8-4 | 16 | 8 | 0500 | S | 42.9486 | -124.8167 | 159 | 20-40 | |
| NH22802.11 | LiveNet1 | 33 | 150 | L8-4 | 16 | 8 | 0600 | S | 42.9557 | -124.8212 | nd | 20-40 | |
| NH22802.14 | LiveNet1 | 34 | 150 | L8-4 | 16 | 8 | 0842 | S | 42.9530 | -124.8235 | 142 | 20-40 | |
| NH22802.15 | LiveNet1 | 35 | 150 | L8-4 | 16 | 8 | 1000 | S | 42.9480 | -124.8150 | 163 | 20-40 | |
| NH22802.28 | LiveNet1 | 36 | 154 | L8-4 | 16 | 8 | 1839 | S | 42.9553 | -124.8240 | nd | nd | |
| NH22802.29 | LiveNet1 | 37 | 154 | L8-4 | 16 | 8 | 1933 | S | 42.9500 | -124.8173 | 159 | 20-40 | |
| NH22802.32 | LiveNet1 | 38 | 154 | L8-4 | 16 | 8 | 2053 | S | 42.9485 | -124.8255 | nd | 20-40 | |
| NH22802.35 | LiveNet1 | 39 | 154 | L8-4 | 16 | 8 | 2145 | S | 42.9538 | -124.8245 | nd | 20-40 | |
| NH22902.07 | LiveNet1 | 40 | 157 | HH3 | 17 | 8 | 1027 | S | 43.9975 | -124.5926 | 153 | 40 | |
| NH22902.19 | LiveNet1 | 41 | 159 | HH5 | 17 | 8 | 1732 | S | 44.0049 | -125.0061 | 981 | 40 | |
| NH22902.20 | LiveNet1 | 42 | 159 | HH5 | 17 | 8 | 1845 | S | 43.9979 | -124.9984 | 937 | 40 | |
| NH22902.21 | LiveNet1 | 43 | 159 | HH5 | 17 | 8 | 1945 | S | 44.0008 | -124.0014 | 947 | nd | |
| NH22902.24 | LiveNet1 | 44 | 159 | HH5 | 17 | 8 | 2210 | S | 43.9998 | -124.9995 | nd | nd | |
| NH22902.27 | LiveNet1 | 45 | 159 | HH5 | 17 | 8 | 2318 | S | 44.0000 | -125.0051 | 994 | 100 | |
| NH23002.01 | LiveNet1 | 46 | 159 | HH5 | 18 | 8 | 0030 | S | 44.0009 | -125.0042 | 950 | 20 | |
| NH23002.02 | LiveNet1 | 47 | 159 | HH5 | 18 | 8 | 0128 | S | 44.0006 | -125.0027 | 954 | 20 | |
| NH23002.05 | LiveNet1 | 48 | 159 | HH5 | 18 | 8 | 0415 | S | 43.9997 | -125.0003 | 949 | 20 | |

**Table 4: 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 | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH23002.06 | LiveNet1 | 49 | 159 | HH5 | 18 | 8 | 0515 | S | 44.0006 | -125.0008 | 944 | 20 | |
| NH23002.26 | LiveNet1 | 50 | 164 | NH15 | 18 | 8 | 1755 | S | 44.6548 | -124.4162 | nd | nd | |
| NH23002.35 | LiveNet1 | 51 | 166 | NH5 | 18 | 8 | 2029 | S | 44.6521 | -124.1816 | 62 | 20 | |
| NH23102.02 | LiveNet1 | 52 | 168 | NH20 | 19 | 8 | 0143 | S | 44.6501 | -124.5309 | 144 | 30 | |
| NH23102.05 | LiveNet1 | 53 | 170 | NH10 | 19 | 8 | 0445 | S | 44.6493 | -124.2847 | 80 | 30 | |
| NH23102.06 | LiveNet1 | 54 | 171 | NH5 | 19 | 8 | 0535 | S | 44.6479 | -124.1765 | 58 | 30 | |

**Table 5: CTD Casts**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21202.01 | CTD | nd | 1 | NH1 | 31 | 7 | 1630 | S | 44.6517 | -124.1019 | 30 | 25 | |
| NH21202.02 | CTD | nd | 1 | NH1 | 31 | 7 | 1655 | E | 44.6513 | -124.1023 | nd | nd | Cast failed; forgot to log data. |
| NH21202.03 | CTD | 1 | 1 | NH1 | 31 | 7 | 1710 | S | 44.6507 | -124.1025 | 30 | 25 | |
| NH21202.04 | CTD | 1 | 1 | NH1 | 31 | 7 | 1715 | E | 44.6504 | -124.1030 | nd | nd | |
| NH21202.07 | CTD | 2 | 2 | NH3 | 31 | 7 | 1854 | S | 44.6477 | -124.1368 | 50 | 40 | |
| NH21202.08 | CTD | 2 | 2 | NH3 | 31 | 7 | 1918 | E | 44.6468 | -124.1397 | nd | nd | |
| NH21202.09 | CTD | 3 | 3 | NH5 | 31 | 7 | 2007 | S | 44.6465 | -124.1761 | 58 | 51 | |
| NH21202.10 | CTD | 3 | 3 | NH5 | 31 | 7 | 2017 | E | 44.6466 | -124.1798 | nd | nd | |
| NH21202.13 | CTD | 4 | 4 | NH10 | 31 | 7 | 2134 | S | 44.6512 | -124.3005 | 84 | 74 | |
| NH21202.14 | CTD | 4 | 4 | NH10 | 31 | 7 | 2152 | E | 44.6516 | -124.3060 | nd | nd | |
| NH21302.01 | CTD | 5 | 5 | NH15 | 1 | 8 | 0115 | S | 44.6527 | -124.4182 | 90 | 80 | |
| NH21302.02 | CTD | 5 | 5 | NH15 | 1 | 8 | 0130 | E | 44.6538 | -124.4219 | 92 | 80 | |
| NH21302.04 | CTD | 6 | 6 | NH20 | 1 | 8 | 0244 | S | 44.6519 | -124.3646 | 143 | 130 | |
| NH21302.05 | CTD | 6 | 6 | NH20 | 1 | 8 | 0309 | E | 44.6538 | -124.5355 | nd | nd | |
| NH21302.07 | CTD | 7 | 7 | NH25 | 1 | 8 | 0412 | S | 44.6493 | -124.6480 | 296 | 200 | |
| NH21302.08 | CTD | 7 | 7 | NH25 | 1 | 8 | 0438 | E | 44.6475 | -124.6522 | 289 | nd | |
| NH21302.10 | CTD | 8 | 8 | NH35 | 1 | 8 | 0620 | S | 44.6545 | -124.8826 | 440 | 200 | |
| NH21302.11 | CTD | 8 | 8 | NH35 | 1 | 8 | 0640 | E | 44.6577 | -124.8860 | nd | nd | |
| NH21302.14 | CTD | 9 | 9 | NH45 | 1 | 8 | 0839 | S | 44.6525 | -125.1152 | 698 | 200 | |
| NH21302.15 | CTD | 9 | 9 | NH45 | 1 | 8 | 0849 | E | 44.6537 | -125.1163 | 690 | nd | |
| NH21302.18 | CTD | 10 | 10 | NH55 | 1 | 8 | 1054 | S | 44.6523 | -125.3659 | 2889 | 200 | |
| NH21302.19 | CTD | 10 | 10 | NH55 | 1 | 8 | 1127 | E | 44.6517 | -124.3651 | nd | nd | |
| NH21302.22 | CTD | 11 | 11 | NH65 | 1 | 8 | 1300 | S | 44.6492 | -125.5988 | 2882 | 200 | |
| NH21302.23 | CTD | 11 | 11 | NH65 | 1 | 8 | 1327 | E | 44.6444 | -125.6000 | nd | nd | |
| NH21302.26 | CTD | 12 | 12 | BOB6 | 1 | 8 | 1700 | S | 44.2490 | -125.1025 | 1171 | 200 | |
| NH21302.27 | CTD | 12 | 12 | BOB6 | 1 | 8 | 1727 | E | 44.2499 | -125.1059 | nd | nd | |
| NH21302.29 | CTD | 13 | 13 | BOB5 | 1 | 8 | 1853 | S | 44.2486 | -124.8999 | 306 | 200 | Water depth recorded inaccurately; actual depth 153; CTD hit bottom! |
| NH21302.30 | CTD | 13 | 13 | BOB5 | 1 | 8 | 1902 | E | 44.2503 | -124.9001 | nd | nd | No bottles tripped due to uncertainties related to impact. |
| NH21302.31 | CTD | 14 | 13 | BOB5 | 1 | 8 | 1920 | S | 44.2518 | -124.9000 | 153 | 140 | Repeat CTD. |
| NH21302.32 | CTD | 14 | 13 | BOB5 | 1 | 8 | 1935 | E | 44.2540 | -124.8999 | 150 | nd | |
| NH21402.01 | CTD | 15 | 14 | BOB4 | 2 | 8 | 0104 | S | 44.2518 | -124.7844 | 99 | 87 | |
| NH21402.02 | CTD | 15 | 14 | BOB4 | 2 | 8 | 0125 | E | 44.2505 | -124.7000 | 99 | 90 | |
| NH21402.05 | CTD | 16 | 15 | BOB3 | 2 | 8 | 0325 | S | 44.2488 | -124.5094 | 103 | 90 | |
| NH21402.06 | CTD | 16 | 15 | BOB3 | 2 | 8 | 0343 | E | 44.2492 | -124.5123 | nd | nd | |
| NH21402.10 | CTD | 17 | 16 | BOB2 | 2 | 8 | 0617 | S | 44.2498 | -124.3799 | 90 | 80 | |
| NH21402.11 | CTD | 17 | 16 | BOB2 | 2 | 8 | 0631 | E | 44.2518 | -124.3805 | 90 | nd | |
| NH21402.13 | CTD | 18 | 17 | BOB1 | 2 | 8 | 0750 | S | 44.2492 | -124.1913 | 54 | 42 | |
| NH21402.14 | CTD | 18 | 17 | BOB1 | 2 | 8 | 0802 | E | 44.2491 | -124.1990 | nd | nd | |
| NH21402.16 | CTD | 19 | 18 | HH1 | 2 | 8 | 0955 | S | 44.0011 | -124.2003 | 56 | 41 | |
| NH21402.17 | CTD | 19 | 18 | HH1 | 2 | 8 | 1004 | E | 44.0014 | -124.2003 | nd | nd | |
| NH21402.19 | CTD | 20 | 19 | HH2 | 2 | 8 | 1128 | S | 44.0014 | -124.3993 | 121 | 111 | |
| NH21402.20 | CTD | 20 | 19 | HH2 | 2 | 8 | 1144 | E | 44.0020 | -124.3984 | 121 | nd | |
| NH21402.26 | CTD | 21 | 20 | HH3 | 2 | 8 | 1505 | S | 44.0005 | -124.6006 | 155 | 140 | |
| NH21402.27 | CTD | 21 | 20 | HH3 | 2 | 8 | 1552 | E | 44.0028 | -124.6014 | 155 | nd | |
| NH21402.29 | CTD | 22 | 21 | HH4 | 2 | 8 | 1715 | S | 43.9996 | -124.7997 | 112 | 100 | |
| NH21402.30 | CTD | 22 | 21 | HH4 | 2 | 8 | 1731 | E | 44.0007 | -124.7988 | nd | nd | |
| NH21402.34 | CTD | 23 | 22 | HH5 | 2 | 8 | 2050 | S | 44.0004 | -125.0028 | 960 | 200 | |

**Table 5: CTD Casts (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21402.35 | CTD | 23 | 22 | HH5 | 2 | 8 | 2107 | E | 44.0019 | -125.0039 | nd | nd | |
| NH21402.37 | CTD | 24 | 23 | HH7 | 2 | 8 | 2240 | S | 44.0014 | -125.2040 | 1769 | 200 | |
| NH21402.38 | CTD | 24 | 23 | HH7 | 2 | 8 | 2300 | E | 44.0031 | -125.2073 | nd | nd | |
| NH21502.01 | CTD | 25 | 24 | HH9 | 3 | 8 | 0025 | S | 43.9989 | -125.4045 | 3010 | 200 | |
| NH21502.02 | CTD | 25 | 24 | HH9 | 3 | 8 | 0047 | E | 44.0029 | -125.4124 | nd | nd | |
| NH21502.04 | CTD | 26 | 25 | L5-11 | 3 | 8 | 0247 | S | 43.8019 | -125.6044 | 3073 | 200 | |
| NH21502.05 | CTD | 26 | 25 | L5-11 | 3 | 8 | 0314 | E | 43.8068 | -125.6138 | 3075 | 200 | |
| NH21502.07 | CTD | 27 | 26 | L6-12 | 3 | 8 | 0555 | S | 43.4986 | -125.8645 | 3076 | 200 | |
| NH21502.08 | CTD | 27 | 26 | L6-12 | 3 | 8 | 0619 | E | 43.4978 | -125.8655 | nd | nd | |
| NH21502.10 | CTD | 28 | 27 | L6-11 | 3 | 8 | 0749 | S | 43.4986 | -125.6318 | 3087 | 200 | |
| NH21502.11 | CTD | 28 | 27 | L6-11 | 3 | 8 | 0805 | E | 43.4997 | -125.6296 | nd | nd | |
| NH21502.13 | CTD | 29 | 28 | L6-10 | 3 | 8 | 0951 | S | 43.5031 | -125.3344 | 2349 | 200 | |
| NH21502.14 | CTD | 29 | 28 | L6-10 | 3 | 8 | 1010 | E | 43.5078 | -125.3331 | nd | nd | |
| NH21502.16 | CTD | 30 | 29 | L6-9 | 3 | 8 | 1125 | S | 43.5011 | -125.1667 | 1505 | 200 | |
| NH21502.17 | CTD | 30 | 29 | L6-9 | 3 | 8 | 1142 | E | 43.5035 | -125.1668 | nd | nd | |
| NH21502.19 | CTD | 31 | 30 | FM9 | 3 | 8 | 1400 | S | 43.2187 | -125.1637 | 1635 | 200 | |
| NH21502.20 | CTD | 31 | 30 | FM9 | 3 | 8 | 1427 | E | 43.2229 | -125.1623 | nd | nd | |
| NH21502.27 | CTD | 32 | 35 | FM3 | 3 | 8 | 1925 | S | 43.2157 | -124.4982 | 69 | 55 | |
| NH21502.28 | CTD | 32 | 35 | FM3 | 3 | 8 | 1940 | E | 43.2170 | -124.5004 | nd | nd | |
| NH21502.31 | CTD | 33 | 37 | FM5 | 3 | 8 | 2201 | S | 43.2164 | -124.6668 | 158 | 140 | |
| NH21502.32 | CTD | 33 | 38 | FM7 | 3 | 8 | 2216 | E | 43.2181 | -124.6683 | 161 | nd | |
| NH21602.01 | CTD | 34 | 40 | FM7 | 4 | 8 | 0007 | S | 43.2149 | -124.8336 | 343 | 200 | |
| NH21602.02 | CTD | 34 | 40 | FM7 | 4 | 8 | 0036 | E | 43.2060 | -124.8348 | nd | nd | |
| NH21602.04 | CTD | 35 | 41 | L8-2 | 4 | 8 | 0315 | S | 42.9500 | -123.6666 | 109 | 100 | |
| NH21602.05 | CTD | 35 | 41 | L8-2 | 4 | 8 | 0332 | E | 42.9500 | -124.6662 | nd | nd | Beroe,hydromedusae,siphonphores+euph swarm at surface. |
| NH21602.07 | CTD | 36 | 42 | L9-1 | 4 | 8 | 0611 | S | 42.6840 | -124.5985 | 107 | 96 | |
| NH21602.08 | CTD | 36 | 42 | L9-1 | 4 | 8 | 0627 | E | 42.6845 | -124.5989 | nd | nd | |
| NH21602.10 | CTD | 37 | 43 | L9-3 | 4 | 8 | 0745 | S | 42.6821 | -124.8016 | 206 | 195 | |
| NH21602.11 | CTD | 37 | 43 | L9-3 | 4 | 8 | 0807 | E | 42.6806 | -124.8064 | nd | nd | |
| NH21602.13 | CTD | 38 | 44 | L9-5 | 4 | 8 | 0922 | S | 42.6818 | -125.0005 | 1233 | 200 | |
| NH21602.14 | CTD | 38 | 44 | L9-5 | 4 | 8 | 0939 | E | 42.6822 | -125.0059 | nd | nd | |
| NH21602.16 | CTD | 39 | 45 | L9-6 | 4 | 8 | 1103 | S | 42.6851 | -125.1978 | 3075 | 200 | |
| NH21602.17 | CTD | 39 | 45 | L9-6 | 4 | 8 | 1121 | E | 42.6887 | -125.1941 | nd | nd | |
| NH21602.19 | CTD | 40 | 46 | L9-7 | 4 | 8 | 1253 | S | 42.6849 | -125.4011 | 3102 | 200 | |
| NH21602.20 | CTD | 40 | 46 | L9-7 | 4 | 8 | 1316 | E | 42.6910 | -125.3979 | nd | nd | End of Sheet #6. |
| NH21602.24 | CTD | 41 | 47 | L9-8 | 4 | 8 | 1607 | S | 42.6840 | -125.5996 | 3096 | 200 | |
| NH21602.25 | CTD | 41 | 47 | L9-8 | 4 | 8 | 1624 | E | 42.6848 | -125.6037 | 3074 | 200 | |
| NH21602.29 | CTD | 42 | 48 | L9-9 | 4 | 8 | 1840 | S | 42.6782 | -125.7958 | 2964 | 200 | |
| NH21602.30 | CTD | 42 | 48 | L9-9 | 4 | 8 | 1905 | E | 42.6727 | -125.7963 | nd | nd | |
| NH21602.32 | CTD | 43 | 49 | L9-10 | 4 | 8 | 2030 | S | 42.6811 | -125.9991 | 2270 | 200 | |
| NH21602.33 | CTD | 43 | 49 | L9-10 | 4 | 8 | 2050 | E | 42.6764 | -126.0021 | nd | nd | |
| NH21602.35 | CTD | 44 | 50 | L9-7 | 4 | 8 | 2353 | S | 42.6848 | -125.3968 | 3100 | 200 | |
| NH21702.01 | CTD | 44 | 50 | L9-7 | 5 | 8 | 0014 | E | 42.6910 | -125.3937 | nd | nd | |
| NH21702.09 | CTD | 45 | 51 | L9-6 | 5 | 8 | 0540 | S | 42.6866 | -125.2042 | 3078 | 200 | |
| NH21702.10 | CTD | 45 | 51 | L9-6 | 5 | 8 | 0600 | E | 42.6892 | -125.2045 | nd | nd | |
| NH21702.11 | CTD | 46 | 52 | RR7 | 5 | 8 | 0736 | S | 42.5012 | -125.1992 | 2994 | 200 | |
| NH21702.12 | CTD | 46 | 52 | RR7 | 5 | 8 | 0749 | E | 42.5018 | -125.1968 | 2963 | nd | |
| NH21702.16 | CTD | 47 | 53 | RR6 | 5 | 8 | 1112 | S | 42.4980 | -124.9995 | 1820 | 200 | |

**Table 5: CTD Casts (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21702.17 | CTD | 47 | 53 | RR6 | 5 | 8 | 1128 | E | 42.4979 | -125.0026 | 1830 | nd | |
| NH21702.19 | CTD | 48 | 54 | RR4 | 5 | 8 | 1251 | S | 42.5000 | -124.7987 | 591 | 200 | |
| NH21702.20 | CTD | 48 | 54 | RR4 | 5 | 8 | 1316 | E | 42.5023 | -124.7987 | 615 | nd | |
| NH21702.22 | CTD | 49 | 55 | RR3 | 5 | 8 | 1425 | S | 42.4997 | -124.7987 | nd | nd | 1000's of moon jellies. |
| NH21702.23 | CTD | 49 | 55 | RR3 | 5 | 8 | 1447 | E | 42.5116 | -124.6922 | 138 | nd | |
| NH21702.28 | CTD | 50 | 57 | RR2 | 5 | 8 | 1752 | S | 42.4991 | -124.5998 | 87 | 75 | |
| NH21702.29 | CTD | 50 | 57 | RR2 | 5 | 8 | 1804 | E | 42.5018 | -124.5976 | nd | nd | |
| NH21702.31 | CTD | 51 | 58 | RR1 | 5 | 8 | 1856 | S | 42.4986 | -124.4989 | 37 | 25 | |
| NH21702.32 | CTD | 51 | 58 | RR1 | 5 | 8 | 1908 | E | 42.5000 | -124.4967 | nd | nd | |
| NH21702.34 | CTD | 52 | 59 | CR4 | 5 | 8 | 2311 | S | 41.9015 | -124.5994 | 507 | 200 | |
| NH21702.35 | CTD | 52 | 59 | CR4 | 5 | 8 | 2327 | E | 41.9157 | -124.6032 | nd | nd | |
| NH21802.03 | CTD | 53 | 60 | CR3 | 6 | 8 | 0235 | S | 41.9005 | -124.4992 | 135 | 125 | |
| NH21802.04 | CTD | 53 | 60 | CR3 | 6 | 8 | 0253 | E | 41.9019 | -124.6512 | nd | nd | |
| NH21802.09 | CTD | 54 | 61 | CR2 | 6 | 8 | 0501 | S | 41.8998 | -124.4004 | 68 | 58 | |
| NH21802.10 | CTD | 54 | 61 | CR2 | 6 | 8 | 0509 | E | 41.9013 | -124.4020 | nd | nd | |
| NH21802.12 | CTD | 55 | 62 | CR1 | 6 | 8 | 0608 | S | 41.8992 | -124.3004 | 41 | 30 | |
| NH21802.13 | CTD | 55 | 62 | CR1 | 6 | 8 | 0616 | E | 41.8995 | -124.3004 | nd | nd | |
| NH21802.21 | CTD | 56 | 65 | CR6 | 6 | 8 | 1157 | S | 41.8995 | -124.7997 | 706 | 200 | |
| NH21802.22 | CTD | 56 | 65 | CR6 | 6 | 8 | 1216 | E | 41.9049 | -124.7991 | 708 | nd | |
| NH21802.24 | CTD | 57 | 66 | CR7 | 6 | 8 | 1340 | S | 41.8840 | -125.0007 | 846 | 200 | |
| NH21802.25 | CTD | 57 | 66 | CR7 | 6 | 8 | nd | E | 41.9514 | -125.0210 | nd | nd | |
| NH21802.29 | CTD | 58 | 67 | CR8 | 6 | 8 | 1643 | S | 41.8999 | -125.2031 | 2770 | 200 | |
| NH21802.30 | CTD | 58 | 67 | CR8 | 6 | 8 | 1708 | E | 41.9016 | -125.2088 | nd | nd | |
| NH21802.32 | CTD | 59 | 68 | CR9 | 6 | 8 | 1827 | S | 41.8951 | -125.3999 | 3120 | 200 | |
| NH21802.33 | CTD | 59 | 68 | CR9 | 6 | 8 | 1845 | E | 41.8936 | -125.4054 | nd | nd | |
| NH21802.35 | CTD | 60 | 69 | CR10 | 6 | 8 | 2022 | S | 41.8982 | -125.6673 | 2951 | 200 | |
| NH21802.36 | CTD | 60 | 69 | CR10 | 6 | 8 | 2042 | E | 41.8975 | -125.6713 | 2944 | 200 | |
| NH21802.38 | CTD | 61 | 70 | CR11 | 6 | 8 | 2238 | S | 41.8998 | -126.0022 | 3349 | 200 | |
| NH21802.39 | CTD | 61 | 70 | CR11 | 6 | 8 | 2254 | E | 41.9020 | -126.0062 | 3345 | 200 | |
| NH21902.01 | CTD | 62 | 71 | EN1 | 7 | 8 | 0123 | S | 42.1482 | -125.7840 | 2779 | 200 | EN=eddy north=>running transect line from south to north. |
| NH21902.02 | CTD | 62 | 71 | EN1 | 7 | 8 | 0143 | E | 42.1474 | -125.7866 | nd | nd | |
| NH21902.04 | CTD | 63 | 72 | EN2 | 7 | 8 | 0323 | S | 42.2334 | -125.6020 | 3102 | 200 | |
| NH21902.05 | CTD | 63 | 72 | EN2 | 7 | 8 | 0344 | E | 42.2339 | -125.6036 | 3107 | nd | |
| NH21902.09 | CTD | 64 | 74 | EN4 | 7 | 8 | 0611 | S | 42.4184 | -125.5985 | 3099 | 200 | |
| NH21902.10 | CTD | 64 | 74 | EN4 | 7 | 8 | 0628 | E | 42.4192 | -125.5927 | nd | nd | |
| NH21902.13 | CTD | 65 | 76 | EN6 | 7 | 8 | 0833 | S | 42.5849 | -125.6006 | 2698 | 200 | |
| NH21902.14 | CTD | 65 | 76 | EN6 | 7 | 8 | 0855 | E | 42.5917 | -125.6030 | nd | nd | |
| NH21902.16 | CTD | nd | 77 | EW1 | 7 | 8 | 1040 | S | 42.7250 | -125.8500 | nd | nd | CTD mishap; kinked wire; must reterminate; no cast number. |
| NH21902.20 | CTD | 66 | 77 | EW1 | 7 | 8 | 1408 | S | 42.7498 | -125.8411 | 2861 | 150 | CTD test; got water for Harvey group. |
| NH21902.21 | CTD | 66 | 77 | EW1 | 7 | 8 | 1425 | E | 42.7485 | -125.8470 | nd | nd | |
| NH21902.22 | CTD | 67 | 78 | EW2 | 7 | 8 | 1520 | S | 42.7226 | -125.8184 | 2676 | 200 | |
| NH21902.23 | CTD | 67 | 78 | EW2 | 7 | 8 | 1545 | E | 42.7225 | -125.7513 | 2655 | 200 | |
| NH21902.25 | CTD | 68 | 79 | EW3 | 7 | 8 | 1646 | S | 42.7209 | -125.6707 | 3058 | 200 | |
| NH21902.26 | CTD | 68 | 79 | EW3 | 7 | 8 | 1706 | E | 42.7212 | -125.6725 | 3047 | nd | |
| NH21902.28 | CTD | 69 | 80 | EW4 | 7 | 8 | 1819 | S | 42.7239 | -129.9824 | 3102 | 200 | |
| NH21902.29 | CTD | 69 | 80 | EW4 | 7 | 8 | 1854 | E | 42.7328 | -125.5075 | 3095 | nd | |
| NH22002.02 | CTD | 70 | 83 | EW7 | 8 | 8 | 0205 | S | 42.7238 | -124.9340 | 839 | 200 | |
| NH22002.03 | CTD | 70 | 83 | EW7 | 8 | 8 | 0228 | E | 42.7270 | -124.9391 | 847 | nd | |

**Table 5: CTD Casts (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22002.05 | CTD | 71 | 84 | NH45 | 8 | 8 | 1500 | S | 44.6521 | -125.1177 | 717 | 200 | |
| NH22002.06 | CTD | 71 | 84 | NH45 | 8 | 8 | 1524 | E | 44.6540 | -125.1221 | nd | nd | |
| NH22002.08 | CTD | 72 | 85 | NH35 | 8 | 8 | 1657 | S | 44.6386 | -125.8831 | 417 | 200 | |
| NH22002.09 | CTD | 72 | 85 | NH35 | 8 | 8 | 1716 | E | 44.6493 | -125.8845 | 457 | nd | |
| NH22002.11 | CTD | 73 | 86 | NH25 | 8 | 8 | 1843 | S | 44.6505 | -125.6518 | 292 | 200 | |
| NH22002.12 | CTD | 73 | 86 | NH25 | 8 | 8 | 1900 | E | 44.8175 | -125.6513 | nd | nd | |
| NH22002.17 | CTD | 74 | 87 | NH20 | 8 | 8 | 2305 | S | 44.6522 | -125.5295 | 145 | 135 | |
| NH22002.18 | CTD | 74 | 87 | NH20 | 8 | 8 | 2320 | E | 44.6538 | -125.5307 | nd | nd | |
| NH22102.05 | CTD | 75 | 88 | NH15 | 9 | 8 | 0303 | S | 44.6515 | -124.4126 | 93 | 83 | |
| NH22102.06 | CTD | 75 | 88 | NH15 | 9 | 8 | 0317 | E | 44.6527 | -124.4144 | nd | nd | |
| NH22102.09 | CTD | 76 | 89 | NH10 | 9 | 8 | 0443 | S | 44.6516 | -124.2847 | 81 | 71 | |
| NH22102.10 | CTD | 76 | 89 | NH10 | 9 | 8 | 0455 | E | 44.6507 | -124.2848 | 80 | nd | |
| NH22102.12 | CTD | 77 | 90 | NH5 | 9 | 8 | 0549 | S | 44.6505 | -124.1788 | 59 | 50 | |
| NH22102.13 | CTD | 77 | 90 | NH5 | 9 | 8 | 0558 | E | 44.6495 | -124.1808 | nd | nd | |
| NH22102.15 | CTD | 78 | 91 | NH3 | 9 | 8 | 0712 | S | 44.6494 | -124.1327 | 47 | 36 | |
| NH22102.16 | CTD | 78 | 91 | NH3 | 9 | 8 | 0725 | E | 44.6484 | -124.1370 | nd | nd | |
| NH22102.18 | CTD | 79 | 92 | NH1 | 9 | 8 | 0800 | S | 44.6519 | -124.1012 | 28 | 15 | |
| NH22102.19 | CTD | 79 | 92 | NH1 | 9 | 8 | 0805 | E | 44.6523 | -124.1011 | nd | nd | |
| NH22102.38 | CTD | 80 | 98 | L2-6 | 9 | 8 | 1825 | S | 44.4719 | -125.0354 | nd | 200 | End of sheet #14. |
| NH22102.39 | CTD | 80 | 98 | L2-6 | 9 | 8 | 1842 | E | 44.4713 | -125.0400 | 820 | nd | |
| NH22102.42 | CTD | 82 | 99 | L2-5 | 9 | 8 | 2030 | S | 44.4770 | -124.8346 | 237 | 200 | There is no CTD #81. |
| NH22102.43 | CTD | 82 | 99 | L2-5 | 9 | 8 | 2050 | E | 44.4780 | -124.8357 | 228 | nd | |
| NH22102.46 | CTD | 83 | 100 | L2-4 | 9 | 8 | 2238 | S | 44.4738 | -124.6353 | 148 | 137 | |
| NH22102.47 | CTD | 83 | 100 | L2-4 | 9 | 8 | 2252 | E | 44.4745 | -124.6358 | nd | nd | |
| NH22202.01 | CTD | 84 | 101 | L2-3 | 10 | 8 | 0046 | S | 44.4740 | -124.9205 | 74 | 64 | |
| NH22202.02 | CTD | 84 | 101 | L2-3 | 10 | 8 | 0057 | E | 44.4754 | -124.4228 | nd | nd | |
| NH22202.05 | CTD | 85 | 102 | L2-2 | 10 | 8 | 0239 | S | 44.4754 | -124.2513 | 74 | 64 | |
| NH22202.06 | CTD | 85 | 102 | L2-2 | 10 | 8 | 0251 | E | 44.4753 | -124.2532 | 74 | nd | |
| NH22202.08 | CTD | 86 | 103 | L2-1 | 10 | 8 | 0420 | S | 44.4753 | -124.1650 | 51 | 40 | |
| NH22202.09 | CTD | 86 | 103 | L2-1 | 10 | 8 | 0432 | E | 44.4751 | -124.1649 | 51 | nd | |
| NH22202.11 | CTD | 87 | 104 | L3-1 | 10 | 8 | 1522 | S | 44.2489 | -124.1911 | 56 | 45 | |
| NH22202.12 | CTD | 87 | 104 | L3-1 | 10 | 8 | 1532 | E | 44.2518 | -124.1922 | 54 | 45 | |
| NH22202.14 | CTD | 88 | 105 | HH1 | 10 | 8 | 1742 | S | 43.9982 | -124.2023 | 56 | 45 | |
| NH22202.15 | CTD | 88 | 105 | HH1 | 10 | 8 | 1755 | E | 43.9971 | -124.2042 | nd | nd | |
| NH22202.17 | CTD | 89 | 106 | HH2 | 10 | 8 | 1915 | S | 43.9997 | -124.4040 | 121 | 110 | |
| NH22202.18 | CTD | 89 | 106 | HH2 | 10 | 8 | 1935 | E | 44.0026 | -124.4025 | nd | nd | |
| NH22202.20 | CTD | 90 | 107 | HH3 | 10 | 8 | 2107 | S | 44.0009 | -124.6014 | 154 | 144 | |
| NH22202.21 | CTD | 90 | 107 | HH3 | 10 | 8 | 2123 | E | 44.0028 | -124.6038 | 153 | nd | |
| NH22302.01 | CTD | 91 | 108 | HH4 | 11 | 8 | 0046 | S | 43.9999 | -124.8015 | 112 | 102 | |
| NH22302.02 | CTD | 91 | 108 | HH4 | 11 | 8 | 0104 | E | 44.0022 | -124.8032 | nd | nd | |
| NH22302.04 | CTD | 92 | 109 | HH5 | 11 | 8 | 0229 | S | 44.0006 | -125.0016 | 959 | 200 | |
| NH22302.05 | CTD | 92 | 109 | HH5 | 11 | 8 | 0253 | E | 44.0072 | -125.0056 | 998 | nd | |
| NH22302.12 | CTD | 93 | 110 | L4A-6 | 11 | 8 | 0951 | S | 43.8701 | -124.9977 | 1039 | 200 | |
| NH22302.13 | CTD | 93 | 110 | L4A-6 | 11 | 8 | 1011 | E | 43.8753 | -124.9964 | 1083 | nd | |
| NH22302.15 | CTD | 94 | 111 | L4A-5 | 11 | 8 | 1120 | S | 43.8673 | -124.8329 | 341 | 200 | |
| NH22302.16 | CTD | 94 | 111 | L4A-5 | 11 | 8 | 1142 | E | 43.8690 | -124.8308 | 307 | 200 | |
| NH22302.18 | CTD | 95 | 112 | L4A-4 | 11 | 8 | 1320 | S | 43.8662 | -124.6662 | 287 | 200 | |
| NH22302.19 | CTD | 95 | 112 | L4A-4 | 11 | 8 | 1342 | E | 43.8710 | -124.6610 | nd | nd | |
| NH22402.01 | CTD | 96 | 114 | L4A-3 | 12 | 8 | 0016 | S | 43.8648 | -124.4993 | 136 | 126 | |

**Table 5: CTD Casts (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22402.02 | CTD | 96 | 114 | L4A-3 | 12 | 8 | 0037 | E | 43.8661 | -124.4969 | nd | nd | |
| NH22402.05 | CTD | 97 | 115 | L4A-2 | 12 | 8 | 0252 | S | 43.8667 | -124.3337 | 114 | 104 | |
| NH22402.06 | CTD | 97 | 115 | L4A-2 | 12 | 8 | 0306 | E | 43.8671 | -124.3368 | 114 | nd | |
| NH22402.08 | CTD | 98 | 116 | L4A-1 | 12 | 8 | 0443 | S | 43.8648 | -124.2171 | 60 | 50 | |
| NH22402.09 | CTD | 98 | 116 | L4A-1 | 12 | 8 | 0450 | E | 43.8655 | -124.2167 | nd | nd | |
| NH22402.11 | CTD | 99 | 117 | FM1 | 12 | 8 | 0940 | S | 43.2012 | -124.4337 | 36 | 25 | |
| NH22402.12 | CTD | 99 | 117 | FM1 | 12 | 8 | 0945 | E | 43.2190 | -124.4333 | nd | nd | |
| NH22402.14 | CTD | 100 | 118 | FM3 | 12 | 8 | 1038 | S | 43.2172 | -124.4164 | 67 | 55 | |
| NH22402.15 | CTD | 100 | 118 | FM3 | 12 | 8 | 1050 | E | 43.2179 | -124.5014 | 60 | 55 | |
| NH22402.17 | CTD | 101 | 119 | FM4 | 12 | 8 | 1142 | S | 43.2177 | -124.5858 | 90 | 75 | |
| NH22402.18 | CTD | 101 | 119 | FM4 | 12 | 8 | 1155 | E | 43.2174 | -124.5864 | nd | nd | |
| NH22402.20 | CTD | 102 | 120 | FM7 | 12 | 8 | 1405 | S | 43.2217 | -124.8376 | 348 | 200 | |
| NH22402.21 | CTD | 102 | 120 | FM7 | 12 | 8 | 1430 | E | 43.2265 | -124.8424 | nd | nd | |
| NH22402.25 | CTD | 103 | 121 | FM8 | 12 | 8 | 1758 | S | 43.2165 | -125.0009 | 1093 | 200 | |
| NH22402.26 | CTD | 103 | 121 | FM8 | 12 | 8 | 1816 | E | 43.2171 | -125.0034 | 1094 | nd | |
| NH22402.29 | CTD | 104 | 123 | L8-5 | 12 | 8 | 2211 | S | 42.9515 | -124.8724 | 193 | 183 | |
| NH22402.30 | CTD | 104 | 123 | L8-5 | 12 | 8 | 2230 | E | 42.9545 | -124.8777 | 234 | nd | |
| NH22402.32 | CTD | 105 | 124 | L8-4 | 12 | 8 | 2325 | S | 42.9500 | -124.8187 | 155 | 145 | |
| NH22402.33 | CTD | 105 | 124 | L8-4 | 12 | 8 | 2339 | E | 42.9524 | -124.8212 | 145 | nd | |
| NH22502.02 | CTD | 106 | 125 | L8-3 | 13 | 8 | 0115 | S | 42.9519 | -124.6655 | 112 | 100 | |
| NH22502.03 | CTD | 106 | 125 | L8-3 | 13 | 8 | 0133 | E | 42.9573 | -124.6658 | 116 | nd | |
| NH22502.06 | CTD | 107 | 126 | L8-2 | 13 | 8 | 0248 | S | 42.9515 | -124.5830 | 78 | 68 | |
| NH22502.07 | CTD | 107 | 126 | L8-2 | 13 | 8 | 0301 | E | 42.9556 | -124.5832 | 80 | nd | |
| NH22502.09 | CTD | 108 | 127 | L9-0 | 13 | 8 | 0620 | S | 42.6845 | -124.4679 | 26 | 16 | |
| NH22502.10 | CTD | 108 | 127 | L9-0 | 13 | 8 | 0627 | E | 42.6855 | -124.4680 | nd | nd | |
| NH22502.12 | CTD | 109 | 128 | L9-1 | 13 | 8 | 0720 | S | 42.6841 | -124.6012 | 110 | 95 | |
| NH22502.13 | CTD | 109 | 128 | L9-1 | 13 | 8 | 0735 | E | 42.6864 | -124.6008 | 108 | nd | End of sheet #19. |
| NH22502.15 | CTD | 110 | 129 | L9-2 | 13 | 8 | 0835 | S | 42.6833 | -124.7011 | 181 | nd | |
| NH22502.16 | CTD | 110 | 129 | L9-2 | 13 | 8 | 0855 | E | 42.6832 | -124.7029 | 185 | 175 | |
| NH22502.20 | CTD | 111 | 130 | L9-3 | 13 | 8 | 1057 | S | 42.6850 | -124.8003 | 656 | 200 | |
| NH22502.21 | CTD | 111 | 130 | L9-3 | 13 | 8 | 1118 | E | 41.6863 | -124.8012 | nd | nd | |
| NH22502.23 | CTD | 112 | 131 | L9-4 | 13 | 8 | 1211 | S | 42.6882 | -124.9095 | 725 | 200 | |
| NH22502.24 | CTD | 112 | 131 | L9-4 | 13 | 8 | 1231 | E | 42.6860 | -124.9032 | nd | nd | |
| NH22502.28 | CTD | 113 | 132 | L9-5 | 13 | 8 | 1530 | S | 42.6849 | -125.0049 | 1296 | 200 | |
| NH22502.29 | CTD | 113 | 132 | L9-5 | 13 | 8 | 1554 | E | 42.6884 | -125.0140 | 1183 | nd | |
| NH22502.31 | CTD | 114 | 133 | L9-6 | 13 | 8 | 1708 | S | 42.6843 | -125.2000 | 3083 | 200 | |
| NH22502.32 | CTD | 114 | 133 | L9-6 | 13 | 8 | 1729 | E | 42.6939 | -125.2051 | nd | nd | End of sheet #20. |
| NH22502.34 | CTD | 115 | 134 | ED1 | 13 | 8 | 1915 | S | 42.5641 | -125.4285 | 3102 | 200 | ED=Eddy Diversion stations. |
| NH22502.35 | CTD | 115 | 134 | ED1 | 13 | 8 | 1937 | E | 42.5655 | -125.4257 | 3102 | nd | |
| NH22502.37 | CTD | 116 | 135 | ED2 | 13 | 8 | 2133 | S | 42.4167 | -125.6665 | 3092 | 200 | |
| NH22502.38 | CTD | 116 | 135 | ED2 | 13 | 8 | 2153 | E | 42.4177 | -125.6675 | 3094 | 200 | |
| NH22502.40 | CTD | 117 | 136 | ED3 | 13 | 8 | 2340 | S | 42.2502 | -125.6648 | 2965 | 200 | |
| NH22602.01 | CTD | 117 | 136 | ED3 | 14 | 8 | 0000 | E | 42.2540 | -125.6576 | 3002 | nd | |
| NH22602.04 | CTD | 118 | 137 | ED4 | 14 | 8 | 0145 | S | 42.1672 | -125.6651 | 2877 | 200 | |
| NH22602.05 | CTD | 118 | 137 | ED4 | 14 | 8 | 0208 | E | 42.1671 | -125.6600 | 2866 | 200 | |
| NH22602.08 | CTD | 119 | 138 | ED5 | 14 | 8 | 0330 | S | 42.0839 | -125.6648 | 2820 | 200 | |
| NH22602.09 | CTD | 119 | 138 | ED5 | 14 | 8 | 0352 | E | 42.0853 | -125.6604 | 2879 | 200 | |
| NH22602.12 | CTD | 120 | 139 | ED6 | 14 | 8 | 0507 | S | 42.0023 | -125.6664 | 2943 | 200 | |

**Table 5: CTD Casts (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22602.13 | CTD | 120 | 139 | ED6 | 14 | 8 | 0530 | E | 42.0012 | -125.6635 | 2918 | 200 | |
| NH22602.15 | CTD | 121 | 140 | ED7 | 14 | 8 | 0720 | S | 42.1985 | -125.5005 | nd | 200 | End of sheet #21. |
| NH22602.16 | CTD | 121 | 140 | ED7 | 14 | 8 | 0743 | E | 42.2008 | -125.5046 | 3112 | 200 | |
| NH22602.18 | CTD | 122 | 141 | L11-8 | 14 | 8 | 0934 | S | 42.2006 | -125.2028 | 2158 | 200 | |
| NH22602.19 | CTD | 122 | 141 | L11-8 | 14 | 8 | 0950 | E | 42.2011 | -125.2056 | nd | nd | |
| NH22602.21 | CTD | 123 | 142 | L11-6 | 14 | 8 | 1155 | S | 42.2032 | -125.2023 | 876 | 200 | |
| NH22602.22 | CTD | 123 | 142 | L11-6 | 14 | 8 | 1222 | E | 42.2019 | -125.8736 | 887 | nd | |
| NH22602.24 | CTD | 124 | 143 | L11-5 | 14 | 8 | 1410 | S | 42.2003 | -125.7020 | 545 | 200 | |
| NH22602.25 | CTD | 124 | 143 | L11-5 | 14 | 8 | 1427 | E | 42.2020 | -125.7053 | nd | nd | |
| NH22602.29 | CTD | 125 | 144 | L11-4 | 14 | 8 | 1650 | S | 42.2007 | -124.6335 | 367 | 200 | |
| NH22602.30 | CTD | 125 | 144 | L11-4 | 14 | 8 | 1710 | E | 42.2025 | -124.6492 | 368 | nd | |
| NH22602.32 | CTD | 126 | 145 | L11-3 | 14 | 8 | 1752 | S | 42.2013 | -124.5671 | 167 | 150 | |
| NH22602.33 | CTD | 126 | 145 | L11-3 | 14 | 8 | 1808 | E | 42.2022 | -124.5683 | 169 | nd | |
| NH22602.37 | CTD | 127 | 146 | L11-2 | 14 | 8 | 2049 | S | 42.2006 | -124.4824 | 116 | 106 | |
| NH22602.38 | CTD | 127 | 146 | L11-2 | 14 | 8 | 2106 | E | 42.2061 | -124.4818 | nd | nd | |
| NH22602.41 | CTD | 128 | 147 | L11-1 | 14 | 8 | 2221 | S | 42.1997 | -124.4206 | 68 | 58 | |
| NH22602.42 | CTD | 128 | 147 | L11-1 | 14 | 8 | 2228 | E | 42.2005 | -124.4212 | nd | nd | |
| NH22702.01 | CTD | 129 | 148 | RR2 | 15 | 8 | 0155 | S | 42.5060 | -124.6041 | 90 | 80 | |
| NH22702.02 | CTD | 129 | 148 | RR2 | 15 | 8 | 0210 | E | 42.5070 | -124.6105 | nd | nd | |
| NH22702.07 | CTD | 130 | 149 | L8-3 | 15 | 8 | 1656 | S | 42.9506 | -124.6685 | 113 | nd | |
| NH22702.08 | CTD | 130 | 149 | L8-3 | 15 | 8 | 1715 | E | 42.9500 | -124.6667 | nd | nd | |
| NH22702.10 | CTD | 131 | 150 | L8-4 | 15 | 8 | 1820 | S | 42.9503 | -124.8280 | 157 | 145 | |
| NH22702.11 | CTD | 131 | 150 | L8-4 | 15 | 8 | 1837 | E | 42.9520 | -124.8199 | 152 | nd | |
| NH22702.17 | CTD | 132 | 150 | L8-4 | 15 | 8 | 2233 | S | 42.9507 | -124.8184 | 155 | 100 | |
| NH22702.18 | CTD | 132 | 150 | L8-4 | 15 | 8 | 2245 | E | 42.9520 | -124.8201 | nd | nd | |
| NH22802.01 | CTD | 133 | 150 | L8-4 | 16 | 8 | 0055 | S | 42.9489 | -124.8192 | 157 | 100 | |
| NH22802.02 | CTD | 133 | 150 | L8-4 | 16 | 8 | 0107 | E | 42.9505 | -124.8215 | 150 | nd | |
| NH22802.05 | CTD | 134 | 150 | L8-4 | 16 | 8 | 0350 | S | 42.9501 | -124.8159 | 158 | 100 | |
| NH22802.06 | CTD | 134 | 150 | L8-4 | 16 | 8 | 0400 | E | 42.9509 | -124.8176 | 156 | 100 | |
| NH22802.09 | CTD | 135 | 150 | L8-4 | 16 | 8 | 0547 | S | 42.9492 | -124.8172 | 161 | 100 | |
| NH22802.10 | CTD | 135 | 150 | L8-4 | 16 | 8 | 0557 | E | 42.9508 | -124.8180 | 155 | 100 | |
| NH22802.12 | CTD | 136 | 150 | L8-4 | 16 | 8 | 0815 | S | 42.9487 | -124.8329 | 161 | 100 | |
| NH22802.13 | CTD | 136 | 150 | L8-4 | 16 | 8 | 0832 | E | 42.9513 | -124.8201 | 152 | nd | |
| NH22802.16 | CTD | 137 | 150 | L8-4 | 16 | 8 | 1045 | S | 42.9477 | -124.8160 | 161 | 150 | |
| NH22802.17 | CTD | 137 | 150 | L8-4 | 16 | 8 | 1108 | E | 42.9492 | -124.8193 | nd | nd | |
| NH22802.19 | CTD | 138 | 151 | L8-3 | 16 | 8 | 1428 | S | 42.9482 | -124.6680 | 110 | 95 | |
| NH22802.20 | CTD | 138 | 151 | L8-3 | 16 | 8 | 1443 | E | 42.9498 | -124.6675 | 110 | nd | |
| NH22802.22 | CTD | 139 | 152 | L8-2 | 16 | 8 | 1532 | S | 42.9489 | -124.5845 | 73 | 70 | |
| NH22802.23 | CTD | 139 | 152 | L8-2 | 16 | 8 | 1550 | E | 42.9532 | -124.5868 | 79 | nd | |
| NH22802.25 | CTD | 140 | 153 | L8-1 | 16 | 8 | 1640 | S | 42.9341 | -124.5239 | 30 | 25 | |
| NH22802.26 | CTD | 140 | 153 | L8-1 | 16 | 8 | 1652 | E | 42.9328 | -124.5256 | nd | nd | |
| NH22802.30 | CTD | 141 | 154 | L8-4 | 16 | 8 | 2029 | S | 42.9435 | -124.8184 | 155 | nd | |
| NH22802.31 | CTD | 141 | 154 | L8-4 | 16 | 8 | 2045 | E | 42.9454 | -124.8224 | 161 | nd | |
| NH22802.33 | CTD | 142 | 154 | L8-4 | 16 | 8 | 2130 | S | 42.9500 | -124.8192 | 155 | 100 | |
| NH22802.34 | CTD | 142 | 154 | L8-4 | 16 | 8 | 2138 | E | 42.9517 | -124.8213 | 152 | nd | |
| NH22902.01 | CTD | 143 | 155 | HH1 | 17 | 8 | 0710 | S | 44.0011 | -124.1999 | 55 | 45 | |
| NH22902.02 | CTD | 143 | 155 | HH1 | 17 | 8 | 0721 | E | 44.0014 | -124.1992 | nd | nd | |
| NH22902.04 | CTD | 144 | 156 | HH2 | 17 | 8 | 0900 | S | 43.9981 | -124.4019 | 123 | 110 | |

**Table 5: CTD Casts (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22902.05 | CTD | 144 | 156 | HH2 | 17 | 8 | 0917 | E | 43.9990 | -124.4070 | nd | nd | |
| NH22902.09 | CTD | 145 | 157 | HH3 | 17 | 8 | 1104 | S | 44.0015 | -124.5960 | 156 | nd | |
| NH22902.10 | CTD | 145 | 157 | HH3 | 17 | 8 | 1124 | E | 44.0002 | -124.5960 | nd | nd | |
| NH22902.11 | CTD | 146 | 158 | HH4 | 17 | 8 | 1240 | S | 44.0000 | -124.8008 | 108 | 95 | |
| NH22902.12 | CTD | 146 | 158 | HH4 | 17 | 8 | 1257 | E | 44.0014 | -124.8020 | nd | nd | |
| NH22902.17 | CTD | 147 | 159 | HH5 | 17 | 8 | 1658 | S | 43.9652 | -125.0000 | nd | nd | |
| NH22902.18 | CTD | 147 | 159 | HH5 | 17 | 8 | 1720 | E | 44.0030 | -125.0030 | nd | nd | |
| NH22902.25 | CTD | 148 | 159 | HH5 | 17 | 8 | 2300 | S | 43.9987 | -125.0011 | 951 | 100 | |
| NH22902.26 | CTD | 148 | 159 | HH5 | 17 | 8 | 2317 | E | 43.9995 | -125.0039 | nd | nd | |
| NH23002.07 | CTD | 149 | 160 | NH45 | 18 | 8 | 0949 | S | 44.6507 | -125.1196 | 739 | 650 | |
| NH23002.08 | CTD | 149 | 160 | NH45 | 18 | 8 | 1025 | E | 44.6527 | -125.1233 | 763 | nd | |
| NH23002.13 | CTD | 150 | 162 | NH25 | 18 | 8 | 1323 | S | 44.6528 | -124.6524 | 298 | 200 | |
| NH23002.14 | CTD | 150 | 162 | NH25 | 18 | 8 | 1347 | E | 44.6527 | -124.6360 | nd | nd | |
| NH23002.19 | CTD | 151 | 163 | NH20 | 18 | 8 | 1610 | S | 44.6523 | -124.5290 | 147 | 130 | |
| NH23002.20 | CTD | 151 | 163 | NH20 | 18 | 8 | 1623 | E | 44.6535 | -124.5327 | nd | nd | |
| NH23002.23 | CTD | 152 | 164 | NH15 | 18 | 8 | 1728 | S | 44.6506 | -124.4257 | 92 | 80 | |
| NH23002.24 | CTD | 152 | 164 | NH15 | 18 | 8 | 1743 | E | 44.6515 | -124.4132 | nd | nd | |
| NH23002.27 | CTD | 153 | 165 | NH10 | 18 | 8 | 1900 | S | 44.6510 | -124.2855 | 83 | 70 | |
| NH23002.28 | CTD | 153 | 165 | NH10 | 18 | 8 | 1911 | E | 44.6519 | -124.2878 | 83 | nd | |
| NH23002.31 | CTD | 154 | 166 | NH5 | 18 | 8 | 2008 | S | 44.6508 | -124.1776 | 62 | 50 | |
| NH23002.32 | CTD | 154 | 166 | NH5 | 18 | 8 | 2015 | E | 44.6508 | -124.1778 | nd | nd | |
| NH23102.07 | CTD | 155 | 172 | NH1 | 19 | 8 | 0618 | S | 44.6503 | -124.0996 | 28 | 20 | |
| NH23102.08 | CTD | 155 | 172 | NH1 | 19 | 8 | 0626 | E | 44.6657 | -124.1005 | nd | nd | |

**Table 6: MOCNESS Sampling**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21302.34 | MOC | 1 | 13 | BOB5 | 1 | 8 | 2130 | S | 44.2833 | -124.8832 | nd | 150 | Repositioned due to fishing boat in area. |
| NH21302.35 | MOC | 1 | 13 | BOB5 | 1 | 8 | 2315 | E | 44.3086 | -124.8861 | nd | nd | First MOC of cruise; winch problems delayed us. |
| NH21402.08 | MOC | 2 | 15 | BOB3 | 2 | 8 | 0415 | S | 44.2519 | -124.5180 | 104 | 90 | |
| NH21402.09 | MOC | 2 | 15 | BOB3 | 2 | 8 | 0500 | E | 44.2708 | -124.5269 | nd | nd | |
| NH21402.22 | MOC | 3 | 19 | HH2 | 2 | 8 | 1227 | S | 44.0085 | -124.3978 | 120 | 110 | |
| NH21402.23 | MOC | 3 | 19 | HH2 | 2 | 8 | 1255 | E | 44.0230 | -124.3992 | nd | nd | |
| NH21402.24 | MOC | 4 | 20 | HH3 | 2 | 8 | 1414 | S | 44.0026 | -124.6030 | 150 | 140 | |
| NH21402.25 | MOC | 4 | 20 | HH3 | 2 | 8 | 1459 | E | 44.0313 | -124.6102 | nd | nd | |
| NH21402.32 | MOC | 5 | 22 | HH5 | 2 | 8 | 1859 | S | 44.0002 | -125.0001 | 950 | 350 | |
| NH21402.33 | MOC | 5 | 22 | HH5 | 2 | 8 | 2005 | E | 44.0443 | -125.0185 | 1093 | nd | |
| NH21502.29 | MOC | 6 | 36 | FM4A | 3 | 8 | 2035 | S | 43.2097 | -124.5947 | 100 | 95 | Acoustics calibration. |
| NH21502.30 | MOC | 6 | 36 | FM4A | 3 | 8 | 2115 | E | 43.2300 | -124.6112 | nd | nd | |
| NH21602.22 | MOC | 7 | 46 | L9-7 | 4 | 8 | 1345 | S | 42.7000 | -125.3932 | nd | nd | |
| NH21602.23 | MOC | 7 | 46 | L9-7 | 4 | 8 | 1510 | E | 42.7450 | -125.4402 | nd | nd | |
| NH21602.27 | MOC | 8 | 47 | L9-8 | 4 | 8 | 1652 | S | 42.6871 | -125.6134 | 3047 | 350 | |
| NH21602.28 | MOC | 8 | 47 | L9-8 | 4 | 8 | 1757 | E | 42.7056 | -125.6715 | nd | nd | |
| NH21702.04 | MOC | 9 | 50 | L9-7 | 5 | 8 | 0115 | S | 42.7153 | -125.3874 | 3101 | 350 | |
| NH21702.05 | MOC | 9 | 50 | L9-7 | 5 | 8 | 0240 | E | 42.7280 | -125.3087 | nd | nd | |
| NH21702.06 | MOC | 10 | 51 | L9-6 | 5 | 8 | 0334 | S | 42.6955 | -125.2000 | 3077 | 350 | |
| NH21702.07 | MOC | 10 | 51 | L9-6 | 5 | 8 | 0436 | E | 42.7284 | -125.2074 | 3082 | nd | |
| NH21702.14 | MOC | 11 | 52 | RR7 | 5 | 8 | 0838 | S | 42.5088 | -125.1962 | nd | 350 | |
| NH21702.15 | MOC | 11 | 52 | RR7 | 5 | 8 | 0943 | E | 42.5425 | -125.2324 | nd | nd | End Sheet #7. |
| NH21702.25 | MOC | 12 | 56 | RR3.5 | 5 | 8 | 1555 | S | 42.5014 | -124.7446 | 264 | 250 | 1000s of moon jellies. |
| NH21702.26 | MOC | 12 | 56 | RR3.5 | 5 | 8 | 1645 | E | 42.5319 | -124.7167 | nd | nd | |
| NH21802.01 | MOC | 13 | 59 | CR4 | 6 | 8 | 0013 | S | 41.9176 | -124.6195 | 542 | 350 | |
| NH21802.02 | MOC | 13 | 59 | CR4 | 6 | 8 | 0123 | E | 41.9601 | -124.6638 | 610 | 350 | |
| NH21802.07 | MOC | 14 | 60 | CR3 | 6 | 8 | 0335 | S | 41.9128 | -124.5126 | 139 | 125 | |
| NH21802.08 | MOC | 14 | 60 | CR3 | 6 | 8 | 0403 | E | 41.9241 | -124.5270 | nd | nd | |
| NH21802.16 | MOC | 15 | 63 | CR3 | 6 | 8 | 0751 | S | 41.9038 | -124.5067 | 142 | 133 | |
| NH21802.17 | MOC | 15 | 63 | CR3 | 6 | 8 | 0838 | E | 41.9373 | -124.5404 | nd | nd | |
| NH21802.19 | MOC | 16 | 64 | CR4 | 6 | 8 | 0944 | S | 41.9055 | -124.6042 | 510 | 350 | |
| NH21802.20 | MOC | 16 | 64 | CR4 | 6 | 8 | 1035 | E | 41.9430 | -124.6236 | nd | nd | |
| NH21802.27 | MOC | 17 | 66 | CR7 | 6 | 8 | 1436 | S | 41.9164 | -125.0025 | nd | 350 | |
| NH21802.28 | MOC | 17 | 66 | CR7 | 6 | 8 | 1531 | E | 41.9154 | -125.0230 | nd | nd | |
| NH21902.18 | MOC | 18 | 77 | EW1 | 7 | 8 | 1151 | S | 42.7329 | -125.8412 | 2800 | 350 | Maneuvered around Revelle. |
| NH21902.19 | MOC | 18 | 77 | EW1 | 7 | 8 | 1243 | E | 42.7329 | -125.8333 | 2869 | nd | |
| NH21902.32 | MOC | 19 | 81 | EW5 | 7 | 8 | 2027 | S | 42.7354 | -125.4103 | 3099 | 300 | |
| NH21902.33 | MOC | 19 | 81 | EW5 | 7 | 8 | 2157 | E | 42.8193 | -125.4172 | 3098 | nd | |
| NH22002.15 | MOC | 20 | 86 | NH25 | 8 | 8 | 2100 | S | 44.6526 | -125.6483 | 295 | 200 | |
| NH22002.16 | MOC | 20 | 86 | NH25 | 8 | 8 | 2155 | E | 44.6867 | -125.6500 | 299 | nd | |
| NH22102.01 | MOC | 21 | 87 | NH20 | 9 | 8 | 0001 | S | 44.6651 | -125.5342 | 150 | 135 | |
| NH22102.02 | MOC | 21 | 87 | NH20 | 9 | 8 | 0034 | E | 44.6856 | -124.5350 | nd | nd | |
| NH22102.03 | MOC | 22 | 88 | NH15 | 9 | 8 | 0208 | S | 44.6523 | -124.4126 | 95 | 85 | Waited 30 min for Revelle to clear station. |
| NH22102.04 | MOC | 22 | 88 | NH15 | 9 | 8 | 0229 | E | 44.6694 | -124.4168 | nd | nd | |
| NH22102.28 | MOC | 23 | 95 | NH15 | 9 | 8 | 1112 | S | 44.6615 | -124.4117 | 98 | 85 | |
| NH22102.29 | MOC | 23 | 95 | NH15 | 9 | 8 | 1140 | E | 44.6656 | -124.4126 | nd | nd | |
| NH22102.32 | MOC | 24 | 96 | NH20 | 9 | 8 | 1315 | S | 44.6625 | -124.5350 | 145 | 135 | |
| NH22102.33 | MOC | 24 | 96 | NH20 | 9 | 8 | 1356 | E | 44.6857 | -124.5420 | nd | nd | |

**Table 6: MOCNESS Sampling (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22102.36 | MOC | 25 | 97 | NH25 | 9 | 8 | 1510 | S | 44.6574 | -124.6626 | 295 | 275 | |
| NH22102.37 | MOC | 25 | 97 | NH25 | 9 | 8 | 1616 | E | 44.7017 | -124.6900 | nd | nd | |
| NH22202.24 | MOC | 26 | 107 | HH3 | 10 | 8 | 2209 | S | 44.0107 | -124.6133 | 150 | 135 | |
| NH22202.25 | MOC | 26 | 107 | HH3 | 10 | 8 | 2245 | E | 44.0334 | -124.6050 | 141 | nd | |
| NH22302.07 | MOC | 27 | 109 | HH5 | 11 | 8 | 0323 | S | 44.0165 | -125.0083 | 1015 | 350 | |
| NH22302.08 | MOC | 27 | 109 | HH5 | 11 | 8 | 0430 | E | 44.0662 | -125.0132 | nd | nd | |
| NH22302.10 | MOC | 28 | 109 | HH5 | 11 | 8 | 0658 | S | 44.0012 | -125.0003 | nd | nd | |
| NH22302.11 | MOC | 28 | 109 | HH5 | 11 | 8 | 0750 | E | 44.0253 | -125.0025 | nd | nd | |
| NH22302.22 | MOC | 29 | 113 | HH4H | 11 | 8 | 1800 | S | 43.9628 | -124.6783 | 123 | 115 | |
| NH22302.23 | MOC | 29 | 113 | HH4H | 11 | 8 | 1830 | E | 43.9818 | -124.6833 | nd | nd | |
| NH22302.24 | MOC | 30 | 113 | HH4H | 11 | 8 | 2115 | S | 43.9524 | -124.6767 | 155 | 125 | |
| NH22302.25 | MOC | 30 | 113 | HH4H | 11 | 8 | 2150 | E | 43.9769 | -124.6847 | 121 | nd | |
| NH22402.23 | MOC | 31 | 120 | FM7 | 12 | 8 | 1501 | S | 43.2386 | -124.8500 | 420 | 350 | |
| NH22402.24 | MOC | 31 | 120 | FM7 | 12 | 8 | 1608 | E | 43.2750 | -124.8650 | nd | nd | |
| NH22502.18 | MOC | 32 | 129 | L9-2 | 13 | 8 | 0932 | S | 42.6865 | -124.7040 | nd | nd | |
| NH22502.19 | MOC | 32 | 129 | L9-2 | 13 | 8 | 0959 | E | 42.7030 | -124.6983 | nd | nd | |
| NH22502.26 | MOC | 33 | 131 | L9-4 | 13 | 8 | 1307 | S | 42.6954 | -124.9233 | 788 | 350 | |
| NH22502.27 | MOC | 33 | 131 | L9-4 | 13 | 8 | 1420 | E | 42.7352 | -124.9655 | nd | nd | |
| NH22602.27 | MOC | 34 | 143 | L11-5 | 14 | 8 | 1502 | S | 42.2081 | -125.7117 | 531 | 365 | |
| NH22602.28 | MOC | 34 | 143 | L11-5 | 14 | 8 | 1544 | E | 42.2137 | -125.7117 | nd | nd | |
| NH22602.35 | MOC | 35 | 145 | L11-3 | 14 | 8 | 1857 | S | 42.2052 | -124.5748 | 200 | 185 | |
| NH22602.36 | MOC | 35 | 145 | L11-3 | 14 | 8 | 1920 | E | 42.2246 | -124.6000 | nd | nd | End sheet #22. |
| NH22702.14 | MOC | 36 | 150 | L8-4 | 15 | 8 | 2005 | S | 42.8711 | -124.8200 | 148 | 75 | |
| NH22702.15 | MOC | 36 | 150 | L8-4 | 15 | 8 | 2110 | E | 42.9970 | -124.8300 | 114 | nd | |
| NH22802.36 | MOC | 37 | 154 | L8-4 | 16 | 8 | 2237 | S | 42.9526 | -124.8183 | 160 | 110 | |
| NH22802.37 | MOC | 37 | 154 | L8-4 | 16 | 8 | 2310 | E | 42.8896 | -124.8367 | 133 | nd | |
| NH22902.15 | MOC | 38 | 159 | HH5 | 17 | 8 | 1515 | S | 43.9905 | -125.0014 | 932 | 350 | |
| NH22902.16 | MOC | 38 | 159 | HH5 | 17 | 8 | 1608 | E | 44.0254 | -125.0132 | nd | nd | |
| NH22902.22 | MOC | 39 | 159 | HH5 | 17 | 8 | 2005 | S | 44.0060 | -125.0102 | 1010 | 75 | |
| NH22902.23 | MOC | 39 | 159 | HH5 | 17 | 8 | 2125 | E | 44.0518 | -125.0054 | nd | nd | |
| NH23002.03 | MOC | 40 | 159 | HH5 | 18 | 8 | 0150 | S | 44.0062 | -125.0130 | 1014 | 350 | |
| NH23002.04 | MOC | 40 | 159 | HH5 | 18 | 8 | 0307 | E | 44.0463 | -125.0680 | 1308 | nd | |
| NH23002.17 | MOC | 41 | 162 | NH25 | 18 | 8 | 1421 | S | 44.6575 | -124.6100 | 293 | 280 | |
| NH23002.18 | MOC | 41 | 162 | NH25 | 18 | 8 | 1504 | E | 44.6822 | -124.6800 | nd | nd | |
| NH23002.36 | MOC | 42 | 167 | NH25 | 18 | 8 | 2305 | S | 44.6517 | -124.6517 | 295 | 280 | |
| NH23102.01 | MOC | 42 | 167 | NH25 | 19 | 8 | 0010 | E | 44.6860 | -124.6767 | 332 | nd | |
| NH23102.03 | MOC | 43 | 169 | NH15 | 19 | 8 | 0251 | S | 44.6556 | -124.4157 | 95 | 85 | |
| NH23102.04 | MOC | 43 | 169 | NH15 | 19 | 8 | 0312 | E | 44.6675 | -124.4250 | nd | nd | |

**Table 7: Secchi Sampling**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21202.06 | Secchi | 1 | 1 | NH1 | 31 | 7 | 1800 | S | 44.6517 | -124.0999 | 32 | 25 | |
| NH21202.12 | Secchi | 2 | 3 | NH5 | 31 | 7 | nd | S | 44.6472 | -124.1810 | nd | nd | |
| NH21302.13 | Secchi | 3 | 8 | NH35 | 1 | 8 | 0717 | S | 44.6584 | -124.8870 | nd | nd | |
| NH21302.17 | Secchi | 4 | 9 | NH45 | 1 | 8 | 0915 | S | 44.6555 | -125.1172 | nd | 12 | |
| NH21302.21 | Secchi | 5 | 10 | NH55 | 1 | 8 | 1146 | S | 44.6504 | -125.3652 | nd | 10 | |
| NH21302.25 | Secchi | 6 | 11 | NH65 | 1 | 8 | 1349 | S | 44.6517 | -125.6000 | nd | 9 | |
| NH22102.21 | Secchi | 7 | 92 | NH1 | 9 | 8 | 0822 | S | 44.6515 | -124.1010 | nd | 5 | |
| NH22102.23 | Secchi | 8 | 93 | NH5 | 9 | 8 | 0856 | S | 44.6496 | -124.1783 | nd | 3.5 | |
| NH22102.25 | Secchi | 9 | 94 | NH10 | 9 | 8 | 0950 | S | 44.6435 | -124.2090 | nd | 5 | |
| NH22102.27 | Secchi | 10 | 95 | NH15 | 9 | 8 | 1040 | S | 44.6526 | -124.4130 | nd | 6 | |
| NH22102.31 | Secchi | 11 | 96 | NH20 | 9 | 8 | 1259 | S | 44.6513 | -124.5321 | nd | 5 | |
| NH22102.35 | Secchi | 12 | 97 | NH25 | 9 | 8 | 1448 | S | 44.6511 | -124.6537 | nd | 3.5 | |
| NH23002.09 | Secchi | 13 | 160 | NH45 | 18 | 8 | 1028 | S | 44.6527 | -125.1233 | nd | 6 | |
| NH23002.12 | Secchi | 14 | 161 | NH35 | 18 | 8 | 1208 | S | 44.6534 | -124.8830 | nd | 3.25 | |
| NH23002.15 | Secchi | 15 | 162 | NH25 | 18 | 8 | 1341 | S | 44.6527 | -124.6524 | 298 | 4.5 | |
| NH23002.22 | Secchi | 16 | 163 | NH20 | 18 | 8 | 1634 | S | 44.6543 | -124.5337 | nd | nd | |
| NH23002.29 | Secchi | 17 | 165 | NH10 | 18 | 8 | 1905 | S | 44.6519 | -124.3208 | nd | nd | |
| NH23002.33 | Secchi | 18 | 166 | NH5 | 18 | 8 | 2019 | S | 44.6508 | -124.1778 | nd | nd | 3.5 meters. |

**Table 8: Vertical Plankton Tows**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21202.05 | VPT | 1 | 1 | NH1 | 31 | 7 | 1755 | S | 44.6509 | -124.1008 | nd | nd | |
| NH21202.11 | VPT | 2 | 3 | NH5 | 31 | 7 | 2031 | S | 44.6472 | -124.1810 | nd | nd | |
| NH21202.17 | VPT | 3 | 4 | NH10 | 31 | 7 | 2322 | S | 44.6639 | -124.2951 | 83 | 75 | |
| NH21302.03 | VPT | 4 | 5 | NH15 | 1 | 8 | 0146 | S | 44.6374 | -124.4277 | 97 | 85 | |
| NH21302.06 | VPT | 5 | 6 | NH20 | 1 | 8 | 0316 | S | 44.6530 | -124.5361 | 150 | 100 | |
| NH21302.09 | VPT | 6 | 7 | NH25 | 1 | 8 | 0440 | S | 44.6504 | -124.6521 | 294 | 100 | |
| NH21302.12 | VPT | 7 | 8 | NH35 | 1 | 8 | 0655 | S | 44.6563 | -124.8852 | nd | 100 | |
| NH21302.16 | VPT | 8 | 9 | NH45 | 1 | 8 | 0900 | S | 44.6555 | -125.1172 | 690 | 100 | |
| NH21302.20 | VPT | 9 | 10 | NH55 | 1 | 8 | 1137 | S | 44.6504 | -125.3652 | nd | 100 | |
| NH21302.24 | VPT | 10 | 11 | NH65 | 1 | 8 | 1332 | S | 44.6435 | -125.5935 | nd | 100 | |
| NH21302.28 | VPT | 11 | 12 | BOB6 | 1 | 8 | 1733 | S | 44.2502 | -125.1075 | 1171 | 100 | |
| NH21302.33 | VPT | 12 | 13 | BOB5 | 1 | 8 | 1955 | S | 44.2574 | -124.9015 | 149 | 100 | |
| NH21402.03 | VPT | 13 | 14 | BOB4 | 2 | 8 | 0134 | S | 44.2537 | -124.7015 | 96 | 89 | |
| NH21402.07 | VPT | 14 | 15 | BOB3 | 2 | 8 | 0350 | S | 44.2499 | -124.5132 | 103 | 95 | |
| NH21402.12 | VPT | 15 | 16 | BOB2 | 2 | 8 | 0641 | S | 44.2527 | -124.3806 | 90 | 85 | |
| NH21402.15 | VPT | 16 | 17 | BOB1 | 2 | 8 | 0810 | S | 44.2492 | -124.1913 | 56 | 45 | |
| NH21402.18 | VPT | 17 | 18 | HH1 | 2 | 8 | 1012 | S | 44.0012 | -124.1997 | nd | nd | |
| NH21402.21 | VPT | 18 | 19 | HH2 | 2 | 8 | 1156 | S | 44.0035 | -124.3993 | 121 | 100 | |
| NH21402.28 | VPT | 19 | 20 | HH3 | 2 | 8 | 1600 | S | 44.0032 | -124.6018 | 155 | 100 | |
| NH21402.31 | VPT | 20 | 21 | HH4 | 2 | 8 | 1737 | S | 44.0013 | -124.7985 | nd | 100 | Not in the event log sheets. |
| NH21402.36 | VPT | 21 | 22 | HH5 | 2 | 8 | 2118 | S | 44.0030 | -125.0044 | 970 | 100 | |
| NH21402.39 | VPT | 22 | 23 | HH7 | 2 | 8 | 2303 | S | 44.0032 | -125.2069 | 1776 | 100 | |
| NH21502.03 | VPT | 23 | 24 | HH9 | 3 | 8 | 0056 | S | 44.0049 | -125.4151 | 3047 | 100 | |
| NH21502.06 | VPT | 24 | 25 | L5-11 | 3 | 8 | 0320 | S | 43.8075 | -125.6142 | 3073 | 100 | |
| NH21502.09 | VPT | 25 | 26 | L6-12 | 3 | 8 | 0630 | S | 43.4986 | -125.8652 | 3076 | 100 | END of sheet #4. |
| NH21502.12 | VPT | 26 | 27 | L6-11 | 3 | 8 | 0815 | S | 43.4998 | -125.6288 | 3087 | 100 | |
| NH21502.15 | VPT | 27 | 28 | L6-10 | 3 | 8 | 1020 | S | 43.5106 | -125.3327 | 2335 | 100 | |
| NH21502.18 | VPT | 28 | 29 | L6-9 | 3 | 8 | 1149 | S | 43.5053 | -125.1671 | 1601 | 100 | |
| NH21502.21 | VPT | 29 | 30 | FM9 | 3 | 8 | 1430 | S | 43.2233 | -125.1619 | 1652 | 100 | |
| NH21502.22 | VPT | 30 | 31 | FM8 | 3 | 8 | 1535 | S | 43.2167 | -125.0012 | 1097 | 100 | |
| NH21502.23 | VPT | 31 | 32 | FM7 | 3 | 8 | 1647 | S | 43.2167 | -124.8333 | 692 | 100 | Lat/long approximate. |
| NH21502.24 | VPT | 32 | 33 | FM5 | 3 | 8 | 1752 | S | 43.2168 | -124.6683 | 506 | 100 | |
| NH21502.25 | VPT | 33 | 34 | FM4 | 3 | 8 | 1835 | S | 43.2151 | -124.5816 | 89 | 82 | |
| NH21502.26 | VPT | 34 | 35 | FM3 | 3 | 8 | 1905 | S | 43.2148 | -124.4998 | 70 | 60 | |
| NH21602.06 | VPT | 35 | 41 | L8-2 | 4 | 8 | 0338 | S | 42.9493 | -124.6620 | 107 | 100 | |
| NH21602.09 | VPT | 36 | 42 | L9-1 | 4 | 8 | 0633 | S | 42.6846 | -124.5988 | 107 | 92 | Net hit bottom! |
| NH21602.12 | VPT | 37 | 43 | L9-3 | 4 | 8 | 0809 | S | 42.6806 | -124.8065 | 204 | 100 | |
| NH21602.15 | VPT | 38 | 44 | L9-5 | 4 | 8 | 0946 | S | 42.6813 | -125.0016 | 1244 | 100 | |
| NH21602.18 | VPT | 39 | 45 | L9-6 | 4 | 8 | 1128 | S | 42.6917 | -125.1927 | 3076 | 100 | |
| NH21602.21 | VPT | 40 | 46 | L9-7 | 4 | 8 | 1324 | S | 42.6930 | -125.3954 | 3102 | 100 | |
| NH21602.26 | VPT | 41 | 47 | L9-8 | 4 | 8 | 1630 | S | 42.6850 | -125.6055 | 3059 | 100 | |
| NH21602.31 | VPT | 42 | 48 | L9-9 | 4 | 8 | 1909 | S | 42.6717 | -125.7975 | 2961 | 100 | |
| NH21602.34 | VPT | 43 | 49 | L9-10 | 4 | 8 | 2055 | S | 42.6740 | -126.0022 | 2300 | 100 | |
| NH21702.02 | VPT | 44 | 50 | L9-7 | 5 | 8 | 0025 | S | 42.6910 | -125.3946 | 3100 | 100 | |
| NH21702.08 | VPT | 45 | 51 | L9-6 | 5 | 8 | 0522 | S | 42.6851 | -125.2039 | 3073 | 100 | |
| NH21702.13 | VPT | 46 | 52 | RR7 | 5 | 8 | 0800 | S | 42.5022 | -125.1963 | 2964 | 100 | |
| NH21702.18 | VPT | 47 | 53 | RR6 | 5 | 8 | 1134 | S | 42.4979 | -125.0028 | 1817 | 100 | |
| NH21702.21 | VPT | 48 | 54 | RR4 | 5 | 8 | 1328 | S | 42.5025 | -124.7988 | 614 | 100 | |

**Table 8: Vertical Plankton Tows (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21702.24 | VPT | 49 | 55 | RR3 | 5 | 8 | 1450 | S | 42.5126 | -124.6926 | 140 | 100 | |
| NH21702.30 | VPT | 50 | 57 | RR2 | 5 | 8 | 1806 | S | 42.5027 | -124.5965 | 87 | 80 | Dumped first tow due to jellyfish. |
| NH21702.33 | VPT | 51 | 58 | RR1 | 5 | 8 | 1912 | S | 42.5008 | -124.4954 | 37 | 30 | |
| NH21702.36 | VPT | 52 | 59 | CR4 | 5 | 8 | 2331 | S | 41.9048 | -124.6038 | 507 | 100 | |
| NH21802.05 | VPT | 53 | 60 | CR3 | 6 | 8 | 0300 | S | 41.9032 | -124.5025 | 138 | 100 | |
| NH21802.11 | VPT | 54 | 61 | CR2 | 6 | 8 | 0517 | S | 41.9019 | -124.4025 | 68 | 62 | |
| NH21802.14 | VPT | 55 | 62 | CR1 | 6 | 8 | 0619 | S | 41.8997 | -124.3005 | nd | 34 | |
| NH21802.15 | VPT | 56 | 63 | CR3 | 6 | 8 | 0730 | S | 41.8999 | -124.5018 | 141 | 100 | |
| NH21802.18 | VPT | 57 | 64 | CR4 | 6 | 8 | 0925 | S | 41.9026 | -124.6149 | 510 | 100 | |
| NH21802.23 | VPT | 58 | 65 | CR6 | 6 | 8 | 1220 | S | 41.9060 | -124.7993 | 709 | 100 | |
| NH21802.26 | VPT | 59 | 66 | CR7 | 6 | 8 | 1415 | S | 41.9081 | -125.0003 | 848 | 100 | |
| NH21802.31 | VPT | 60 | 67 | CR8 | 6 | 8 | 1711 | S | 41.9016 | -125.2090 | nd | 100 | |
| NH21802.34 | VPT | 61 | 68 | CR9 | 6 | 8 | 1852 | S | 41.8947 | -125.4048 | 3119 | 100 | |
| NH21802.37 | VPT | 62 | 69 | CR10 | 6 | 8 | 2046 | S | 41.8970 | -125.6729 | 2941 | 100 | |
| NH21802.40 | VPT | 63 | 70 | CR11 | 6 | 8 | 2259 | S | 41.9029 | -126.0082 | 3351 | 100 | |
| NH21902.03 | VPT | 64 | 71 | EN1 | 7 | 8 | 0150 | S | 42.1470 | -125.7876 | 2772 | 100 | |
| NH21902.06 | VPT | 65 | 72 | EN2 | 7 | 8 | 0351 | S | 42.2343 | -125.6038 | 3162 | 100 | |
| NH21902.07 | VPT | 66 | 73 | EN3 | 7 | 8 | 0448 | S | 42.3319 | -125.6001 | 3073 | 100 | |
| NH21902.11 | VPT | 67 | 74 | EN4 | 7 | 8 | 0636 | S | 42.4192 | -125.5926 | 3097 | 100 | |
| NH21902.12 | VPT | 68 | 75 | EN5 | 7 | 8 | 0734 | S | 42.5002 | -125.4313 | 3098 | 100 | |
| NH21902.15 | VPT | 69 | 76 | EN6 | 7 | 8 | 0859 | S | 42.5963 | -125.6043 | 2716 | 100 | |
| NH21902.17 | VPT | 70 | 77 | EW1 | 7 | 8 | 1051 | S | 42.7283 | -125.8646 | 2967 | 100 | EW1=eddy west=>transect from west to east. |
| NH21902.24 | VPT | 71 | 78 | EW2 | 7 | 8 | 1547 | S | 42.7227 | -125.7587 | 2635 | 100 | |
| NH21902.27 | VPT | 72 | 79 | EW3 | 7 | 8 | 1713 | S | 42.7211 | -125.6787 | 3059 | 100 | |
| NH21902.30 | VPT | 73 | 80 | EW4 | 7 | 8 | 1859 | S | 42.7351 | -125.5096 | 3103 | 100 | |
| NH21902.31 | VPT | 74 | 81 | EW5 | 7 | 8 | 2010 | S | 42.7266 | -125.4035 | 3100 | 100 | |
| NH22002.01 | VPT | 75 | 82 | EW6 | 8 | 8 | 0022 | S | 42.7259 | -125.1745 | 3036 | 100 | |
| NH22002.04 | VPT | 76 | 83 | EW7 | 8 | 8 | 0235 | S | 42.7277 | -124.9403 | 845 | 100 | |
| NH22002.07 | VPT | 77 | 84 | NH45 | 8 | 8 | 1530 | S | 44.6554 | -125.1234 | 727 | 100 | |
| NH22002.10 | VPT | 78 | 85 | NH35 | 8 | 8 | 1721 | S | 44.6500 | -125.8858 | 459 | 100 | |
| NH22002.13 | VPT | 79 | 86 | NH25 | 8 | 8 | 1904 | S | 44.6505 | -125.6512 | nd | 100 | |
| NH22002.19 | VPT | 80 | 87 | NH20 | 8 | 8 | 2327 | S | 44.6539 | -125.5308 | 145 | 100 | |
| NH22102.07 | VPT | 81 | 88 | NH15 | 9 | 8 | 0325 | S | 44.6541 | -124.4164 | 97 | 87 | |
| NH22102.11 | VPT | 82 | 89 | NH10 | 9 | 8 | 0501 | S | 44.6516 | -124.2843 | 80 | 75 | |
| NH22102.14 | VPT | 83 | 90 | NH5 | 9 | 8 | 0606 | S | 44.6501 | -124.1792 | 59 | 52 | End of sheet #13. |
| NH22102.17 | VPT | 84 | 91 | NH3 | 9 | 8 | 0728 | S | 44.6483 | -124.1372 | 47 | 40 | |
| NH22102.20 | VPT | 85 | 92 | NH1 | 9 | 8 | 0814 | S | 44.6515 | -124.1010 | 28 | 22 | |
| NH22102.22 | VPT | 86 | 93 | NH5 | 9 | 8 | 0845 | S | 44.6496 | -124.1783 | 58 | 52 | |
| NH22102.24 | VPT | 87 | 94 | NH10 | 9 | 8 | 0940 | S | 44.6435 | -124.2090 | 80 | 72 | |
| NH22102.26 | VPT | 88 | 95 | NH15 | 9 | 8 | 1035 | S | 44.6526 | -124.4130 | 93 | 85 | |
| NH22102.30 | VPT | 89 | 96 | NH20 | 9 | 8 | 1245 | S | 44.6513 | -124.5321 | 145 | 100 | |
| NH22102.34 | VPT | 90 | 97 | NH25 | 9 | 8 | 1442 | S | 44.6511 | -124.6537 | 295 | 100 | |
| NH22102.40 | VPT | 91 | 98 | L2-6 | 9 | 8 | 1851 | S | 44.4753 | -125.0391 | 856 | 100 | |
| NH22102.44 | VPT | 92 | 99 | L2-5 | 9 | 8 | 2055 | S | 44.4779 | -124.8359 | 232 | 100 | |
| NH22102.48 | VPT | 93 | 100 | L2-4 | 9 | 8 | 2301 | S | 44.4755 | -124.6357 | 149 | 100 | |
| NH22202.03 | VPT | 94 | 101 | L2-3 | 10 | 8 | 0105 | S | 44.4784 | -124.4251 | 74 | 67 | |
| NH22202.07 | VPT | 95 | 102 | L2-2 | 10 | 8 | 0257 | S | 44.4764 | -124.2539 | 74 | 67 | |
| NH22202.10 | VPT | 96 | 103 | L2-1 | 10 | 8 | 0438 | S | 44.4753 | -124.1651 | 51 | nd | |

**Table 8: Vertical Plankton Tows (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22202.13 | VPT | 97 | 104 | L3-1 | 10 | 8 | 1539 | S | 44.2540 | -124.1928 | 56 | 50 | |
| NH22202.16 | VPT | 98 | 105 | HH1 | 10 | 8 | 1800 | S | 44.0009 | -124.2052 | 56 | 50 | |
| NH22202.19 | VPT | 99 | 106 | HH2 | 10 | 8 | 1938 | S | 44.0026 | -124.4105 | 122 | 100 | |
| NH22202.22 | VPT | 100 | 107 | HH3 | 10 | 8 | 2135 | S | 44.0044 | -124.6050 | 153 | 100 | |
| NH22302.03 | VPT | 101 | 108 | HH4 | 11 | 8 | 0110 | S | 44.0047 | -124.8043 | 106 | 100 | |
| NH22302.06 | VPT | 102 | 109 | HH5 | 11 | 8 | 0257 | S | 44.0076 | -125.0057 | 994 | 100 | |
| NH22302.14 | VPT | 103 | 110 | L4A-6 | 11 | 8 | 1014 | S | 43.8763 | -124.9957 | 1083 | 100 | |
| NH22302.17 | VPT | 104 | 111 | L4A-5 | 11 | 8 | 1146 | S | 43.8694 | -124.8316 | nd | 100 | |
| NH22302.20 | VPT | 105 | 112 | L4A-4 | 11 | 8 | 1348 | S | 43.8726 | -124.6603 | 285 | 100 | |
| NH22302.21 | VPT | 106 | 113 | HH4H | 11 | 8 | 1520 | S | 44.0026 | -124.7053 | 225 | 100 | H suffix signifies Humpback station. |
| NH22402.03 | VPT | 107 | 114 | L4A-3 | 12 | 8 | 0044 | S | 43.8702 | -124.4969 | 144 | 100 | |
| NH22402.07 | VPT | 108 | 115 | L4A-2 | 12 | 8 | 0314 | S | 43.8699 | -124.3389 | 115 | 100 | |
| NH22402.10 | VPT | 109 | 116 | L4A-1 | 12 | 8 | 0458 | S | 43.8668 | -124.2168 | 60 | 55 | |
| NH22402.13 | VPT | 110 | 117 | FM1 | 12 | 8 | 0953 | S | 43.2197 | -124.4330 | 35 | 30 | |
| NH22402.16 | VPT | 111 | 118 | FM3 | 12 | 8 | 1056 | S | 43.2174 | -124.5023 | 57 | 50 | |
| NH22402.19 | VPT | 112 | 119 | FM4 | 12 | 8 | 1159 | S | 43.2179 | -124.5871 | 90 | 85 | Skipped FM5 because Revelle was there for an extended period. |
| NH22402.22 | VPT | 113 | 120 | FM7 | 12 | 8 | 1435 | S | 43.2292 | -124.8456 | 349 | 100 | |
| NH22402.27 | VPT | 114 | 121 | FM8 | 12 | 8 | 1825 | S | 43.2183 | -125.0055 | 1093 | 100 | |
| NH22402.28 | VPT | 115 | 122 | FM9 | 12 | 8 | 1935 | S | 43.2158 | -125.1667 | nd | nd | Revelle did CTD. |
| NH22402.31 | VPT | 116 | 123 | L8-5 | 12 | 8 | 2235 | S | 42.9620 | -124.8792 | 262 | 100 | |
| NH22402.34 | VPT | 117 | 124 | L8-4 | 12 | 8 | 2345 | S | 42.9536 | -124.8219 | 140 | 100 | |
| NH22502.04 | VPT | 118 | 125 | L8-3 | 13 | 8 | 0135 | S | 42.9589 | -124.6656 | 116 | 100 | |
| NH22502.08 | VPT | 119 | 126 | L8-2 | 13 | 8 | 0315 | S | 42.9585 | -124.5830 | nd | 75 | |
| NH22502.11 | VPT | 120 | 127 | L9-0 | 13 | 8 | 0631 | S | 42.6864 | -124.4669 | 26 | 22 | |
| NH22502.14 | VPT | 121 | 128 | L9-1 | 13 | 8 | 0740 | S | 42.6873 | -124.6008 | 108 | 100 | |
| NH22502.17 | VPT | 122 | 129 | L9-2 | 13 | 8 | 0905 | S | 42.6827 | -124.7037 | 185 | 100 | |
| NH22502.22 | VPT | 123 | 130 | L9-3 | 13 | 8 | 1123 | S | 42.6881 | -124.8011 | 657 | 100 | |
| NH22502.25 | VPT | 124 | 131 | L9-4 | 13 | 8 | 1250 | S | 42.6888 | -124.9145 | nd | 100 | |
| NH22502.30 | VPT | 125 | 132 | L9-5 | 13 | 8 | 1557 | S | 42.6885 | -125.0143 | 1177 | 100 | |
| NH22502.33 | VPT | 126 | 133 | L9-6 | 13 | 8 | 1734 | S | 42.6943 | -125.2035 | 3083 | 100 | |
| NH22502.36 | VPT | 127 | 134 | ED1 | 13 | 8 | 1945 | S | 42.5667 | -125.4263 | 3102 | 100 | |
| NH22502.39 | VPT | 128 | 135 | ED2 | 13 | 8 | 2159 | S | 42.4178 | -125.6676 | 3095 | 100 | |
| NH22602.02 | VPT | 129 | 136 | ED3 | 14 | 8 | 0008 | S | 42.2571 | -125.6561 | 3010 | 100 | |
| NH22602.06 | VPT | 130 | 137 | ED4 | 14 | 8 | 0212 | S | 42.1658 | -125.6566 | 2884 | 100 | |
| NH22602.10 | VPT | 131 | 138 | ED5 | 14 | 8 | 0401 | S | 42.0852 | -125.6587 | 2868 | 100 | |
| NH22602.14 | VPT | 132 | 139 | ED6 | 14 | 8 | 0533 | S | 42.0012 | -125.6618 | 2927 | 100 | |
| NH22602.17 | VPT | 133 | 140 | ED7 | 14 | 8 | 0748 | S | 42.2008 | -125.5047 | 3112 | 100 | |
| NH22602.20 | VPT | 134 | 141 | L11-8 | 14 | 8 | 0955 | S | 42.2012 | -125.2070 | 2436 | 200 | |
| NH22602.23 | VPT | 135 | 142 | L11-6 | 14 | 8 | 1228 | S | 42.2020 | -125.8754 | 891 | 100 | |
| NH22602.26 | VPT | 136 | 143 | L11-5 | 14 | 8 | 1437 | S | 42.2003 | -125.7020 | 552 | 100 | |
| NH22602.31 | VPT | 137 | 144 | L11-4 | 14 | 8 | 1713 | S | 42.2026 | -124.6326 | 368 | 100 | |
| NH22602.34 | VPT | 138 | 145 | L11-3 | 14 | 8 | 1815 | S | 42.2022 | -124.5690 | 173 | nd | |
| NH22602.39 | VPT | 139 | 146 | L11-2 | 14 | 8 | 2115 | S | 42.2073 | -124.4805 | 114 | 100 | |
| NH22602.43 | VPT | 140 | 147 | L11-1 | 14 | 8 | 2236 | S | 42.2011 | -124.4252 | 68 | 62 | |
| NH22702.03 | VPT | 141 | 148 | RR2 | 15 | 8 | 0220 | S | nd | nd | nd | nd | Aborted; high winds. |
| NH22702.05 | VPT | 142 | nd | RR2 | 15 | 8 | 1025 | S | 42.5038 | -124.6050 | 90 | nd | Winch broke; high winds; aborted again. |
| NH22702.09 | VPT | 143 | 149 | L8-3 | 15 | 8 | 1721 | S | 42.9570 | -124.6713 | nd | 100 | |

**Table 8: Vertical Plankton Tows (cont'd)**

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22702.12 | VPT | 144 | 150 | L8-4 | 15 | 8 | 1846 | S | 42.9525 | 124.8206 | 149 | 100 | |
| NH22802.18 | VPT | 145 | 150 | L8-4 | 16 | 8 | 1100 | S | 42.9493 | 124.8198 | 157 | 100 | |
| NH22802.21 | VPT | 146 | 151 | L8-3 | 16 | 8 | 1450 | S | 42.9507 | 124.6675 | 112 | 100 | |
| NH22802.24 | VPT | 147 | 152 | L8-2 | 16 | 8 | 1553 | S | 42.9515 | 124.5879 | 73 | 70 | |
| NH22802.27 | VPT | 148 | 153 | L8-1 | 16 | 8 | 1657 | S | 42.9341 | 124.5263 | 37 | 30 | |
| NH22902.03 | VPT | 149 | 155 | HH1 | 17 | 8 | 0725 | S | 44.0014 | 124.1989 | 55 | 45 | |
| NH22902.06 | VPT | 150 | 156 | HH2 | 17 | 8 | 0921 | S | 43.9990 | 124.4073 | 123 | 100 | |
| NH22902.08 | VPT | 151 | 157 | HH3 | 17 | 8 | 1045 | S | 44.0006 | 124.5971 | 152 | 100 | |
| NH22902.13 | VPT | 152 | 158 | HH4 | 17 | 8 | 1304 | S | 44.0044 | 124.8022 | 107 | 100 | |
| NH22902.14 | VPT | 153 | 159 | HH5 | 17 | 8 | 1423 | S | 44.0040 | 125.0000 | 942 | 100 | |
| NH23002.10 | VPT | 154 | 160 | NH45 | 18 | 8 | 1030 | S | 44.6527 | 125.1235 | 740 | 100 | |
| NH23002.11 | VPT | 155 | 161 | NH35 | 18 | 8 | 1158 | S | 44.6534 | 124.8830 | 450 | 100 | Skipped CTD to save time; Revelle to do it later tonight. |
| NH23002.16 | VPT | 156 | 162 | NH25 | 18 | 8 | 1402 | S | 44.6540 | 124.6555 | 292 | 100 | |
| NH23002.21 | VPT | 157 | 163 | NH20 | 18 | 8 | 1629 | S | 44.6543 | 124.5338 | 147 | 100 | |
| NH23002.25 | VPT | 158 | 164 | NH15 | 18 | 8 | 1750 | S | 44.6525 | 124.4144 | 92 | 80 | |
| NH23002.30 | VPT | 159 | 165 | NH10 | 18 | 8 | 1915 | S | 44.6525 | 124.2890 | 83 | 75 | |
| NH23002.34 | VPT | 160 | 166 | NH5 | 18 | 8 | 2020 | S | 44.6511 | 124.1787 | 62 | 53 | |
| NH23102.09 | VPT | 161 | 172 | NH1 | 19 | 8 | 0631 | S | 44.6488 | 124.1015 | 28 | 20 | |

# APPENDIX I

# NH0207A EVENT LOG

**EVENT LOG CONTENTS**

| Column Label | Description |
|---|---|
| Event# | Unique identifier for each line of event log |
| Instrument (Instr) | CTD: Conductivity Temperature Depth profile collected with Seabird SBE with 5 liter rosette, fluorescence;<br>VPT: Vertical Plankton Tow, 0.5 m diameter with 0.200 mm mesh;<br>MOC: 1$m^2$ MOCNESS with 0.505 mm mesh;<br>LiveNet1: 1.0 m diameter ring net with 0.333 mm mesh for collecting animals for experiments; |
| Cast | Sequence # for a particular instrument |
| Station (Sta) | Consecutively numbered locations sampled |
| 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 |
| Comments | |

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21202.01 | CTD | nd | 1 | NH1 | 31 | 7 | 1630 | S | 44.6517 | -124.1019 | 30 | 25 | |
| NH21202.02 | CTD | nd | 1 | NH1 | 31 | 7 | 1655 | E | 44.6513 | -124.1023 | nd | nd | Cast failed; forgot to log data. |
| NH21202.03 | CTD | 1 | 1 | NH1 | 31 | 7 | 1710 | S | 44.6507 | -124.1025 | 30 | 25 | |
| NH21202.04 | CTD | 1 | 1 | NH1 | 31 | 7 | 1715 | E | 44.6504 | -124.1030 | nd | nd | |
| NH21202.05 | VPT | 1 | 1 | NH1 | 31 | 7 | 1755 | S | 44.6509 | -124.1008 | nd | nd | |
| NH21202.06 | Secchi | 1 | 1 | NH1 | 31 | 7 | 1800 | S | 44.6517 | -124.0999 | 32 | 25 | |
| NH21202.07 | CTD | 2 | 2 | NH3 | 31 | 7 | 1854 | S | 44.6477 | -124.1368 | 50 | 40 | |
| NH21202.08 | CTD | 2 | 2 | NH3 | 31 | 7 | 1918 | E | 44.6468 | -124.1397 | nd | nd | |
| NH21202.09 | CTD | 3 | 3 | NH5 | 31 | 7 | 2007 | S | 44.6465 | -124.1761 | 58 | 51 | |
| NH21202.10 | CTD | 3 | 3 | NH5 | 31 | 7 | 2017 | E | 44.6466 | -124.1798 | nd | nd | |
| NH21202.11 | VPT | 2 | 3 | NH5 | 31 | 7 | 2031 | S | 44.6472 | -124.1810 | nd | nd | |
| NH21202.12 | Secchi | 2 | 3 | NH5 | 31 | 7 | nd | S | 44.6472 | -124.1810 | nd | nd | |
| NH21202.13 | CTD | 4 | 4 | NH10 | 31 | 7 | 2134 | S | 44.6512 | -124.3005 | 84 | 74 | |
| NH21202.14 | CTD | 4 | 4 | NH10 | 31 | 7 | 2152 | E | 44.6516 | -124.3060 | nd | nd | |
| NH21202.15 | repair | nd | 4 | NH10 | 31 | 7 | 2200 | S | nd | nd | nd | nd | Wire caught in block; damaged; cut off end; new nicopress. |
| NH21202.16 | repair | nd | 4 | NH10 | 31 | 7 | 2315 | E | nd | nd | nd | nd | Fixed after an hour or so. |
| NH21202.17 | VPT | 3 | 4 | NH10 | 31 | 7 | 2322 | S | 44.6639 | -124.2951 | 83 | 75 | |
| NH21302.01 | CTD | 5 | 5 | NH15 | 1 | 8 | 0115 | S | 44.6527 | -124.4182 | 90 | 80 | |
| NH21302.02 | CTD | 5 | 5 | NH15 | 1 | 8 | 0130 | E | 44.6538 | -124.4219 | 92 | 80 | |
| NH21302.03 | VPT | 4 | 5 | NH15 | 1 | 8 | 0146 | S | 44.6374 | -124.4277 | 97 | 85 | |
| NH21302.04 | CTD | 6 | 6 | NH20 | 1 | 8 | 0244 | S | 44.6519 | -124.3646 | 143 | 130 | |
| NH21302.05 | CTD | 6 | 6 | NH20 | 1 | 8 | 0309 | E | 44.6538 | -124.5355 | nd | nd | |
| NH21302.06 | VPT | 5 | 6 | NH20 | 1 | 8 | 0316 | S | 44.6530 | -124.5361 | 150 | 100 | |
| NH21302.07 | CTD | 7 | 7 | NH25 | 1 | 8 | 0412 | S | 44.6493 | -124.6480 | 296 | 200 | |
| NH21302.08 | CTD | 7 | 7 | NH25 | 1 | 8 | 0438 | E | 44.6475 | -124.6522 | 289 | nd | |
| NH21302.09 | VPT | 6 | 7 | NH25 | 1 | 8 | 0440 | S | 44.6504 | -124.6521 | 294 | 100 | |
| NH21302.10 | CTD | 8 | 8 | NH35 | 1 | 8 | 0620 | S | 44.6545 | -124.8826 | 440 | 200 | |
| NH21302.11 | CTD | 8 | 8 | NH35 | 1 | 8 | 0640 | E | 44.6577 | -124.8860 | nd | nd | |
| NH21302.12 | VPT | 7 | 8 | NH35 | 1 | 8 | 0655 | S | 44.6563 | -124.8852 | nd | 100 | |
| NH21302.13 | Secchi | 3 | 8 | NH35 | 1 | 8 | 0717 | S | 44.6584 | -124.8870 | nd | nd | |
| NH21302.14 | CTD | 9 | 9 | NH45 | 1 | 8 | 0839 | S | 44.6525 | -125.1152 | 698 | 200 | |
| NH21302.15 | CTD | 9 | 9 | NH45 | 1 | 8 | 0849 | E | 44.6537 | -125.1163 | 690 | nd | |
| NH21302.16 | VPT | 8 | 9 | NH45 | 1 | 8 | 0900 | S | 44.6555 | -125.1172 | 690 | 100 | |
| NH21302.17 | Secchi | 4 | 9 | NH45 | 1 | 8 | 0915 | S | 44.6555 | -125.1172 | nd | 12 | |
| NH21302.18 | CTD | 10 | 10 | NH55 | 1 | 8 | 1054 | S | 44.6523 | -125.3659 | 2889 | 200 | |
| NH21302.19 | CTD | 10 | 10 | NH55 | 1 | 8 | 1127 | E | 44.6517 | -124.3651 | nd | nd | |
| NH21302.20 | VPT | 9 | 10 | NH55 | 1 | 8 | 1137 | S | 44.6504 | -125.3652 | nd | 100 | |
| NH21302.21 | Secchi | 5 | 10 | NH55 | 1 | 8 | 1146 | S | 44.6504 | -125.3652 | nd | 10 | |
| NH21302.22 | CTD | 11 | 11 | NH65 | 1 | 8 | 1300 | S | 44.6492 | -125.5988 | 2882 | 200 | |
| NH21302.23 | CTD | 11 | 11 | NH65 | 1 | 8 | 1327 | E | 44.6444 | -125.6000 | nd | nd | |
| NH21302.24 | VPT | 10 | 11 | NH65 | 1 | 8 | 1332 | S | 44.6435 | -125.5935 | nd | 100 | |
| NH21302.25 | Secchi | 6 | 11 | NH65 | 1 | 8 | 1349 | S | 44.6517 | -125.6000 | nd | 9 | |
| NH21302.26 | CTD | 12 | 12 | BOB6 | 1 | 8 | 1700 | S | 44.2490 | -125.1025 | 1171 | 200 | |
| NH21302.27 | CTD | 12 | 12 | BOB6 | 1 | 8 | 1727 | E | 44.2499 | -125.1059 | nd | nd | |
| NH21302.28 | VPT | 11 | 12 | BOB6 | 1 | 8 | 1733 | S | 44.2502 | -125.1075 | 1171 | 100 | |
| NH21302.29 | CTD | 13 | 13 | BOB5 | 1 | 8 | 1853 | S | 44.2486 | -124.8999 | 306 | 200 | Water depth recorded inaccurately; actual depth 153; CTD hit bottom! |
| NH21302.30 | CTD | 13 | 13 | BOB5 | 1 | 8 | 1902 | E | 44.2503 | -124.9001 | nd | nd | No bottles tripped due to uncertainties related to impact. |

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21302.31 | CTD | 14 | 13 | BOB5 | 1 | 8 | 1920 | S | 44.2518 | -124.9000 | 153 | 140 | Repeat CTD. |
| NH21302.32 | CTD | 14 | 13 | BOB5 | 1 | 8 | 1935 | E | 44.2540 | -124.8999 | 150 | nd | |
| NH21302.33 | VPT | 12 | 13 | BOB5 | 1 | 8 | 1955 | S | 44.2574 | -124.9015 | 149 | 100 | |
| NH21302.34 | MOC | 1 | 13 | BOB5 | 1 | 8 | 2130 | S | 44.2833 | -124.8832 | nd | 150 | Repositioned due to fishing boat in area. |
| NH21302.35 | MOC | 1 | 13 | BOB5 | 1 | 8 | 2315 | E | 44.3086 | -124.8861 | nd | nd | First MOC of cruise; winch problems delayed us. |
| NH21402.01 | CTD | 15 | 14 | BOB4 | 2 | 8 | 0104 | S | 44.2518 | -124.7844 | 99 | 87 | |
| NH21402.02 | CTD | 15 | 14 | BOB4 | 2 | 8 | 0125 | E | 44.2505 | -124.7000 | 99 | 90 | |
| NH21402.03 | VPT | 13 | 14 | BOB4 | 2 | 8 | 0134 | S | 44.2537 | -124.7015 | 96 | 89 | |
| NH21402.04 | LiveNet1 | 1 | 14 | BOB4 | 2 | 8 | 0152 | S | 44.2552 | -124.7015 | 97 | 30 | |
| NH21402.05 | CTD | 16 | 15 | BOB3 | 2 | 8 | 0325 | S | 44.2488 | -124.5094 | 103 | 90 | |
| NH21402.06 | CTD | 16 | 15 | BOB3 | 2 | 8 | 0343 | E | 44.2492 | -124.5123 | nd | nd | |
| NH21402.07 | VPT | 14 | 15 | BOB3 | 2 | 8 | 0350 | S | 44.2499 | -124.5132 | 103 | 95 | |
| NH21402.08 | MOC | 2 | 15 | BOB3 | 2 | 8 | 0415 | S | 44.2519 | -124.5180 | 104 | 90 | |
| NH21402.09 | MOC | 2 | 15 | BOB3 | 2 | 8 | 0500 | E | 44.2708 | -124.5269 | nd | nd | |
| NH21402.10 | CTD | 17 | 16 | BOB2 | 2 | 8 | 0617 | S | 44.2498 | -124.3799 | 90 | 80 | |
| NH21402.11 | CTD | 17 | 16 | BOB2 | 2 | 8 | 0631 | E | 44.2518 | -124.3805 | 90 | nd | |
| NH21402.12 | VPT | 15 | 16 | BOB2 | 2 | 8 | 0641 | S | 44.2527 | -124.3806 | 90 | 85 | |
| NH21402.13 | CTD | 18 | 17 | BOB1 | 2 | 8 | 0750 | S | 44.2492 | -124.1913 | 54 | 42 | |
| NH21402.14 | CTD | 18 | 17 | BOB1 | 2 | 8 | 0802 | E | 44.2491 | -124.1990 | nd | nd | |
| NH21402.15 | VPT | 16 | 17 | BOB1 | 2 | 8 | 0810 | S | 44.2492 | -124.1913 | 56 | 45 | |
| NH21402.16 | CTD | 19 | 18 | HH1 | 2 | 8 | 0955 | S | 44.0011 | -124.2003 | 56 | 41 | |
| NH21402.17 | CTD | 19 | 18 | HH1 | 2 | 8 | 1004 | E | 44.0014 | -124.2003 | nd | nd | |
| NH21402.18 | VPT | 17 | 18 | HH1 | 2 | 8 | 1012 | S | 44.0012 | -124.1997 | nd | nd | |
| NH21402.19 | CTD | 20 | 19 | HH2 | 2 | 8 | 1128 | S | 44.0014 | -124.3993 | 121 | 111 | |
| NH21402.20 | CTD | 20 | 19 | HH2 | 2 | 8 | 1144 | E | 44.0020 | -124.3984 | 121 | nd | |
| NH21402.21 | VPT | 18 | 19 | HH2 | 2 | 8 | 1156 | S | 44.0035 | -124.3993 | 121 | 100 | |
| NH21402.22 | MOC | 3 | 19 | HH2 | 2 | 8 | 1227 | S | 44.0085 | -124.3978 | 120 | 110 | |
| NH21402.23 | MOC | 3 | 19 | HH2 | 2 | 8 | 1255 | E | 44.0230 | -124.3992 | nd | nd | |
| NH21402.24 | MOC | 4 | 20 | HH3 | 2 | 8 | 1414 | S | 44.0026 | -124.6030 | 150 | 140 | |
| NH21402.25 | MOC | 4 | 20 | HH3 | 2 | 8 | 1459 | E | 44.0313 | -124.6102 | nd | nd | |
| NH21402.26 | CTD | 21 | 20 | HH3 | 2 | 8 | 1505 | S | 44.0005 | -124.6006 | 155 | 140 | |
| NH21402.27 | CTD | 21 | 20 | HH3 | 2 | 8 | 1552 | E | 44.0028 | -124.6014 | 155 | nd | |
| NH21402.28 | VPT | 19 | 20 | HH3 | 2 | 8 | 1600 | S | 44.0032 | -124.6018 | 155 | 100 | |
| NH21402.29 | CTD | 22 | 21 | HH4 | 2 | 8 | 1715 | S | 43.9996 | -124.7997 | 112 | 100 | |
| NH21402.30 | CTD | 22 | 21 | HH4 | 2 | 8 | 1731 | E | 44.0007 | -124.7988 | nd | nd | |
| NH21402.31 | VPT | 20 | 21 | HH4 | 2 | 8 | 1737 | S | 44.0013 | -124.7985 | nd | 100 | Not in the event log sheets. |
| NH21402.32 | MOC | 5 | 22 | HH5 | 2 | 8 | 1859 | S | 44.0002 | -125.0001 | 950 | 350 | |
| NH21402.33 | MOC | 5 | 22 | HH5 | 2 | 8 | 2005 | E | 44.0443 | -125.0185 | 1093 | nd | |
| NH21402.34 | CTD | 23 | 22 | HH5 | 2 | 8 | 2050 | S | 44.0004 | -125.0028 | 960 | 200 | |
| NH21402.35 | CTD | 23 | 22 | HH5 | 2 | 8 | 2107 | E | 44.0019 | -125.0039 | nd | nd | |
| NH21402.36 | VPT | 21 | 22 | HH5 | 2 | 8 | 2118 | S | 44.0030 | -125.0044 | 970 | 100 | |
| NH21402.37 | CTD | 24 | 23 | HH7 | 2 | 8 | 2240 | S | 44.0014 | -125.2040 | 1769 | 200 | |
| NH21402.38 | CTD | 24 | 23 | HH7 | 2 | 8 | 2300 | E | 44.0031 | -125.2073 | nd | nd | |
| NH21402.39 | VPT | 22 | 23 | HH7 | 2 | 8 | 2303 | S | 44.0032 | -125.2069 | 1776 | 100 | |
| NH21502.01 | CTD | 25 | 24 | HH9 | 3 | 8 | 0025 | S | 43.9989 | -125.4045 | 3010 | 200 | |
| NH21502.02 | CTD | 25 | 24 | HH9 | 3 | 8 | 0047 | E | 44.0029 | -125.4124 | nd | nd | |
| NH21502.03 | VPT | 23 | 24 | HH9 | 3 | 8 | 0056 | S | 44.0049 | -125.4151 | 3047 | 100 | |

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21502.04 | CTD | 26 | 25 | L5-11 | 3 | 8 | 0247 | S | 43.8019 | -125.6044 | 3073 | 200 | |
| NH21502.05 | CTD | 26 | 25 | L5-11 | 3 | 8 | 0314 | E | 43.8068 | -125.6138 | 3075 | 200 | |
| NH21502.06 | VPT | 24 | 25 | L5-11 | 3 | 8 | 0320 | S | 43.8075 | -125.6142 | 3073 | 100 | |
| NH21502.07 | CTD | 27 | 26 | L6-12 | 3 | 8 | 0555 | S | 43.4986 | -125.8645 | 3076 | 200 | |
| NH21502.08 | CTD | 27 | 26 | L6-12 | 3 | 8 | 0619 | E | 43.4978 | -125.8655 | nd | nd | |
| NH21502.09 | VPT | 25 | 26 | L6-12 | 3 | 8 | 0630 | S | 43.4986 | -125.8652 | 3076 | 100 | END of sheet #4. |
| NH21502.10 | CTD | 28 | 27 | L6-11 | 3 | 8 | 0749 | S | 43.4986 | -125.6318 | 3087 | 200 | |
| NH21502.11 | CTD | 28 | 27 | L6-11 | 3 | 8 | 0805 | E | 43.4997 | -125.6296 | nd | nd | |
| NH21502.12 | VPT | 26 | 27 | L6-11 | 3 | 8 | 0815 | S | 43.4998 | -125.6288 | 3087 | 100 | |
| NH21502.13 | CTD | 29 | 28 | L6-10 | 3 | 8 | 0951 | S | 43.5031 | -125.3344 | 2349 | 200 | |
| NH21502.14 | CTD | 29 | 28 | L6-10 | 3 | 8 | 1010 | E | 43.5078 | -125.3331 | nd | nd | |
| NH21502.15 | VPT | 27 | 28 | L6-10 | 3 | 8 | 1020 | S | 43.5106 | -125.3327 | 2335 | 100 | |
| NH21502.16 | CTD | 30 | 29 | L6-9 | 3 | 8 | 1125 | S | 43.5011 | -125.1667 | 1505 | 200 | |
| NH21502.17 | CTD | 30 | 29 | L6-9 | 3 | 8 | 1142 | E | 43.5035 | -125.1668 | nd | nd | |
| NH21502.18 | VPT | 28 | 29 | L6-9 | 3 | 8 | 1149 | S | 43.5053 | -125.1671 | 1601 | 100 | |
| NH21502.19 | CTD | 31 | 30 | FM9 | 3 | 8 | 1400 | S | 43.2187 | -125.1637 | 1635 | 200 | |
| NH21502.20 | CTD | 31 | 30 | FM9 | 3 | 8 | 1427 | E | 43.2229 | -125.1623 | nd | nd | |
| NH21502.21 | VPT | 29 | 30 | FM9 | 3 | 8 | 1430 | S | 43.2233 | -125.1619 | 1652 | 100 | |
| NH21502.22 | VPT | 30 | 31 | FM8 | 3 | 8 | 1535 | S | 43.2167 | -125.0012 | 1097 | 100 | |
| NH21502.23 | VPT | 31 | 32 | FM7 | 3 | 8 | 1647 | S | 43.2167 | -124.8333 | 692 | 100 | Lat/long approximate. |
| NH21502.24 | VPT | 32 | 33 | FM5 | 3 | 8 | 1752 | S | 43.2168 | -124.6683 | 506 | 100 | |
| NH21502.25 | VPT | 33 | 34 | FM4 | 3 | 8 | 1835 | S | 43.2151 | -124.5816 | 89 | 82 | |
| NH21502.26 | VPT | 34 | 35 | FM3 | 3 | 8 | 1905 | S | 43.2148 | -124.4998 | 70 | 60 | |
| NH21502.27 | CTD | 32 | 35 | FM3 | 3 | 8 | 1925 | S | 43.2157 | -124.4982 | 69 | 55 | |
| NH21502.28 | CTD | 32 | 35 | FM3 | 3 | 8 | 1940 | E | 43.2170 | -124.5004 | nd | nd | |
| NH21502.29 | MOC | 6 | 36 | FM4A | 3 | 8 | 2035 | S | 43.2097 | -124.5947 | 100 | 95 | Acoustics calibration. |
| NH21502.30 | MOC | 6 | 36 | FM4A | 3 | 8 | 2115 | E | 43.2300 | -124.6112 | nd | nd | |
| NH21502.31 | CTD | 33 | 37 | FM5 | 3 | 8 | 2201 | S | 43.2164 | -124.6668 | 158 | 140 | |
| NH21502.32 | CTD | 33 | 38 | FM7 | 3 | 8 | 2216 | E | 43.2181 | -124.6683 | 161 | nd | |
| NH21502.33 | LiveNet1 | 2 | 39 | FM5 | 3 | 8 | 2234 | S | 43.2232 | -124.6710 | 165 | 40 | |
| NH21502.34 | DipNet | 1 | 39 | FM5 | 3 | 8 | 2245 | S | 43.2235 | -124.6710 | nd | nd | Amphipods in lights + some euphausiids. |
| NH21602.01 | CTD | 34 | 40 | FM7 | 4 | 8 | 0007 | S | 43.2149 | -124.8336 | 343 | 200 | |
| NH21602.02 | CTD | 34 | 40 | FM7 | 4 | 8 | 0036 | E | 43.2060 | -124.8348 | nd | nd | |
| NH21602.03 | LiveNet1 | 3 | 40 | FM7 | 4 | 8 | 0047 | S | 43.2198 | -124.8414 | 340 | 20 | Surface swarm euphausiids + siphonophores |
| NH21602.04 | CTD | 35 | 41 | L8-2 | 4 | 8 | 0315 | S | 42.9500 | -123.6666 | 109 | 100 | |
| NH21602.05 | CTD | 35 | 41 | L8-2 | 4 | 8 | 0332 | E | 42.9500 | -124.6662 | nd | nd | Beroe, hydromedusae, siphonphores + euph swarm at surface. |
| NH21602.06 | VPT | 35 | 41 | L8-2 | 4 | 8 | 0338 | S | 42.9493 | -124.6620 | 107 | 100 | |
| NH21602.07 | CTD | 36 | 42 | L9-1 | 4 | 8 | 0611 | S | 42.6840 | -124.5985 | 107 | 96 | |
| NH21602.08 | CTD | 36 | 42 | L9-1 | 4 | 8 | 0627 | E | 42.6845 | -124.5989 | nd | nd | |
| NH21602.09 | VPT | 36 | 42 | L9-1 | 4 | 8 | 0633 | S | 42.6846 | -124.5988 | 107 | 92 | Net hit bottom! |
| NH21602.10 | CTD | 37 | 43 | L9-3 | 4 | 8 | 0745 | S | 42.6821 | -124.8016 | 206 | 195 | |
| NH21602.11 | CTD | 37 | 43 | L9-3 | 4 | 8 | 0807 | E | 42.6806 | -124.8064 | nd | nd | |
| NH21602.12 | VPT | 37 | 43 | L9-3 | 4 | 8 | 0809 | S | 42.6806 | -124.8065 | 204 | 100 | |
| NH21602.13 | CTD | 38 | 44 | L9-5 | 4 | 8 | 0922 | S | 42.6818 | -125.0005 | 1233 | 200 | |
| NH21602.14 | CTD | 38 | 44 | L9-5 | 4 | 8 | 0939 | E | 42.6822 | -125.0059 | nd | nd | |
| NH21602.15 | VPT | 38 | 44 | L9-5 | 4 | 8 | 0946 | S | 42.6813 | -125.0016 | 1244 | 100 | |
| NH21602.16 | CTD | 39 | 45 | L9-6 | 4 | 8 | 1103 | S | 42.6851 | -125.1978 | 3075 | 200 | |
| NH21602.17 | CTD | 39 | 45 | L9-6 | 4 | 8 | 1121 | E | 42.6887 | -125.1941 | nd | nd | |

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21602.18 | VPT | 39 | 45 | L9-6 | 4 | 8 | 1128 | S | 42.6917 | -125.1927 | 3076 | 100 | |
| NH21602.19 | CTD | 40 | 46 | L9-7 | 4 | 8 | 1253 | S | 42.6849 | -125.4011 | 3102 | 200 | |
| NH21602.20 | CTD | 40 | 46 | L9-7 | 4 | 8 | 1316 | E | 42.6910 | -125.3979 | nd | nd | End of Sheet #6. |
| NH21602.21 | VPT | 40 | 46 | L9-7 | 4 | 8 | 1324 | S | 42.6930 | -125.3954 | 3102 | 100 | |
| NH21602.22 | MOC | 7 | 46 | L9-7 | 4 | 8 | 1345 | S | 42.7000 | -125.3932 | nd | nd | |
| NH21602.23 | MOC | 7 | 46 | L9-7 | 4 | 8 | 1510 | E | 42.7450 | -125.4402 | nd | nd | |
| NH21602.24 | CTD | 41 | 47 | L9-8 | 4 | 8 | 1607 | S | 42.6840 | -125.5996 | 3096 | 200 | |
| NH21602.25 | CTD | 41 | 47 | L9-8 | 4 | 8 | 1624 | E | 42.6848 | -125.6037 | 3074 | 200 | |
| NH21602.26 | VPT | 41 | 47 | L9-8 | 4 | 8 | 1630 | S | 42.6850 | -125.6055 | 3059 | 100 | |
| NH21602.27 | MOC | 8 | 47 | L9-8 | 4 | 8 | 1652 | S | 42.6871 | -125.6134 | 3047 | 350 | |
| NH21602.28 | MOC | 8 | 47 | L9-8 | 4 | 8 | 1757 | E | 42.7056 | -125.6715 | nd | nd | |
| NH21602.29 | CTD | 42 | 48 | L9-9 | 4 | 8 | 1840 | S | 42.6782 | -125.7958 | 2964 | 200 | |
| NH21602.30 | CTD | 42 | 48 | L9-9 | 4 | 8 | 1905 | E | 42.6727 | -125.7963 | nd | nd | |
| NH21602.31 | VPT | 42 | 48 | L9-9 | 4 | 8 | 1909 | S | 42.6717 | -125.7975 | 2961 | 100 | |
| NH21602.32 | CTD | 43 | 49 | L9-10 | 4 | 8 | 2030 | S | 42.6811 | -125.9991 | 2270 | 200 | |
| NH21602.33 | CTD | 43 | 49 | L9-10 | 4 | 8 | 2050 | E | 42.6764 | -126.0021 | nd | nd | |
| NH21602.34 | VPT | 43 | 49 | L9-10 | 4 | 8 | 2055 | S | 42.6740 | -126.0022 | 2300 | 100 | |
| NH21602.35 | CTD | 44 | 50 | L9-7 | 4 | 8 | 2353 | S | 42.6848 | -125.3968 | 3100 | 200 | |
| NH21702.01 | CTD | 44 | 50 | L9-7 | 5 | 8 | 0014 | E | 42.6910 | -125.3937 | nd | nd | |
| NH21702.02 | VPT | 44 | 50 | L9-7 | 5 | 8 | 0025 | S | 42.6910 | -125.3946 | 3100 | 100 | |
| NH21702.03 | LiveNet1 | 4 | 50 | L9-7 | 5 | 8 | 0038 | S | 42.7015 | -125.3950 | 3100 | 40 | |
| NH21702.04 | MOC | 9 | 50 | L9-7 | 5 | 8 | 0115 | S | 42.7153 | -125.3874 | 3101 | 350 | |
| NH21702.05 | MOC | 9 | 50 | L9-7 | 5 | 8 | 0240 | E | 42.7280 | -125.3087 | nd | nd | |
| NH21702.06 | MOC | 10 | 51 | L9-6 | 5 | 8 | 0334 | S | 42.6955 | -125.2000 | 3077 | 350 | |
| NH21702.07 | MOC | 10 | 51 | L9-6 | 5 | 8 | 0436 | E | 42.7284 | -125.2074 | 3082 | nd | |
| NH21702.08 | VPT | 45 | 51 | L9-6 | 5 | 8 | 0522 | S | 42.6851 | -125.2039 | 3073 | 100 | |
| NH21702.09 | CTD | 45 | 51 | L9-6 | 5 | 8 | 0540 | S | 42.6866 | -125.2042 | 3078 | 200 | |
| NH21702.10 | CTD | 45 | 51 | L9-6 | 5 | 8 | 0600 | E | 42.6892 | -125.2045 | nd | nd | |
| NH21702.11 | CTD | 46 | 52 | RR7 | 5 | 8 | 0736 | S | 42.5012 | -125.1992 | 2994 | 200 | |
| NH21702.12 | CTD | 46 | 52 | RR7 | 5 | 8 | 0749 | E | 42.5018 | -125.1968 | 2963 | nd | |
| NH21702.13 | VPT | 46 | 52 | RR7 | 5 | 8 | 0800 | S | 42.5022 | -125.1963 | 2964 | 100 | |
| NH21702.14 | MOC | 11 | 52 | RR7 | 5 | 8 | 0838 | S | 42.5088 | -125.1962 | nd | 350 | |
| NH21702.15 | MOC | 11 | 52 | RR7 | 5 | 8 | 0943 | E | 42.5425 | -125.2324 | nd | nd | End Sheet #7. |
| NH21702.16 | CTD | 47 | 53 | RR6 | 5 | 8 | 1112 | S | 42.4980 | -124.9995 | 1820 | 200 | |
| NH21702.17 | CTD | 47 | 53 | RR6 | 5 | 8 | 1128 | E | 42.4979 | -125.0026 | 1830 | nd | |
| NH21702.18 | VPT | 47 | 53 | RR6 | 5 | 8 | 1134 | S | 42.4979 | -125.0028 | 1817 | 100 | |
| NH21702.19 | CTD | 48 | 54 | RR4 | 5 | 8 | 1251 | S | 42.5000 | -124.7987 | 591 | 200 | |
| NH21702.20 | CTD | 48 | 54 | RR4 | 5 | 8 | 1316 | E | 42.5023 | -124.7987 | 615 | nd | |
| NH21702.21 | VPT | 48 | 54 | RR4 | 5 | 8 | 1328 | S | 42.5025 | -124.7988 | 614 | 100 | |
| NH21702.22 | CTD | 49 | 55 | RR3 | 5 | 8 | 1425 | S | 42.4997 | -124.7987 | nd | nd | 1000’s of moon jellies. |
| NH21702.23 | CTD | 49 | 55 | RR3 | 5 | 8 | 1447 | E | 42.5116 | -124.6922 | 138 | nd | |
| NH21702.24 | VPT | 49 | 55 | RR3 | 5 | 8 | 1450 | S | 42.5126 | -124.6926 | 140 | 100 | |
| NH21702.25 | MOC | 12 | 56 | RR3.5 | 5 | 8 | 1555 | S | 42.5014 | -124.7446 | 264 | 250 | 1000’s of moon jellies. |
| NH21702.26 | MOC | 12 | 56 | RR3.5 | 5 | 8 | 1645 | E | 42.5319 | -124.7167 | nd | nd | |
| NH21702.27 | DipNet | 2 | 56 | RR3.5 | 5 | 8 | 1655 | S | 42.5319 | -124.7167 | nd | nd | Collected moon jellies for gut contents. |
| NH21702.28 | CTD | 50 | 57 | RR2 | 5 | 8 | 1752 | S | 42.4991 | -124.5998 | 87 | 75 | |
| NH21702.29 | CTD | 50 | 57 | RR2 | 5 | 8 | 1804 | E | 42.5018 | -124.5976 | nd | nd | |
| NH21702.30 | VPT | 50 | 57 | RR2 | 5 | 8 | 1806 | S | 42.5027 | -124.5965 | 87 | 80 | Dumped first tow due to jellyfish. |

| Event# | Instr | Cast | Sta | Sta std | Day | Mos | Time | S/E Flag | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21702.31 | CTD | 51 | 58 | RR1 | 5 | 8 | 1856 | S | 42.4986 | -124.4989 | 37 | 25 | |
| NH21702.32 | CTD | 51 | 58 | RR1 | 5 | 8 | 1908 | E | 42.5000 | -124.4967 | nd | nd | |
| NH21702.33 | VPT | 51 | 58 | RR1 | 5 | 8 | 1912 | S | 42.5008 | -124.4954 | 37 | 30 | |
| NH21702.34 | CTD | 52 | 59 | CR4 | 5 | 8 | 2311 | S | 41.9015 | -124.5994 | 507 | 200 | |
| NH21702.35 | CTD | 52 | 59 | CR4 | 5 | 8 | 2327 | E | 41.9157 | -124.6032 | nd | nd | |
| NH21702.36 | VPT | 52 | 59 | CR4 | 5 | 8 | 2331 | S | 41.9048 | -124.6038 | 507 | 100 | |
| NH21702.37 | LiveNet1 | 5 | 59 | CR4 | 5 | 8 | 2338 | S | 41.9089 | -124.6119 | 531 | 40 | |
| NH21802.01 | MOC | 13 | 59 | CR4 | 6 | 8 | 0013 | S | 41.9176 | -124.6195 | 542 | 350 | |
| NH21802.02 | MOC | 13 | 59 | CR4 | 6 | 8 | 0123 | E | 41.9601 | -124.6638 | 610 | 350 | |
| NH21802.03 | CTD | 53 | 60 | CR3 | 6 | 8 | 0235 | S | 41.9005 | -124.4992 | 135 | 125 | |
| NH21802.04 | CTD | 53 | 60 | CR3 | 6 | 8 | 0253 | E | 41.9019 | -124.6512 | nd | nd | |
| NH21802.05 | VPT | 53 | 60 | CR3 | 6 | 8 | 0300 | S | 41.9032 | -124.5025 | 138 | 100 | |
| NH21802.06 | LiveNet1 | 6 | 60 | CR3 | 6 | 8 | 0315 | S | 41.9060 | -124.5048 | 139 | 20-40 | |
| NH21802.07 | MOC | 14 | 60 | CR3 | 6 | 8 | 0335 | S | 41.9128 | -124.5126 | 139 | 125 | |
| NH21802.08 | MOC | 14 | 60 | CR3 | 6 | 8 | 0403 | E | 41.9241 | -124.5270 | nd | nd | |
| NH21802.09 | CTD | 54 | 61 | CR2 | 6 | 8 | 0501 | S | 41.8998 | -124.4004 | 68 | 58 | |
| NH21802.10 | CTD | 54 | 61 | CR2 | 6 | 8 | 0509 | E | 41.9013 | -124.4020 | nd | nd | |
| NH21802.11 | VPT | 54 | 61 | CR2 | 6 | 8 | 0517 | S | 41.9019 | -124.4025 | 68 | 62 | |
| NH21802.12 | CTD | 55 | 62 | CR1 | 6 | 8 | 0608 | S | 41.8992 | -124.3004 | 41 | 30 | |
| NH21802.13 | CTD | 55 | 62 | CR1 | 6 | 8 | 0616 | E | 41.8995 | -124.3004 | nd | nd | |
| NH21802.14 | VPT | 55 | 62 | CR1 | 6 | 8 | 0619 | S | 41.8997 | -124.3005 | nd | 34 | |
| NH21802.15 | VPT | 56 | 63 | CR3 | 6 | 8 | 0730 | S | 41.8999 | -124.5018 | 141 | 100 | |
| NH21802.16 | MOC | 15 | 63 | CR3 | 6 | 8 | 0751 | S | 41.9038 | -124.5067 | 142 | 133 | |
| NH21802.17 | MOC | 15 | 63 | CR3 | 6 | 8 | 0838 | E | 41.9373 | -124.5404 | nd | nd | |
| NH21802.18 | VPT | 57 | 64 | CR4 | 6 | 8 | 0925 | S | 41.9026 | -124.6149 | 510 | 100 | |
| NH21802.19 | MOC | 16 | 64 | CR4 | 6 | 8 | 0944 | S | 41.9055 | -124.6042 | 510 | 350 | |
| NH21802.20 | MOC | 16 | 64 | CR4 | 6 | 8 | 1035 | E | 41.9430 | -124.6236 | nd | nd | |
| NH21802.21 | CTD | 56 | 65 | CR6 | 6 | 8 | 1157 | S | 41.8995 | -124.7997 | 706 | 200 | |
| NH21802.22 | CTD | 56 | 65 | CR6 | 6 | 8 | 1216 | E | 41.9049 | -124.7991 | 708 | nd | |
| NH21802.23 | VPT | 58 | 65 | CR6 | 6 | 8 | 1220 | S | 41.9060 | -124.7993 | 709 | 100 | |
| NH21802.24 | CTD | 57 | 66 | CR7 | 6 | 8 | 1340 | S | 41.8840 | -125.0007 | 846 | 200 | |
| NH21802.25 | CTD | 57 | 66 | CR7 | 6 | 8 | nd | E | 41.9514 | -125.0210 | nd | nd | |
| NH21802.26 | VPT | 59 | 66 | CR7 | 6 | 8 | 1415 | S | 41.9081 | -125.0003 | 848 | 100 | |
| NH21802.27 | MOC | 17 | 66 | CR7 | 6 | 8 | 1436 | S | 41.9164 | -125.0025 | nd | 350 | |
| NH21802.28 | MOC | 17 | 66 | CR7 | 6 | 8 | 1531 | E | 41.9154 | -125.0230 | nd | nd | |
| NH21802.29 | CTD | 58 | 67 | CR8 | 6 | 8 | 1643 | S | 41.8999 | -125.2031 | 2770 | 200 | |
| NH21802.30 | CTD | 58 | 67 | CR8 | 6 | 8 | 1708 | E | 41.9016 | -125.2088 | nd | nd | |
| NH21802.31 | VPT | 60 | 67 | CR8 | 6 | 8 | 1711 | S | 41.9016 | -125.2090 | nd | 100 | |
| NH21802.32 | CTD | 59 | 68 | CR9 | 6 | 8 | 1827 | S | 41.8951 | -125.3999 | 3120 | 200 | |
| NH21802.33 | CTD | 59 | 68 | CR9 | 6 | 8 | 1845 | E | 41.8936 | -125.4054 | nd | nd | |
| NH21802.34 | VPT | 61 | 68 | CR9 | 6 | 8 | 1852 | S | 41.8947 | -125.4048 | 3119 | 100 | |
| NH21802.35 | CTD | 60 | 69 | CR10 | 6 | 8 | 2022 | S | 41.8982 | -125.6673 | 2951 | 200 | |
| NH21802.36 | CTD | 60 | 69 | CR10 | 6 | 8 | 2042 | E | 41.8975 | -125.6713 | 2944 | 200 | |
| NH21802.37 | VPT | 62 | 69 | CR10 | 6 | 8 | 2046 | S | 41.8970 | -125.6729 | 2941 | 100 | |
| NH21802.38 | CTD | 61 | 70 | CR11 | 6 | 8 | 2238 | S | 41.8998 | -126.0022 | 3349 | 200 | |
| NH21802.39 | CTD | 61 | 70 | CR11 | 6 | 8 | 2254 | E | 41.9020 | -126.0062 | 3345 | 200 | |
| NH21802.40 | VPT | 63 | 70 | CR11 | 6 | 8 | 2259 | S | 41.9029 | -126.0082 | 3351 | 100 | |
| NH21902.01 | CTD | 62 | 71 | EN1 | 7 | 8 | 0123 | S | 42.1482 | -125.7840 | 2779 | 200 | EN=eddy north=>running transect line from south to north. |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH21902.02 | CTD | 62 | 71 | EN1 | 7 | 8 | 0143 | E | 42.1474 | -125.7866 | nd | nd | |
| NH21902.03 | VPT | 64 | 71 | EN1 | 7 | 8 | 0150 | S | 42.1470 | -125.7876 | 2772 | 100 | |
| NH21902.04 | CTD | 63 | 72 | EN2 | 7 | 8 | 0323 | S | 42.2334 | -125.6020 | 3102 | 200 | |
| NH21902.05 | CTD | 63 | 72 | EN2 | 7 | 8 | 0344 | E | 42.2339 | -125.6036 | 3107 | nd | |
| NH21902.06 | VPT | 65 | 72 | EN2 | 7 | 8 | 0351 | S | 42.2343 | -125.6038 | 3162 | 100 | |
| NH21902.07 | VPT | 66 | 73 | EN3 | 7 | 8 | 0448 | S | 42.3319 | -125.6001 | 3073 | 100 | |
| NH21902.08 | LiveNet1 | 7 | 73 | EN3 | 7 | 8 | 0504 | S | 42.3328 | -125.5975 | 3080 | 20-40 | |
| NH21902.09 | CTD | 64 | 74 | EN4 | 7 | 8 | 0611 | S | 42.4184 | -125.5985 | 3099 | 200 | |
| NH21902.10 | CTD | 64 | 74 | EN4 | 7 | 8 | 0628 | E | 42.4192 | -125.5927 | nd | nd | |
| NH21902.11 | VPT | 67 | 74 | EN4 | 7 | 8 | 0636 | S | 42.4192 | -125.5926 | 3097 | 100 | |
| NH21902.12 | VPT | 68 | 75 | EN5 | 7 | 8 | 0734 | S | 42.5002 | -125.4313 | 3098 | 100 | |
| NH21902.13 | CTD | 65 | 76 | EN6 | 7 | 8 | 0833 | S | 42.5849 | -125.6006 | 2698 | 200 | |
| NH21902.14 | CTD | 65 | 76 | EN6 | 7 | 8 | 0855 | E | 42.5917 | -125.6030 | nd | nd | |
| NH21902.15 | VPT | 69 | 76 | EN6 | 7 | 8 | 0859 | S | 42.5963 | -125.6043 | 2716 | 100 | |
| NH21902.16 | CTD | nd | 77 | EW1 | 7 | 8 | 1040 | S | 42.7250 | -125.8500 | nd | nd | CTD mishap; kinked wire; must reterminate; no cast #. |
| NH21902.17 | VPT | 70 | 77 | EW1 | 7 | 8 | 1051 | S | 42.7283 | -125.8646 | 2967 | 100 | EW1=eddy west=>transect from west to east. |
| NH21902.18 | MOC | 18 | 77 | EW1 | 7 | 8 | 1151 | S | 42.7329 | -125.8412 | 2800 | 350 | Maneuvered around Revelle. |
| NH21902.19 | MOC | 18 | 77 | EW1 | 7 | 8 | 1243 | E | 42.7329 | -125.8333 | 2869 | nd | |
| NH21902.20 | CTD | 66 | 77 | EW1 | 7 | 8 | 1408 | S | 42.7498 | -125.8411 | 2861 | 150 | CTD test; got water for Harvey group. |
| NH21902.21 | CTD | 66 | 77 | EW1 | 7 | 8 | 1425 | E | 42.7485 | -125.8470 | nd | nd | |
| NH21902.22 | CTD | 67 | 78 | EW2 | 7 | 8 | 1520 | S | 42.7226 | -125.8184 | 2676 | 200 | |
| NH21902.23 | CTD | 67 | 78 | EW2 | 7 | 8 | 1545 | E | 42.7225 | -125.7513 | 2655 | 200 | |
| NH21902.24 | VPT | 71 | 78 | EW2 | 7 | 8 | 1547 | S | 42.7227 | -125.7587 | 2635 | 100 | |
| NH21902.25 | CTD | 68 | 79 | EW3 | 7 | 8 | 1646 | S | 42.7209 | -125.6707 | 3058 | 200 | |
| NH21902.26 | CTD | 68 | 79 | EW3 | 7 | 8 | 1706 | E | 42.7212 | -125.6725 | 3047 | nd | |
| NH21902.27 | VPT | 72 | 79 | EW3 | 7 | 8 | 1713 | S | 42.7211 | -125.6787 | 3059 | 100 | |
| NH21902.28 | CTD | 69 | 80 | EW4 | 7 | 8 | 1819 | S | 42.7239 | -129.9824 | 3102 | 200 | |
| NH21902.29 | CTD | 69 | 80 | EW4 | 7 | 8 | 1854 | E | 42.7328 | -125.5075 | 3095 | nd | |
| NH21902.30 | VPT | 73 | 80 | EW4 | 7 | 8 | 1859 | S | 42.7351 | -125.5096 | 3103 | 100 | |
| NH21902.31 | VPT | 74 | 81 | EW5 | 7 | 8 | 2010 | S | 42.7266 | -125.4035 | 3100 | 100 | |
| NH21902.32 | MOC | 19 | 81 | EW5 | 7 | 8 | 2027 | S | 42.7354 | -125.4103 | 3099 | 300 | |
| NH21902.33 | MOC | 19 | 81 | EW5 | 7 | 8 | 2157 | E | 42.8193 | -125.4172 | 3098 | nd | |
| NH22002.01 | VPT | 75 | 82 | EW6 | 8 | 8 | 0022 | S | 42.7259 | -125.1745 | 3036 | 100 | |
| NH22002.02 | CTD | 70 | 83 | EW7 | 8 | 8 | 0205 | S | 42.7238 | -124.9340 | 839 | 200 | |
| NH22002.03 | CTD | 70 | 83 | EW7 | 8 | 8 | 0228 | E | 42.7270 | -124.9391 | 847 | nd | |
| NH22002.04 | VPT | 76 | 83 | EW7 | 8 | 8 | 0235 | S | 42.7277 | -124.9403 | 845 | 100 | |
| NH22002.05 | CTD | 71 | 84 | NH45 | 8 | 8 | 1500 | S | 44.6521 | -125.1177 | 717 | 200 | |
| NH22002.06 | CTD | 71 | 84 | NH45 | 8 | 8 | 1524 | E | 44.6540 | -125.1221 | nd | nd | |
| NH22002.07 | VPT | 77 | 84 | NH45 | 8 | 8 | 1530 | S | 44.6554 | -125.1234 | 727 | 100 | |
| NH22002.08 | CTD | 72 | 85 | NH35 | 8 | 8 | 1657 | S | 44.6386 | -125.8831 | 417 | 200 | |
| NH22002.09 | CTD | 72 | 85 | NH35 | 8 | 8 | 1716 | E | 44.6493 | -125.8845 | 457 | nd | |
| NH22002.10 | VPT | 78 | 85 | NH35 | 8 | 8 | 1721 | S | 44.6500 | -125.8858 | 459 | 100 | |
| NH22002.11 | CTD | 73 | 86 | NH25 | 8 | 8 | 1843 | S | 44.6505 | -125.6518 | 292 | 200 | |
| NH22002.12 | CTD | 73 | 86 | NH25 | 8 | 8 | 1900 | E | 44.8175 | -125.6513 | nd | nd | |
| NH22002.13 | VPT | 79 | 86 | NH25 | 8 | 8 | 1904 | S | 44.6505 | -125.6512 | nd | 100 | |
| NH22002.14 | LiveNet1 | 8 | 86 | NH25 | 8 | 8 | 1933 | S | 44.6549 | -125.6520 | 301 | 60 | |
| NH22002.15 | MOC | 20 | 86 | NH25 | 8 | 8 | 2100 | S | 44.6526 | -125.6483 | 295 | 200 | |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22002.16 | MOC | 20 | 86 | NH25 | 8 | 8 | 2155 | E | 44.6867 | -125.6500 | 299 | nd | |
| NH22002.17 | CTD | 74 | 87 | NH20 | 8 | 8 | 2305 | S | 44.6522 | -125.5295 | 145 | 135 | |
| NH22002.18 | CTD | 74 | 87 | NH20 | 8 | 8 | 2320 | E | 44.6538 | -125.5307 | nd | nd | |
| NH22002.19 | VPT | 80 | 87 | NH20 | 8 | 8 | 2327 | S | 44.6539 | -125.5308 | 145 | 100 | |
| NH22002.20 | LiveNet1 | 9 | 87 | NH20 | 8 | 8 | 2342 | S | 44.6572 | -125.5322 | 149 | 20 | |
| NH22102.01 | MOC | 21 | 87 | NH20 | 9 | 8 | 0001 | S | 44.6651 | -125.5342 | 150 | 135 | |
| NH22102.02 | MOC | 21 | 87 | NH20 | 9 | 8 | 0034 | E | 44.6856 | -124.5350 | nd | nd | |
| NH22102.03 | MOC | 22 | 88 | NH15 | 9 | 8 | 0208 | S | 44.6523 | -124.4126 | 95 | 85 | Waited 30 min for Revelle to clear station. |
| NH22102.04 | MOC | 22 | 88 | NH15 | 9 | 8 | 0229 | E | 44.6694 | -124.4168 | nd | nd | |
| NH22102.05 | CTD | 75 | 88 | NH15 | 9 | 8 | 0303 | S | 44.6515 | -124.4126 | 93 | 83 | |
| NH22102.06 | CTD | 75 | 88 | NH15 | 9 | 8 | 0317 | E | 44.6527 | -124.4144 | nd | nd | |
| NH22102.07 | VPT | 81 | 88 | NH15 | 9 | 8 | 0325 | S | 44.6541 | -124.4164 | 97 | 87 | |
| NH22102.08 | LiveNet1 | 10 | 88 | NH15 | 9 | 8 | 0330 | S | 44.6551 | -124.4125 | 96 | 20-40 | |
| NH22102.09 | CTD | 76 | 89 | NH10 | 9 | 8 | 0443 | S | 44.6516 | -124.2847 | 81 | 71 | |
| NH22102.10 | CTD | 76 | 89 | NH10 | 9 | 8 | 0455 | E | 44.6507 | -124.2848 | 80 | nd | |
| NH22102.11 | VPT | 82 | 89 | NH10 | 9 | 8 | 0501 | S | 44.6516 | -124.2843 | 80 | 75 | |
| NH22102.12 | CTD | 77 | 90 | NH5 | 9 | 8 | 0549 | S | 44.6505 | -124.1788 | 59 | 50 | |
| NH22102.13 | CTD | 77 | 90 | NH5 | 9 | 8 | 0558 | E | 44.6495 | -124.1808 | nd | nd | |
| NH22102.14 | VPT | 83 | 90 | NH5 | 9 | 8 | 0606 | S | 44.6501 | -124.1792 | 59 | 52 | End of sheet #13. |
| NH22102.15 | CTD | 78 | 91 | NH3 | 9 | 8 | 0712 | S | 44.6494 | -124.1327 | 47 | 36 | |
| NH22102.16 | CTD | 78 | 91 | NH3 | 9 | 8 | 0725 | E | 44.6484 | -124.1370 | nd | nd | |
| NH22102.17 | VPT | 84 | 91 | NH3 | 9 | 8 | 0728 | S | 44.6483 | -124.1372 | 47 | 40 | |
| NH22102.18 | CTD | 79 | 92 | NH1 | 9 | 8 | 0800 | S | 44.6519 | -124.1012 | 28 | 15 | |
| NH22102.19 | CTD | 79 | 92 | NH1 | 9 | 8 | 0805 | E | 44.6523 | -124.1011 | nd | nd | |
| NH22102.20 | VPT | 85 | 92 | NH1 | 9 | 8 | 0814 | S | 44.6515 | -124.1010 | 28 | 22 | |
| NH22102.21 | Secchi | 7 | 92 | NH1 | 9 | 8 | 0822 | S | 44.6515 | -124.1010 | nd | 5 | |
| NH22102.22 | VPT | 86 | 93 | NH5 | 9 | 8 | 0845 | S | 44.6496 | -124.1783 | 58 | 52 | |
| NH22102.23 | Secchi | 8 | 93 | NH5 | 9 | 8 | 0856 | S | 44.6496 | -124.1783 | nd | 3.5 | |
| NH22102.24 | VPT | 87 | 94 | NH10 | 9 | 8 | 0940 | S | 44.6435 | -124.2090 | 80 | 72 | |
| NH22102.25 | Secchi | 9 | 94 | NH10 | 9 | 8 | 0950 | S | 44.6435 | -124.2090 | nd | 5 | |
| NH22102.26 | VPT | 88 | 95 | NH15 | 9 | 8 | 1035 | S | 44.6526 | -124.4130 | 93 | 85 | |
| NH22102.27 | Secchi | 10 | 95 | NH15 | 9 | 8 | 1040 | S | 44.6526 | -124.4130 | nd | 6 | |
| NH22102.28 | MOC | 23 | 95 | NH15 | 9 | 8 | 1112 | S | 44.6615 | -124.4117 | 98 | 85 | |
| NH22102.29 | MOC | 23 | 95 | NH15 | 9 | 8 | 1140 | E | 44.6656 | -124.4126 | nd | nd | |
| NH22102.30 | VPT | 89 | 96 | NH20 | 9 | 8 | 1245 | S | 44.6513 | -124.5321 | 145 | 100 | |
| NH22102.31 | Secchi | 11 | 96 | NH20 | 9 | 8 | 1259 | S | 44.6513 | -124.5321 | nd | 5 | |
| NH22102.32 | MOC | 24 | 96 | NH20 | 9 | 8 | 1315 | S | 44.6625 | -124.5350 | 145 | 135 | |
| NH22102.33 | MOC | 24 | 96 | NH20 | 9 | 8 | 1356 | E | 44.6857 | -124.5420 | nd | nd | |
| NH22102.34 | VPT | 90 | 97 | NH25 | 9 | 8 | 1442 | S | 44.6511 | -124.6537 | 295 | 100 | |
| NH22102.35 | Secchi | 12 | 97 | NH25 | 9 | 8 | 1448 | S | 44.6511 | -124.6537 | nd | 3.5 | |
| NH22102.36 | MOC | 25 | 97 | NH25 | 9 | 8 | 1510 | S | 44.6574 | -124.6626 | 295 | 275 | |
| NH22102.37 | MOC | 25 | 97 | NH25 | 9 | 8 | 1616 | E | 44.7017 | -124.6900 | nd | nd | |
| NH22102.38 | CTD | 80 | 98 | L2-6 | 9 | 8 | 1825 | S | 44.4719 | -125.0354 | nd | 200 | End of sheet #14. |
| NH22102.39 | CTD | 80 | 98 | L2-6 | 9 | 8 | 1842 | E | 44.4713 | -125.0400 | 820 | nd | |
| NH22102.40 | VPT | 91 | 98 | L2-6 | 9 | 8 | 1851 | S | 44.4753 | -125.0391 | 856 | 100 | |
| NH22102.41 | LiveNet1 | 11 | 98 | L2-6 | 9 | 8 | 1901 | S | 44.4774 | -125.0420 | 901 | 20 | |
| NH22102.42 | CTD | 82 | 99 | L2-5 | 9 | 8 | 2030 | S | 44.4770 | -124.8346 | 237 | 200 | There is no CTD #81. |
| NH22102.43 | CTD | 82 | 99 | L2-5 | 9 | 8 | 2050 | E | 44.4780 | -124.8357 | 228 | nd | |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22102.44 | VPT | 92 | 99 | L2-5 | 9 | 8 | 2055 | S | 44.4779 | -124.8359 | 232 | 100 | |
| NH22102.45 | LiveNet1 | 12 | 99 | L2-5 | 9 | 8 | 2111 | S | 44.4788 | -124.8389 | nd | 20-40 | |
| NH22102.46 | CTD | 83 | 100 | L2-4 | 9 | 8 | 2238 | S | 44.4738 | -124.6353 | 148 | 137 | |
| NH22102.47 | CTD | 83 | 100 | L2-4 | 9 | 8 | 2252 | E | 44.4745 | -124.6358 | nd | nd | |
| NH22102.48 | VPT | 93 | 100 | L2-4 | 9 | 8 | 2301 | S | 44.4755 | -124.6357 | 149 | 100 | |
| NH22102.49 | LiveNet1 | 13 | 100 | L2-4 | 9 | 8 | 2315 | S | 44.6431 | -124.6357 | 149 | 20-40 | |
| NH22202.01 | CTD | 84 | 101 | L2-3 | 10 | 8 | 0046 | S | 44.4740 | -124.9205 | 74 | 64 | |
| NH22202.02 | CTD | 84 | 101 | L2-3 | 10 | 8 | 0057 | E | 44.4754 | -124.4228 | nd | nd | |
| NH22202.03 | VPT | 94 | 101 | L2-3 | 10 | 8 | 0105 | S | 44.4784 | -124.4251 | 74 | 67 | |
| NH22202.04 | LiveNet1 | 14 | 101 | L2-3 | 10 | 8 | 0117 | S | 44.4813 | -124.4286 | 76 | 20-40 | |
| NH22202.05 | CTD | 85 | 102 | L2-2 | 10 | 8 | 0239 | S | 44.4754 | -124.2513 | 74 | 64 | |
| NH22202.06 | CTD | 85 | 102 | L2-2 | 10 | 8 | 0251 | E | 44.4753 | -124.2532 | 74 | nd | |
| NH22202.07 | VPT | 95 | 102 | L2-2 | 10 | 8 | 0257 | S | 44.4764 | -124.2539 | 74 | 67 | |
| NH22202.08 | CTD | 86 | 103 | L2-1 | 10 | 8 | 0420 | S | 44.4753 | -124.1650 | 51 | 40 | |
| NH22202.09 | CTD | 86 | 103 | L2-1 | 10 | 8 | 0432 | E | 44.4751 | -124.1649 | 51 | nd | |
| NH22202.10 | VPT | 96 | 103 | L2-1 | 10 | 8 | 0438 | S | 44.4753 | -124.1651 | 51 | nd | |
| NH22202.11 | CTD | 87 | 104 | L3-1 | 10 | 8 | 1522 | S | 44.2489 | -124.1911 | 56 | 45 | |
| NH22202.12 | CTD | 87 | 104 | L3-1 | 10 | 8 | 1532 | E | 44.2518 | -124.1922 | 54 | 45 | |
| NH22202.13 | VPT | 97 | 104 | L3-1 | 10 | 8 | 1539 | S | 44.2540 | -124.1928 | 56 | 50 | |
| NH22202.14 | CTD | 88 | 105 | HH1 | 10 | 8 | 1742 | S | 43.9982 | -124.2023 | 56 | 45 | |
| NH22202.15 | CTD | 88 | 105 | HH1 | 10 | 8 | 1755 | E | 43.9971 | -124.2042 | nd | nd | |
| NH22202.16 | VPT | 98 | 105 | HH1 | 10 | 8 | 1800 | S | 44.0009 | -124.2052 | 56 | 50 | |
| NH22202.17 | CTD | 89 | 106 | HH2 | 10 | 8 | 1915 | S | 43.9997 | -124.4040 | 121 | 110 | |
| NH22202.18 | CTD | 89 | 106 | HH2 | 10 | 8 | 1935 | E | 44.0026 | -124.4025 | nd | nd | |
| NH22202.19 | VPT | 99 | 106 | HH2 | 10 | 8 | 1938 | S | 44.0026 | -124.4105 | 122 | 100 | |
| NH22202.20 | CTD | 90 | 107 | HH3 | 10 | 8 | 2107 | S | 44.0009 | -124.6014 | 154 | 144 | |
| NH22202.21 | CTD | 90 | 107 | HH3 | 10 | 8 | 2123 | E | 44.0028 | -124.6038 | 153 | nd | |
| NH22202.22 | VPT | 100 | 107 | HH3 | 10 | 8 | 2135 | S | 44.0044 | -124.6050 | 153 | 100 | |
| NH22202.23 | LiveNet1 | 15 | 107 | HH3 | 10 | 8 | 2140 | S | 44.0058 | -124.6103 | 152 | 25 | |
| NH22202.24 | MOC | 26 | 107 | HH3 | 10 | 8 | 2209 | S | 44.0107 | -124.6133 | 150 | 135 | |
| NH22202.25 | MOC | 26 | 107 | HH3 | 10 | 8 | 2245 | E | 44.0334 | -124.6050 | 141 | nd | |
| NH22302.01 | CTD | 91 | 108 | HH4 | 11 | 8 | 0046 | S | 43.9999 | -124.8015 | 112 | 102 | |
| NH22302.02 | CTD | 91 | 108 | HH4 | 11 | 8 | 0104 | E | 44.0022 | -124.8032 | nd | nd | |
| NH22302.03 | VPT | 101 | 108 | HH4 | 11 | 8 | 0110 | S | 44.0047 | -124.8043 | 106 | 100 | |
| NH22302.04 | CTD | 92 | 109 | HH5 | 11 | 8 | 0229 | S | 44.0006 | -125.0016 | 959 | 200 | |
| NH22302.05 | CTD | 92 | 109 | HH5 | 11 | 8 | 0253 | E | 44.0072 | -125.0056 | 998 | nd | |
| NH22302.06 | VPT | 102 | 109 | HH5 | 11 | 8 | 0257 | S | 44.0076 | -125.0057 | 994 | 100 | |
| NH22302.07 | MOC | 27 | 109 | HH5 | 11 | 8 | 0323 | S | 44.0165 | -125.0083 | 1015 | 350 | |
| NH22302.08 | MOC | 27 | 109 | HH5 | 11 | 8 | 0430 | E | 44.0662 | -125.0132 | nd | nd | |
| NH22302.09 | LiveNet1 | 16 | 109 | HH5 | 11 | 8 | 0442 | S | 44.0762 | -125.0148 | nd | 20 | |
| NH22302.10 | MOC | 28 | 109 | HH5 | 11 | 8 | 0658 | S | 44.0012 | -125.0003 | nd | nd | |
| NH22302.11 | MOC | 28 | 109 | HH5 | 11 | 8 | 0750 | E | 44.0253 | -125.0025 | nd | nd | |
| NH22302.12 | CTD | 93 | 110 | L4A-6 | 11 | 8 | 0951 | S | 43.8701 | -124.9977 | 1039 | 200 | |
| NH22302.13 | CTD | 93 | 110 | L4A-6 | 11 | 8 | 1011 | E | 43.8753 | -124.9964 | 1083 | nd | |
| NH22302.14 | VPT | 103 | 110 | L4A-6 | 11 | 8 | 1014 | S | 43.8763 | -124.9957 | 1083 | 100 | |
| NH22302.15 | CTD | 94 | 111 | L4A-5 | 11 | 8 | 1120 | S | 43.8673 | -124.8329 | 341 | 200 | |
| NH22302.16 | CTD | 94 | 111 | L4A-5 | 11 | 8 | 1142 | E | 43.8690 | -124.8308 | 307 | 200 | |
| NH22302.17 | VPT | 104 | 111 | L4A-5 | 11 | 8 | 1146 | S | 43.8694 | -124.8316 | nd | 100 | |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22302.18 | CTD | 95 | 112 | L4A-4 | 11 | 8 | 1320 | S | 43.8662 | -124.6662 | 287 | 200 | |
| NH22302.19 | CTD | 95 | 112 | L4A-4 | 11 | 8 | 1342 | E | 43.8710 | -124.6610 | nd | nd | |
| NH22302.20 | VPT | 105 | 112 | L4A-4 | 11 | 8 | 1348 | S | 43.8726 | -124.6603 | 285 | 100 | |
| NH22302.21 | VPT | 106 | 113 | HH4H | 11 | 8 | 1520 | S | 44.0026 | -124.7053 | 225 | 100 | H suffix signifies Humpback station. |
| NH22302.22 | MOC | 29 | 113 | HH4H | 11 | 8 | 1800 | S | 43.9628 | -124.6783 | 123 | 115 | |
| NH22302.23 | MOC | 29 | 113 | HH4H | 11 | 8 | 1830 | E | 43.9818 | -124.6833 | nd | nd | |
| NH22302.24 | MOC | 30 | 113 | HH4H | 11 | 8 | 2115 | S | 43.9524 | -124.6767 | 155 | 125 | |
| NH22302.25 | MOC | 30 | 113 | HH4H | 11 | 8 | 2150 | E | 43.9769 | -124.6847 | 121 | nd | |
| NH22302.26 | LiveNet1 | 17 | 113 | HH4H | 11 | 8 | 2243 | S | 43.9913 | -124.6984 | 121 | 20-40 | |
| NH22402.01 | CTD | 96 | 114 | L4A-3 | 12 | 8 | 0016 | S | 43.8648 | -124.4993 | 136 | 126 | |
| NH22402.02 | CTD | 96 | 114 | L4A-3 | 12 | 8 | 0037 | E | 43.8661 | -124.4969 | nd | nd | |
| NH22402.03 | VPT | 107 | 114 | L4A-3 | 12 | 8 | 0044 | S | 43.8702 | -124.4969 | 144 | 100 | |
| NH22402.04 | LiveNet1 | 18 | 114 | L4A-3 | 12 | 8 | 0058 | S | 43.8727 | -124.4969 | 127 | 20-40 | End of sheet #17. |
| NH22402.05 | CTD | 97 | 115 | L4A-2 | 12 | 8 | 0252 | S | 43.8667 | -124.3337 | 114 | 104 | |
| NH22402.06 | CTD | 97 | 115 | L4A-2 | 12 | 8 | 0306 | E | 43.8671 | -124.3368 | 114 | nd | |
| NH22402.07 | VPT | 108 | 115 | L4A-2 | 12 | 8 | 0314 | S | 43.8699 | -124.3389 | 115 | 100 | |
| NH22402.08 | CTD | 98 | 116 | L4A-1 | 12 | 8 | 0443 | S | 43.8648 | -124.2171 | 60 | 50 | |
| NH22402.09 | CTD | 98 | 116 | L4A-1 | 12 | 8 | 0450 | E | 43.8655 | -124.2167 | nd | nd | |
| NH22402.10 | VPT | 109 | 116 | L4A-1 | 12 | 8 | 0458 | S | 43.8668 | -124.2168 | 60 | 55 | |
| NH22402.11 | CTD | 99 | 117 | FM1 | 12 | 8 | 0940 | S | 43.2012 | -124.4337 | 36 | 25 | |
| NH22402.12 | CTD | 99 | 117 | FM1 | 12 | 8 | 0945 | E | 43.2190 | -124.4333 | nd | nd | |
| NH22402.13 | VPT | 110 | 117 | FM1 | 12 | 8 | 0953 | S | 43.2197 | -124.4330 | 35 | 30 | |
| NH22402.14 | CTD | 100 | 118 | FM3 | 12 | 8 | 1038 | S | 43.2172 | -124.4164 | 67 | 55 | |
| NH22402.15 | CTD | 100 | 118 | FM3 | 12 | 8 | 1050 | E | 43.2179 | -124.5014 | 60 | 55 | |
| NH22402.16 | VPT | 111 | 118 | FM3 | 12 | 8 | 1056 | S | 43.2174 | -124.5023 | 57 | 50 | |
| NH22402.17 | CTD | 101 | 119 | FM4 | 12 | 8 | 1142 | S | 43.2177 | -124.5858 | 90 | 75 | |
| NH22402.18 | CTD | 101 | 119 | FM4 | 12 | 8 | 1155 | E | 43.2174 | -124.5864 | nd | nd | |
| NH22402.19 | VPT | 112 | 119 | FM4 | 12 | 8 | 1159 | S | 43.2179 | -124.5871 | 90 | 85 | Skipped FM5 because Revelle was there for an extended period. |
| NH22402.20 | CTD | 102 | 120 | FM7 | 12 | 8 | 1405 | S | 43.2217 | -124.8376 | 348 | 200 | |
| NH22402.21 | CTD | 102 | 120 | FM7 | 12 | 8 | 1430 | E | 43.2265 | -124.8424 | nd | nd | |
| NH22402.22 | VPT | 113 | 120 | FM7 | 12 | 8 | 1435 | S | 43.2292 | -124.8456 | 349 | 100 | |
| NH22402.23 | MOC | 31 | 120 | FM7 | 12 | 8 | 1501 | S | 43.2386 | -124.8500 | 420 | 350 | |
| NH22402.24 | MOC | 31 | 120 | FM7 | 12 | 8 | 1608 | E | 43.2750 | -124.8650 | nd | nd | |
| NH22402.25 | CTD | 103 | 121 | FM8 | 12 | 8 | 1758 | S | 43.2165 | -125.0009 | 1093 | 200 | |
| NH22402.26 | CTD | 103 | 121 | FM8 | 12 | 8 | 1816 | E | 43.2171 | -125.0034 | 1094 | nd | |
| NH22402.27 | VPT | 114 | 121 | FM8 | 12 | 8 | 1825 | S | 43.2183 | -125.0055 | 1093 | 100 | |
| NH22402.28 | VPT | 115 | 122 | FM9 | 12 | 8 | 1935 | S | 43.2158 | -125.1667 | nd | nd | Revelle did CTD. |
| NH22402.29 | CTD | 104 | 123 | L8-5 | 12 | 8 | 2211 | S | 42.9515 | -124.8724 | 193 | 183 | |
| NH22402.30 | CTD | 104 | 123 | L8-5 | 12 | 8 | 2230 | E | 42.9545 | -124.8777 | 234 | nd | |
| NH22402.31 | VPT | 116 | 123 | L8-5 | 12 | 8 | 2235 | S | 42.9620 | -124.8792 | 262 | 100 | |
| NH22402.32 | CTD | 105 | 124 | L8-4 | 12 | 8 | 2325 | S | 42.9500 | -124.8187 | 155 | 145 | |
| NH22402.33 | CTD | 105 | 124 | L8-4 | 12 | 8 | 2339 | E | 42.9524 | -124.8212 | 145 | nd | |
| NH22402.34 | VPT | 117 | 124 | L8-4 | 12 | 8 | 2345 | S | 42.9536 | -124.8219 | 140 | 100 | |
| NH22502.01 | LiveNet1 | 19 | 124 | L8-4 | 13 | 8 | 0001 | S | 42.9580 | -124.8268 | 130 | 20 | |
| NH22502.02 | CTD | 106 | 125 | L8-3 | 13 | 8 | 0115 | S | 42.9519 | -124.6655 | 112 | 100 | |
| NH22502.03 | CTD | 106 | 125 | L8-3 | 13 | 8 | 0133 | E | 42.9573 | -124.6658 | 116 | nd | |
| NH22502.04 | VPT | 118 | 125 | L8-3 | 13 | 8 | 0135 | S | 42.9589 | -124.6656 | 116 | 100 | |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22502.05 | LiveNet1 | 20 | 125 | L8-3 | 13 | 8 | 0137 | S | 42.9606 | -124.6653 | 116 | 20-40 | |
| NH22502.06 | CTD | 107 | 126 | L8-2 | 13 | 8 | 0248 | S | 42.9515 | -124.5830 | 78 | 68 | |
| NH22502.07 | CTD | 107 | 126 | L8-2 | 13 | 8 | 0301 | E | 42.9556 | -124.5832 | 80 | nd | |
| NH22502.08 | VPT | 119 | 126 | L8-2 | 13 | 8 | 0315 | S | 42.9585 | -124.5830 | nd | 75 | |
| NH22502.09 | CTD | 108 | 127 | L9-0 | 13 | 8 | 0620 | S | 42.6845 | -124.4679 | 26 | 16 | |
| NH22502.10 | CTD | 108 | 127 | L9-0 | 13 | 8 | 0627 | E | 42.6855 | -124.4680 | nd | nd | |
| NH22502.11 | VPT | 120 | 127 | L9-0 | 13 | 8 | 0631 | S | 42.6864 | -124.4669 | 26 | 22 | |
| NH22502.12 | CTD | 109 | 128 | L9-1 | 13 | 8 | 0720 | S | 42.6841 | -124.6012 | 110 | 95 | |
| NH22502.13 | CTD | 109 | 128 | L9-1 | 13 | 8 | 0735 | E | 42.6864 | -124.6008 | 108 | nd | End of sheet #19. |
| NH22502.14 | VPT | 121 | 128 | L9-1 | 13 | 8 | 0740 | S | 42.6873 | -124.6008 | 108 | 100 | |
| NH22502.15 | CTD | 110 | 129 | L9-2 | 13 | 8 | 0835 | S | 42.6833 | -124.7011 | 181 | nd | |
| NH22502.16 | CTD | 110 | 129 | L9-2 | 13 | 8 | 0855 | E | 42.6832 | -124.7029 | 185 | 175 | |
| NH22502.17 | VPT | 122 | 129 | L9-2 | 13 | 8 | 0905 | S | 42.6827 | -124.7037 | 185 | 100 | |
| NH22502.18 | MOC | 32 | 129 | L9-2 | 13 | 8 | 0932 | S | 42.6865 | -124.7040 | nd | nd | |
| NH22502.19 | MOC | 32 | 129 | L9-2 | 13 | 8 | 0959 | E | 42.7030 | -124.6983 | nd | nd | |
| NH22502.20 | CTD | 111 | 130 | L9-3 | 13 | 8 | 1057 | S | 42.6850 | -124.8003 | 656 | 200 | |
| NH22502.21 | CTD | 111 | 130 | L9-3 | 13 | 8 | 1118 | E | 41.6863 | -124.8012 | nd | nd | |
| NH22502.22 | VPT | 123 | 130 | L9-3 | 13 | 8 | 1123 | S | 42.6881 | -124.8011 | 657 | 100 | |
| NH22502.23 | CTD | 112 | 131 | L9-4 | 13 | 8 | 1211 | S | 42.6882 | -124.9095 | 725 | 200 | |
| NH22502.24 | CTD | 112 | 131 | L9-4 | 13 | 8 | 1231 | E | 42.6860 | -124.9032 | nd | nd | |
| NH22502.25 | VPT | 124 | 131 | L9-4 | 13 | 8 | 1250 | S | 42.6888 | -124.9145 | nd | 100 | |
| NH22502.26 | MOC | 33 | 131 | L9-4 | 13 | 8 | 1307 | S | 42.6954 | -124.9233 | 788 | 350 | |
| NH22502.27 | MOC | 33 | 131 | L9-4 | 13 | 8 | 1420 | E | 42.7352 | -124.9655 | nd | nd | |
| NH22502.28 | CTD | 113 | 132 | L9-5 | 13 | 8 | 1530 | S | 42.6849 | -125.0049 | 1296 | 200 | |
| NH22502.29 | CTD | 113 | 132 | L9-5 | 13 | 8 | 1554 | E | 42.6884 | -125.0140 | 1183 | nd | |
| NH22502.30 | VPT | 125 | 132 | L9-5 | 13 | 8 | 1557 | S | 42.6885 | -125.0143 | 1177 | 100 | |
| NH22502.31 | CTD | 114 | 133 | L9-6 | 13 | 8 | 1708 | S | 42.6843 | -125.2000 | 3083 | 200 | |
| NH22502.32 | CTD | 114 | 133 | L9-6 | 13 | 8 | 1729 | E | 42.6939 | -125.2051 | nd | nd | End of sheet #20. |
| NH22502.33 | VPT | 126 | 133 | L9-6 | 13 | 8 | 1734 | S | 42.6943 | -125.2035 | 3083 | 100 | |
| NH22502.34 | CTD | 115 | 134 | ED1 | 13 | 8 | 1915 | S | 42.5641 | -125.4285 | 3102 | 200 | ED=Eddy Diversion stations. |
| NH22502.35 | CTD | 115 | 134 | ED1 | 13 | 8 | 1937 | E | 42.5655 | -125.4257 | 3102 | nd | |
| NH22502.36 | VPT | 127 | 134 | ED1 | 13 | 8 | 1945 | S | 42.5667 | -125.4263 | 3102 | 100 | |
| NH22502.37 | CTD | 116 | 135 | ED2 | 13 | 8 | 2133 | S | 42.4167 | -125.6665 | 3092 | 200 | |
| NH22502.38 | CTD | 116 | 135 | ED2 | 13 | 8 | 2153 | E | 42.4177 | -125.6675 | 3094 | 200 | |
| NH22502.39 | VPT | 128 | 135 | ED2 | 13 | 8 | 2159 | S | 42.4178 | -125.6676 | 3095 | 100 | |
| NH22502.40 | CTD | 117 | 136 | ED3 | 13 | 8 | 2340 | S | 42.2502 | -125.6648 | 2965 | 200 | |
| NH22602.01 | CTD | 117 | 136 | ED3 | 14 | 8 | 0000 | E | 42.2540 | -125.6576 | 3002 | nd | |
| NH22602.02 | VPT | 129 | 136 | ED3 | 14 | 8 | 0008 | S | 42.2571 | -125.6561 | 3010 | 100 | |
| NH22602.03 | LiveNet1 | 21 | 136 | ED3 | 14 | 8 | 0022 | S | 42.2597 | -125.6482 | 3046 | 20-40 | |
| NH22602.04 | CTD | 118 | 137 | ED4 | 14 | 8 | 0145 | S | 42.1672 | -125.6651 | 2877 | 200 | |
| NH22602.05 | CTD | 118 | 137 | ED4 | 14 | 8 | 0208 | E | 42.1671 | -125.6600 | 2866 | 200 | |
| NH22602.06 | VPT | 130 | 137 | ED4 | 14 | 8 | 0212 | S | 42.1658 | -125.6566 | 2884 | 100 | |
| NH22602.07 | LiveNet1 | 22 | 137 | ED4 | 14 | 8 | 0228 | S | 42.1644 | -125.6527 | 2911 | 20-40 | |
| NH22602.08 | CTD | 119 | 138 | ED5 | 14 | 8 | 0330 | S | 42.0839 | -125.6648 | 2820 | 200 | |
| NH22602.09 | CTD | 119 | 138 | ED5 | 14 | 8 | 0352 | E | 42.0853 | -125.6604 | 2879 | 200 | |
| NH22602.10 | VPT | 131 | 138 | ED5 | 14 | 8 | 0401 | S | 42.0852 | -125.6587 | 2868 | 100 | |
| NH22602.11 | LiveNet1 | 23 | 138 | ED5 | 14 | 8 | 0409 | S | 42.0853 | -125.6566 | 2848 | 20-40 | |
| NH22602.12 | CTD | 120 | 139 | ED6 | 14 | 8 | 0507 | S | 42.0023 | -125.6664 | 2943 | 200 | |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22602.13 | CTD | 120 | 139 | ED6 | 14 | 8 | 0530 | E | 42.0012 | -125.6635 | 2918 | 200 | |
| NH22602.14 | VPT | 132 | 139 | ED6 | 14 | 8 | 0533 | S | 42.0012 | -125.6618 | 2927 | 100 | |
| NH22602.15 | CTD | 121 | 140 | ED7 | 14 | 8 | 0720 | S | 42.1985 | -125.5005 | nd | 200 | End of sheet #21. |
| NH22602.16 | CTD | 121 | 140 | ED7 | 14 | 8 | 0743 | E | 42.2008 | -125.5046 | 3112 | 200 | |
| NH22602.17 | VPT | 133 | 140 | ED7 | 14 | 8 | 0748 | S | 42.2008 | -125.5047 | 3112 | 100 | |
| NH22602.18 | CTD | 122 | 141 | L11-8 | 14 | 8 | 0934 | S | 42.2006 | -125.2028 | 2158 | 200 | |
| NH22602.19 | CTD | 122 | 141 | L11-8 | 14 | 8 | 0950 | E | 42.2011 | -125.2056 | nd | nd | |
| NH22602.20 | VPT | 134 | 141 | L11-8 | 14 | 8 | 0955 | S | 42.2012 | -125.2070 | 2436 | 200 | |
| NH22602.21 | CTD | 123 | 142 | L11-6 | 14 | 8 | 1155 | S | 42.2032 | -125.2023 | 876 | 200 | |
| NH22602.22 | CTD | 123 | 142 | L11-6 | 14 | 8 | 1222 | E | 42.2019 | -125.8736 | 887 | nd | |
| NH22602.23 | VPT | 135 | 142 | L11-6 | 14 | 8 | 1228 | S | 42.2020 | -125.8754 | 891 | 100 | |
| NH22602.24 | CTD | 124 | 143 | L11-5 | 14 | 8 | 1410 | S | 42.2003 | -125.7020 | 545 | 200 | |
| NH22602.25 | CTD | 124 | 143 | L11-5 | 14 | 8 | 1427 | E | 42.2020 | -125.7053 | nd | nd | |
| NH22602.26 | VPT | 136 | 143 | L11-5 | 14 | 8 | 1437 | S | 42.2003 | -125.7020 | 552 | 100 | |
| NH22602.27 | MOC | 34 | 143 | L11-5 | 14 | 8 | 1502 | S | 42.2081 | -125.7117 | 531 | 365 | |
| NH22602.28 | MOC | 34 | 143 | L11-5 | 14 | 8 | 1544 | E | 42.2137 | -125.7117 | nd | nd | |
| NH22602.29 | CTD | 125 | 144 | L11-4 | 14 | 8 | 1650 | S | 42.2007 | -124.6335 | 367 | 200 | |
| NH22602.30 | CTD | 125 | 144 | L11-4 | 14 | 8 | 1710 | E | 42.2025 | -124.6492 | 368 | nd | |
| NH22602.31 | VPT | 137 | 144 | L11-4 | 14 | 8 | 1713 | S | 42.2026 | -124.6326 | 368 | 100 | |
| NH22602.32 | CTD | 126 | 145 | L11-3 | 14 | 8 | 1752 | S | 42.2013 | -124.5671 | 167 | 150 | |
| NH22602.33 | CTD | 126 | 145 | L11-3 | 14 | 8 | 1808 | E | 42.2022 | -124.5683 | 169 | nd | |
| NH22602.34 | VPT | 138 | 145 | L11-3 | 14 | 8 | 1815 | S | 42.2022 | -124.5690 | 173 | nd | |
| NH22602.35 | MOC | 35 | 145 | L11-3 | 14 | 8 | 1857 | S | 42.2052 | -124.5748 | 200 | 185 | |
| NH22602.36 | MOC | 35 | 145 | L11-3 | 14 | 8 | 1920 | E | 42.2246 | -124.6000 | nd | nd | End sheet #22. |
| NH22602.37 | CTD | 127 | 146 | L11-2 | 14 | 8 | 2049 | S | 42.2006 | -124.4824 | 116 | 106 | |
| NH22602.38 | CTD | 127 | 146 | L11-2 | 14 | 8 | 2106 | E | 42.2061 | -124.4818 | nd | nd | |
| NH22602.39 | VPT | 139 | 146 | L11-2 | 14 | 8 | 2115 | S | 42.2073 | -124.4805 | 114 | 100 | |
| NH22602.40 | LiveNet1 | 24 | 146 | L11-2 | 14 | 8 | 2128 | S | 42.2055 | -124.4785 | 112 | 20-40 | |
| NH22602.41 | CTD | 128 | 147 | L11-1 | 14 | 8 | 2221 | S | 42.1997 | -124.4206 | 68 | 58 | |
| NH22602.42 | CTD | 128 | 147 | L11-1 | 14 | 8 | 2228 | E | 42.2005 | -124.4212 | nd | nd | |
| NH22602.43 | VPT | 140 | 147 | L11-1 | 14 | 8 | 2236 | S | 42.2011 | -124.4252 | 68 | 62 | |
| NH22602.44 | LiveNet1 | 25 | 147 | L11-1 | 14 | 8 | 2240 | S | 42.2051 | -124.4247 | 65 | 20-40 | |
| NH22702.01 | CTD | 129 | 148 | RR2 | 15 | 8 | 0155 | S | 42.5060 | -124.6041 | 90 | 80 | |
| NH22702.02 | CTD | 129 | 148 | RR2 | 15 | 8 | 0210 | E | 42.5070 | -124.6105 | nd | nd | |
| NH22702.03 | VPT | 141 | 148 | RR2 | 15 | 8 | 0220 | S | nd | nd | nd | nd | Aborted; high winds. |
| NH22702.04 | Hove to | nd | nd | nd | 15 | 8 | nd | nd | nd | nd | nd | nd | |
| NH22702.05 | VPT | 142 | nd | RR2 | 15 | 8 | 1025 | S | 42.5038 | -124.6050 | 90 | nd | Winch broke; high winds; aborted again. |
| NH22702.06 | Hove to | nd | nd | nd | 15 | 8 | nd | nd | nd | nd | nd | nd | Gave up and steamed north to Line 8. |
| NH22702.07 | CTD | 130 | 149 | L8-3 | 15 | 8 | 1656 | S | 42.9506 | -124.6685 | 113 | nd | |
| NH22702.08 | CTD | 130 | 149 | L8-3 | 15 | 8 | 1715 | E | 42.9500 | -124.6667 | nd | nd | |
| NH22702.09 | VPT | 143 | 149 | L8-3 | 15 | 8 | 1721 | S | 42.9570 | -124.6713 | nd | 100 | |
| NH22702.10 | CTD | 131 | 150 | L8-4 | 15 | 8 | 1820 | S | 42.9503 | -124.8280 | 157 | 145 | |
| NH22702.11 | CTD | 131 | 150 | L8-4 | 15 | 8 | 1837 | E | 42.9520 | -124.8199 | 152 | nd | |
| NH22702.12 | VPT | 144 | 150 | L8-4 | 15 | 8 | 1846 | S | 42.9525 | -124.8206 | 149 | 100 | |
| NH22702.13 | LiveNet1 | 26 | 150 | L8-4 | 15 | 8 | 1925 | S | 42.9493 | -124.8188 | 158 | nd | |
| NH22702.14 | MOC | 36 | 150 | L8-4 | 15 | 8 | 2005 | S | 42.8711 | -124.8200 | 148 | 75 | |
| NH22702.15 | MOC | 36 | 150 | L8-4 | 15 | 8 | 2110 | E | 42.9970 | -124.8300 | 114 | nd | |
| NH22702.16 | LiveNet1 | 27 | 150 | L8-4 | 15 | 8 | 2202 | S | 42.9500 | -124.8185 | 156 | 20-40 | End of sheet #23. |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22702.17 | CTD | 132 | 150 | L8-4 | 15 | 8 | 2233 | S | 42.9507 | -124.8184 | 155 | 100 | |
| NH22702.18 | CTD | 132 | 150 | L8-4 | 15 | 8 | 2245 | E | 42.9520 | -124.8201 | nd | nd | |
| NH22702.19 | LiveNet1 | 28 | 150 | L8-4 | 15 | 8 | 2335 | S | 42.9478 | -124.8187 | 160 | 20 | |
| NH22802.01 | CTD | 133 | 150 | L8-4 | 16 | 8 | 0055 | S | 42.9489 | -124.8192 | 157 | 100 | |
| NH22802.02 | CTD | 133 | 150 | L8-4 | 16 | 8 | 0107 | E | 42.9505 | -124.8215 | 150 | nd | |
| NH22802.03 | LiveNet1 | 29 | 150 | L8-4 | 16 | 8 | 0112 | S | 42.9533 | -124.8211 | 144 | 20-40 | |
| NH22802.04 | LiveNet1 | 30 | 150 | L8-4 | 16 | 8 | 0230 | S | 42.9526 | -124.8190 | nd | nd | |
| NH22802.05 | CTD | 134 | 150 | L8-4 | 16 | 8 | 0350 | S | 42.9501 | -124.8159 | 158 | 100 | |
| NH22802.06 | CTD | 134 | 150 | L8-4 | 16 | 8 | 0400 | E | 42.9509 | -124.8176 | 156 | 100 | |
| NH22802.07 | LiveNet1 | 31 | 150 | L8-4 | 16 | 8 | 0405 | S | 42.9525 | -124.8194 | 148 | 20-40 | |
| NH22802.08 | LiveNet1 | 32 | 150 | L8-4 | 16 | 8 | 0500 | S | 42.9486 | -124.8167 | 159 | 20-40 | |
| NH22802.09 | CTD | 135 | 150 | L8-4 | 16 | 8 | 0547 | S | 42.9492 | -124.8172 | 161 | 100 | |
| NH22802.10 | CTD | 135 | 150 | L8-4 | 16 | 8 | 0557 | E | 42.9508 | -124.8180 | 155 | 100 | |
| NH22802.11 | LiveNet1 | 33 | 150 | L8-4 | 16 | 8 | 0600 | S | 42.9557 | -124.8212 | nd | 20-40 | |
| NH22802.12 | CTD | 136 | 150 | L8-4 | 16 | 8 | 0815 | S | 42.9487 | -124.8329 | 161 | 100 | |
| NH22802.13 | CTD | 136 | 150 | L8-4 | 16 | 8 | 0832 | E | 42.9513 | -124.8201 | 152 | nd | |
| NH22802.14 | LiveNet1 | 34 | 150 | L8-4 | 16 | 8 | 0842 | S | 42.9530 | -124.8235 | 142 | 20-40 | |
| NH22802.15 | LiveNet1 | 35 | 150 | L8-4 | 16 | 8 | 1000 | S | 42.9480 | -124.8150 | 163 | 20-40 | |
| NH22802.16 | CTD | 137 | 150 | L8-4 | 16 | 8 | 1045 | S | 42.9477 | -124.8160 | 161 | 150 | |
| NH22802.17 | CTD | 137 | 150 | L8-4 | 16 | 8 | 1108 | E | 42.9492 | -124.8193 | nd | nd | |
| NH22802.18 | VPT | 145 | 150 | L8-4 | 16 | 8 | 1100 | S | 42.9493 | -124.8198 | 157 | 100 | |
| NH22802.19 | CTD | 138 | 151 | L8-3 | 16 | 8 | 1428 | S | 42.9482 | -124.6680 | 110 | 95 | |
| NH22802.20 | CTD | 138 | 151 | L8-3 | 16 | 8 | 1443 | E | 42.9498 | -124.6675 | 110 | nd | |
| NH22802.21 | VPT | 146 | 151 | L8-3 | 16 | 8 | 1450 | S | 42.9507 | -124.6675 | 112 | 100 | |
| NH22802.22 | CTD | 139 | 152 | L8-2 | 16 | 8 | 1532 | S | 42.9489 | -124.5845 | 73 | 70 | |
| NH22802.23 | CTD | 139 | 152 | L8-2 | 16 | 8 | 1550 | E | 42.9532 | -124.5868 | 79 | nd | |
| NH22802.24 | VPT | 147 | 152 | L8-2 | 16 | 8 | 1553 | S | 42.9515 | -124.5879 | 73 | 70 | |
| NH22802.25 | CTD | 140 | 153 | L8-1 | 16 | 8 | 1640 | S | 42.9341 | -124.5239 | 30 | 25 | |
| NH22802.26 | CTD | 140 | 153 | L8-1 | 16 | 8 | 1652 | E | 42.9328 | -124.5256 | nd | nd | |
| NH22802.27 | VPT | 148 | 153 | L8-1 | 16 | 8 | 1657 | S | 42.9341 | -124.5263 | 37 | 30 | |
| NH22802.28 | LiveNet1 | 36 | 154 | L8-4 | 16 | 8 | 1839 | S | 42.9553 | -124.8240 | nd | nd | |
| NH22802.29 | LiveNet1 | 37 | 154 | L8-4 | 16 | 8 | 1933 | S | 42.9500 | -124.8173 | 159 | 20-40 | |
| NH22802.30 | CTD | 141 | 154 | L8-4 | 16 | 8 | 2029 | S | 42.9435 | -124.8184 | 155 | nd | |
| NH22802.31 | CTD | 141 | 154 | L8-4 | 16 | 8 | 2045 | E | 42.9454 | -124.8224 | 161 | nd | |
| NH22802.32 | LiveNet1 | 38 | 154 | L8-4 | 16 | 8 | 2053 | S | 42.9485 | -124.8255 | nd | 20-40 | |
| NH22802.33 | CTD | 142 | 154 | L8-4 | 16 | 8 | 2130 | S | 42.9500 | -124.8192 | 155 | 100 | |
| NH22802.34 | CTD | 142 | 154 | L8-4 | 16 | 8 | 2138 | E | 42.9517 | -124.8213 | 152 | nd | |
| NH22802.35 | LiveNet1 | 39 | 154 | L8-4 | 16 | 8 | 2145 | S | 42.9538 | -124.8245 | nd | 20-40 | |
| NH22802.36 | MOC | 37 | 154 | L8-4 | 16 | 8 | 2237 | S | 42.9526 | -124.8183 | 160 | 110 | |
| NH22802.37 | MOC | 37 | 154 | L8-4 | 16 | 8 | 2310 | E | 42.8896 | -124.8367 | 133 | nd | |
| NH22902.01 | CTD | 143 | 155 | HH1 | 17 | 8 | 0710 | S | 44.0011 | -124.1999 | 55 | 45 | |
| NH22902.02 | CTD | 143 | 155 | HH1 | 17 | 8 | 0721 | E | 44.0014 | -124.1992 | nd | nd | |
| NH22902.03 | VPT | 149 | 155 | HH1 | 17 | 8 | 0725 | S | 44.0014 | -124.1989 | 55 | 45 | |
| NH22902.04 | CTD | 144 | 156 | HH2 | 17 | 8 | 0900 | S | 43.9981 | -124.4019 | 123 | 110 | |
| NH22902.05 | CTD | 144 | 156 | HH2 | 17 | 8 | 0917 | E | 43.9990 | -124.4070 | nd | nd | |
| NH22902.06 | VPT | 150 | 156 | HH2 | 17 | 8 | 0921 | S | 43.9990 | -124.4073 | 123 | 100 | |
| NH22902.07 | LiveNet1 | 40 | 157 | HH3 | 17 | 8 | 1027 | S | 43.9975 | -124.5926 | 153 | 40 | |
| NH22902.08 | VPT | 151 | 157 | HH3 | 17 | 8 | 1045 | S | 44.0006 | -124.5971 | 152 | 100 | |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH22902.09 | CTD | 145 | 157 | HH3 | 17 | 8 | 1104 | S | 44.0015 | -124.5960 | 156 | nd | |
| NH22902.10 | CTD | 145 | 157 | HH3 | 17 | 8 | 1124 | E | 44.0002 | -124.5960 | nd | nd | |
| NH22902.11 | CTD | 146 | 158 | HH4 | 17 | 8 | 1240 | S | 44.0000 | -124.8008 | 108 | 95 | |
| NH22902.12 | CTD | 146 | 158 | HH4 | 17 | 8 | 1257 | E | 44.0014 | -124.8020 | nd | nd | |
| NH22902.13 | VPT | 152 | 158 | HH4 | 17 | 8 | 1304 | S | 44.0044 | -124.8022 | 107 | 100 | |
| NH22902.14 | VPT | 153 | 159 | HH5 | 17 | 8 | 1423 | S | 44.0040 | -125.0000 | 942 | 100 | |
| NH22902.15 | MOC | 38 | 159 | HH5 | 17 | 8 | 1515 | S | 43.9905 | -125.0014 | 932 | 350 | |
| NH22902.16 | MOC | 38 | 159 | HH5 | 17 | 8 | 1608 | E | 44.0254 | -125.0132 | nd | nd | |
| NH22902.17 | CTD | 147 | 159 | HH5 | 17 | 8 | 1658 | S | 43.9652 | -125.0000 | nd | nd | |
| NH22902.18 | CTD | 147 | 159 | HH5 | 17 | 8 | 1720 | E | 44.0030 | -125.0030 | nd | nd | |
| NH22902.19 | LiveNet1 | 41 | 159 | HH5 | 17 | 8 | 1732 | S | 44.0049 | -125.0061 | 981 | 40 | |
| NH22902.20 | LiveNet1 | 42 | 159 | HH5 | 17 | 8 | 1845 | S | 43.9979 | -124.9984 | 937 | 40 | |
| NH22902.21 | LiveNet1 | 43 | 159 | HH5 | 17 | 8 | 1945 | S | 44.0008 | -124.0014 | 947 | nd | |
| NH22902.22 | MOC | 39 | 159 | HH5 | 17 | 8 | 2005 | S | 44.0060 | -125.0102 | 1010 | 75 | |
| NH22902.23 | MOC | 39 | 159 | HH5 | 17 | 8 | 2125 | E | 44.0518 | -125.0054 | nd | nd | |
| NH22902.24 | LiveNet1 | 44 | 159 | HH5 | 17 | 8 | 2210 | S | 43.9998 | -124.9995 | nd | nd | |
| NH22902.25 | CTD | 148 | 159 | HH5 | 17 | 8 | 2300 | S | 43.9987 | -125.0011 | 951 | 100 | |
| NH22902.26 | CTD | 148 | 159 | HH5 | 17 | 8 | 2317 | E | 43.9995 | -125.0039 | nd | nd | |
| NH22902.27 | LiveNet1 | 45 | 159 | HH5 | 17 | 8 | 2318 | S | 44.0000 | -125.0051 | 994 | 100 | |
| NH23002.01 | LiveNet1 | 46 | 159 | HH5 | 18 | 8 | 0030 | S | 44.0009 | -125.0042 | 950 | 20 | |
| NH23002.02 | LiveNet1 | 47 | 159 | HH5 | 18 | 8 | 0128 | S | 44.0006 | -125.0027 | 954 | 20 | |
| NH23002.03 | MOC | 40 | 159 | HH5 | 18 | 8 | 0150 | S | 44.0062 | -125.0130 | 1014 | 350 | |
| NH23002.04 | MOC | 40 | 159 | HH5 | 18 | 8 | 0307 | E | 44.0463 | -125.0680 | 1308 | nd | |
| NH23002.05 | LiveNet1 | 48 | 159 | HH5 | 18 | 8 | 0415 | S | 43.9997 | -125.0003 | 949 | 20 | |
| NH23002.06 | LiveNet1 | 49 | 159 | HH5 | 18 | 8 | 0515 | S | 44.0006 | -125.0008 | 944 | 20 | |
| NH23002.07 | CTD | 149 | 160 | NH45 | 18 | 8 | 0949 | S | 44.6507 | -125.1196 | 739 | 650 | |
| NH23002.08 | CTD | 149 | 160 | NH45 | 18 | 8 | 1025 | E | 44.6527 | -125.1233 | 763 | nd | |
| NH23002.09 | Secchi | 13 | 160 | NH45 | 18 | 8 | 1028 | S | 44.6527 | -125.1233 | nd | 6 | |
| NH23002.10 | VPT | 154 | 160 | NH45 | 18 | 8 | 1030 | S | 44.6527 | -125.1235 | 740 | 100 | |
| NH23002.11 | VPT | 155 | 161 | NH35 | 18 | 8 | 1158 | S | 44.6534 | -124.8830 | 450 | 100 | Skipped CTD to save time; Revelle to do it later tonight. |
| NH23002.12 | Secchi | 14 | 161 | NH35 | 18 | 8 | 1208 | S | 44.6534 | -124.8830 | nd | 3.25 | |
| NH23002.13 | CTD | 150 | 162 | NH25 | 18 | 8 | 1323 | S | 44.6528 | -124.6524 | 298 | 200 | |
| NH23002.14 | CTD | 150 | 162 | NH25 | 18 | 8 | 1347 | E | 44.6527 | -124.6360 | nd | nd | |
| NH23002.15 | Secchi | 15 | 162 | NH25 | 18 | 8 | 1341 | S | 44.6527 | -124.6524 | 298 | 4.5 | |
| NH23002.16 | VPT | 156 | 162 | NH25 | 18 | 8 | 1402 | S | 44.6540 | -124.6555 | 292 | 100 | |
| NH23002.17 | MOC | 41 | 162 | NH25 | 18 | 8 | 1421 | S | 44.6575 | -124.6100 | 293 | 280 | |
| NH23002.18 | MOC | 41 | 162 | NH25 | 18 | 8 | 1504 | E | 44.6822 | -124.6800 | nd | nd | |
| NH23002.19 | CTD | 151 | 163 | NH20 | 18 | 8 | 1610 | S | 44.6523 | -124.5290 | 147 | 130 | |
| NH23002.20 | CTD | 151 | 163 | NH20 | 18 | 8 | 1623 | E | 44.6535 | -124.5327 | nd | nd | |
| NH23002.21 | VPT | 157 | 163 | NH20 | 18 | 8 | 1629 | S | 44.6543 | -124.5338 | 147 | 100 | |
| NH23002.22 | Secchi | 16 | 163 | NH20 | 18 | 8 | 1634 | S | 44.6543 | -124.5337 | nd | nd | |
| NH23002.23 | CTD | 152 | 164 | NH15 | 18 | 8 | 1728 | S | 44.6506 | -124.4257 | 92 | 80 | |
| NH23002.24 | CTD | 152 | 164 | NH15 | 18 | 8 | 1743 | E | 44.6515 | -124.4132 | nd | nd | |
| NH23002.25 | VPT | 158 | 164 | NH15 | 18 | 8 | 1750 | S | 44.6525 | -124.4144 | 92 | 80 | |
| NH23002.26 | LiveNet1 | 50 | 164 | NH15 | 18 | 8 | 1755 | S | 44.6548 | -124.4162 | nd | nd | |
| NH23002.27 | CTD | 153 | 165 | NH10 | 18 | 8 | 1900 | S | 44.6510 | -124.2855 | 83 | 70 | |
| NH23002.28 | CTD | 153 | 165 | NH10 | 18 | 8 | 1911 | E | 44.6519 | -124.2878 | 83 | nd | |
| NH23002.29 | Secchi | 17 | 165 | NH10 | 18 | 8 | 1905 | S | 44.6519 | -124.3208 | nd | nd | |

| Event# | Instr | Cast | Sta | Sta std | Mos | Day | Time | | Lat | Long | Water Depth | Cast Depth | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NH23002.30 | VPT | 159 | 165 | NH10 | 18 | 8 | 1915 | S | 44.6525 | -124.2890 | 83 | 75 | |
| NH23002.31 | CTD | 154 | 166 | NH5 | 18 | 8 | 2008 | S | 44.6508 | -124.1776 | 62 | 50 | |
| NH23002.32 | CTD | 154 | 166 | NH5 | 18 | 8 | 2015 | E | 44.6508 | -124.1778 | nd | nd | |
| NH23002.33 | Secchi | 18 | 166 | NH5 | 18 | 8 | 2019 | S | 44.6508 | -124.1778 | nd | nd | 3.5 meters. |
| NH23002.34 | VPT | 160 | 166 | NH5 | 18 | 8 | 2020 | S | 44.6511 | -124.1787 | 62 | 53 | |
| NH23002.35 | LiveNet1 | 51 | 166 | NH5 | 18 | 8 | 2029 | S | 44.6521 | -124.1816 | 62 | 20 | |
| NH23002.36 | MOC | 42 | 167 | NH25 | 18 | 8 | 2305 | S | 44.6517 | -124.6517 | 295 | 280 | |
| NH23102.01 | MOC | 42 | 167 | NH25 | 19 | 8 | 0010 | E | 44.6860 | -124.6767 | 332 | nd | |
| NH23102.02 | LiveNet1 | 52 | 168 | NH20 | 19 | 8 | 0143 | S | 44.6501 | -124.5309 | 144 | 30 | |
| NH23102.03 | MOC | 43 | 169 | NH15 | 19 | 8 | 0251 | S | 44.6556 | -124.4157 | 95 | 85 | |
| NH23102.04 | MOC | 43 | 169 | NH15 | 19 | 8 | 0312 | E | 44.6675 | -124.4250 | nd | nd | |
| NH23102.05 | LiveNet1 | 53 | 170 | NH10 | 19 | 8 | 0445 | S | 44.6493 | -124.2847 | 80 | 30 | |
| NH23102.06 | LiveNet1 | 54 | 171 | NH5 | 19 | 8 | 0535 | S | 44.6479 | -124.1765 | 58 | 30 | |
| NH23102.07 | CTD | 155 | 172 | NH1 | 19 | 8 | 0618 | S | 44.6503 | -124.0996 | 28 | 20 | |
| NH23102.08 | CTD | 155 | 172 | NH1 | 19 | 8 | 0626 | E | 44.6657 | -124.1005 | nd | nd | |
| NH23102.09 | VPT | 161 | 172 | NH1 | 19 | 8 | 0631 | S | 44.6488 | -124.1015 | 28 | 20 | |