

06

$$PDT + 7 = UTC$$

## OCEAN PHYSICS

INSTITUTE OF OCEAN SCIENCES

YEAR 1992

MONTH JUNE

TIME ZONE UTC

SHIP *Petrel Rock*

CRUISE

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[illegible]

# SAMPLE SURVEY #3

JUNE 5/92

0900

Calibrate YSI 11.4°C  $\Rightarrow$  10.91 mg/L  $O_2$

0945

Depart dock for PRH113

1010

Mayday called  $\rightarrow$  depart for assistance

1030

Distress over. (helped already)

1050

Arrive PRH 1

1105

begin (T1) downcast

1115

(T1) upcast complete.

PRH113.RAW

PRH113.REL

sounder depth: 45.0 m

# records = 167

## Hypocast summary #13

Depth (m)

°/m

2

24.748

20

2

30.545

42

3

31.168

NOTE: Attaching YSI probe to connerball on which cable works well with virtually no angle on the cable.

- Reversing thermometer.

14033

13.0

8.27

13166

13.2

8.45

13.0

8.48

13.1

8.45

## Summary YSI cast #13

Depth

°/m

Temp.

$O_2$

0

24.8

9.9

8.80

2

26.5

9.7

8.70

5

28.0

9.3

8.15

10

30.2

8.5

7.88

15

30.4

8.3

7.85

20

30.6

8.3

7.76

25

30.7

8.3

7.80

30

30.7

8.3

7.80

40

31.2

8.3

7.80

45

31.2

8.2

7.77

1145 Depart PRH1 for PRH2  
1215 Arrive PRH2

1217 Begin CTD downcast  
1221 Downcast complete  
1227 Upcast complete  
Sonde depth = 62.0 m  
# records = 215

PRH214. RAW  
PRH214. REL

### Hydrocast Summary #14

| Depth | ‰ |        |
|-------|---|--------|
| 2     | 4 | 23.386 |
| 25    | 5 | 30.429 |
| 60    | 6 | 30.775 |

1238 Begin YSI cast  
1255 YSI cast complete

### Summary YSI cast #14

| Depth | ‰    | Temp (°C) | O <sub>2</sub> (mg/L) |
|-------|------|-----------|-----------------------|
| 0     | 23.3 | 10.1      | 9.60                  |
| 2     | 23.7 | 10.0      | 9.15                  |
| 5     | 24.5 | 9.9       | 8.92                  |
| 10    | 26.9 | 9.3       | 8.40                  |
| 15    | 28.6 | 8.6       | 8.05                  |
| 20    | 30.0 | 8.4       | 7.88                  |
| 25    | 30.5 | 8.2       | 7.70                  |
| 30    | 30.6 | 8.2       | 7.68                  |
| 40    | 30.7 | 8.1       | 7.60                  |
| 50    | 30.7 | 8.1       | 7.58                  |
| 60    | 30.8 |           |                       |

1255 Depart PRH2 for dock to get fuel  
1320 Depart fuel dock for PRH3  
1335 Arrive PRH3

JUNE 5/92 (00N17)

Sounder Depth = 44.0 m

1340 Begin CTD downcast

1355 CTD upcast complete

PRH315. RAW

PRH315. REL

# records = 157

Hydrocast Summary #15

| Depth | σ <sub>θ</sub> |        |
|-------|----------------|--------|
| 2     | 7              | 23.399 |
| 20    | 8              | 29.566 |
| 43    | 9              | 30.841 |

1405 Begin YSI cast

1425 YSI cast complete

Reversing Thermometers14033

|      |      |
|------|------|
| 17.3 | 8.28 |
| 15.5 | 8.25 |

13166

|      |      |
|------|------|
| 16.3 | 8.22 |
| 14.6 | 8.20 |

Summary YSI cast #15

| Depth | σ <sub>θ</sub> | temp. | O <sub>2</sub> |
|-------|----------------|-------|----------------|
| 0     | 23.4           | 10.5  | 9.10           |
| 2     | 23.6           | 10.3  | 9.15           |
| 5     | 24.6           | 10.2  | 9.12           |
| 10    | 26.7           | 9.8   | 8.65           |
| 15    | 28.3           | 8.6   | 8.00           |
| 20    | 29.9           | 8.4   | 7.78           |
| 25    | 30.4           | 8.2   | 7.65           |
| 30    | 30.6           | 8.1   | 7.52           |
| 40    | 30.9           | 7.9   | 7.25           |
| 43.2  | 30.9           |       | -              |
| 45    |                | 7.9   | 7.20           |

1430 Depart PRH3 for PRH4

1435 Arrive PRH4



1442  
1453

Sounder depth = 50 m.

Begin (TI) downcast  
(TI) upcast complete

PRH 416. RAW  
PRH 416. REL

# records = 181

1455

Begin YSI cast

1510

YSI Cast complete

1510

Depart PRH 4 for PRH 5

### Hydrocast Summary #16

| Depth | ‰  |        |
|-------|----|--------|
| 2     | 10 | 23.883 |
| 20    | 11 | 29.426 |
| 50    | 12 | 30.907 |

### Summary YSI. cast #16

| Depth | ‰    | temp | O <sub>2</sub> | Wire Angle | true depth |
|-------|------|------|----------------|------------|------------|
| 0     | 23.8 | 10.8 | 9.20           |            |            |
| 2     | 24.3 | 10.8 | 9.35           |            |            |
| 5     | 25.0 | 10.4 | 8.95           |            |            |
| 10    | 26.0 | 9.5  | 8.45           |            |            |
| 15    | 28.1 | 8.8  | 7.95           |            |            |
| 20    | 29.1 | 8.5  | 7.65           |            |            |
| 25    | 30.0 | 8.2  | 7.62           |            |            |
| 30    | 30.3 | 8.1  | 7.60           |            |            |
| 40    | 30.7 | 8.1  | 7.45           | L = 20°    |            |
| 50    | 30.9 | 7.9  | 7.15           | L = 20°    |            |

1525

Arrive PRH 5

1525 Begin CTD downcast #17  
 1530 CTD downcast complete  
 1535 Begin upcast  
 1541 Upcast complete  
 #records = 200  
 Soander depth: 60m

PRHS17.RAW  
 PRHS17.REL

### Reversing Thermometers:

14033

10.0

8.05

12.6

8.10

13166

10.8

8.04

13.0

8.08

### Hydrocast Summary # 17

| Depth | σ <sub>θ</sub> |        |
|-------|----------------|--------|
| 2     | 13             | 24.186 |
| 20    | 14             | 30.010 |
| 60    | 15             | 31.011 |

1550 Begin YSI cast #17  
 1610 YSI cast #17 complete

### Summary YSI Cast # 17

| Depth | σ <sub>θ</sub> | Temp. | O <sub>2</sub> |
|-------|----------------|-------|----------------|
| 0     | 24.2           | 11.1  | 9.35           |
| 2     | 24.8           | 10.9  | 9.00           |
| 5     | 25.7           | 10.0  | 8.35           |
| 10    | 26.8           | 9.5   | 8.15           |
| 15    | 28.7           | 8.7   | 7.70           |
| 20    | 30.0           | 8.2   | 7.45           |
| 25    | 30.3           | 8.1   | 7.40           |
| 30    | 30.5           | 8.1   | 7.30           |
| 40    | 30.7           | 8.0   | 7.25           |
| 50    | 30.9           | 7.8   | 7.15           |
| 60    | 31.0           | -     | -              |

1610 Depart PRHS for dock  
 1625 Arrive at wharf

1645 Saturate new fresh water to see if YSI is sustaining its accuracy

H<sub>2</sub>O temp: 20°C, O<sub>2</sub>: 8.30 mg/l → Should be 9.07 mg/l  
Note: Water taken from warm black hose which may be reason why the [O<sub>2</sub>] is too low.

June 8/92

1000

Run fresh tap water & saturate with O<sub>2</sub> to check YSI stability.

13.2°C, O<sub>2</sub>: 10.5 → Should be 10.47

Note: YSI was turned off over night and still gave accurate reading (calibration dial was never adjusted.)

1515

Check YSI stability

Temp. 18°C → [O<sub>2</sub>]: 8.140 mg/l → should be 9.45 mg/l  
13°C → [O<sub>2</sub>]: 8.9 mg/l → should be 10.52

1525

Recalibrate YSI to 13°C → 10.52 mg/l

test at 18°C → [O<sub>2</sub>]: 9.45 mg/l → should be 9.45 mg/l

June 10/92

1030

Replace C-cells in YSI

1100

Recalibrate YSI at 14°C to 10.3 mg/l O<sub>2</sub>.

YSI left on (temp.) F/ 1100 until 1315

1315

YSI temp = 17°C

- stir to saturate with oxygen.

- DO reading of 9.10 mg/l → should be 9.65 mg/l

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[illegible]



JUNE 12/92

P RUPERT HBR SURVEY #4

0730 Get equipment from Lab - warehouse  
0845 Depart dock for PRH1  
0850 turn on YSI and let probe polarize  
0905 Calibrate YSI at  $13.5^{\circ}\text{C} \rightarrow 10.40 \text{ mg/l O}_2$

Arrive PRH1 - calm and cloudy  
Sounder Depth = 47.9 m

0940 Begin CTD downcast

0955 CTD upcast complete  
#Records = 164

PRH18 RAW  
PRH18. REL

NOTE: No salinity samples will be taken since no sample bottles are available.

Reversing Thermometer:

14033

13166

14.2 8.01  
14.4 8.01

14.5 8.71  
14.5 8.71

1005: Begin YSI cast #18  
1020 YSI cast complete

NOTE: YSI only to 35 m since we drifted to shallow water during cast

1020 Depart PRH1 for PRH2

# Summary YSI cast #18

| Depth | ‰    | Temp. | DO (mg/l) |
|-------|------|-------|-----------|
| 0     | 20.0 | 11.3  | 10.6      |
| 2     | 20.7 | 11.4  | 10.7      |
| 5     | 21.6 | 11.0  | 10.6      |
| 10    | 25.8 | 10.4  | 10.3      |
| 15    | 26.5 | 9.8   | 9.7       |
| 20    | 28.7 | 8.8   | 8.8       |
| 25    | 30.2 | 8.6   | 8.65      |
| 30    | 30.9 | 8.6   | 8.60      |
| 35    | -    | 8.6   | 8.50      |
| 40    | 31.2 |       | n/a       |
| 46.2  | 31.2 |       | n/a       |

1022 Check YSI calibration 14.5° → 10.2 mg/l  
 - had to slightly adjust

1038 Arrive PRH2  
 1039 Begin CTD downcast  
 1041 Downcast complete  
 1046 Begin CTD upcast (w/ Rev. Thermometer)  
 1050 upcast complete

Sounder Depth = 50.0

PRH219.PAW  
 PRH219.REL

# records = 183

1100 Begin YSI cast #19  
 1110 YSI cast #19 complete

NOTE: Drifted during YSI cast so that depth at final reading (som) the sounder depth = 75.0m

Rev. Thermometer.

14033

13166

|      |      |      |      |
|------|------|------|------|
| 12.8 | 8.59 | 13.5 | 8.57 |
| 15.2 | 8.62 | 15.6 | 8.60 |

JUNE 12, 1972 (cont.)

Summary YSI cast #19

| Depth | ‰    | Temp. | DO   | Wind angle. |
|-------|------|-------|------|-------------|
| 0     | 22.3 | 11.1  | 10.2 |             |
| 2     | 23.1 | 10.9  | 10.6 |             |
| 5     | 23.3 | 10.9  | 10.7 |             |
| 10    | 25.6 | 10.8  | 10.6 |             |
| 15    | 28.2 | 9.9   | 9.7  |             |
| 20    | 29.7 | 9.1   | 8.9  | L = 22°     |
| 25    | 30.7 | 8.4   | 8.40 |             |
| 30    | 30.8 | 8.3   | 8.30 |             |
| 40    | 30.8 | 8.3   | 8.25 | L = 25°     |
| 45    | -    | 8.2   | 8.10 |             |
| 48.4  | 30.9 |       |      |             |
| 50    | 43   | 8.2   | 8.10 | L = 30°     |

1115 Arrive deep hole (PRH 7)

Sounder depth = 90.0 m

1117 Begin CTD downcast at deep hole = PRH 7  
1125 Upcast complete

PRH 720. RAW

PRH 720. RFL

# records = 284

1125 Depart deep hole (PRH 7) for PRH 3

1135 Arrive PRH 3 Sounder Depth 47 m

Begin CTD downcast 1138 AM PRH 321.  
Downcast complete 1141 AM  
Begin retrieve 1146 AM 47.4 m D

# records = 165

1200 Begin YSI cast #21 (#20 does not exist)  
1215 YSI cast #21 complete

Note: Raining heavily

# YSI Summary Cast #21

| Depth | %O <sub>2</sub> | Temp | DO   |
|-------|-----------------|------|------|
| 0     | 23.1            | 11.7 | 11.7 |
| 2     | 22.5            | 11.6 | 11.6 |
| 5     | 23.7            | 11.5 | 11.8 |
| 10    | 25.5            | 11.0 | 10.4 |
| 15    | 28.2            | 9.2  | 9.85 |
| 20    | 28.8            | 9.0  | 8.86 |
| 25    | 29.9            | 8.5  | 8.40 |
| 30    | 30.6            | 8.3  | 8.15 |
| 40    | 30.8            | 8.3  | 8.05 |
| 45    | -               | 8.3  | 8.00 |
| 46.3  | 30.9            | -    | -    |

Rev. Thermometer F/ PRH321

14033

13166

12.8 8.59 13.2 8.57  
Thermometer was flipped → no reading

1220 Depart Pt 43 for sewage outfall off of B.C. Harbor

1240 Check YSI calibration  
Temp. 14.5°C - reads 10.1 mg/L  
- correct to 10.2 mg/L



# PRH 822

# Off BC. Packet

Arrive PRH 822 at 1242

Sounder depth = 48.0 m

1252 Begin CTD Downcast #22

1255 Downcast complete

1300 Begin upcast (w/ rev. thermometer)

1302 Upcast complete

#records = 159

PRH 822 - RAW

PRH 822 - R62

1310 Begin YSI cast #22

Sounder depth = 58.0 m

1323 YSI cast complete

Rev. Thermometer.

14033

13.2 8.57

14.3 8.60

13166

13.4 8.55

14.7 8.59

Summary YSI cast #22

| Depth | Sal  | Temp. (°C) | DO (mg/l) |
|-------|------|------------|-----------|
| 0     | 22.9 | 11.4       | 11.4      |
| 2     | 22.0 | 11.4       | 11.2      |
| 5     | 24.5 | 11.5       | 11.2      |
| 10    | 24.8 | 10.5       | 10.1      |
| 15    | 28.2 | 8.9        | 8.65      |
| 20    | 29.5 | 8.6        | 8.50      |
| 25    | 30.2 | 8.4        | 8.40      |
| 30    | 30.7 | 8.3        | 8.30      |
| 40    | 30.8 | 8.3        | 8.20      |
| 45.6  | 30.8 | -          | -         |
| 50    | -    | 8.3        | 8.15      |
| 55    | -    | 8.3        | 8.10      |

1325 Depart PRH 822 for PRH 4

1332 Arrive PRH 4/  
1333 Begin (CTD) downcast #23

1338 Upcast complete

PRH423.RAW  
PRH423.REL

Sounder depth 50.0m  
#records = 167

1346 Begin YSI cast #23  
1400 YSI cast #23 complete

### Summary YSI cast #23

| Depth | ‰    | temp. | DO   |
|-------|------|-------|------|
| 0     | 22.9 | 11.8  | 11.9 |
| 2     | 23.5 | 11.6  | 11.3 |
| 5     | 24.5 | 10.8  | 10.6 |
| 10    | 26.9 | 10.5  | 10.0 |
| 15    | 28.0 | 9.1   | 8.95 |
| 20    | 30.1 | 8.5   | 8.55 |
| 25    | 30.5 | 8.3   | 8.35 |
| 30    | 30.7 | 8.3   | 8.3  |
| 40    | 30.8 | 8.2   | 8.15 |
| 48    | 30.9 | -     | -    |
| 50    | -    | 8.2   | 8.25 |

1400 Depart PRH4 for PRH5

1407 Arrive PRH5  
1407 Begin (CTD) downcast #24  
Sounder depth = 59.0m

1405 Check YSI calibration  
11.5°C → 10.2 mg/L - exactly right (no need to re-adjust)

1422 (CTD) upcast complete  
#records = 198

PRH524.RAW  
PRH524.REL

JUNE 12/92 (CON'T)

1428 Begin YSI cast #24  
1442 YSI cast #24 complete

PRH524 - RAW  
PRH524 - REL

Rev. Thermometer

| 14033 |      | 13166 |      |
|-------|------|-------|------|
| 13.7  | 8.29 | 13.8  | 8.27 |
| 13.8  | 8.30 | 14.0  | 8.28 |

Summary YSI Cast #24

| Depth | %<br>O <sub>2</sub> | Temp. | DO   | Wind Angle |
|-------|---------------------|-------|------|------------|
| 0     | 22.8                | 12.1  | 12.0 |            |
| 2     | 24.0                | 12.1  | 12.0 |            |
| 5     | 25.1                | 11.3  | 10.8 |            |
| 10    | 26.2                | 10.0  | 9.95 | L = 10°    |
| 15    | 27.6                | 9.3   | 9.15 |            |
| 20    | 29.9                | 8.5   | 8.55 | L = 20°    |
| 25    | 30.6                | 8.2   | 8.40 |            |
| 30    | 30.7                | 8.2   | 8.3  |            |
| 40    | 30.8                | 8.1   | 8.15 | L = 35°    |
| 50    | 30.9                | 8.2   | 8.25 | L = 45°    |
| 55.7  | 30.9                |       |      |            |

1445 Depart PRH5 For Dock

1458 Test YSI calibration  
14.5° → 10.20 mg/l → exactly right

1500 Arrive at dock.

[illegible]



Captain: Mike

First Officer: Bill

Second Officer: \_\_\_\_\_

Third Officer: \_\_\_\_\_

Cruise Participants/Agencies: DFO

| Scientific Personnel: | Party Chief: | _____ | _____ |       |       |
|-----------------------|--------------|-------|-------|-------|-------|
| Name                  | Watch        | Cabin | Name  | Watch | Cabin |

|                        |       |       |       |       |       |
|------------------------|-------|-------|-------|-------|-------|
| <u>Bernard Minkley</u> | _____ | _____ | _____ | _____ | _____ |
| <u>Harry</u>           | _____ | _____ | _____ | _____ | _____ |
| _____                  | _____ | _____ | _____ | _____ | _____ |
| _____                  | _____ | _____ | _____ | _____ | _____ |
| _____                  | _____ | _____ | _____ | _____ | _____ |
| _____                  | _____ | _____ | _____ | _____ | _____ |
| _____                  | _____ | _____ | _____ | _____ | _____ |
| _____                  | _____ | _____ | _____ | _____ | _____ |
| _____                  | _____ | _____ | _____ | _____ | _____ |
| _____                  | _____ | _____ | _____ | _____ | _____ |

Second leg of cruise: Party Chief: \_\_\_\_\_

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |

Third leg of cruise: Party Chief: \_\_\_\_\_

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |

Data logging system: Unit number: \_\_\_\_\_ Program version: \_\_\_\_\_

|                           |              |                   |
|---------------------------|--------------|-------------------|
| CTD deck unit make: _____ | model: _____ | serial no.: _____ |
| Computer make: _____      | model: _____ | serial no.: _____ |
| Monitor make: _____       | model: _____ | serial no.: _____ |
| Printer make: _____       | model: _____ | serial no.: _____ |

|                              |              |                   |
|------------------------------|--------------|-------------------|
| 1st CTD make: _____          | model: _____ | serial no.: _____ |
| Temperature sensor           | model: _____ | serial no.: _____ |
| coefficients: slope: _____   |              | offset: _____     |
| Conductivity sensor          | model: _____ | serial no.: _____ |
| coefficients: slope: _____   |              | offset: _____     |
| Pressure sensor range: _____ | psi          | serial no.: _____ |
| coefficients: FSP: _____     | dB           | offset: _____     |
| Transmissometer              | model: _____ | serial no.: _____ |
| coefficients: slope: _____   |              | offset: _____     |

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

\_\_\_\_\_

\_\_\_\_\_

May 11, 92

0800 PDT. - T. Juhasz picks up Budget  
Rent-a-Truck.  
(34T c/c)

Tom + Bernard load at I.O.S.

1015 PDT Tom + Bernard depart I.O.S.  
for 1100 B.C. Ferry to Van.  
- notified Uriah of departure.

2030 PDT. Shore party (T + B) reach  
Williams Lake + overnight at  
Overlander Inn.

May 12 92

0800 PDT - Shore party proceeds to Prince Rupert.

NB next time we rent a truck with  
bigger gas tank, this one is  
only good for 75L results  
in frequent fill up stops +  
potential to run out of gas  
far from services.

2030 PDT

- contacted Uriah to check on arrangements
- arrive in Prince Rupert overnight  
at Crest Motel
- total of 1582 km. driven.

May 13, 92

0800

- meet Uriah at Crest
- proceed to DFO lab and unload.  
Winkler kit and mooring instruments
- proceed to DFO facility at Seal Cove
  - meet Jack Capt' Arrow Post
  - Mike Capt' Petrel Rock
- unload mooring hardware on jetty
- Arrow Post going on ways for paint job  
1030 and coming off 1300 May 14.  
(this is too tight for completion of mooring  
ops.)
- decision made to use Lewis Reef to launch

May 13 cont'd

0930 PDT  
1000 PDT

- Petrel Rock loaded  
set up on deck for hydro casting  
- calibrated YSI  
- TPC 11.0 water temp.  
cal. val. 11.01 on YSI  
- fresh water stirred for 15 min  
using  $\frac{1}{4}$ " drill and stirring rod.

1030  
1100  
1105

- departed DFO based  
- pick Uriah up at jetty in town  
after he picked up last minute itans.  
- depart for PRH1.

1200

- on station PRH1.  
- some shake down problems  
- CTD aluminum case lost overboard  
- traffic.

1215

- on station again  
- CTD Cast #1 depth 47.4 m (~ +5.5m) (@ high tide datum)

1220 PDT

- file PRH1 CTD . RAW 166 records  
PRH1 CTD . REL to bottom

1230 PDT  
1310

- start hydrocast #1  
- launched marker buoy - depressed by current  
not enough scope.

1335

- hydro finished, samples drawn move back  
on station for YSI cast.

Summary  
Hydro #1

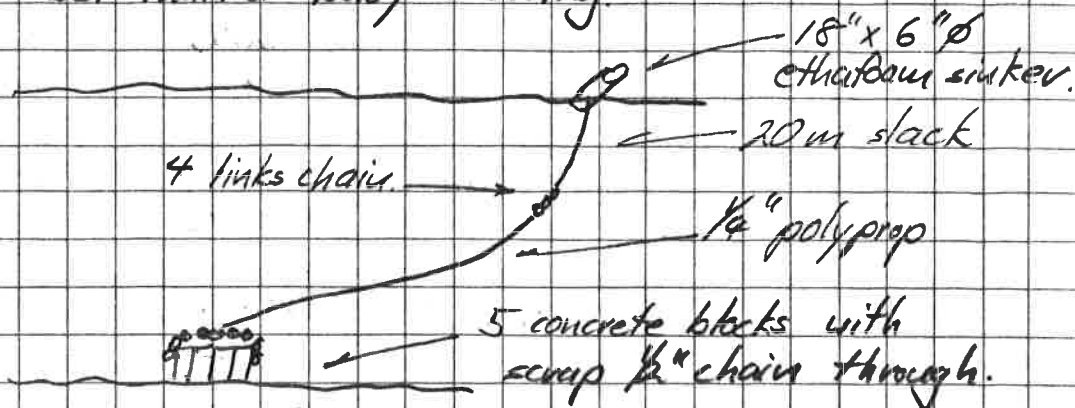
| Hydro depths | Winklers   | ‰  | BOD's      |
|--------------|------------|----|------------|
| 0            | 1090 6.878 | 1  | 25.300     |
| 2            | 1092 6.849 | 2  | 25.301/45  |
| 5            | 1095 6.708 | 3  | 25.891     |
| 10           | 1096 6.643 | 4  | 27.859     |
| 15           | 1097 6.399 | 5  | 29.081     |
| 20           | 2000 6.239 | 6  | 30.126/146 |
| 25           | 2001 6.182 | 7  | 30.624     |
| 30           | 2002 6.132 | 8  | 30.748     |
| 40           | 2004 6.094 | 9  | 31.015/147 |
| 48           | 2005 6.062 | 10 | 31.114     |

May 13 cont'd.

1405 PDT -depart PRH1.

1505

- arrive PRH3
- set marker buoy mooring



1515 PDT

- CTD<sup>#2</sup> PRH3 CTD. RAW
- PRH3 CTD. REL

-depth is 45.4 m @ low tide (datum  $\pm 2$  m)

1526 PDT

- CTD downcast completed with calibration bottle #11. CTD depth = 40m records = 192
- wire angle = 15°

-upcast started 1527.

1532

- CTD up moving back on station for hydro.

14033

12.0

8.21

12.0

8.21

13166

11.9

8.17

11.8

8.17

1536

- start Hydro cast #2

1545

- start upcast.

1600

- YSI cast to 40 m.

1625

- depart for PRH5



# Summary Hydro #2

| Depth | Winkler    | ‰  | BOD       |
|-------|------------|----|-----------|
| 0     | 2006 6.977 | 12 | 25.671    |
| 2     | 2007 6.978 | 13 | 25.664/50 |
| 5     | 2008 6.770 | 14 | 26.163    |
| 10    | 2009 6.401 | 15 | 28.142    |
| 15    | 2010 6.279 | 16 | 29.056    |
| 20    | 2012 6.143 | 17 | 30.228/51 |
| 25    | 2013 6.093 | 18 | 30.618    |
| 30    | 2014 6.084 | 19 | 30.653    |
| 40    | 2015 6.058 | 20 | 30.697/58 |

| Summary YSI Cast #1 |       | PRH1    |                |
|---------------------|-------|---------|----------------|
| @ ‰                 | Depth | Temp °C | O <sub>2</sub> |
| 25                  | 0     | 9.3     | 10.0           |
| 25                  | 1     | 9.3     | 9.9            |
| 25                  | 5     | 9.3     | 10.0           |
| 27                  | 10    | 9.0     | 10.0           |
| 29                  | 15    | 8.7 8.3 | 9.7 9.2        |
| 30                  | 20    | 8.2 8.0 | 9.2 8.9        |
| 30                  | 25    | 8.0 8.0 | 9.0 8.9        |
| 31                  | 30    | 8.0 8.0 | 8.5 8.9        |
| 31                  | 40    | 8.0     | 8.7            |
| 31                  | 48    | —       | —              |

∠ = 30°

∠ = 30°

| Summary YSI Cast #2 |       | PRH3    |                |
|---------------------|-------|---------|----------------|
| @ ‰                 | Depth | Temp °C | O <sub>2</sub> |
| 25.6                | 0     | 10.0    | 9.8            |
| 25.7                | 2     | 10.0    | 9.9            |
| 26.5                | 5     | 9.1     | 9.7            |
| 28.4                | 10    | 8.5     | 8.75           |
| 29.3                | 15    | 8.3     | 8.8            |
| 30.1                | 20    | 8.2     | 8.7            |
| 30.6                | 25    | 7.9     | 8.6            |
| 30.6                | 30    | 7.9     | 8.6            |
| 30.7                | 40    | 7.9     | 8.6            |
| 30.7                | 44    | —       | —              |

∠ = 0° due to vessel maneuvering

May 13 cont'd

- 1640 - on station PRH5
- launched marker buoy (same configuration)
- 1705 - CTD #3 PRH5 CTD. RAW  
PRH5 CTD. REL
- depth = 54 m  
CTD to 55 m records = 200
- 1710 - start hydrocast #3
- 1730 - hydro cast finished to 50m
- hydro cast #3
- 1730 0030 - YSI cast #3
- 1745 - depart PRH5 for Seal Cove.

Summary hydrocast #3

| <u>Depth</u> | <u>Winkler</u> | <u>‰</u> | <u>BOD's</u> |
|--------------|----------------|----------|--------------|
| 0            | 2017 7.624     | 21       | 25.515       |
| 2            | 2018 7.620     | 22       | 25.718       |
| 5            | 2019 7.074     | 23       | 25.923       |
| 10           | 2020 6.626     | 24       | 26.894       |
| 15           | 2021 6.116     | 25       | 29.119       |
| 20           | 2022 6.293     | 26       | 30.396       |
| 25           | 2025 6.058     | 27       | 30.559       |
| 30           | 2027 5.939     | 28       | 30.612       |
| 40           | 2028 5.792     | 29       | 30.657/66    |
| 50           | 2032 5.911     | 30       | 30.724       |

Summary YSI #3

| <u>‰</u> | <u>Temp °C</u> | <u>O<sub>2</sub></u> |
|----------|----------------|----------------------|
| 25.6     | 10.3           | 10.38                |
| 25.8     | 10.2           | 10.21                |
| 26.0     | 9.9            | 10.1                 |
| 26.8     | 9.1            | 9.35                 |
| 28.7     | 8.6            | 8.95                 |
| 30.2     | 8.1            | 8.60                 |
| 30.6     | 8.0            | 8.48                 |
| 30.6     | 7.9            | 8.42                 |
| 30.7     | 8.0            | 8.45                 |
| 30.7     | 8.0            | 8.55                 |

-1900 PDT

- to DFO lab analyse  $O_2$  samples and set up instruments
- prior to this the Petrel Rock was off-loaded and the Lewis Reef prepared for next day mooring work.

May 14

0800 PDT

- all parties met at Lewis Reef and loaded mooring equipment.
- mooring prepared on deck

1015 PDT

- depart jetty for mooring site.
- selected site acc. letter from harbour master.
- cut mooring line to length. <sup>tide + draft</sup> corrected
- deployed mooring and towed into position
- GPS dropping out frequently
- relied on Radar positioning to back up
- 1st instrument in water
- launched mooring

1140

1217

GPS.  $54^{\circ}19.70'N$   
 $130^{\circ}19.86'W$

sounder = 47 m  
+ draft = 2 m

Radar.  $54^{\circ}19.55'N$   
 $130^{\circ}19.86'W$

+ tide = -5.5 m  
datum = 43.5 m

- checked mooring after deployment
  - on sounder
  - by acoustic release - OK
  - by pinger - OK

(see mooring diagram for details.)

- Notice to Shipping issued from ship 1445 PDT 4/05/92

1245

- depart for PRH2 site.

1310

- arrive PRH2 site.

May 14 cont'd.

- 1340 - deployed marker buoy
- 1404 PDT - start CTD #4 { CTD depth to bottom  
c/w CTD Calibration bottle } water depth 46 m.
- 1406 - down cast completed. PRH2. RAW  
PRH2. REL
- 1410 - upcast completed  
moved back to station
- 1418 218 - start hydro #4

| Depth | Winkler    | ‰         |
|-------|------------|-----------|
| 0     | 1043 6.800 | 31 26.629 |
| 2     | 1045 6.752 | 32 27.002 |
| 5     | 1046 6.642 | 33 27.342 |
| 10    | 1047 6.571 | 34 28.063 |
| 15    | 1048 6.330 | 35 29.162 |
| 20    | 1049 6.261 | 36 29.625 |
| 25    | 1050 6.133 | 37 30.409 |
| 30    | 1051 6.115 | 38 30.531 |
| 40    | 1052 6.089 | 39 30.663 |

CTD #4 Cal. Bottle ‰ # 40 30.755

1435 - cast completed. Temp °C 14033 15.8 8.36  
15.8 8.36

1450 - YSI Cast #4 13166 15.8 8.32  
15.8 8.32

| Depth | Temp °C | O <sub>2</sub> |
|-------|---------|----------------|
| 0     | 9.9     | 10.5           |
| 2     | 9.9     | 10.4           |
| 5     | 9.6     | 10.3           |
| 10    | 8.8     | 10.1           |
| 15    | 8.5     | 9.9            |
| 20    | 8.3     | 9.6            |
| 25    | 8.0     | 9.0            |
| 30    | 8.0     | 9.2            |
| 40    | 8.0     | 8.9            |



Sta PRH4 Cast #5.

| #  | Depth | Salinity | oxygen (ml/l) |
|----|-------|----------|---------------|
| 42 | 0     | 26.555   | 6.889         |
| 43 | 2     | 27.020   | 6.689         |
| 44 | 5     | 27.278   | 6.630         |
| 45 | 10    | 27.432   | 6.640         |
| 46 | 15    | 28.632   | 6.407         |
| 47 | 20    | 29.768   | 6.209         |
| 48 | 25    | 30.478   | 6.088         |
| 49 | 30    | 30.575   | 6.035         |
| 50 | 40    | 30.661   | 6.044         |
| 51 | 50    | 30.708   | 5.951         |

May 14, cont'd

-1530

T. Sukias dropped off at jetty  
for departure to Victoria.

1551 sh PRH4 CTD # 5 calibration bottle 30.705  
depth 53.7 m

1601 complete CTD #records = 239

1606 bottle cast #5 0 to 50 m No 33 15.4 8.29 / 15.6 8.30  
13166 15.5 8.26 / 15.8 8.27  
YSI cast

1657 depart PRH4, heading for PRH6.

Tested HACH company pocket colorimeter

1735 Arrive station PRH6.

water depth = 47 m.

1737 STD-12 down cast complete

1741 upcast complete

#records = 179

- move back to station

1745 begin YSI cast

1800 end YSI cast

| Depth | Temp (°C) | O <sub>2</sub> |
|-------|-----------|----------------|
| 0     | 9.7       | 10.0           |
| 2     | 9.6       | 10.0           |
| 5     | 9.3       | 9.9            |
| 10    | 9.0       | 9.65           |
| 15    | 8.4       | 9.1            |
| 20    | 8.1       | 8.8            |
| 25    | 7.9       | 8.45           |
| 30    | 7.9       | 8.2            |
| 40    | 7.9       | 8.4            |
| ~45   | 7.9       | 8.2            |

1805 leave PRH6 to Dock.

YEAR 1992

MONTH

July

TIME ZONE

VTC

SHIP

SHIP *Smoker Craft*

CRUISE

PAGE 1 OF 6

10

[illegible]

July 6 / 92

POT

0730 Depart dock with smoker craft

0800 Arrive PRH1 and anchor

sounder depth 47m

0830 Calibrate YSI (already let stabilize for 15 min)  
YSI calibration  $14.0^{\circ}\text{C} \rightarrow 10.29 \text{ } \mu\text{S}$

- no wind, light drizzle

Strong ebb

- CTD line angle =  $10^{\circ}$

0905 Begin CTD downcast #31  
along with nitrogen bottles

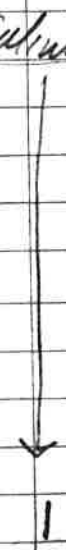
PRH131-RAW  
PRH131-REL

0915 Downcast complete

$\rightarrow$  winch hard to start

0933 Begin CTD upcast

### HYDROCAST SUMMARY #31

| Depth (m) | Nutrients | Salinity                                                                              |
|-----------|-----------|---------------------------------------------------------------------------------------|
| 0         | 1/2       |  |
| 2         | 3/4       |                                                                                       |
| 5         | 5/6       |                                                                                       |
| 10        | 7/8       |                                                                                       |
| 15        | 9/10      |                                                                                       |
| 20        | 11/12     |                                                                                       |
| 25        | 13/14     |                                                                                       |
| 30        | 15/16     |                                                                                       |
| 40        | 17/18     |                                                                                       |
| 47        | 19/20     |                                                                                       |

- Salinity Samples taken at bottom (47m at PRH1)  
- Reversing Thermometer: Mercury in thermometer 14033 not moving  
- is stuck in the end of the thermometer.

14033

13/66

10.6 n/a  
11.4 n/a

13.3 8.26  
13.0 8.26



0936 - nutrient samples at 30, 40, & 47 m taken w/ CTD cast  
CTD upcast complete  
#records = 172

1000 Reposition to PRH1 - dragged because of strong tide

1045 Nutrient samples for 25, 20, 15 m  
went to 26m with a 10° angle

1110 Nutrient samples for 10, 5, 2, 0 m.  
reposition - dragged ~ .5 km again

1230 Attempt YSI cast #31  
YSI unstable - membrane broken

1255 Depart PRH1

1330 Arrive PRH3  
- drop anchor  
- have lunch  
sounder depth = 44 m

1439 Begin CTD downcast #32  
1441 Downcast complete  
1446 Begin CTD upcast  
CTD cast includes sal. sample & nutrient samples  
for 44, 40, & 30 meters

PRH332. RAW  
PRH332. REL

#records = 164

July 6/92 (cont)

Summary Hydrocast #32

| Depth | Nutrient | Salinity |
|-------|----------|----------|
| 0     | 21/22    |          |
| 2     | 23/24    |          |
| 5     | 25/26    |          |
| 10    | 27/28    |          |
| 15    | 29/30    |          |
| 20    | 31/32    |          |
| 25    | 33/34    |          |
| 30    | 35/36    |          |
| 40    | 37/38    |          |
| 44    | 39/40    | 2        |

Rev. Thermometer

|      |         |           |
|------|---------|-----------|
| 13.6 | 14033 ? | 13/66     |
| 14.6 | ?       | 143 8.48  |
|      |         | 15.0 8.49 |

1523 Do nutrient samples for 25, 20, 15 m.  
 1535 Nutrient samples from 10, 5, 2, 0 m

1550 Depart PRH3 for PRH2

1615 Arrive PRH2

Sounder depth = 44 m

1623 Begin CTD Downcast # 33  
 1625 Begin CTD Upcast # 33  
 1627 upcast complete

#records = 165

PRH233.RAW  
 PRH233.REL

1640

Bring up anchor

1645

Depart PR42 for PR44

1705

Arrive PR44

Sounding depth = 50 m  
Put down anchor

1710

Begin CTD downcast

1718

CTD upcast complete

PR4434 RAW  
PR4434 REL# records = 186  
bring up anchor.

1725

Depart PR44 for PR45

1740

Arrive PR45

1748

Begin CTD downcast #35

1750

1755

1758

Begin CTD upcast  
Upcast complete

Sounding depth = 58 m

PR4535 RAW  
PR4535 REL

# records = 209

Summary hydrocast #35

| Depth | Nutrient |
|-------|----------|
| 0     | 41/42    |
| 2     | 43/44    |
| 5     | 45/46    |
| 10    | 47/48    |
| 15    | 49/50    |
| 20    | 51/52    |
| 25    | 53/54    |
| 30    | 55/56    |
| 40    | 57/58    |
| 58    | 59/60    |

Salinity

July 6/92 (cont)

1820 Begin nutrient sampling

Rec. Thermometer

14033  
12.5 n/t  
12.6 N/A

13166  
12.8  
13.0

8.35  
8.35

1850 Finish nutrient sampling

Bring up anchor

1900 Depart PRH5

1930 Arrive at ramp.



[illegible]

JUNE 22/92

## HARBOUR SURVEY #5

0700 GRT equipment packed into truck  
 0800 Load up Refuel Rock  
 0845 Depart dock for PRH1  
 0900 Turn on YSI and let stabilize for 15 min  
 0920 Calibrate YSI at 12.7 → 10.6 mg/l O<sub>2</sub>

0951 Begin (CT) downcast  
 0954 Downcast complete  
 0959 Begin (CT) upcast  
 1002 Upcast complete  
 sounder depth 49.5 m

# records = 191

PRH125. RAW  
 PRH125. REL

1010 Begin YSI cast #25  
 1030 YSI cast #25 complete

NOTE: probe became unattached from winch cable  
 at 15 m (upcast from 45m), reattached & sent down  
 to 25m. Data didn't coincide just right.  
 latter data is logged from 25m to surface.

Summary YSI cast #25

| Depth | ‰    | temp. | DO (mg/l) |
|-------|------|-------|-----------|
| 0     | 22.2 | 11.1  | 10.1      |
| 2     | 25.4 | 10.5  | 9.7       |
| 5     | 26.3 | 8.9   | 8.20      |
| 10    | 28.9 | 8.5   | 7.8       |
| 15    | 30.4 | 8.1   | 7.6       |
| 20    | 31.2 | 8.0   | 7.5       |
| 25    | 31.4 | 8.0   | 7.5       |
| 30    | 31.4 | 8.2   | 7.65      |
| 40    | 31.5 | 8.1   | 7.6       |
| 45    | 31.6 | 7.8   | 7.25      |

NOTE SEPARATE  
CAST

1035 Depart PRH1 for PRH2

1105

Check YSI calibration.  $14^{\circ} \rightarrow 10.0 \text{ mg/L O}_2$  - should be 10.3 - 10.5  
Arrive PRH2

Sounder depth = 39 m

PRH226.RAU  
PRH226.KEL

1106

Begin CTD downcast #26  
CTD upcast complete

Reversing

Therm. From PRH125

14033  
13.7

-merc. all the way  
to the top.

13166  
13.8  
14.8

8.15  
8.17

PRH226.RAU  
PRH226.KEL

#records = 137

1118  
1131

Begin YSI cast #26  
YSI cast complete

Summary YSI cast #26

| Depth | $\sigma_t$ | Temp | DO   |
|-------|------------|------|------|
| 0     | 20.1       | 11.0 | 10.4 |
| 2     | 20.8       | 11.0 | 10.4 |
| 5     | 22.9       | 10.7 | 10.1 |
| 10    | 27.4       | 9.5  | 8.7  |
| 15    | 30.0       | 8.5  | 7.8  |
| 20    | 30.6       | 8.3  | 7.6  |
| 25    | 30.8       | 8.1  | 7.55 |
| 30    | 31.1       | 8.1  | 7.55 |
| 40    | 31.2       | 8.0  | 7.45 |

1132 Depart PRH2 for PRH3

1145  
1155

Arrive PRH3  
Begin (T) downcast # 27  
Sounder depth = 44.1  
downcast complete  
begin upcast

1157  
1200

PRH327.PAW  
PRH327.REL  
#records = 158

Reversing Thermometer.

14033

11.7  
13.0  
8.32  
8.35

13166

12.6  
13.8  
8.30  
8.32

1220

1235

Begin YSI cast # 27  
YSI cast # 27 complete

Summary YSI cast # 27

| Depth | ‰    | Temp. | O <sub>2</sub> |
|-------|------|-------|----------------|
| 0     | 19.8 | 11.8  | 11.0           |
| 2     | 20.4 | 11.7  | 11.4           |
| 5     | 22.5 | 10.5  | 9.9            |
| 10    | 27.1 | 9.5   | 8.6            |
| 15    | 30.3 | 8.8   | 7.7            |
| 20    | 30.7 | 8.2   | 7.45           |
| 25    | 30.9 | 8.1   | 7.4            |
| 30    | 30.9 | 8.1   | 7.35           |
| 40    | 31.1 | 8.0   | 7.25           |
| 44    | 31.2 | 8.0   | 7.25           |

1235

1240

Depart PRH3 for PRH4  
Recalibrate YSI at 12.5°C → 10.5 mg/l  
adjust to 10.64 mg/l.

1250

Arrive PRH4



1252  
1257

Sonde depth = 49.1m  
Begin CTD downcast #28  
CTD upcast complete

PRH428.RAW  
PRH428.REL

#records = 174

1310  
1315

Begin YSI cast #28  
YSI cast #28 complete

Summary YSI cast #28

| Depth | σ <sub>ρ</sub> | Temp | O <sub>2</sub> |
|-------|----------------|------|----------------|
| 0     | 19.0           | 12.0 | 11.6           |
| 2     | 21.5           | 11.2 | 10.5           |
| 5     | 23.3           | 10.8 | 9.8            |
| 10    | 25.0           | 10.3 | 9.3            |
| 15    | 26.8           | 8.5  | 7.8            |
| 20    | 30.7           | 8.2  | 7.4            |
| 25    | 30.8           | 8.2  | 7.4            |
| 30    | 30.8           | 8.2  | 7.35           |
| 40    | 30.9           | 8.1  | 7.35           |
| 48    | 31.1           | 8.0  | 7.35           |

1321

Depart PRH4 for PRH5

1335

Arrive PRH5

1338  
1340  
1345  
1349

Begin CTD downcast #29  
downcast complete  
Begin CTD upcast #29  
upcast complete

PRH529.RAW  
PRH529.REL

Sonde depth = 55m  
#records = 189

Reversing thermometer

14033

11.7 8.42  
13.4 8.45

13166

12.8  
14.6

8.41  
8.45

1355 Recalibrate YSI  $-13.5^{\circ}\text{C} \rightarrow 10.2^{\circ}\text{C} \rightarrow$  readjust to  $10.4^{\circ}\text{C}$

1400 Begin YSI cast #29  
1415 YSI cast complete

1415 Depart PRH5 for PRH6

Summary YSI cast #29

| Depth | ‰    | Temp. | DO (mg/l) |
|-------|------|-------|-----------|
| 0     | 19.7 | 12.3  | 11.8      |
| 2     | 21.1 | 11.8  | 11.1      |
| 5     | 23.2 | 10.7  | 10.0      |
| 10    | 25.7 | 10.0  | 9.4       |
| 15    | 28.0 | 8.9   | 8.2       |
| 20    | 29.5 | 8.2   | 7.8       |
| 25    | 30.8 | 8.2   | 7.55      |
| 30    | 30.9 | 8.1   | 7.45      |
| 40    | 31.0 | 8.1   | 7.7       |
| 50    | 31.0 | 8.1   | 7.7       |
| 55    | 31.1 | -     | -         |

1432 Arrive PRH6

1433 Begin CTD downcast #30  
under depth = 55.4m

1436 Begin CTD upcast  
1438 upcast complete  
# records = 194

PRH630.RAW  
PRH630.REL

1440 Begin YSI cast #30  
1500 YSI cast #30 complete  
1502 Depart PRH6 for dock

VS1 SUMMARY  
cast # 30

(PLH6)

| Depth | ‰    | Temp. | DO (mg/L) |
|-------|------|-------|-----------|
| 0     | 19.9 | 12.7  | 11.2      |
| 2     | 20.3 | 12.5  | 11.4      |
| 5     | 22.1 | 11.0  | 10.4      |
| 10    | 26.6 | 9.7   | 8.95      |
| 15    | 28.6 | 8.8   | 8.1       |
| 20    | 29.8 | 8.5   | 7.6       |
| 25    | 29.9 | 8.5   | 7.65      |
| 30    | 30.0 | 8.5   | 7.6       |
| 40    | 30.1 | 8.3   | 7.4       |
| 50    | 30.1 | 8.3   | 7.3       |

1535 Arrive at dock.