

CRN

9002

DAILY LOG

INSTITUTE OF OCEAN SCIENCES
OCEAN PHYSICS

DATE

August 22 - Sept 6 1990

VESSEL

C.S.S. PARIZEAU

PROJECT

STATION PAPA

Captain: John Campbell

Second Officer: Pat Tipper

First Officer: Siraj Galati

Third Officer: Pat Murphy

Cruise Participants/Agencies: Ocean Physics / Ocean COCC

Scientific Personnel:			Party Chief: <u>Reg Bigham</u>			8-12 A		
name	watch	cabin	name	watch	cabin			
<u>LES SPEARING</u>	<u>12-4</u>	<u>E</u>	<u>BERND SCHNEIDER</u>		<u>C</u>			
<u>DOUG YELLAND</u>	<u>4-8</u>	<u>D</u>						
<u>DARREN TUELLY</u>	<u>8-12</u>	<u>F</u>						
<u>FRANK WHITNEY</u>	<u>4-8</u>	<u>B</u>						
<u>KEITH JOHNSTON</u>		<u>G</u>						
<u>JEFF RIDAL</u>	<u>12-4</u>	<u>F</u>						

second leg of cruise: Party Chief: _____

third leg of cruise: Party Chief: _____

DATA LOGGING SYSTEM: Unit number: #1 program ver. 1-06
CTD deck unit make: Guildline model: 87107 serial no.: 58610
Computer make: HP model: VECTRA serial no.: 2945A07169
monitor make: NEC model: MULTI 24 serial no.: EDR: 009634 A
printer make: ROLAND model: 1212A serial no.: 7HAMAD001271

1st CTD make: GUILDLINE model: 8705 serial no.: 41,226
temperature sensor model: 87401 serial no.: 56,206
coefficients: slope: _____ offset: _____
conductivity sensor model: 87410 serial no.: 41,664
coefficients: slope: _____ offset: _____
pressure sensor range: 2000 3750 psi serial no.: 144477
coefficients: FSP: 2500 dB offset: 3.000
transmissometer model: _____ serial no.: _____
coefficients: slope: _____ offset: _____
Comments: no calibs for temp sensor

2nd 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: _____

WINCHES:

CTD	make: <u>SWANN</u>	model: <u>410</u>	serial no.: <u>1433</u>
counter	make: <u>SYTEX</u>	model: <u>B31</u>	serial no.: <u>87002</u>
HYDRO	make: <u>SWANN</u>	model: <u>310</u>	serial no.: <u>1083</u>
counter	make: <u>REVLIS</u>	model: <u>8750</u>	serial no.: <u>EDR 00929</u> 4 A remote
Spooling	make: <u>SWANN</u>	model: <u>455</u>	serial no.: <u>1450</u>
Drag	make: <u>H&R</u>	model: <u>589</u>	serial no.: <u>515</u> (Empty)
other	make: _____	model: _____	serial no.: _____

Salinometer make: _____ model: _____ serial no.: _____

SAIL System:

program version: 8. BAS (BSAIL) time zone: UTC
sampling interval: 120 sec.
CTF module no.: _____ serial no.: 104
remote temperature model: _____ serial no.: _____
flow sensor model: _____ serial no.: _____
Other sensors: (special for this cruise)
name: _____ module I.D.: _____ serial no.: _____
name: _____ module I.D.: _____ serial no.: _____
Comments: Set to print all modules every 15 sec i: updates screen
(printer itself is turned off)

ADCP Setup:

Program version: 2.38 number of depth bins: 60
time zone: UTC bin length (2°): 3
sampling interval: 300.00 sec. pulse length: 8
blank beyond transmit: 1.0 pings per ensemble: 1
pulse cycle time: 1.00
percent pings good threshold: 50
Comments: bottom tracking turned off.

Aug 22/90

11:30 (PDT) - ship sailed
12:13 - started SA1L
12:24 - started RDI

- Doppler log not working - will pick up technician in Sidney on way past. (NOTE: NEVER DID WORK ON TRIP)
- Andy Sybrandy picked up at Sidney to retrofit shallow drifters.
- RDI in shallow water is screwy - bottom tracking is turned off
- Andy Sybrandy dropped off near Agden Pt. - He did 3/10 drifters.
- 1802 Loop Samples from JF01 (Sal, Chl, Nutrients + TCO_2)
- 2031 - Loop Samples for JF02 (S, Chl, Nut + TCO_2)
- 2214 - Loop Samples for JF03 (S, Chl, Nut + TCO_2)

90/8/23 PDT

- 0013 - JF04 loop samples underway (S, Chl, Nut, TCO_2) after bleeding air from loop pump.
- 0228 - Arr MPO1 #5 Loops: S, Chl, TCO_2 , Nut.
CTD #2 to 130 m
- 0244 - L5 MPO1.
- 0300 to 0345 - Spectacular display of Northern Lights.
Fairly broad band of lights, very actively flickering like waves coming from North.
- also the brightest bioluminescence I've ever seen - all the wave tops for miles around are glowing bright green.
- 0500 - arrive MPO2 loops #6
CTD #3 to
- 0510 - depart MPO2

all file new hole #

1	✓	5	P04	9005 mts
2	✓	8	P06	
3	✓	19	P16	
4	✓	21	P18	
5	✓	23	P20	
6	✓	24	P20	
7	✓	9024	P20	
8	✓	25	P26	
9			P26	Trutium cast no data
10	✓	27		
		9027	P26	mts
		9008		

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[illegible]

Aug 23/90

0650 - arr MPO3 Loop samples #7
CTD #4 to 730 m

0903 - arr MPO4 - Start 10 l cast for productivity,
drifter - 8 depths
1041 - - Sta to 1328 m.

1235 - (1935 UTC) - found RDI paused (someone had
hit escape or something)
- ensemble 183 no good

1151 0-1310 m hydro cast MPO4 messenger

1254 800, 1000, 1200 m 10 l go-flo messenger

1328 200, 400, 600 m 10 l go-flo messenger

1350 las MPO4

1412 drifter lifted from surface on board.

1602 Arr. Oceana test morning NORTH

1618 - sent release code to #47 (TOP section)

1705 - sighted on surface

1710 - large TURTLE at surface

1742 - release 47 on board.

1752 - ranging on middle section

1807 - sent release code to 200 (middle section)

1853 - in sight on eye.

1912 - release 200, spider 44591 on board

1916 - ranging on bottom section

1917 - sent release code to 960 (bottom section)

1953 - in sight on surface

2018 - on board.

2103 — CTD #6 at mooring site.

Aug 24 1990 PDT

0545 — South Ocean test mooring site;
ranging on TOP SECTION

0552 — released TOP SECTION (17U)

0642 — TOP SECTION in sight

0653 — on board, 2 Simfish on surface,

0655 — ranging on MIDDLE SECTION

0702 — released middle section (94U)

0747 — in sight

0802 — on board.

0808 — attempted ranging on bottom section. Nothing audible.

0821 — ship at original mooring position. Nothing audible.

0822 — released bottom section (18U).

0900 — in sight

0912 — on board. Proceed to Stn MPO5.

1113 — Stn MPO5 CTD to 1500 m loops ✓

— Temperature scale changed (3-20 to 2-20)

1144 — Proceed to MPO6

1348 — Arr MPO6 #9 loops: S, CH, Nut, Eco.
CTD #8 to 1503 m
— Jellyfish.

1545 — Messenger 0-2510 hydro cast: O₂, S.

1917 — CTD #9 to 1500 m loops?

2158 — Stopped on Stn MPO8 CTD to 1500 m.
loops, S%, CH, Nut, Eco.
Wind 12/15 knots @ 320°

YEAR	1990	MONTH	8	TIME ZONE	UTC	SHIP	PARIZEAU	CRUISE	9002	PAGE	2 OF	
DAY	STATION NUMBER	DEPTH SOUNDING (M)	SHIP STOP/START TIME	LATITUDE/LONGITUDE	STD CONSEC. #/DEPTH	STD TIME	HYDRO CONSEC. #/DEPTH	MESSANGER TIME	SALINITY #/CALIBRATION LOOP OR DEPTH	OXYGEN #	SURFACE TEMPERATURE/ SALINITY	NOTES
24	TEST MOORING SITE	1043		48 27.29 6						16.03		
				126 53.03 982	0403					31.912		
24	MP05	2101	1811	48 41.54 7				8		16.64		loops taken, 5‰, Nut.
			1844	127 09.98 1501	1813					31.877		Chlor, TCO ₂ .
24	MP06	2570	2048	48 44.49 008		02		9	2004	22	15.08	(8)
				127 39.78 1503	2102	2510	2245	LOOP	1051	44	31.784	
25	MP07	-	0213	48 46.59 9				10		17.21		
			0257	128 09.99 1502	0217			LOOP		31.814		
25	MP08	2570	0455	48 49.00 10				11		17.06		loops taken, 5‰, Nut.
				128 40.03 1501	0458			loop.		31.820		Chlor, TCO ₂ .
25	MP09	2370	0736	48 51.47 11				12		17.50		
			0816	129 09.99 1502	0739			Loop		32.045		
25	MP10	2693	1015	48 53.59 12				13		17.44		
			1055	129 40.10 1503	1017			Loop		32.001		
25	MP11	2777	1253	48 55.99 13				14		17.37		
			1336	130 10.02 1503	1256			Loop		31.909		
25	MP12		1538	48 58.18 14				15		17.60		
		3300	1611	130 40.10 1500	1540			Loop		32.046		
25	MP13	2950	2011	49 02.56 15				16		17.62		would not start - #15 garbage
			2056	131 40.15 1501	2019			Loop		32.238		
26	MP14	3340	0054	49 07.41 17				17		17.27		
			0132	132 40.05 1503	0055			Loop		32.286		
26	MP15	3425	0529	49 12.00 18				18		16.83		DRIFTER deployed
			0610	133 39.98 1502	0530			Loop		32.232		loops taken

90/8/25 PDT

0036 - Arr MP09 #12 loop samples: S, chl, Nut, ΣCO_2
CTD #11 to 1502 m

SORI in A-frame lights, a few 5" jellyfish,
small school of (~30) tightly grouped snail (8") fish
(greenish tops).

0216 - LV MP09

0315 - Arr MP10 #13 loop samples: S, chl, Nut, ΣCO_2
CTD #12 to 1503 m

A few jellyfish, one medium fish (brown colour) (~14") in perimeter
of A-frame light.

0355 LV MP10

0553 - Str MP11 CTD to 1500, #13. loop samples taken

0636 - LV MP11

0838 - Arr MP12

0840 - CTD #14 to 1500.0 m

- loop samples taken

- light air, sunny / partly cloudy, calm.

0911 - LV MP12

1311 - Arr MP13 #16 loop samples: S, chl, Nut, ΣCO_2
CTD logging program did not start with
first ALT S. Started second ALT S, but
note cast number incremented.

CTD #16 to 1501 m.

Bottom must be rough here - sonar bottom is
indefinite: 2930 - 2950 m.

- water colour has changed to the electric blue
from the brown-green nearer the coast.

1356 - LV MP13

1755 - MP14

2229 - Stop on Str MP15

2230 - CTD #18 to 1502 m.

- loop samples S%, Nut, ΣCO_2 , chl.

2307 - drifter 99 deployed 49 11.81 133 39.99

2310 - proceed to MP16

90/8/26 PDT

0332 Arr MP16 #19 loop samples: S, chl, Nut, ΣCO_2
CTD #19 to 1505 m

0420 Hydro #3 to 3510 m 2 parts: 0-1200 m mess: 0507
1500-3510 m mess: 0632

1205 Arr MP17 #20 loops: S, chl, Nut, ΣCO_2
CTD #20 to 1542 m Overcast sky.

1249 Lvs MP17

1648 Arr MP18 #21 Loops: S, chl, Nut, ΣCO_2
CTD #21 to

1900 Many porpoises ^{>20} (Davis count 432 of which 219 are male and
372 female) swimming around ship during hydrocasts.

~~27 Aug~~

~~0114~~ Arr MP19 #22 loops: S, chl, Nut, ΣCO_2
CTD #22 to 1502 m

Several 6" jellyfish; raining lightly, 1 bird flew by.

0152 LV MP19

Depth Correction Calculations

- inflection points from STD #21 (MP18) (IMA data)
4 extended to bottom using reversing therm temp
and estimating salinity from graph

<u>Depth</u>	<u>Temp</u>	<u>Sal</u>
4	16.201	32.221
50	8.777	32.371
100	6.230	32.503
150	5.100	33.192
200	5.574	33.567
350	4.683	33.707
500	4.329	33.846
850	3.520	34.056
1450	2.629	34.254
3500	1.8	34.38
4000	1.5	34.4

} estimated

- using DCP#4.BAS - corrected average sound speed
is 1494.5 m/sec

∴ 4000 m on sounder (using 1500 m/sec)
is really 3985 m (-15 m)

∴ correction factor near this depth
is .99625

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[illegible]

Aug 27, 1990 (P.d. time)

Mooring QEP 2-A *

1248 - Top current meter in water

1322 - Second current meter in water

1344 - Bottom current meter in water

1439 - Anchor released (free-fallen). ** 4000 lbs $\frac{1}{2}$ damping plate

Position $49^{\circ} 19.42' N$
 $138^{\circ} 02.37' W$

TDS $X = 12266.27$
 $Y = 29713.15$

Depth on sounder 4007 m.
heel $\frac{5}{4012 \text{ m}}$

corrected depth (0.996361)

= 3997.4 m.

Regular "burping" or flexing noise evident
on headphones heard following launch.
May be drag plate - flexing or?

** The most conservative estimate of drop speed - 160 m/min
(25 min.)

* The new Kevlar lines (Kevlar from Campbell River)
looked terrible. There were sections where the cover
was damaged, sections of too-tight cover
and long sections where the kevlar pore was
rough and bumpy feeling. Some lines felt and
looked good while others were the opposite.

QEPI-C Recovery UTC

0159 Anchor released.

0330 RCM 5 out of water

0358 RCM 5 ✓ ✓ ✓

0416 RCM 4 ✓ ✓ ✓

0435 RCM 7908

0443 RCM 676

0452 Moving on board.

Notes:

all
Tangles occurred around current
meter - mispin / keulan joins No damage
to either lines.

Meters/tails and floatation clean, no
apparent damage.

Keulan lines seem in very good condition.

28 Aug 90 (Pdttime)

0015 Start Niskin + Go-FL0 cast to 3802 m.

0020 Loop samples #23, no CTD cast.

QEP1-d

0800 - Start assembling gear on deck for deployment of QEP1-DELTA.

- Open current meters from QEP1-C, ① CM had dead battery. ① current meter had no data on tape (shallow one).

- Service RCM5 (perfected record) for deployment on QEP1-DELTA.

1330 - Hydro cast, 600-1200 m at 020.

1450 - Start deployment (1st CM in water).

1616 - anchor free faller

Corrected depth 3977 m.

depth on EPC 3987.

Correction factor 0.996238.

Position $49^{\circ} 33.04$

$138^{\circ} 40.13$

T.D.'S $X = 12164.78$

$Y = 29756.56$

will stay near mooring until VHF is under,
then proceed back to P-20 for CTD to 2500m.
Frank Whitney would like to do some
sampling at P-20 at about midnight.

1704 - Drifter deployment, #1198

Position $49^{\circ} 33.32$ ' N

$138^{\circ} 40.14$ ' W

Aug 29/1990 (Pdt)

Mooring QEP 3-A. (26 miles north of P-20)

0600 - Sounding in grid over proposed mooring site.

0800 - Commence assembling mooring gear on deck. Repair RCM's for QEP 3

1130 = lunch.

1320 - Start deployment.

1448 - Anchor dropped, corrected depth 3917.2 m.

1505:50 - VHF Beacon stopped

1513:00 - probable time anchor on bottom.

Position	50° 00.00' N	TD's	X = 12084.27
	138° 38.02' W		Y = 29822.83

There was the same problem with the doors under the A-Frame during deployment. The nylon was caught there and released with no damage and the nilspin was nearly damaged in the same way. The suggestion of the inward swinging doors by John Green seems worth investigating.

Aug 30 1990 (P. Stemes)

0630 - Sounding in area of proposed mooring site OEP 4A.

- Wind was steady at 30 knts during the night and a sizable swell has built up.

0800 - Wind 25 knts from Northwest
After discussions with Captain it was decided that we would assemble as much of the mooring on deck as possible and see how the weather was then.

1130 - It was decided to wait until 1400 and look at weather.

1400 - Decision to deploy mooring

1600 - Because of the extra ^{time} taken to get ready, Capt decided to start after supper.

1745 - Start deployment

1855 - drop weights

Position	49° 19.53' N	TD'S	29731.38
	139° 13.93' W		12154.62

Depth on sounder	4004 m.
Corrected depth	3994 m.

The doors under the A-frame again caused a problem during the last stages of the deployment.

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[illegible]

Aug 30 Cont. P.d. time

- Ship stayed in the position of QEP 4-A until the anchors had reached bottom.
- Because of time constraints and the uncertainty of weather it was decided to go directly to Stn P with no stops. A quicker course was chosen, precluding the collection of loop samples. The missed stations will be picked up on the way home if time permits.

Aug 31, 1990

Steaming towards Stn P. FD Stan will be deployed 10 miles east of P. at about 1800 hrs.

1800 - Start deployment of FD Stan

1900 - FD Stan complete, proceed towards Stn P

2035 Stop on Stn P

2036 CTD No. 25 to 2500 m - loop samples

2142 Hydrocast - Part 1 to 1200 m

2219 messenger 0-1200 m hydro cast

2343 messenger 1500-4210 m hydro cast.

Sept 1/90

0650-0750 Go-Flo Casts for Productivity work + DOC/DiOP 0-100 m

0818 Incubator in near P26.

0900-1030 Go Flo samples for POC etc, 200 to 2000 m, P26.

1250 Air samples from Bow.

1420 Recovered productivity incubator line.

1450 - Start cast for Tritium, S%o & temp to 800 m
0, 50, 100, 150, 200, 300, 500, 800

1540 - Cast complete.

90/9/1 PDT

2015 - 2230 : Oceanic release testing to
4000 m on hydro wire. (140).

90/9/2 PDT

0800 - CTD #26 to 2500 m + calibration bottle
- calibration salinity #27 32.767

- temperatures:

	Aux	Main	
5960 :	21.6	2.17	sal. 34.630
	21.5	2.17	
29341 :	21.5	2.10	
	21.5	2.10	
5957 :	21.8	2.10	
	21.9	2.10	

0930 - begin bottle casts

- done in 5 separate cast due to matching Go-flo's with Niskins (only have 6 Go-flo's)
- Go-flo's @ standard depths - Niskins 2 m below
- all samples from Go-flos except ΣCO_2 + temperatures.

1003 - 0-75 m messenger

1108 - 100-250 m messenger

1150 300-1000 m messenger.

1314 600, 1200 - 3000 messenger

1457 3500 - 4210 m messenger

1940 Go-Flo Cast to 200 m for PCO_2 samples

1955 10L Niskins Soaked at 200 m to clean.

[illegible]

90/9/3 P.d.t.

- 0730 Go Flo from 5m, Deck Incubations
- 0900 Go Flos to 1200m for DOP
- ~1000 10 L Niskins to 2500m for Storage tests, CO_2
- 1100 Go Flo to 75m for TCO_2 - SALINITY #27 FOR KEITH
- 1110 4 Niskins to 200m for soaking.
- 1120 Chains in, finished water sampling at P26.
- 1232 - Drifter 1424 (deep) away at NE corner of grid, steam towards NW corner.
- 1238 - Drifter 1310 (shallow) away at NW corner of grid, proceed to SW corner
- 1248 - Drifter 1425 (deep) away at SW corner of grid, proceed to SE corner.
1259. - Drifter 1311 (shallow) away at SE corner. Proceed towards last position of FD Star.
- 1425 - Recovery of FD Star: Hooked top buoy and brought aboard
- 1440 - Glass spheres aboard, start hauling main line (1000m.)
- 1505 - Drifter recovered proceed 080°T. 14 miles to CTD Stn 35.

Sept 3, 1939 Pacific Daylight Time

- 1650 - Arrive Stn MP 35, STD to 1500m, #28
loops No. 28
1729 - Leave Stn MP 35
1956 - Arrive Stn MP 25, STD to 1500, #29.
loops No. 29.
2034 - Deploy Technoscan Drifter No. 1312 (shallow drogue)
@ 49° 59.54' N 143° 35.87' W.
2036 - Leave Stn MP 25

90/9/4 PDT

0017 - Arr. MP24 - #30 loops: S, Chl, Nut, ECO_2
CTD #30 to 1504m.

0445 - Arr MP23 - #31 loops: S, Chl, Nut, ECO_2
CTD #31 to 1500m
Deployed drifter #1313 @ 0539 PDT
Pos'n: 49 45.58 N
141 40.15 W
TD's 2982.27
11904.12
} Loran jumping ~ 1/3 mi

0919 - Arrive MP22 #32 loops.
CTD #32 to 1500m.

Calibration bottle 2m above probe. Nominal
sample depth 1500m. Wire angle increased -
sample depth may be as little as 1490m.
Calibration file No. 33.

1006 - Proceed to next station (the last!).

Calibration P# 5960 19.3 2.71

Thermometers -

P# 29431 - 19.1 2.70

P# 5957 19.4 2.68

LOOP SAMPLES LINE P RETURN LEG 9002

S.N.	DATE TIME	TIME(UTC) DATE	LAT(N)	LONG(W)	TEMP (T)	SAL (S)	SAL 1	CHL 2	NUT 3	PHYT 4	TCO ₂
				MONITOR							
34	1915	90/9/6	48 44.6	127 40	15.484	31.984		0.45			P06
35	2103	90/9/6	48 41.6	127 10	15.976	31.892		1.00			P05
36	2253	90/9/6	48 39.0	126 40	16.716	31.845		2.38			P04
37	1331	90/9/6	48 38.8	126 30	15.665	31.987		2.21			
38	0010	90/9/7	48 37.5	126 20	15.915	31.959		3.45			P03
39	0047	90/9/7	48 36.8	126 10	16.622	32.120		2.90			
40	0126	90/9/7	48 36.0	126 00	16.361	31.925		3.70			P02
41	0203	90/9/7	48 35.5	125 50	16.358	31.793		4.06			
42	0239	90/9/7	48 35.0	125 40	16.374	31.756		3.71			
43	0316	90/9/7	48 34.5	125 30	15.867	32.124		4.24			P01
44	0354	90/9/7	48 33.8	125 20	16.054	32.148		4.27			
45	0438	90/9/7	48 33.0	125 10	13.307	30.723		7.66			
46	0522	90/9/7	48 32.3	125 00	15.051	31.766		6.74			SOUTH OF JF4
47			48 29.7N								
48											
49											
50											

- 1 RINSE AND ALMOST FILL SALINITY BOTTLE.
- 2 RINSE AND FILL CHL BOTTLE, FRIDGE.
- 3 RINSE AND ALMOST FILL NUTRIENT TUBES, FRIDGE
- 4 ALMOST FILL PHYTO BOTTLE, ADD LUGOL'S, 2-3 drops.
- 5 TCO₂ FILL, OVERFLOW 1 VOLUME NO GRASS, TAPE OR HgCl₂

90/9/4 PDT

1357 AN MP21 #33 loop samples: S, Chl, Nut, SCO_2
CTD #34 to 1503 m
Calibration bottle 3 m above probe.
1445 Stopped at 14 m on up cast.
1453 CTD #35 stopped when felt messenger hit.
1456 2nd MP21.
1703 Thermometers: 5960 19.0 14.95 32.482
19.0 14.96
29341 18.6 15.01
18.6 15.00
5957 18.6 14.96
18.7 14.96

90/9/6 PDT

1215 — #34 loops: S, Chl, Nut, phyt. (MP06)
1403 — #35 loops: S, Chl, Nut, phyt, SCO_2 (MP05)
1553 — #36 loops: S, Chl, Nut, phyt, SCO_2 (MP04)
1615 48 38N 126 33W passed through red tide land, lasting
~ 2-3 minutes.
1631 — Stn 37 — water colour normal greenish murky — no
brown or red flocs
1710 ~~Stn~~ 38 — water greenish blue.
1747 loop 39 — water greeny-brown.
1826 loops #40 — water green
1903 loop #41 — same colour
1942 loop #42 — greenish water
2016 loop 43 — sun has set
2054 loop 44 — Bioluminescence in water striking
2138 loop 45
2222 loop 46 South of JF4 to complete sampling