

CRUISE  
NUMBER

9742

# DAILY LOG

## INSTITUTE OF OCEAN SCIENCES

## OCEAN PHYSICS

DATE

Sep. 23 - Oct. 5 97

VESSEL

J. P. Tully

PROJECT

La Perouse / CRD / Barkley Canyon /  
Georgia Strait / WCVI Tide Gauge /  
EL Nino Monitor.



2nd CTD make: \_\_\_\_\_ model: \_\_\_\_\_ serial no.: 2443  
Primary Temperature sensor model: \_\_\_\_\_ serial no.: 2095  
secondary coefficients: slope: \_\_\_\_\_ offset: sln 2142  
Primary Conductivity sensor model: \_\_\_\_\_ serial no.: 1729  
secondary coefficients: slope: \_\_\_\_\_ offset: sln 1766  
Pressure sensor range: \_\_\_\_\_ psi  
coefficients: FSP: \_\_\_\_\_ dB  
Transmissometer model: \_\_\_\_\_ serial no.: \_\_\_\_\_  
coefficients: slope: \_\_\_\_\_ offset: \_\_\_\_\_  
Winches: \_\_\_\_\_

1. make: Swan model: 329 serial no.: 1307 use: CTD  
2. make: " model: 329 serial no.: 1482 use: CTD  
3. make: " model: 515 serial no.: 589 use: Mooring  
4. make: " model: 331 serial no.: 1231 use: Dredging  
5. make: " model: 475 serial no.: 1550 use: Spooling  
6. make: \_\_\_\_\_ model: \_\_\_\_\_ serial no.: \_\_\_\_\_ use: \_\_\_\_\_  
7. make: \_\_\_\_\_ model: \_\_\_\_\_ serial no.: \_\_\_\_\_ use: \_\_\_\_\_

Salinometer: make: \_\_\_\_\_ model: 8410 serial no.: 59724  
SAIL System: \_\_\_\_\_

Program version: \_\_\_\_\_ Time zone: UTC  
Sampling interval: 120 sec  
CTF module no.: \_\_\_\_\_ serial no.: \_\_\_\_\_  
Remote temperature model: \_\_\_\_\_ serial no.: \_\_\_\_\_  
Flow sensor model: \_\_\_\_\_ serial no.: \_\_\_\_\_

Other sensors: (special for this cruise)

Name: \_\_\_\_\_ module ID: \_\_\_\_\_ serial no.: \_\_\_\_\_  
Name: \_\_\_\_\_ module ID: \_\_\_\_\_ serial no.: \_\_\_\_\_  
Name: \_\_\_\_\_ module ID: \_\_\_\_\_ serial no.: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ADCP Setup:

Program version: \_\_\_\_\_ number of depth bins: \_\_\_\_\_  
Time zone: \_\_\_\_\_ bin length (2x): \_\_\_\_\_  
Sampling interval: \_\_\_\_\_ sec pulse length: \_\_\_\_\_  
Blank beyond transmit: \_\_\_\_\_ pings per ensemble: \_\_\_\_\_  
Pulse cycle time: \_\_\_\_\_  
% pings good threshold: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

| <u>Date</u> | <u>Time (PDT)</u> |                                                                                                                                                                                                                                                                                     |
|-------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sep. 23.    | 0830              | - depart L.O.S.                                                                                                                                                                                                                                                                     |
|             | 1245              | - pickup Doug A. in Victoria outbound heading for LG line                                                                                                                                                                                                                           |
|             | 1645 (app)        | - completed a test cast to shake out problems in CTD/Ros system at D14a. - tripped 3 bottles at 160m in 180m depth.<br>- collected 2 salinity samples #001 #002.                                                                                                                    |
|             | 1730              | - ship develops steering problems in both primary + secondary systems.<br>- we anchor off Sombrio Pt. to identify problem.<br>- during operation Captain informs me he will not go after the tide gauges with steering problems - no surprise! We may have to recover by small boat |
|             | 2045              | - we continue to LG line. steering equipment repaired by reconnecting loose wires.<br>- due to time lost we have to head for E03 mooring for recovery + servicing.                                                                                                                  |

Date Time (PDT)

- Sep. 24 0730 - at station E01-Y for recovery + redeployment.  
- moving directly over position.  
- range while moving. = 127 m
- 0737 - stopped on station.  
- ranges 103, 104, 105, 106  
- moving off ranges 108, 107, 109 → 122 m = 82 m distance
- 0745 - sending B C D F  
0746 - sighted on surface
- recovery, cleanup, service mooring
- 1032 - launched E01-Z in 101 m water at  $49^{\circ} 17.350'$   
 $126^{\circ} 35.940'$
- 1040 - depart for E03 for servicing ETA 1230.
- Rick calls out with Effingham stations he would like occupied if possible  
- we discuss TG situation - TG stations can be moved to accommodate ship stowage problems but they are a high priority
- Rick will fax out B Canyon CTD stations  
- Rick also requested a CTD at each El Niño mooring.
- 1230 - on station E03  
- range 479 m., 481 m.  
- moved off range 571.
- 1238 - sent C D E F - received positive response.  
1240 - sighted on surface.

## DAILY LOG

## OCEAN PHYSICS

## INSTITUTE OF OCEAN SCIENCES

| YEAR      |            | MONTH     |            | SHIP      |                    | CRUISE    |           | PAGE          |                  | OF                     |                 |              |      |                                |
|-----------|------------|-----------|------------|-----------|--------------------|-----------|-----------|---------------|------------------|------------------------|-----------------|--------------|------|--------------------------------|
| 1997      |            | 09        |            |           |                    | 9742      |           |               |                  |                        |                 |              |      |                                |
| DAY (UTC) | STATION ID | CAST TYPE | TIME (UTC) | TIME CODE | STD/HYDRO CONSEC # | LATITUDE  | LONGITUDE | POSITION CODE | BOTTOM DEPTH (m) | MAX SAMPLING DEPTH (m) | CONSEC SAMPLE # | # OF BOTTLES | INIT | COMMENTS                       |
| 23        | D14A       | CTD       | 23:35      | UTC       | 1                  | 48 22.10  | 124 14.96 | ✓             | 180              |                        |                 |              |      | CTD 0437                       |
| 23        |            | CTD       | 2341       |           | 2                  | 48 22.21  | 124 14.95 | ✓             |                  | 163,                   | 1-2             | 3            |      | Testing CTD/Rosette            |
| 25        | LG08       | ROS       | 0117       |           | 3                  | 48 55.58  | 127 13.52 | ✓             | 2063.            |                        |                 |              |      | keep sal.                      |
| 25        | LG08       | ROS       | 0152       |           | 4                  | 48 55.88  | 127 13.87 | ✓             |                  |                        | 3-8             | 6            |      | calibration samples            |
| 25        | LG07       | CTD       | 0324       | BE        | 5                  | 48 59.30  | 127 6.91  | ✓             | 1760             |                        |                 |              |      |                                |
| 25        | LG07       | CTD       | 0401       | BO        | 5/6                | 48 59.280 | 127 06.74 |               |                  |                        |                 |              |      |                                |
| 25        | LG07       | CTD       | 0404       | BE        | 6                  | 59.290    | 06.76     | ✓             |                  | 1760                   |                 |              |      |                                |
| "         | LG07       |           | 0434       | EN        | 6                  | 59.250    | 06.48     |               |                  |                        |                 |              |      |                                |
| 25        | LG06       | ROS       | 0529       | BE        | 7                  | 49 03.56  | 127 01.17 | ✓             | 948              |                        |                 |              |      |                                |
|           |            |           | 0549       | BO        | 7/8                |           |           |               |                  |                        |                 |              |      |                                |
|           |            |           | 0549       | BE        | 8                  | 49 03.48  | 127 01.29 | ✓✓            |                  | 964                    | 9-26            | 18           |      | O <sub>2</sub> , Phyto, Chlor. |
|           | LG06       | Loop      |            |           |                    |           |           |               |                  | Loop                   | 27              | 1            |      | Loop. Sal. Cal.                |
| 25        | LG05       | CTD       | 07:19      | BE        | 9                  | 49 07.15  | 126 35.07 | ✓             | 273              |                        |                 |              |      |                                |
|           |            |           | 0729       | BO        | 10                 | 49 07.03  | 126 34.99 | ✓             |                  |                        |                 |              |      |                                |
|           |            |           |            |           |                    |           |           |               |                  |                        |                 |              |      |                                |
|           |            |           |            |           |                    |           |           |               |                  |                        |                 |              |      |                                |
| 25        | LG04       | ROS       | 08:33      | BE        | 11                 | 49 11.09  | 126 49.46 | ✓             | 148              |                        |                 |              |      |                                |

CAST TYPE -

BOT -  
CTD -  
MOR -bottle cast  
ctd  
mooringROS -  
NET -  
DRF -rosette  
net haul  
drifter

USW - sea water loop

TIME CODE -

BE -  
BO -  
EN -beginning time of cast  
bottom time of cast  
end of castDE -  
MR -  
RE -deployment time  
messenger release  
recover mooring

POSITION CODE -

RAD -  
GPS -  
LOR -RADAR  
GLOBAL  
LORAN

Date      Time (PDT)

Sep. 24      1624      - launched E03-Z at  $49^{\circ}05.158'$   $126^{\circ}57.250'$  in 495m depth  
sounding @ default speed of sound without CTD profile added.

- set off for offshore end of LG Line LG08

LG08      Thermosalinograph salinity reading 27. (caused by air bubble). Drained tank  
and refilled unit. Salinity OK.

Sep 24      LG07      - 1760m of water. Very large transmission minimum (off scale) at ~900m. Probably  
hit Jellies or octopus or some sort of sea monster.  
- Interesting water column inversion/salt finger/anomalous water mass/error at 900m.  
Both up and down. Reported at LG08 as well.

## Date Time (PDT)

- Sep. 25 -0800 - on station at mouth of Boca del Inferno to recover TG. Nootka TG - A.
- 0807 - moved in close.  
- sent Call Ping. - received response 2 times  
- sent release Code 07 - no response.  
- sent release Code 07 - got back call ping at start  
" " " " at end  
- got release confirmation.
- 0812 - sighted on surface.  
- recovered by launch - + towed back to Tully.  
- serviced instrumentation and prep. for redeployment.  
- selected an alternate location because ship steering problems did not allow redeployment in Boca del Inferno location.  
- tried small bay to south of Marinas Bay - too close for ship.  
- moved to flat bottom at Discovery Pt. - moved as far in as possible to shelter from swell. crossing the protective reef to the south west
- 1123 - deployed Nootka TG - B at  $49^{\circ} 35.113'$   $126^{\circ} 33.705'$  in 19.5 m water at start ebb tide  $\approx + 2.25$
- 1130 - proceed to Kyuguat TG for recovery
- 1630 - arrive of Kyuguat TG site
- app -1700 - ship goes to east side Union Island, app. 7 nm from TG site, for shelter from storm conditions on coast.  
- launch is deployed with Dave S., Will E. + T. Jurkicz for recovery  
- arrive on site - sent call ping received response  
- sent release Code 02 received positive response but mooring does not surface  
- " " " " 3 more times all positive
- 1720 - sighted on surface and recovered onto launch except for 5528B which was towed back.

## DAILY LOG

## OCEAN PHYSICS

INSTITUTE OF OCEAN SCIENCES

| YEAR      |            | MONTH     |            |           |                    | SHIP      |            |               |                  | CRUISE                 |                 |              |      | PAGE                                            |  | OF |  |
|-----------|------------|-----------|------------|-----------|--------------------|-----------|------------|---------------|------------------|------------------------|-----------------|--------------|------|-------------------------------------------------|--|----|--|
| A97       |            | 09        |            |           |                    | TULLY     |            |               |                  | 9742                   |                 |              |      |                                                 |  |    |  |
| DAY (UTC) | STATION ID | CAST TYPE | TIME (UTC) | TIME CODE | STD/HYDRO CONSEC # | LATITUDE  | LONGITUDE  | POSITION CODE | BOTTOM DEPTH (m) | MAX SAMPLING DEPTH (m) | CONSEC SAMPLE # | # OF BOTTLES | INIT | COMMENTS                                        |  |    |  |
| 25        | LG04       | RCS       | 08:33      | BO        | 12                 | 49 11.03  | 126 49.48  |               |                  |                        | 28-36           | 9            |      |                                                 |  |    |  |
| 25        | LG04       | RCS       | 8:47       | EN        | 12                 | 49 10.854 | 126 49.409 | ✓✓            |                  |                        |                 |              |      |                                                 |  |    |  |
| 25        | LG03       | CTD       | 9:41       | BE        | 13                 | 49 15.02  | 126 43.68  | ✓             | 122              |                        |                 |              |      |                                                 |  |    |  |
| 25        | LG03       | CTD       | 9:44       | BO        | 14                 | 49 15.00  | 126 43.68  | ✓             |                  |                        |                 |              |      |                                                 |  |    |  |
| 25        | LG03       | CTD       | 9:46       | EN        | 14                 | 49 15.00  | 126 43.76  |               |                  |                        |                 |              |      |                                                 |  |    |  |
| 25        | LG02       | CTD       | 10:34      | BE        | 15                 | 49 18.71  | 126 38.11  | ✓             | 98               |                        |                 |              |      |                                                 |  |    |  |
| 25        | LG02       | CTD       | 10:36      | BO        | 16                 | 49 18.65  | 126 38.01  | ✓             |                  |                        |                 |              |      |                                                 |  |    |  |
| 25        | LG02       | CTD       | 10:39      | EN        | 16                 | 49 18.71  | 126 37.97  |               |                  |                        |                 |              |      |                                                 |  |    |  |
| 25        | LG01/R05   |           | 11:17      | BE        | 17                 | 49 20.44  | 126 35.09  | ✓             | 53               |                        |                 |              |      |                                                 |  |    |  |
| 25        | LG01       | R05       | 11:20      | Bo        | 18                 | 49 20.42  | 126 35.05  | ✓✓            |                  |                        | 37-41           | 5            |      | Deep sea @ 1123<br>CO <sub>2</sub> , Phyto, Chl |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |
|           |            |           |            |           |                    |           |            |               |                  |                        |                 |              |      |                                                 |  |    |  |

|             |       |             |       |          |       |                |
|-------------|-------|-------------|-------|----------|-------|----------------|
| CAST TYPE - | BOT - | bottle cast | ROS - | rosette  | USW - | sea water loop |
|             | CTD - | ctd         | NET - | net haul |       |                |
|             | MOR - | mooring     | DRF - | drifter  |       |                |

|             |      |                        |
|-------------|------|------------------------|
| TIME CODE - | BE - | beginning time of cast |
|             | BO - | bottom time of cast    |
|             | EN-  | end of cast            |

|    |                   |
|----|-------------------|
| DE | deployment time   |
| MR | messenger release |
| RE | recover mooring   |

|                 |       |        |
|-----------------|-------|--------|
| POSITION CODE - | RAD - | RADAR  |
|                 | GPS - | GLOBAL |
|                 | LOB - | LOBAN  |

Date Time PDT

Sep 25 1800

- arrive back at ship to prep for redeployment
- a new site was chosen previously, being the flat bottom on east side + north side of Rugged Pt.
- greeted by Captain that RCC has ordered a SAR - sail boat in distress, dismasted, injured people without food or fuel and conditions are storm warning for north island coast. The endangered vessel is 50 nm off Brooke's Penn.
- the sailboat has not issued a May Day but RCC wants a rescue and Tully has to proceed to area. Captain will call for alternate vessels if possible.
- scientific work suspended. - Kyugot TG not redeployed at this time.

Sep 26 0800

- standing by the "Nutshell"
- Tully arrived at 0100 at "Nutshell" and took occupants Barry and Tony on board. Barry is an older man 50-60, Tony is younger woman in her 30-40's and 7 months pregnant. During the dismasting Barry suffered a broken collar bone and thumb and several cracked ribs. They were nearly out of food and suffered from saltwater sores and exhaustion. → 23

- Tully standing by in full gale conditions waiting to take the Nutshell under tow. At present conditions are unsafe for boarding.

1300

- securing tow line begins. Warren sprained his ankle during operations.

1405

- towing commences to Winter Harbour app. 65 nm away ETA 0600 Sep 27.

- the Tana was to come from south island to take over tow. I decided to have Tully complete tow and to deploy the Kyugot TG in Quatsino Sound instead, then continue to work BP mooring + CTD line. This way the Tana is free to participate in the pending Nitrat fishery opening and increase chances of Tully being left free to continue science program.

Date Time (PDT)

Sep 27 0700 - arrive in Quatsino Sound to drop off Barry, Tony and the Nutshell in Winter Harbour.  
- setting up tide gauge mooring for deployment. Quatsino TG-B.

0930 - Nutshell departs.

0945 - anchor weighed. heading for TG site.

1020 - deployed Quatsino TG-B in 21.5 m water at  $50^{\circ}29.448'$ ,  $128^{\circ}02.560'$   
at the near peak high tide tide = 2.75 m

1030 - heading out Quatsino sound for BPI mooring recovery + redeployment.

1350 - arrive at station BI-Y

- 246, 233

- moved closer.

- range 151

1355 - range 204, 269, 248 - lost contact.

- moving closer.

- ranges 360 - 350 - lost contact.

- moving back to north west of mooring to drift toward mooring.

- range 337, 329, ~~318~~ 218. closing fast sent release.

1410 - sent ABCD - received positive response.

1412 - sighted on surface

- cleanup + prepare on deck - seas + winds rising to gale force.

1602 - launched BPI-Z in 102 m water at position  $50^{\circ}03.720'$ ,  $127^{\circ}53.536'$  in marginal conditions

} ship maneuvering in marginal conditions made getting consistent ranges difficult in shallow water.

# DAILY LOG

## OCEAN PHYSICS

## INSTITUTE OF OCEAN SCIENCES

| YEAR      |            |           |            | MONTH     |                    | SHIP        |              | CRUISE        |                  | PAGE                         |                 | OF           |      |                                             |                                              |
|-----------|------------|-----------|------------|-----------|--------------------|-------------|--------------|---------------|------------------|------------------------------|-----------------|--------------|------|---------------------------------------------|----------------------------------------------|
| 1997      |            |           |            | 09        |                    | Tully       |              | 9742          |                  |                              |                 |              |      |                                             |                                              |
| DAY (UTC) | STATION ID | CAST TYPE | TIME (UTC) | TIME CODE | STD/HYDRO CONSEC # | LATITUDE    | LONGITUDE    | POSITION CODE | BOTTOM DEPTH (m) | MAX SAMPLING DEPTH (m)       | CONSEC SAMPLE # | # OF BOTTLES | INIT | NOTE: TRANSMISSION LOSS IN VERTICAL PROFILE | COMMENTS                                     |
| 27        | LBP1       | CTD       | 2344.12    |           | 19                 | 50 04.84    | 127 52.88    | ✓             | 52               | wrong CON file, use 0443 fix |                 |              |      | secondary salinity calibration wrong        | } NO TRANSMISSION LOSS                       |
| 27        | LBP1       |           | 2346.12    |           | 20                 | 50 04.88    | 127 52.91    | ✓             |                  |                              |                 |              |      | loop sal @ 2340                             |                                              |
| 28        | LBP2       | CTD       | 0012.08    |           | 21                 | 50 04.16    | 127 54.26    | ✓             | 93               |                              |                 |              |      |                                             | loop sal @ 0010                              |
| 28        | LBP2       | CTD       | 0016.02    |           | 22                 | 50 04.18    | 127 54.27    | ✓             |                  |                              |                 |              |      |                                             |                                              |
| 28        | LBP3       | CTD       | 0135.47    |           | 23                 | 50 03.14    | 127 55.48    | ✓             | 186              |                              |                 |              |      |                                             | loop sal @ 0134                              |
| 28        | LBP3       | CTD       | 0140.39    |           | 24                 | 50 03.14    | 127 55.55    | ✓             |                  |                              |                 |              |      |                                             |                                              |
| 28        | LBP4       | CTD       | 0239       |           | 25                 | 50 01.26    | 127 59.48    |               | 1050             |                              |                 |              |      | overwritten by up cast                      | transmission needs cleaning?                 |
| 28        | LBP4       | CTD       | 0238.49    |           | 25                 | 50 01.26    | 127 59.48    | ✓             |                  |                              |                 |              |      |                                             |                                              |
| 28        | LBP5       | CTD       | 0337       | BE        | 26                 | 50 00.12    | 128 00.74    | ✓             |                  |                              |                 |              |      |                                             |                                              |
| 28        | LBP5       | CTD       | 0405       | BO        | 27                 | 50 0.13 N   | 128 61.71 W  | ✓             | 1290             | 1300                         |                 |              |      | upcast has lost data                        | collected some SEA CUCUMBERS (w/ WITHIN 10m) |
| 28        | LBP5       | CTD       | 0422       | EN        | 27                 | 50 0.13 N   | 128 01.70 W  | ✓             |                  |                              |                 |              |      |                                             |                                              |
| 28        | LBP6       | CTD       | 0511       | BE        | 28                 | 49° 56.19 N | 128° 05.43 W | ✓             | 790              |                              |                 |              |      |                                             |                                              |
| 28        | LBP6       | CTD       | 0529       | BO        | 28/29              | 49° 56.20 N | 128° 5.70 W  | ✓             |                  | 795                          |                 |              |      |                                             | WITHIN 25m FROM OCEAN FLOOR                  |
| 28        | LBP6       | CTD       | 0542       | EN        | 29                 | 49° 56.13 N | 128° 05.91 W | ✓             |                  |                              |                 |              |      |                                             |                                              |
| 28        | LBP7       | CTD       | 0636       | BE        | 30                 | 49° 52.35 N | 128° 11.24 W | ✓             | 2190             |                              |                 |              |      |                                             | SECONDARY SALINITY GETTING FUZZY (NOISY)     |
| 28        | LBP7       | CTD       | 0715       | BO        | 30/31              | 49° 51.92 N | 128° 11.55 W |               |                  |                              |                 |              |      |                                             | SOME INTERMITTENCY                           |
| 28        | LBP7       | CTD       | 0746       | EN        | 31                 | 49° 51.68 N | 128° 11.96 W |               | 2130             |                              |                 |              |      |                                             | IN THE FUZZINESS, MAYBE DIRT?                |
|           |            |           |            |           |                    |             |              |               |                  |                              |                 |              |      |                                             |                                              |

CAST TYPE - BOT - bottle cast  
CTD - ctd  
MOR - mooring

ROS - rosette  
NET - net haul  
DRF - drifter

USW - sea water loop

TIME CODE - BE - beginning time of cast  
BO - bottom time of cast  
EN - end of cast

DE - deployment time  
MR - messenger release  
RE - recover mooring

POSITION CODE - RAD - RADAR  
GPS - GLOBAL  
LOR - LORAN

Date Time PDT

- Sep. 27 1610 - depart for BP Line LBP1. CTD station.  
- due to deteriorating conditions Rosette/CTD's have been changed to CTD only.

- SEP 27 2307 - WEATHER CONDITIONS IMPROVING WINDS 20KN SEA STATE 6  
DOWN FROM WINDS 40KN GUSTING 50KN SEA STATE 8. BAROMETER IS STILL  
DRIPPING, TEMPERATURE UP. COULD NOT DO CTD CAST LPB8 (THE LAST ON THE  
BROOKS PENINSULAR LINE DUE TO TIME CONSTRAINTS).

- SEP 27 2455 - INTERMITTENT NOISE ON SECONDARY SAL. CHANNEL ON LBP7 DOWNCAST. FIXED  
AFTER CONTACT WITH BOTTOM FOR UPLAST.

- Sep. 28 0800 - on station P8 for mooring deployment.  
- preparing mooring on deck

- 1358 - deployed mooring ENP8 - A in 2525m depth corrected at  
position  $48^{\circ} 48.916'$   $128^{\circ} 38.805'$  launch position recorded in lab DGPS  
( $48^{\circ} 48.921$   $128^{\circ} 38.807'$ ) recorded on bridge DGPS

- 1415  $48^{\circ} 48.425'$   $128^{\circ} 38.520'$  submerge position

- observed top component submerge completely

- completed a CTD + Bouge at P8 see log.  
- set up WASP for deployment Sep. 29. acc instructions.  
1453 - heading for LJ line offshore end.

- received  $\hat{U}$  - - -  $\hat{U}$  filling screen  
line by line. app. corresponding to sample interval  
→ could feel ping pulse app. 2 sec. interval  
- dummied up Wasp  
- zinc added to pressure case

CM.TXT

1500x32.HDR OK  
.RAW

TG366x25.RAW .105  
TG366x1.HDR

flooded.

3506f1x24.RAW bad data  
3506x24.HDR

TG80x25.RAW .105  
TG80x25.HDR

6101x28.RAW .105  
.HDR

6491x10.RAW .HDR .105

6582x4.RAW .HDR .105

731x34.RAW .105

7907x1.RAW .105

flooded.

7996f1x8.RAW  
7996x8.HDR

8831x10.RAW .105

| YEAR      |            | MONTH     |            | SHIP      |                    | CRUISE    |            | PAGE     |                  | OF                     |                 |              |      |                                             |
|-----------|------------|-----------|------------|-----------|--------------------|-----------|------------|----------|------------------|------------------------|-----------------|--------------|------|---------------------------------------------|
| 1997      |            | 09        |            | Tully     |                    | 9742      |            |          |                  |                        |                 |              |      |                                             |
| DAY (UTC) | STATION ID | CAST TYPE | TIME (UTC) | TIME CODE | STD/HYDRO CONSEC # | LATITUDE  | LONGITUDE  | POSITION | BOTTOM DEPTH (m) | MAX SAMPLING DEPTH (m) | CONSEC SAMPLE # | # OF BOTTLES | INIT | COMMENTS                                    |
| 28        | P8         | CTD       | 2133       | BE        | 32                 | 48°49.04' | 128°40.31' | ✓        | 2525             |                        |                 |              |      |                                             |
| 28        | P8         | CTD       | 2245       | EN        | 33                 | 48°49.58' | 128°41.50' | /        |                  |                        |                 |              |      | apparent CTD problem on upcast ≈ 2150m      |
| 29        | LJ09       | CTD/ROS   | 0434       | BE        | 34                 | 49°16.37' | 127°47.34' | ✓        | 2486             |                        |                 |              |      |                                             |
| 29        | LJ09       | ROS       | 0520       | BO        | 34/35              | 49°17.22' | 127°46.82' | ✓        |                  | 2490                   | 42-48           | 7            |      | salinity cal. samples                       |
| 29        | LJ09       | ROS       | 0605       | EN        | 35                 | 49°17.88' | 127°45.78' |          |                  |                        |                 |              |      |                                             |
| 29        | LJ08       | ROS       | 0644       | BE        | 36                 | 49°20.37' | 127°40.74' | ✓        | 1665             |                        |                 |              |      | 1                                           |
| 29        | LJ08       | ROS       | 0714       | BO        | 36/37              | 49°20.84' | 127°40.33' | ✓        | 1588             |                        | 47-69           | 21           |      | O <sub>2</sub> ,                            |
| 29        | LJ08       | ROS       | 0735       | EN        | 37                 |           |            | ✓        |                  |                        |                 |              |      |                                             |
|           |            | Loop      |            |           |                    |           |            |          |                  |                        | 70              | 1            |      |                                             |
| 29        | P4         | CTD       | 2025       | BE        | 38                 | 48°38.96' | 126°39.96' | ✓        | 1298             |                        |                 |              |      | downcast                                    |
| 29        | P4         | ROS       | 2108       | EN        | 39                 | 48°39.09' | 126°39.40' | ✓✓       |                  |                        | 71-73           | 3            |      | sal. cal.                                   |
| 30        | LC12       | CTD       | 0048       | BE        | 40                 | 48°15.04' | 126°39.93' | ✓        | 2524             |                        |                 |              |      | loop sal @ 0049                             |
| 30        | LC12       | ROS       | 0138       | BO        | 41                 | 48°15.24' | 126°40.60' | ✓/       |                  |                        | 74-81           | 8            |      | sal cal                                     |
| 30        | LC11       | CTD       | 0428       | BE        | 42                 | 48°18.92' | 126°26.88' | ✓        | 1460             |                        |                 |              |      | TOP ~ 10m SAL BAD                           |
| 30        | LC11       | ROS       | 0455       | BO        | 43                 | 48°18.86' | 126°26.82' | ✓✓       |                  |                        | 82-101          | 20           |      | CUZ PUMPS WEREN'T ON                        |
| 30        | LC11       | LOOP      | 0442       |           |                    | 48°18.90' | 126°26.91' |          |                  |                        | 102             | 1            |      | DOESN'T MATTER THOUGH                       |
| 30        | LC11       |           | 0533       | EN        | 43                 | 48°18.87' | 126°26.67' |          |                  |                        |                 |              |      | CUZ THE WATER COLUMN IS COMPLETELY MIXED TO |

DATE

TIME (PDT)

SEPT 29

2130

- Arrive on offshore end of line J (LP09)

Sept 30

0130

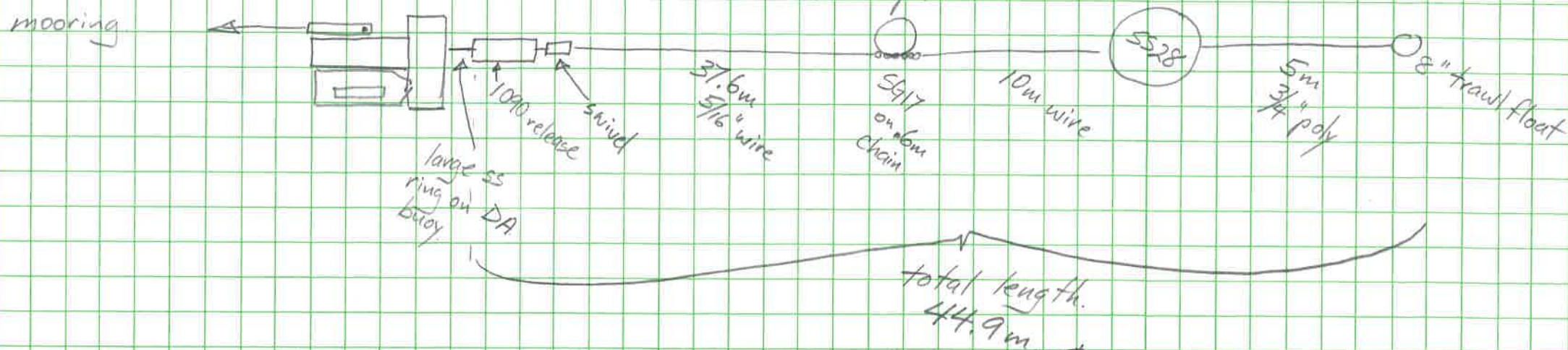
- broke off at L508 to arrive at P4 at 0200 HRS.

Sep. 29

0800

- on station P4 for deployment of ENP4 mooring  
- selected site app  $\frac{1}{2}$  nm south east of P4 where 1310 m depth was found

(PDT) 1159 - deployed mooring ENP4-A in (1312 m water depth + 2m for ram) <sup>corrected</sup> = 1314 m  
at position:  $48^{\circ} 39.397'$   $126^{\circ} 39.078'$  DGPS repeater in lab.  
- depths were ranging from 1312 - 1314 with swell  
- mooring deployed with additional floats on top and acoustic release to retard its fall rate + indicate its final depth.



- the release used for the upper package was #462 ADFH rel. code 9 kHz
- during deployment the release seemed to stay clear of the WASP transducer.
- the mooring was under moderate tension during the entire deployment to avoid tangles or any chance of the release at the top hitting the WASP transducer.

Date Time PDT

Sep. 29

- ENP4-A deployment continues
- Positions bridge DGPS

|           |             |              |
|-----------|-------------|--------------|
| launch    | 48° 39.397' | 126° 39.078' |
| submerged | 48° 39.657' | 126° 39.552' |
| floating  | 48° 39.352' | 126° 39.350' |

- all three top buoys SG17, SS28, 8" float disappeared at submerged position.
- within 30 sec - 60 sec the trawl float and SS28 were on the surface again.
- we stood by mooring for app. 30 min (lunch) before releasing top package.
- when we released top package the SG17 was also on the surface and submerging and surfacing with each wave.

- conditions were 1-2 m swell and app. 1/2 m. seas on top - no white caps - wind at 10-15 knots.

- could not range on Seastar because AUV was not working. - Seastar was tested using start up procedure.

1245

- top package was released and recovered without any problems.
- depth sounding beside mooring was 1308 - 1311 corrected depth for SOS + draft + rain depth
- we proceed to P4 To complete CTD + Bongo.

1500

- proceed to LC12

## DAILY LOG

## OCEAN PHYSICS

## INSTITUTE OF OCEAN SCIENCES

| YEAR      |            | MONTH     |            | SHIP          |                    | CRUISE    |            | PAGE          |                  | OF                     |                 |              |      |                                                                                           |
|-----------|------------|-----------|------------|---------------|--------------------|-----------|------------|---------------|------------------|------------------------|-----------------|--------------|------|-------------------------------------------------------------------------------------------|
| 1997      |            | 09/10     |            | JOHN P. TULLY |                    | 9742      |            |               |                  |                        |                 |              |      |                                                                                           |
| DAY (UTC) | STATION ID | CAST TYPE | TIME (UTC) | TIME CODE     | STD/HYDRO CONSEC # | LATITUDE  | LONGITUDE  | POSITION CODE | BOTTOM DEPTH (m) | MAX SAMPLING DEPTH (m) | CONSEC SAMPLE # | # OF BOTTLES | INIT | COMMENTS                                                                                  |
| 30        | LC10       | CTD       | 0642       | BE            | 44                 | 48°22.45' | 126°19.91  | ✓             | 1239             |                        |                 | 0            |      |                                                                                           |
| 30        | LC10       | CTD       | 0706       | BO            | 44/45              | 48 22.48  | 126 19.97  |               |                  |                        |                 |              |      |                                                                                           |
| 30        | LC10       | CTD       | 0730       | EN            | 45                 | 48 22.23  | 126 19.90  |               |                  |                        |                 |              |      |                                                                                           |
| 30        | LC09       | ROS       | 08:29      | BE            | 46                 | 48 25.77  | 126 13.72  | ✓             | 610              |                        |                 |              |      |                                                                                           |
| 30        | LC09       | ROS       | 08:41      | BO            | 47                 | 48 25.63  | 126 13.76  | ✓✓            |                  |                        | 103-118         | 16           |      |                                                                                           |
| 30        | LC09       | ROS       | 08:58      | EN            | 47                 | 48 25.56  | 126 13.96  |               |                  |                        |                 |              |      |                                                                                           |
| 30        | LC08       | ROS       | 10:35      | BE            | 48                 | 48 29.37  | 126 07.12  | ✓             | 200              |                        |                 |              |      | loop sal                                                                                  |
| 30        | LC08       | ROS       | 10:42      | BO            | 48/49              | 48 29.31  | 126 07.15  | ✓✓            |                  |                        | 119-129         | 11           |      |                                                                                           |
| 30        | LC08       | ROS       | 10:50      | EN            | 49                 | 48 29.28  | 126 07.22  |               |                  |                        |                 |              |      |                                                                                           |
| 01        | LC07       | ROS       | 0422       | BE            | 50                 | 48 32.89  | 126 00.58  |               | 128              |                        |                 |              |      | loop sal.                                                                                 |
| 1         | LC07       | ROS       | 0427       | BO            |                    |           |            |               |                  |                        | 130-137         | 8            |      | SMALL BOO-BOD RESULTED IN ONLY ONE FILE FOR UPAND DOWNCAST AT STN. LC07 → 9742.00 50. DAT |
| 1         | LC07       | ROS       | 0436       | EN            | 50                 | 48°32.88' | 126°00.47' | ✓✓            |                  |                        |                 |              |      |                                                                                           |
| 1         | LC06       | CTD       | 0527       | BE            | 51                 | 48 36.37  | 125 54.05  | ✓             | 85               |                        |                 |              |      |                                                                                           |
| 1         | LC06       | CTD       | 0530       | BO            | 52                 | 48°36.47  | 125°54.04' | ✓             |                  |                        |                 |              |      |                                                                                           |
| 1         | LC06       | CTD       | 0533       | EN            | 52                 | 48°36.46' | 125°54.05' |               |                  |                        |                 |              |      |                                                                                           |
| 1         | LC05       | CTD       | 0642       | BE            | 53                 | 48°39.91' | 125°47.46' | ✓             | 65               | 63                     |                 |              |      |                                                                                           |
| 1         | LC05       | CTD       | 0640       | EN            | 54                 | 48°39.93' | 125°47.57' | ✓             |                  |                        |                 |              |      | BIZZY WIRE UPGAST BIG GLITCH OF BOTH SAL.                                                 |
| 1         | LC04       | ROS       | 0758       | BE            | 55                 | 48°43.55' | 125 40.88' | ✓             |                  |                        |                 |              |      | AND TEMPI                                                                                 |

CAST TYPE - BOT - bottle cast ROS - rosette USW - sea water loop

TIME CODE BE

CAST TYPE -

BOT -  
CTD -  
MOR -bottle cast  
ctd  
mooringROS -  
NET -  
DRF -rosette  
net haul  
drifter

USW -

sea water loop

TIME CODE -

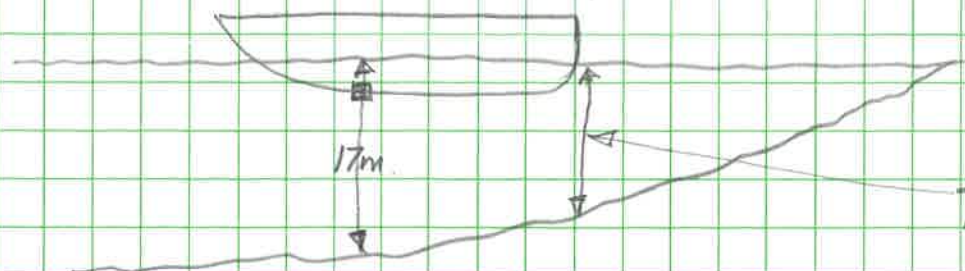
BE -  
BO -  
EN -beginning time of cast  
bottom time of cast  
end of castDE -  
MR -  
RE -deployment time  
messenger release  
recover mooring

POSITION CODE -

RAD -  
GPS -  
LOR -RADAR  
GLOBAL  
LORAN

Date Time(PDT)

- Sep. 30 0815 - entering Barkley Sound. to recover Effingham Island TG-A.
- 0845 - launch recovery in progress of tide gauge mooring.
- 0900 - at tide gauge site - set up command units.
- 0910 - located mooring and sent release Code 05 - received positive response.
- 0915 - mooring sighted on surface
- 0915 - instruments recovered buoy towed back to ship.
- 0915 - equipment overgrown with juvenile barnacles.
- cleanup + service equipment head for new location .6 nm east of Robber's Passage. Tszartus Is. Tszartus TG-B
- 1055 - deployed tide gauge in 17m water almost at high tide.  
at  $48^{\circ}53.771'$   $125^{\circ}05.835'$  near Robber's Passage  
NB 17m showed on sounder + 2m for ram depth = 19m including draft of 4.5m  
at transducer but mooring was deployed in shallower water under stern of ship



draft  
correction in.  
+2m for ram depth  
= 19m  
near high tide.

TG depth is not known accurately but  
is less than 19m at the  
transducer location.

Date Time (PDT)

- Sep. 30 1730 - on station AI-Y for recovery.  
- range 466, ~~446~~, ~~447~~, 465, 475, 477. - on top of mooring moving off  
- moved  
- range 528, 530  
1738 - sent BEGH - received positive response.  
1741 - sighted on surface  
- instruments recovered in good condition - light winds, 2 m swell not seas.  
- cleanup and service mooring.

2009 - deployed AI-Z in  $48^{\circ}31.923'$   $126^{\circ}12.363'$   
in 521.25 m - why the overshoot in depth?

## DAILY LOG

## OCEAN PHYSICS

## INSTITUTE OF OCEAN SCIENCES

| YEAR         |               |              | MONTH         |              |                       | SHIP       |             |                          | CRUISE              |                           |                    |                 |      | PAGE                             |  | OF |  |
|--------------|---------------|--------------|---------------|--------------|-----------------------|------------|-------------|--------------------------|---------------------|---------------------------|--------------------|-----------------|------|----------------------------------|--|----|--|
| 1997         |               |              | OCTOBER       |              |                       | TULLY      |             |                          | 9742                |                           |                    |                 |      |                                  |  |    |  |
| DAY<br>(UTC) | STATION<br>ID | CAST<br>TYPE | TIME<br>(UTC) | TIME<br>CODE | STD/HYDRO<br>CONSEC # | LATITUDE   | LONGITUDE   | POSITION<br>CODE<br>CONV | BOTTOM<br>DEPTH (m) | MAX SAMPLING<br>DEPTH (m) | CONSEC<br>SAMPLE # | # OF<br>BOTTLES | INIT | COMMENTS                         |  |    |  |
| 1            | LC04          | ROS          | 8:02          | BO           | 56                    | 48 43.59   | 125 40.85   | ✓                        |                     |                           |                    | 10              |      | loop sal,<br>* lost hook holding |  |    |  |
| 1            | LC04          | ROS          | 8:10          | EN           | 56                    | 48 43.72   | 125 40.92   |                          |                     |                           |                    |                 |      | weights.                         |  |    |  |
| 1            | LC04          | ROS          | 8:41          | BE           | 57                    | 48 44.21   | 125 40.88   | ✓                        | 170                 |                           |                    |                 |      | + Repeated cast,                 |  |    |  |
| 1            | LC04          | ROS          | 8:44          | BO           | 58                    | 48 44.23   | 125 40.89   | ✓✓                       |                     |                           | 138-147            | 10              |      | spigots left open.               |  |    |  |
| 1            | LC04          | ROS          | 8:52          | EN           | 58                    | 48 44.34   | 125 40.94   |                          |                     |                           |                    |                 |      |                                  |  |    |  |
| 1            | LC03          | CTD          | 9:43          | BE           | 59                    | 48 46.95   | 125 34.36   | ✓                        | 130                 |                           |                    |                 |      | broke off to be                  |  |    |  |
| 1            | LC03          | CTD          | 9:46          | BO           | 60                    | 48 47.01   | 125 34.35   | ✓                        |                     |                           |                    |                 |      | at BC03 at 07:00                 |  |    |  |
| 1            | LC03          | CTD          | 9:48          | EN           | 60                    | 48 47.05   | 125 34.38   |                          |                     |                           |                    |                 |      |                                  |  |    |  |
| 2            | BC03A         | CTD          | 22:50         | BE           | 61                    | 48° 21.31' | 125° 56.72' | ✓                        |                     |                           |                    |                 |      | loop sal @ 22:52                 |  |    |  |
| 2            | BC03A         | CTD          | 2307          | BO           | 62                    | 48° 21.53' | 125° 57.04' | ✓                        | 705                 |                           |                    |                 |      | surface @ 2321                   |  |    |  |
| 2            | BC2A          | CTD          | 2338          | BE           | 63                    | 48° 22.21  | 125° 58.64' | ✓                        | 571-532             |                           |                    |                 |      | loop sal @ 2340                  |  |    |  |
| 2            | BC2A          | CTD          | 2348          | BO           | 64                    | 48° 22.39' | 125° 58.74' | ✓                        |                     |                           |                    |                 |      | surface @ 2358                   |  |    |  |
| 3            | BC01A-2       | CTD          | 0045          | BE           | 65                    | 48° 23.91' | 125° 54.87' | ✓                        | 379                 |                           |                    |                 |      | loop sal @ 0047                  |  |    |  |
| 3            | BC01A-2       | CTD          | 0054          | BO           | 66                    | 48° 24.12' | 125° 54.55' | ✓                        |                     |                           |                    |                 |      | surface @ 0102                   |  |    |  |
| 3            | BC-WASP       | CTD          | 0129          | BE           | 67                    | 48° 24.91' | 125° 56.82' | ✓                        | 265-200             |                           |                    |                 |      | loop sal @ 0130                  |  |    |  |
| 3            | BC-WASP       | CTD          | 0133          | BO           | 68                    | 48° 25.02' | 125° 56.99' | ✓                        |                     |                           |                    |                 |      | surface @ 0137                   |  |    |  |
| 3            | CRD8          | CTD          | 1644          | BE           | 69                    | 48° 23.58' | 123° 21.28' | ✓                        | 70                  |                           |                    |                 |      |                                  |  |    |  |
| 3            | CRD8          | CTD          | 1646          | BO           | 70                    | 48° 23.50  | 123° 21.28' | ✓                        |                     |                           |                    |                 |      |                                  |  |    |  |

CAST TYPE -

BOT -  
CTD -  
MOR -bottle cast  
ctd  
mooringROS -  
NET -  
DRF -rosette  
net haul  
drifter

USW - sea water loop

TIME CODE -

BE -  
BO -  
EN -beginning time of cast  
bottom time of cast  
end of castDE -  
MR -  
RE -deployment time  
messenger release  
recover mooring

POSITION CODE -

RAD -  
GPS -  
LOR -RADAR  
GLOBAL  
LORAN

GOS rev. 2.03 10/29/92

Date Time (PDT)

Oct. 1 0735

- on station BC03-A for recovery.  $1\frac{1}{2}$  cables away drifting off fast
- full gale conditions - seas building 2-3 meter swells, breaking with spin drifts
- winds steady 40 gusting higher.
- very marginal. Beaufort high 8 low 9

0850

- could not communicate with mooring. - moving closer. - no contact - moved to BC02
- ranging again - no contact - no contact from any moorings in area.
- conferred with captain + office + have-to. for passing of system.
- expecting a 960-970 low we are at 980-970 already
- tomorrow should be workable
- have-to all day + night Oct. 1 - unworkable conditions.

Oct. 2 0755

- on station BC03-A for recovery  $1\frac{1}{2}$  cable away - too noisy - no contact
- moving closer and then de-clutching
- 1 cable to north drifting down - no ranges.
- wind had dropped to 20-25 kts but seas were still up 2-3 m swell slightly better than marginal.
- listening with pinger receiver - heard both pingers 1 strong 1 faint.
- using dunking transducer - no ranges
- decide not to release until other moorings are out of water
- move to BC02

0840

- at BC02 - A

- 586, 582 app. 200m distant

0843

- sent ABEF got positive response

0845

- on surface.

0930

- all on board + cleaned heading for BC01-A-2

Date Time (PDT)

Oct. 2 0955 - on station BCOI-A-2  
- range 660, 635 while approaching station.

1000 - stopped app. 1 cable from site.  
- range 488 m, 487 m = 260 ~~to~~ distance

1001 - sent ABEH. received positive response.  
- range 369 } = rising  
344 }  
334 }  
324 }

1002 - range 118 sited on surface.

1030 - recovered + cleaned up heading for BCWASP-A.

1050 - on station BCWASP-A  
- range 326, 318 m distance = 220 m

1053 - sent BCEH - received positive response  
- range 297 }  
220 } rising.  
199 }  
186 }

1056 - on surface 141 m. - VHF transmitter gave signal + DF on surfacing.  
- recovered bottom package first to avoid damage to WASP  
- VHF worked, Argos worked, XF light worked.  
- mooring recovered, cleaned and operations were stopped for lunch.  
- high pressure ridge continues to build winds still 20-25 kts creating white cap seas on top of low swell. 2-3 m. - generally improving conditions.

Date Time PDT

- Oct. 2 1242 - on station BC03-A for recovery - better acoustic conditions with reduced seas + winds
- 1247 - still no ranges (but pingers indicate mooring is on location <sup>approximately</sup>) app 1/2 cable from mooring position. - still no contact.
- moving directly on station and declutching.
- ranging and sending CDFG without result.
- on station declutched no contact
- using clunking transducer 452 621 - not repeated, received other inconsistent ranges.
- reengaged clutch moved off 1 cable.
- 1257 - sent ADEF - no response
- sent CDFG
- sent ADEF - no response.
- 1300 - sighted on surface (app. 200m) Lucky!
- 1330 - all on deck prepare new mooring for deployment
- checked release from this mooring in the lab and it transponded?
- 1526 - launched mooring BC03-B in 555m water corrected (including 2m for ram depth) at position  $48^{\circ} 21.113'$   $125^{\circ} 56.120'$ .
- completed CTD's at each BC mooring site
- 1830 - heading in for Victoria to deal with CRD moorings. ETA 0700-0730 Oct. 3

## Date Time (PDT)

- Oct. 3
- 0807 - on station CRD5A - sent XPND - no response  
- sent CDF  
- range 237, 249, 254
- 0811 - sent ABCE  
- sighted off port quarter  
- recovered top first heavy growth on all components  
- lower RCM4 missing rotor
- 0835 - On Deck
- 0850 - On station CRD5 - sent XPND - no response  
- sent BDH  
- range 233 239 241 243
- 0854 - Sent BDCH - received positive response
- 0911 - On deck - top rotor fouled - bottom rotor still apparently free to turn & unfouled  
- cleaned both moorings and completed CRD 1-8 CTD stations
- 1155 - leave for I.O.S. to pick up Mary, Melanie + Joe ETA 1530.  
- contacted new science crew - people are ready + equipment is ready  
- turn around estimated at 1 hour.
- 1600 - arrive I.O.S. for crew change  
- steering problems returned - delayed our arrival from an ETA of 1500 app.  
- examining the cause for the steering problems will probably delay our departure.

## DAILY LOG

## OCEAN PHYSICS

## INSTITUTE OF OCEAN SCIENCES

| YEAR                                                                                                                                                                                                                                                                                                                                                                       |            |           | MONTH      |           |                    | SHIP                   |        |           | CRUISE |               |                  | PAGE                   |                 | OF           |      |                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|------------|-----------|--------------------|------------------------|--------|-----------|--------|---------------|------------------|------------------------|-----------------|--------------|------|-------------------------|
| 1997                                                                                                                                                                                                                                                                                                                                                                       |            |           | 10         |           |                    | John P. Tully          |        |           | 9742   |               |                  |                        |                 |              |      |                         |
| DAY (UTC)                                                                                                                                                                                                                                                                                                                                                                  | STATION ID | CAST TYPE | TIME (UTC) | TIME CODE | STD/HYDRO CONSEC # | LATITUDE               |        | LONGITUDE |        | POSITION CODE | BOTTOM DEPTH (m) | MAX SAMPLING DEPTH (m) | CONSEC SAMPLE # | # OF BOTTLES | INIT | COMMENTS                |
| 3                                                                                                                                                                                                                                                                                                                                                                          | CRD7       | CTD       | 1701       | BE        | 71                 | 48°                    | 23.87' | 123       | 21.02' | ✓             | 40               |                        |                 |              |      |                         |
| 3                                                                                                                                                                                                                                                                                                                                                                          | CRD7       | CTD       | 1701       | BO        | 72                 | 48°                    | 23.88' | 123       | 21.02' | ✓             |                  |                        |                 |              |      |                         |
| 3                                                                                                                                                                                                                                                                                                                                                                          | CRD5       | CTD       | 1709       | BE        | 73                 | 48°                    | 23.76' | 123       | 21.01' | ✓             | 58               |                        |                 |              |      | down + up cast together |
| 3                                                                                                                                                                                                                                                                                                                                                                          | CRD6       | CTD       | 1732       | BE        | 74                 | 48°                    | 23.57' | 123       | 20.75' | ✓             | 78               |                        |                 |              |      | "                       |
| 3                                                                                                                                                                                                                                                                                                                                                                          | CRD4       | CTD       | 1806       | BE        | 75                 | 48°                    | 24.19' | 123       | 24.94' | ✓             | 55               |                        |                 |              |      | "                       |
| 3                                                                                                                                                                                                                                                                                                                                                                          | CRD1       | CTD       | 1823       | BE        | 76                 | 48°                    | 23.90' | 123       | 24.24' | ✓             | 57               |                        |                 |              |      | "                       |
| 3                                                                                                                                                                                                                                                                                                                                                                          | CRD3       | CTD       | 1834       | BE        | 77                 | 48°                    | 23.45' | 123       | 24.27' | ✓             | 63               |                        |                 |              |      | "                       |
| 3                                                                                                                                                                                                                                                                                                                                                                          | CRD2       | CTD       | 1849       | BE        | 78                 | 48°                    | 24.05' | 123°      | 23.52' |               | 62               |                        |                 |              |      | "                       |
|                                                                                                                                                                                                                                                                                                                                                                            |            |           |            |           |                    |                        |        |           |        |               |                  |                        |                 |              |      |                         |
|                                                                                                                                                                                                                                                                                                                                                                            |            |           |            |           |                    | Georgia Strait Project |        |           |        |               |                  |                        |                 |              |      |                         |
| 4                                                                                                                                                                                                                                                                                                                                                                          | DTA        | ROS       | 343        | BE        | 79                 | 48                     | 43.94  | 123       | 08.77  |               | 182              |                        |                 |              |      |                         |
| 4                                                                                                                                                                                                                                                                                                                                                                          | "          | ROS       | 348        | BO        | 79/80              | 48                     | 43.88  | 123       | 08.88  |               |                  |                        |                 |              |      |                         |
| 4                                                                                                                                                                                                                                                                                                                                                                          | "          | ROS       | 356        | EN        | 80                 | 48                     | 43.09  | 123       | 09.23  |               |                  |                        | 148-157         | 10           |      | up                      |
| 4                                                                                                                                                                                                                                                                                                                                                                          | MIO3       | ROS       | 616        | BE        | 81                 | 48                     | 55.03  | 123       | 10.86  |               | 127              |                        |                 |              |      |                         |
| 4                                                                                                                                                                                                                                                                                                                                                                          | MIO3       | ROS       | 620        | BO        | 81/82              | 48                     | 55.02  | 123       | 10.79  |               |                  |                        |                 |              |      |                         |
| 4                                                                                                                                                                                                                                                                                                                                                                          | MIO3       | ROS       | 626        | EN        | 82                 | 48                     | 55.03  | 123       | 10.73  |               |                  |                        | 158-165         | 8            |      | up                      |
| 4                                                                                                                                                                                                                                                                                                                                                                          | EIO2       | ROS       | 821        | BE        | 83                 | 49                     | 02.58  | 123       | 23.49  |               |                  |                        |                 |              |      |                         |
| 4                                                                                                                                                                                                                                                                                                                                                                          | EIO2       | ROS       | 827        | BO        | 83/84              | 49                     | 02.47  | 123       | 23.68  |               |                  |                        |                 |              |      |                         |
| CAST TYPE - BOT - bottle cast<br>CTD - ctd<br>MOR - mooring<br>ROS - rosette<br>NET - net haul<br>DRF - drifter<br>USW - sea water loop<br>TIME CODE - BE - beginning time of cast<br>BO - bottom time of cast<br>EN - end of cast<br>DE - deployment time<br>MR - messenger release<br>RE - recover mooring<br>POSITION CODE - RAD - RADAR<br>GPS - GLOBAL<br>LOR - LORAN |            |           |            |           |                    |                        |        |           |        |               |                  |                        |                 |              |      |                         |

Date Time (PDT)

- Oct 3 1805 - depart I.O.S. with Mary Melanic and Joe on board  
- Leslie Z, Steve B, Will E, Jane E, Bernard M and Doug M. left ship.
- 1950 - en route to GSCM1 for recovery, I decided it is too dark! We do DTA CTD/Rosette instead and collect filter water for the sediment traps.
- Oct. 4 0745 - on station GSCM4-E for recovery, service + redeployment.  
- sent XPND - no response  
- sent ABF to enable - range 478 m, 491 = distance 277 m.
- 0750 → - sent AFGH - got positive response.  
- range 368 m - mooring rising  
- sighted on surface
- 0820 - on surface - cleaning up and service on site.
- 1116 - deployed GSCM4-F in 406 m on sounder + 2 for ram depth = 408 m  
at position  $49^{\circ}15.986'$   $123^{\circ}46.635'$
- 1135 - depart for GSCM3-E for recovery, service and redeployment.
- 1310 - on station GSCM3-E  
- sent XPND - no range response  
- sent CDF - range 519, 406, 403 distance = 200 m.
- 1315 - sent ACDF - positive response.
- 1318 - sighted on surface.

Date   Time (PDT)

Oct. 4   1641   - deployed GSCM3-F in 348 m water (346 + 2 m, ram depth correction) at position  $49^{\circ} 06.980$ ,  $123^{\circ} 29.561'$

1650   - proceed to VIO3 for CTD/Rosette and then completion of NI + VI lines  
- we are running out of time / drop NIO1 and NIO1 in order to have both NI and VI lines completed, for the largest part.

## DAILY LOG

## OCEAN PHYSICS

## INSTITUTE OF OCEAN SCIENCES

| YEAR<br>1997 |               |              | MONTH<br>OCTOBER |              |                       | SHIP<br>TULLY |             |                  | CRUISE<br>9742      |                           |                    |                 |      | PAGE     | OF |
|--------------|---------------|--------------|------------------|--------------|-----------------------|---------------|-------------|------------------|---------------------|---------------------------|--------------------|-----------------|------|----------|----|
| DAY<br>(UTC) | STATION<br>ID | CAST<br>TYPE | TIME<br>(UTC)    | TIME<br>CODE | STD/HYDRO<br>CONSEC # | LATITUDE      | LONGITUDE   | POSITION<br>CODE | BOTTOM<br>DEPTH (m) | MAX SAMPLING<br>DEPTH (m) | CONSEC<br>SAMPLE # | # OF<br>BOTTLES | INIT | COMMENTS |    |
| 4            | G102          | ROS          | 8:37             | EN           | 84                    | 49 02.47      | 123 23.92   |                  | 248                 |                           | 166-177            |                 |      | up       |    |
| 4            | G104          | ROS          | 10:16            | BE           | 85                    | 49 12.61      | 123 40.58   |                  |                     |                           |                    |                 |      |          |    |
| 4            | G104          | ROS          | 10:23            | BO           | 85/86                 | 49 12.62      | 123 40.57   |                  |                     |                           | 178-191            |                 |      |          |    |
| 4            | G104          | ROS          | 10:36            | EN           | 86                    | 49 12.81      | 123 40.50   |                  | 365                 |                           |                    |                 |      |          |    |
| 5            | V103          | ROS          | 0004             | BE           | 87                    | 49° 5.98'     | 123° 29.12' |                  | 346                 |                           |                    |                 |      |          |    |
| 5            | "             | "            | 0023             | EN           | 88                    | 49° 05.75'    | 123° 29.25' |                  |                     |                           | 192-205            |                 |      | up       |    |
| 5            | N106          | ROS          | 0207             | BE           | 89                    | 49 21.42      | 123 35.25   |                  | 165                 |                           |                    |                 |      |          |    |
| 5            | N106          | ROS          | 210              | BO           | 89/90                 | 49 21.43      | 123 35.36   |                  |                     |                           | 206-215            |                 |      |          |    |
| 5            | N106          | ROS          | 2117             | EN           | 90                    | 49 21.49      | 123 35.37   |                  |                     |                           |                    |                 |      |          |    |
| 5            | W105          | ROS          | 0246             | BE           | 91                    | 49 19.53      | 123 38.62   |                  | 264                 |                           |                    |                 |      |          |    |
| 5            | W105          | "            | 0252             | BO           | 91/92                 | 49 19.50      | 123 38.62   |                  |                     |                           | 216-227            |                 |      |          |    |
| 5            | N105          | "            | 03:00            | EN           | 92                    | 49 19.55      | 123 38.62   |                  |                     |                           |                    |                 |      |          |    |
| 5            | N104          | "            | 0330             | BE           | 93                    | 49 17.66      | 123 42.42   |                  | 292                 |                           |                    |                 |      |          |    |
| 5            | N104          | "            | 0338             | BO           | 93/94                 | 49 17.62      | 123 42.37   |                  |                     |                           | 228-240            | 12              |      |          |    |
| 5            | N104          | "            | 0350             | EN           | 94                    | 49° 17.60'    | 123° 42.28' |                  |                     |                           |                    |                 |      |          |    |
| 5            | N103          | ROS          | 0419             | BE           | 95                    | 49 15.97      | 123 45.89   |                  | 415                 |                           |                    |                 |      |          |    |
| 5            | N103          | "            | 0427             | BO           | 96                    | 49 16.03      | 123 45.83   |                  |                     |                           | 241-254            |                 |      |          |    |
| 5            | N103          | "            | 0438             | EN           | 96                    | 49° 16.04'    | 123° 45.67' |                  |                     |                           |                    |                 |      |          |    |

CAST TYPE - BOT - bottle cast  
CTD - ctd  
MOR - mooring

ROS - rosette  
NET - net haul  
DRF - drifter

USW - sea water loop

TIME CODE - BE - beginning time of cast  
BO - bottom time of cast  
EN - end of cast

DE - deployment time  
MR - messenger release  
RE - recover mooring

POSITION CODE - RAD - RADAR  
GPS - GLOBAL  
LOR - LORAN

## Date Time (PDT)

- Oct. 5 0800 - on station GSCM1-E for recovery  
- sent range - no range  
- sent CDF - range 134, 189, 187 = 111 m distance
- 0805 - sent BDFH - received positive response.  
- mooring on surface.  
- recovery cleanup + servicing.  
- short delay due to traffic.
- 1015 - launched GSCM1-F in 151 m depth (149 + 2 m for ram depth)  
at position  $48^{\circ} 44.495'$   $123^{\circ} 08.365'$
- 1020 - head for GSCM2-E for recovery.
- 1200 - on station GSCM2-F  
- sent XPRD - no range  
- sent CDF range 415 m, 417 m = 350 m distance
- 1202 - sent ADEH - received confirmation. on second command  
- range 512, 515, 540  
- not on surface  
- sent ADEH again - received confirmation. but mooring not rising.  
- moving closer ranges decreasing 377, 234, 231  
- directly on station 230 m range 224 m, 223 m = 98 m distance  
- 1 pinger was coming in strong - where is the other. - alternatives ① - 1 pinger has failed + mooring is intact  
② part (top) of mooring is missing

Date Time (PDT)

- Oct 5 1220 - recovery GSCM2 continued.  
- moving off station 1 cable for repeated release attempts. - if these fail - we drag!
- 1221 - range 427 m sent ADEH - received positive response  
" 445 m " " " "  
" 466 m } not rising.  
" 469 m
- setting up for drag
- 1241 - sent CDFG (Rearm)  
- sent Xpnd no response  
- sent CDF (Xpnd On)  
- Range 448  
- sent ADEH - Positive Response  
- Range 506, 509
- 1248 - Went through Rearm, Xpnd On, Release Sequence again - 540m Positive Release Response after several release tries  
1254 - Went through " " " " - 530m Positive Response after 3rd release X mist  
1256 - 526m Positive " on 2nd
- 1300 - dragging - Xpnd erratic - unsolicited replies 406m Noisy  
- Rearmed CDFG, Xpnd on CDF - ADEH Sent - Positive Response 406m
- 1st drag commences. - 2 cable  $\phi$  pattern.  
- drag consists of 10m scrap chain, 1 section giftford grapples, hook grapple at end.  
- drag array lowered to bottom - ship moves along drag pattern slowly and drag cable is paid out as ship moves.
- I am trying to contact Service Argos to see if Witness Buoy has transmitted.
- 1320 - drag pattern completed - ship steaming off on tangent
- 1330 - mooring sighted on surface. - Success! - the complete mooring is up.  
- hook still closed on drop shackle and drop line cut near bottom end, app 7m, drop line

## DAILY LOG

## OCEAN PHYSICS

## INSTITUTE OF OCEAN SCIENCES

| YEAR<br>1997 |               |              | MONTH<br>OCTOBER |              |                       | SHIP<br>JOHN P. TULLY |             |                  |                     | CRUISE<br>9742            |                    |                 |      | PAGE<br>OF                                                         |  |
|--------------|---------------|--------------|------------------|--------------|-----------------------|-----------------------|-------------|------------------|---------------------|---------------------------|--------------------|-----------------|------|--------------------------------------------------------------------|--|
| DAY<br>(UTC) | STATION<br>ID | CAST<br>TYPE | TIME<br>(UTC)    | TIME<br>CODE | STD/HYDRO<br>CONSEC # | LATITUDE              | LONGITUDE   | POSITION<br>CODE | BOTTOM<br>DEPTH (m) | MAX SAMPLING<br>DEPTH (m) | CONSEC<br>SAMPLE # | # OF<br>BOTTLES | INIT | COMMENTS                                                           |  |
| 5            | N102          | ROS          | 0506             | BE           | 97                    | 49° 14.51'            | 123° 48.61  |                  | 297                 |                           |                    |                 |      | SAMPLE 258 FROM<br>125m DOES NOT<br>EXIST; DID NOT TRIP<br>BOTTLE. |  |
| 5            | N102          | ROS          | 0512             | BO           | 97/98                 | 49 14.43              | 123 48.51   |                  |                     |                           | 255-267            |                 |      |                                                                    |  |
| 5            | N102          | ROS          | 0524             | BE           | 98                    | 49° 14.25'            | 123° 48.18' |                  |                     |                           |                    |                 |      |                                                                    |  |
| 5            | VI01          | ROS          | 0701             | BE           | 99                    | 49 02.94              | 123 35.33   |                  | 123                 |                           |                    |                 |      |                                                                    |  |
| 5            | VI01          | ROS          | 0706             | BO           | 99/100                | 49 02.94              | 123 35.23   |                  |                     |                           | 268-274            | 7               |      |                                                                    |  |
| 5            | VI01          | ROS          | 0712             | EW           | 100                   | 49° 02.91'            | 123° 35.11  |                  |                     |                           |                    |                 |      |                                                                    |  |
| 5            | VI02          | ROS          | 0741             | BE           | 101                   | 49 04.46              | 123 32.26   |                  | 245                 |                           |                    |                 |      |                                                                    |  |
| 5            | VI02          | ROS          | 0746             | BO           | 101/102               | 49 04.46              | 123 32.17   |                  |                     |                           |                    |                 |      |                                                                    |  |
| 5            | VI02          | ROS          | 0758             | EW           | 102                   | 49 04.34              | 123 31.92   |                  |                     |                           |                    |                 |      |                                                                    |  |
| 5            | VI04          | ROS          | 0905             | BE           | 103                   | 49 08.68              | 123 23.44   |                  | 185                 |                           |                    |                 |      |                                                                    |  |
| 5            | VI04          | ROS          | 0909             | BO           | 103/104               | 49 08.63              | 123 23.46   |                  |                     |                           |                    |                 |      |                                                                    |  |
| 5            | VI04          | ROS          | 0916             | EW           | 104                   | 49 08.57              | 123 23.35   |                  |                     |                           | 287-297            |                 |      |                                                                    |  |
| 5            | VI05          | ROS          | 0955             | BE           | 105                   | 49 11.42              | 123 17.95   |                  | 70                  |                           |                    |                 |      |                                                                    |  |
| 5            | VI05          | ROS          | 0956             | BO           | 105/106               | 49 11.43              | 123 17.91   |                  |                     |                           |                    |                 |      |                                                                    |  |
| 5            | VI05          | ROS          |                  | EW           | 106                   |                       |             |                  |                     |                           | 298-302            |                 |      |                                                                    |  |
| 5            | SI03          | ROS          | 2327             | BE           | 107                   | 4851.87               | 123 05.16   |                  | 158                 |                           |                    |                 |      |                                                                    |  |
| 5            | SI03          | ROS          | 2330             | BO           | 107/108               | 4851.81               | 123 05.26   |                  |                     |                           | 302-311            |                 |      |                                                                    |  |
| 5            | SI03          | ROS          | 2335             | EW           | 108                   | 4851.81               | 123 05.34   |                  |                     |                           | 311                |                 |      |                                                                    |  |

CAST TYPE -

BOT -  
CTD -  
MOR -bottle cast  
ctd  
mooringROS -  
NET -  
DRF -rosette  
net haul  
drifter

USW - sea water loop

TIME CODE -

BE -  
BO -  
EN -beginning time of cast  
bottom time of cast  
end of castDE -  
MR -  
RE -deployment time  
messenger release  
recover mooring

POSITION CODE -

RAD -  
GPS -  
LOR -RADAR  
GLOBAL  
LORAN

Date Time (PDT)

Oct. 5 1415

- drag recovered
- mooring recovered + on deck, without damage, without losses
- release hook was still closed and app. 10m of the 1" poly drop line was still attached the bottom obviously cut by our drag.

Release - 101 failed needs service!

- 206 is suspect, it did not communicate in the water.  
(from BC03-A) no ranges, no release confirmation but released + then worked on deck

- clean + service mooring on deck

1600

- deploy mooring GSCM2-F in 208m water (206 on sounder + 2m for ram)  
at position  $48^{\circ}50.808'$   $123^{\circ}07.035'$

- proceed to SI03 for CTD/Rosette

1645

- CTD completed + heading for I.O.S. - cleanup + pack up.
- off loading will be Monday morning.

# CRD Deployment

Vector Cap't Andy Quail (speaking?)

Date Time (PDT)

- Oct. 12 0815

- joined Vector at I.O.S. - loading.

T. Lukasz  
D. Anderson

0855

- sail for Clover Pt.

- preparing mooring equipment enroute.

1145

- off Clover Pt. - operations halted pending lunch.

1230

- launched CRD5 - M1

48° 23.761'

123° 20.973'

in 56 m of water. - not corrected

48° 23.757'

123° 20.980'

in 60 m. of water corrected for draft

} Bridge DGPS (NAD 83)

} Lab. DGPS (NAD 83)

- prep. 2nd mooring CRD5A - M1

1320

- launched CRD5A - M1

48° 23.402'

123° 21.000'

in 85.7 m water - not corrected

} Bridge DGPS (NAD 83)

48° 23.401'

123° 21.031'

in 88 m water corrected for draft

} Lab. DGPS (NAD 83)

1330

- head for I.O.S. pack up to offload.

1700

- arrive at I.O.S. + unload