

DAILY SCIENCE LOG BOOK

MISSION
NUMBER

2024-006

DATE:

From: 26- April - 2024

To: 13- May - 2024

VESSEL:

J P Tully

PROJECT(S):

Line P

Water Properties Group
Fisheries and Oceans Canada
Institute of Ocean Sciences
Ocean Sciences Division
North Saanich, BC, Canada

WaterProperties.ca

Captain: BENNETT LIGHT First Officer: MATTHEW KERR
Second Officer: ALISTAIR BURT Third Officer: SEBASTIEN DURIEUX DE MADRON
Fishing Master: N/A Chief Engineer: STUART BURNAN

Mission Participants / Agencies:

DFO-TOS / UVIC / MUN / CNL

**** Chief Scientist to tape Scientific Personnel section of their cruise plan here ****

This is accessed from your WaterProperties.ca Dashboard or from here:
<https://www.waterproperties.ca/requests/cruiseplanview.php?cruiseid=YYYY-NNN>

MARIE ROBERT	A	0600-1800
DANIELLE CALSB	C	0000-1200
MICHAEL ARYCHUK	D	0600-1800
ANDREW HICKS	E	1200-2400
LYNN WHARRAM	F	0000-1200
LAURYN TALBOT	F	1200-2400
MOIRA GALBRAITH	G	0000-1200
NICOLE HOLMAN	G	1200-2400
KAILEE CLARKE	H	0000-1200
CHLOE IMMENDEN	H	1200-2400

**** The following 3 pages are VERY IMPORTANT as they document equipment and settings used on board ****

These pages are to be completed by the CTD Technician setting up the equipment, the Watch Leader on board, and the Chief Scientist MUST verify that all relevant sections are completed prior to leaving the vessel. *Any mid-cruise changes to be noted by watch leader in the notes.*

Data logging computer: lenovo 102

Data acquisition program: she seasave

CTD deck unit make: sbe model: 11p serial number: 0508

Primary CTD

Make: sbe model: 9p serial number: 0443

Primary temperature serial number: 2106

Primary conductivity serial number: 2754

Secondary temperature serial number: 5130

Secondary conductivity serial number: 1766

Transmissometer: wetlabs Model: C-star serial: 1185DR

Transmissometer: wetlabs Model: C-star serial: 1883DG

Fluorometer: Model seapoint Cable gain: 3x serial: 4186 **P, S or NO pump?**

Fluorometer: Model wetlabs Cable gain: --- serial: ECO 2216 **P, S or NO pump?**

Oxygen sensor: sbe Model: 43 serial: 9372 **P, S or NO pump?**

PAR sensor: biospherical Model: --- serial: 70613 **Surface PAR? Y / N**

Other sensors: valport va500 serial: 73171 **P, S or NO pump?**

Other sensors: --- serial: --- **P, S or NO pump?**

Other sensors: --- serial: --- **P, S or NO pump?**

Other sensors: --- serial: --- **P, S or NO pump?**

Secondary CTD

Make: sbe model: 9p serial number: 0550

Primary temperature serial number: 2095

Primary conductivity serial number: 3531

Secondary temperature serial number: 47001

Secondary conductivity serial number: 3396

Transmissometer: wetlabs Model: C-star serial: 12012R

Transmissometer: --- Model: --- serial: ---

Fluorometer: Model seapoint Cable gain: 3x serial: 3641 **P, S or NO pump?**

Fluorometer: Model wetlabs Cable gain: --- serial: ECO 2216 **P, S or NO pump?**

Oxygen sensor: sbe Model: 43 serial: 1176 **P, S or NO pump?**

PAR sensor: biospherical Model: --- serial: 70613 **Surface PAR? Y / N**

Other sensors: valport va500 serial: 76241 **P, S or NO pump?**

Other sensors: --- serial: --- **P, S or NO pump?**

Other sensors: --- serial: --- **P, S or NO pump?**

Other sensors: --- serial: --- **P, S or NO pump?**

CTD calibration bottle location (height above CTD in metres): ---

This also includes the bottle location above the CTD on non-rosette casts (typical on small launches).

Rosette Setup:

Number of bottles: 24
Manufacturer: Ocean Technology
Volume of bottles (litres): 10

Rosette/Niskin Bottle Serial Numbers:

1: _____ 2: _____ 3: _____ 4: _____ 5: _____
6: _____ 7: _____ 8: _____ 9: _____ 10: _____
11: _____ 12: _____ 13: _____ 14: _____ 15: _____
16: _____ 17: _____ 18: _____ 19: _____ 20: _____
21: _____ 22: _____ 23: _____ 24: _____

Make sure to note any bottle changes or repairs during your cruise in this log book.

Winches:

1. Make: Swagelok Model: 329 Serial #: 482 Used for: ROSE
2. Make: Swagelok Model: _____ Serial #: 702 Used for: MBE
3. Make: Swagelok Model: _____ Serial #: 702 Used for: ROSE

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

Salinometer:

Make: _____ Model: _____ Serial Number: _____

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

Label Printers:

Primary Printer Kit #: _____
Secondary Printer Kit #: _____
Software Version: _____

Thermosalinograph System (SBE21/45):

Program: _____ Version: _____
Sampling interval (seconds): _____
TSG serial number: 624/603
Fluorometer sensor serial number: _____

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

ADCP Setup:

Computer time zone: _____ User Exits: Name: _____ Exit points: _____
Sampling interval (sec): _____ Name: _____ Exit points: _____
Bin Length: (2^x): _____ Name: _____ Exit points: _____
Pulse Length: _____ Work File: _____
Buffer (bytes): _____
Gyro Offset: _____

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

CTD Test Cast Information

Test Cast along side? ☒ Yes ☐ No

Comments _____

Test Cast in Saanich Inlet or other location? ☒ Yes ☐ No

Comments _____

CTD pressure reading on deck (db), before cast: _____ after cast: _____

Pumps working? ☐ Yes (0011) ☐ No (0010)

Secondary Temp – Primary Temp: _____
(Average from the mixed region)

Secondary Salinity – Primary Salinity: _____
(Average from the mixed region)

Additional Comments:

Scientific Equipment Used During Cruise

This sheet allows you to enter all of the equipment used while on board. Please use the separate CTD sheet for entry for SBE 9/16/19/25.

Other CTD units:

RBR Serial Number: Sensors:

Others:

Plankton Nets:

Bongo/SCOR #1	Frame Size: 0.56 m DIAMETER cm	Mesh: 236 μm	Flowmeter: 5333
Bongo/SCOR #2	Frame Size: 0.56 m cm	Mesh: 236 μm	Flowmeter:
	Frame Size: cm	Mesh: μm	Flowmeter:
	Frame Size: cm	Mesh: μm	Flowmeter:

Multinet BIONESS Neuston Others:

#1 WITH 250 MESH 0.5 m DIAMETER

RBR SILVER WITH YELLOW BACKUP

Trawl Gear:

Midwater Trawls: SOG Highseas Pelagic Other:

Bottom Trawls: Atlantic Western IIA Yankee 36 Hard & Soft Bottom Other:

American Shrimp Trawl

Notes:

Trawl Doors: USA Jet Tyburon

Sounders : Wesmar 380 Others:

Acoustics:

Echosounder #1 Frequencies (KHz): 12 18 38 70 120 200

Others:

Echosounder #2 Frequencies (KHz): 12 18 38 70 120 200

Others:

Software & Notes:

Other Gear in Operation:

FOR THIS CRUISE THE WAIT TIME BEFORE CLOSING ALL NISKINS
IS 30 SECONDS

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 1 of 14

Month <u>Apr / May</u>			Year <u>2024</u>			Vessel <u>J P Tully</u>			Cruise ID <u>2024-006</u>						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
1	S1	30	23:41	BE	ROS	VS.	48°39.539	123°30.189	173		---	24	CI	☒ ☒	chirps during deployment
			23:45	BO			48°39.539	123°30.188		166	-			☐ ☐	11P fired all bottles at
			23:50	EN			48°39.54	123°30.189			-			☐ ☐	50m, no samples
2	WFF1	01	05:45	BE	LOOP	UN	48°15.869	123°30.119	1568	5	5002-5002	—	CI	☐ ☐	1sal, 2chl, 1nut
3	JF2	01	07:34	BE	LOOP	UN	48°18.154	124°00.547	190	4.5	5003	—	MG	☐ ☐	1SAL 2CHL 1NUT
4	JF3	01	09:20	BE	LOOP	UN	48°27.031	124°30.074	223	4.5	5004	—	MG	☐ ☐	1SAL 2CHL 1NUT
5	JF4	01	11:00	BE	LOOP	UN	48°32.302	125°00.152	64	45	5005	—	MG	☐ ☐	1SAL 2CHL 1NUT
6	P1	01	12:56	BE	ROS	US	48°34.495	125°29.942	128	130	1-5	5	MG	☒ ☒	ALT NOT WORKING
			13:00	BO			°34.459	°29.946		120	-			☐ ☐	
			13:08	EN			°34.447	°29.947			-			☐ ☐	
7	P2	01	15:01	BE	LOOP	UN	48°35.922	125°59.996	116	4.5	5007	—	MG	☐ ☐	Cesium
8	P2	01	15:08	BE	NET	—	48°35.987	125°59.96	116	110	-	—	MG	☐ ☐	BONGO
			15:13	BO			°36.00	°59.92		110	-			☐ ☐	
			15:16	EN			°36.01	°59.99			-			☐ ☐	
9	P2	01	15:30	BE	ROS	US	48°36.08	126°00.14	119		6-23	18	MG	☒ ☒	DEEP
			15:33	BO			48°36.07	126°00.14		110	-			☐ ☐	
			15:47	EN			48°36.02	126°00.02			-			☐ ☐	
			:				°	°			-			☐ ☐	
			:				°	°			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
 CTD = Standalone CTD
 ROS = CTD in Rosette
 SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring
 NET = Plankton Net Haul
 DRF = Drifter
 — =

Bottle Firing Method:

US = Up / Stop (default)
 UN = Up / No stop
 DN = Down / No stop

Notes:

Time Code:

BE = Beginning Time of Cast
 BO = Bottom Time of Cast
 EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
 MR = Messenger Release Time
 RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
 Version: 17 Feb 2020

event 1: got seasque error "FFFFFFFF" unsupported modem message FA 3A FA from SBE carousel" a few times throughout the cast. all bottles did fire though? maybe no concern... tbd... altimeter did not work for whole cast → read ~100m the whole time, even when it should have been close to bottom. Went off ship's sounding & 10m above that (166m).

event 2: forgot to put the nut in the freezer for 24 hour after sampling

p1.5/14

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month <i>May</i>				Year <i>2024</i>			Vessel <i>JPRVilly</i>				Cruise ID <i>2024-006</i>				
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
<i>10</i>	<i>P3</i>	<i>01</i>	<i>17:30</i>	<i>BE</i>	<i>ROS</i>	<i>US</i>	<i>48°37.53</i>	<i>126°20.02</i>	<i>800</i>		<i>24 - 25</i>	<i>2</i>	<i>PC</i>	☒ ☒	
			<i>17:42</i>	<i>BO</i>			<i>48°37.52</i>	<i>126°20.02</i>		<i>780</i>	<i>-</i>			☐ ☐	
			<i>17:56</i>	<i>EN</i>			<i>48°37.52</i>	<i>126°20.03</i>			<i>-</i>			☐ ☐	<i>swapped a fluorometer cable after cast</i>
<i>11</i>	<i>P4</i>	<i>01</i>	<i>20:28</i>	<i>DE</i>	<i>DRF</i>		<i>48°39.013</i>	<i>126°38.095</i>	<i>1324</i>		<i>-</i>		<i>LT</i>	☐ ☐	<i>Rosie - 713</i>
			<i>21:49</i>	<i>RE</i>	<i>DRF</i>		<i>48°39.076</i>	<i>126°35.925</i>			<i>-</i>			☐ ☐	
<i>12</i>	<i>P4</i>	<i>01</i>	<i>22:42</i>	<i>BE</i>	<i>BOT</i>	<i>MR</i>	<i>48°38.982</i>	<i>126°40.096</i>	<i>1338</i>		<i>26 - 35</i>	<i>10</i>	<i>DC/CI</i>	☐ ☐	<i>TM</i>
			<i>23:25</i>	<i>BO</i>			<i>48°39.052</i>	<i>126°39.983</i>		<i>955</i>	<i>-</i>			☐ ☐	
			<i>23:26</i>	<i>MR</i>			<i>48°39.052</i>	<i>126°39.978</i>			<i>-</i>			☐ ☐	
		<i>02</i>	<i>00:13</i>	<i>EN</i>			<i>48°39.031</i>	<i>126°39.809</i>			<i>-</i>			☐ ☐	
<i>13</i>	<i>P4</i>	<i>02</i>	<i>00:22</i>	<i>BE</i>	<i>ROS</i>	<i>US</i>	<i>48°39.011</i>	<i>126°39.758</i>	<i>1325</i>		<i>36 - 54</i>	<i>19</i>	<i>CI</i>	☒ ☒	<i>DMS</i>
			<i>00:33</i>	<i>BO</i>			<i>48°39.024</i>	<i>126°39.752</i>		<i>600</i>	<i>-</i>			☐ ☐	
			<i>00:58</i>	<i>EN</i>			<i>48°39.078</i>	<i>126°39.734</i>			<i>-</i>			☐ ☐	
<i>14</i>	<i>P4</i>	<i>02</i>	<i>01:43</i>	<i>BE</i>	<i>ROS</i>	<i>US</i>	<i>48°39.06</i>	<i>126°40.045</i>	<i>1329</i>		<i>55 - 57</i>	<i>21</i>	<i>CI</i>	☒ ☒	<i>deep Cs</i>
			<i>01:49</i>	<i>BO</i>			<i>48°39.065</i>	<i>126°40.02</i>		<i>250</i>	<i>-</i>			☐ ☐	
			<i>01:57</i>	<i>EN</i>			<i>48°39.073</i>	<i>126°40.031</i>			<i>-</i>			☐ ☐	
<i>15</i>	<i>P4</i>	<i>02</i>	<i>02:36</i>	<i>BE</i>	<i>ROS</i>	<i>US</i>	<i>48°39.059</i>	<i>126°40.079</i>	<i>1331</i>		<i>58 - 60</i>	<i>24</i>	<i>CI</i>	☒ ☒	<i>will trip all bottles</i>
			<i>02:39</i>	<i>BO</i>			<i>48°39.056</i>	<i>126°40.078</i>		<i>150</i>	<i>-</i>			☐ ☐	<i>for more sample</i>
			<i>02:46</i>	<i>EN</i>			<i>48°39.065</i>	<i>126°40.085</i>			<i>-</i>			☐ ☐	<i>volume</i>
			<i>:</i>				<i>°</i>	<i>°</i>			<i>-</i>			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
CTD = Standalone CTD
ROS = CTD in Rosette
SET = Fish Set

LOOP = Sea Water Loop
MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter
=

Bottle Firing Method:

US = Up / Stop (default)
UN = Up / No stop
DN = Down / No stop

Time Code:

BE = Beginning Time of Cast
BO = Bottom Time of Cast
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CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

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Notes:

Produced by the Water Properties Group, IOS

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p2.5 /14

event 15: shallow cesium

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month May			Year 2024			Vessel JPTully			Cruise ID 2024-006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
16	P4	02	3:00	BE	NET	/	48°39.054	126°40.08	1329	250	-	/	CI	☐ ☐	no net angle
	↓		3:09	BO	NET		48°39.47	126°40.04	1331	250	-		CI	☐ ☐	Bongo VNH
			3:14	EN	NET		48°39.036	126°40.034	1331	250	-		CI	☐ ☐	
17	P4	02	03:25	BE	NET	/	48°39.029	126°40.083	1334	1200	-	/	CI	☐ ☐	deep bongo
			04:08	BO			48°39.023	126°40.016	1334	1200	-			☐ ☐	POPILIA PARK in flow
			04:28	EN			48°39.006	126°39.991	1331	1200	-			☐ ☐	meter side
18	P4	02	04:56	BE	ROS	US	48°38.991	126°39.995	1334		61-79	19	CI	☒ ☒	deep cast
			05:20	BO			48°39.042	126°39.958		1317	-			☐ ☐	salt spike at 1100
			05:56	EN			48°39.016	126°39.93			-			☐ ☐	on up cast
19	P5	02	08:26	BE	ROS	US	48°41.49	127°10.06	2114		80-81	2	MG	☒ ☒	
			09:02	BO			°41.48	°10.03		2005	-			☐ ☐	
			09:33	EN			°41.48	°09.99			-			☐ ☐	
20	P6	02	11:53	BE	ROS	US	48°44.58	127°39.99	2571		82-83	2	MG	☒ ☒	STOP + RESTART FILE
			12:30	BO			°44.61	°40.05		2005	-			☐ ☐	BIOM SOAK
			13:05	EN			°44.61	°39.98			-			☐ ☐	
21	P7	02	15:26	BE	ROS	US	48°46.59	128°10.22	2533		-		DC	☒ ☒	
			16:01	BO			°46.62	°10.13		2005	-			☐ ☐	
			16:36	EN			°46.62	°10.16			-			☐ ☐	
			:				°	°			-			☐ ☐	

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Notes:

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EVENT 15 CHANGED ALTIMETER after cast. new alt is 70341. cleaned DO sensor connections & cable

EVENT 19 STOP @ 6M TO FIX LARS - 5 MINUTES

EVENT 20 PROGRAM FROZE ON DESCENT TO 10M SOAK HAD TO STOP EXIT + START AGAIN

DAILY SCIENCE LOG

Month April May			Year 2024			Vessel SPTV-Hy			Cruise ID 2024-006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
22	P8	02	18:56	BE	NET		48°48.998	128°39.879	2545	250	-		MG	☐ ☐	bongo
↓	↓	↓	19:05	BO	NET		48°48.998	128°39.855			-			☐ ☐	
↓	↓	↓	19:10	EN	NET		48°48.982	128°39.832			-			☐ ☐	
23	P8	02	19:19	BE	LOOP		48°49.004	128°39.929	2545		5023-			☐ ☐	Cesium loop
24	P8	02	19:26	BE	ROS	VS	48°49.012	128°39.926	2545	2000	86-109		CI	☒ ☒	dropout of T2&C2
			20:02	BO			48°49.003	128°39.94			-			☐ ☐	~ 250m to 50m
			20:58	EN			48°49.027	128°39.939			-			☐ ☐	on upcast →
25	P9	02	23:20	BE	ROS	VS	48°51.444	129°9.96	2367		110-111	2	CI	☒ ☒	cleared T2,C2,
			23:54	BO			48°51.422	129°9.974		2005	-			☐ ☐	pylon cables before cast
		03	00:29	EN			48°51.433	129°10.008			-			☐ ☐	also took loop 5025 1 sal, 2 chl
26	P10	03	03:03	BE	ROS	VS	48°53.666	129°40.058	2668		112-113	2	CI	☒ ☒	
			03:38	BO			48°53.68	129°40.092		2005	-			☐ ☐	
			04:14	EN			48°53.672	129°40.067			-			☐ ☐	
27	P11	03	06:39	BE	ROS	VS	48°56.046	130°10.025	2782		114-115	2	CI/LT	☒ ☒	PAR off (darkout)
			07:11	BO			°56.058	°10.015		2005	-			☐ ☐	
			07:44	EN			°56.058	°10.008			-			☐ ☐	
28	P12	03	10:09	BE	ROS	VS	48°58.21	130°40.06	3260		116-138	23	MG	☒ ☒	Spike @ 2346 OXY SAL
			11:07	BO			°58.20	°40.05		3268	-			☐ ☐	B 3257 P 3268 D 3216 A 10
			:	EN			°58.21	°40.09			-			☐ ☐	OXY SPIKES 3050 3190

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event 24: ran out of niskin 16 water during final 3H sample (only 1.5L collected instead of 2L).

HPLC from niskin 18 may be from niskin 17. ran out of water in bottle 18.

EVENT 28

CHIRP @ SURFACE

SPIKES ON OXY + SALINITY

SPIKES ON DESCENT GRAPH

2340 3050 3180

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month MAY			Year 2024			Vessel JP TULLY			Cruise ID 2024 - 006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
29	P12	03	10:36	BE	LOOP	US	48°58.18	130°40.05	3222	4.5	5029	/	L	☐	Cesium loop
30	P12	03	14:07	BE	BOT	MS	48°58.17	130°40.03	3223		139 - 148	10	DC	☐	TM 800
			14:56	BO			48°58.05	130°40.04		800	-			☐	
			15:53	EN			48°57.97	130°40.051			-			☐	
31	P12	03	16:19	BE	ROS	US	48°58.14	130°40.06	3229		149 - 167	19	MG	☒	PAR ON
			16:30	BO			48°58.14	130°40.06		600	-			☐	CHIRP@ SURFACE
			16:59	EN			48°58.09	130°40.05			-			☐	SPIKES →
32	P13	03	22:08	BE	ROS	US	49°2.551	131°39.855	2916		168 - 169	2	CI	☒	→
			22:39	BO			49°2.555	131°39.874		2005	-			☐	
			23:12	EN			49°2.549	131°39.862			-			☐	pylon dummied
33	test	03	23:46	BE	CTD	/	49°2.963	131°43.294	3114		/		CI	☒	off to test spikes.
			23:50	BO			49°2.943	131°43.305		150	-			☐	oxy spike at 30m
			23:50	EN			49°2.95	131°43.312			-			☐	oxy, T, C spikes 170
34	P14	04	06:05	BE	ROS	US	49°7.339	132°39.938	3306		170 - 190	21	CI	☒	only going to 2000m
			06:41	BO			49°7.322	132°39.96		2000	-			☐	to make up time to slow termination
			:	EN			49°07.287	132°39.979			-			☐	
35	P15	04	12:51	BE	ROS	US	49°11.98	133°39.84	3390		191 - 192	2	MG	☒	CHIRP + SPIKE @ ENTRY
			13:12				°11.97	°39.86		1005	-			☐	Sigs @ Bot To Fix PROGRAMS
			13:30				°11.96	°39.85			-			☐	

Event Type:

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LOOP = Sea Water Loop

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CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

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Notes: _____

Produced by the Water Properties Group, IOS

WaterProperties.ca

Version: 17 Feb 2020

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UPWARD FACING SPIKES ON FLUOR, OXY, TEMP, SAL @ 25

EVENT 31 SPIKE ON OXY @ 88

DESCENT GRAPH SHOWING SPIKES

UNSUPPORTED MODEM @ 75 ↑. after cast, performed merger test of cable - D coated fine

event 32: - huge strain on wire at surface after launching, as LARS operators went to check on the cable, the rosette was not deep enough to stabilize the wire in swell so it got slack & then tightened too quickly. took ~5 minutes after launch to pay out wire enough to fix the mislaid wire on winch drum & then respoal properly. had an FFFFFFFF unsupported modem message from carousel during that time.

- small salt spike on launch ~900m, ~1170, ~1350,
- big transmissometer & oxy spike on descent at 1900

event 34: after termination

- pressure spike in O₂, T, C at ~1500m on descent
- LOTS of errors⁽³²⁾ near bottom of cast (from 1500 to 2000m)
- chirp at 1880m, 1900, 1940,

DAILY SCIENCE LOG

Month MONTH			Year 2024			Vessel P TULLY			Cruise ID 2024-006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
36	ROOP36	04	16:57	BE	ROOP	UN	49° 15.27	134° 18.09	3591	45	5636	✓	MG	☐ ☐	cdsac 524HL
37	P16	04	18:49	BE	ROS	US	49° 16.996	134° 39.892	3616		193-195	24	CT	☒ ☒	shallow CS
			18:52	BO			49° 16.988	134° 39.898		150				☐ ☐	
			18:59	EN			49° 16.984	134° 39.922			-			☐ ☐	
38	P16	04	19:13	BE	BOT	MR	49° 16.99	134° 39.934	3616		196-205	10	DC	☐ ☐	
			19:55	BO			49° 16.923	134° 39.97			-			☐ ☐	
			19:57	MR			49° 16.922	134° 39.973			-			☐ ☐	
			20:42	EN			49° 16.922	134° 39.973			-			☐ ☐	
39	P16	04	20:53	BE	ROS	US	49° 16.916	134° 40.01	3616		206-224	19	CI	☒ ☒	DMS
			21:04	BO			49° 16.929	134° 40.022		600	-			☐ ☐	Chirp @ 300↓
			21:29	EN			49° 16.939	134° 39.975			-			☐ ☐	
40	P16	04	22:05	BE	NET	✓	49° 17.008	134° 39.963	3650		✓	✓	CI	☐ ☐	Bongo
			22:14	BO			49° 17.018	134° 40.018			-			☐ ☐	
			22:19	EN			49° 17.047	134° 40.034			-			☐ ☐	
41	P16	4	22:35	BE	ROS	US	49° 17.01	134° 40.03	3614		225-227	24	MR	☒ ☒	Cesium deep
			22:40	BO			49° 17.00	134° 40.01		250	-			☐ ☐	
			22:48	EN			49° 17.02	134° 40.03			-			☐ ☐	
42	P16	4	23:30	DE	DRF	DE	49° 16.23	134° 37.15			-			☐ ☐	PPOV81011 (CTS4)
			:				°	°			-			☐ ☐	SN: P44168-230A00

Event Type:
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Bottle Firing Method:
US = Up / Stop (default)
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CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products
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RE = Recover Mooring Time

Notes:

Produced by the Water Properties Group, IOS

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Version: 17 Feb 2020

562 = officer's lounge

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month May			Year 2024			Vessel JPTully			Cruise ID 2024-006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
43	P16	5	00:00	BE	ROS	US	49° 17.01	134° 39.97	3614		228-251	24	CI	☒ ☒	deep, PAR off
			01:05	BO			49° 16.988	134° 39.977		3684	-			☐ ☐	
			02:41	EN			49° 16.99	134° 39.963			-			☐ ☐	
44	loop 44	5	05:41	BE	LOOP	UN	49° 20.289	135° 27.244			5044	-	CI/LT	☐ ☐	1 sal, 2 chl
45	P17	5	06:34	BE	ROS	US	49° 21.073	135° 39.991	3596		252-253	2	CI	☒ ☒	+ loop (1 sal, 2 chl)
			06:52	BO			° 21.06	° 39.97		1000	-			☐ ☐	5045
			07:11	EN			° 21.06	° 39.94			-			☐ ☐	
46	LOOP 46	5	10:10	BE	LOOP	UN	49° 25.24	136° 26.78	3775	4.5	5046	-	MG	☐ ☐	NO PROFILE TO CALIBRATE.
47	P18	5	11:11	BE	ROS	US	49° 25.99	136° 39.90	3810		254-277	24	MG	☒ ☒	No PAR
			12:17	BO			° 25.98	° 39.89		3892	-			☐ ☐	D 3824 S 3810
			13:48	EN			° 25.93	° 39.92			-			☐ ☐	P 3891 A 9.6
48	P18	5	11:32	BE	LOOP	US	49° 26.013	136° 39.925	3810	4.5	5048	-	LW	☐ ☐	CESIUM
49	P19	5	19:44	BE	ROS CTD	US	49° 30.027	137° 39.963	3902		278-279	2	CI	☒ ☒	LARS team adjusted to keep on the change above the LARS head prior to the cast
			-	BO			° .	° .			-			☐ ☐	
			20:03	EN			49° 30.013	137° 39.988	3902		-			☐ ☐	→
50	P19	5	20:04	BE	ROS	US	49° 30.024	137° 39.984	3902	1	278-279	2	CI	☒ ☒	
			20:31	BO			49° 30.049	137° 39.972		1500	-			☐ ☐	
			20:55	EN			49° 30.023	137° 39.941			-			☐ ☐	
51	loop 51		01:01	BE			49° 32.618	138° 18.222	3956	5	5051			☐ ☐	1 sal, 2 chl

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Notes: _____

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Version: 17 Feb 2020

event 43: oxy spike ↓ at 1300m, 1500, 1700

chirps at 2100

big pressure spike at 3600

long stop at 3555 to adjust LARS head (touching keeper)

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after event 43 → swapped for new 9p-0443

event 45: huge pressure spike at 30m ↓
700m oxy & salt spikes

event 47: not 277 didn't get frozen right away (19 hours after sampling)

event 49: computer glitch wasn't allowing archived data, noticed at 400m. brought back to surface to start over

event 50: redo of P19 → only going to 1500 to account for lost time

chirp at 360m ↓, 400m ↓

spikes at 550 ↓, 1000 ↓

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month May				Year 2024			Vessel JPTully				Cruise ID 2024-006				
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
52	loop52	06	04:28	BE	LOOP	-	49°34.368	138°45.87	3934	5	5052	/	CI	☐ ☐	1 sal, 2 chl, near P20
53	Loop53	06	08:23	BE	LOOP	UN	49°36.097	139°11.51	3914	4.5	5053	/	MG	☐ ☐	1 sal 2 chl
54	P21	06	12:14	BE	LOOP	UN	49°38.044	139°39.997	3931	4.5	5054	/	MG	☐ ☐	1 sal 1 wt 2 chl 2 HPLC
55	P22	06	20:20	BE	ROS	US	49°41.996	140°39.979	3873		280-303	24	CI	☒ ☒	PAR off-deep
			21:29	BO			49°42.008	140°39.998		3995	-			☐ ☐	
			23:03	EN			49°41.986	140°39.982			-			☐ ☐	
56	P22	06	20:35	BE	LOOP	-	49°41.996	140°39.979	3873	5	-	/	AH	☐ ☐	cesium loop →
57	test 2	06	23:13	BE	CTD	-	49°42.01	140°40.223	-	-	-	/	CI	☐ ☐	testing on deck to
		07	00:31	EN			49°43.281	140°56.281			-			☐ ☐	normal connection →
58	test 3	07	00:47	BE	CTD	-	49°43.274	140°57.768	-	-	-	/	CI	☐ ☐	
			00:50	EN			49°43.326	140°58.437			-			☐ ☐	
59	test 4	07	00:52	BE	CTD	-	49°43.346	140°58.695	-	-	-	/	CI	☐ ☐	cheater cable
			01:45	EN			49°43.977	141°8.959			-			☐ ☐	
60	Loop 60	07	02:59	BE	LOOP	-	49°44.908	141°23.416	4013	5	5060	/	CI	☐ ☐	1 sal, 2 chl
61	P23	07	04:28	BE	ROS	US	49°46.065	141°39.844	4023		304-305	2	CI	☐ ☐	→
			04:46	BO			49°46.028	141°39.837		1005	-			☐ ☐	
			05:05	EN			49°46.028	141°39.868			-			☐ ☐	
			:				°	°			-			☐ ☐	
			:				°	°			-			☐ ☐	

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Notes: _____

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event 55: spike across all channels 2050 ↓
spike at 3240 ↓

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event 56: cesium loop was taken during rosette cast → forgot to log ∴ coordinates & time are not exact

event 57: connection from winch → sea cable → II, & all sensors still plugged into watch for spikes & errors

event 58: gt → test cable → II, to bypass winch

event 61: dummied of PAR, altimeter, both transmissometers, both fluorometers. zero errors on descent but only went to 1005m... not quite deep enough to rule out one of the dummied sensors I think
added back altimeter, red transmissometer, & ECO fluorometer for the next cast

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month May			Year 2024			Vessel JP Tully			Cruise ID 2024 006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
62	P24	07	10:18	BE	ROS	US	49° 50.24	142° 40.04	3960		306-329	24	MG	☒ ☒	D3975 P4847 53960 A10
			11:31	BO			° 50.22	° 39.98		4047	-			☐ ☐	No PAR SEAPoint TRANS GREEN
			13:11	EN			° 50.22	° 39.93			-			☐ ☐	
63	P24	07	12:32	BE	LOOP	UN	49° 50.19	142° 40.51	3982		-			☐ ☐	CESIUM LOOP
64	P24	07	13:29	BE	DRF	✓	49° 50.166	142° 40.207	3958	0	-		MR/DC	☐ ☐	227625-0346
65	Loop65	07	17:44	BE	LOOP	UN	49° 58.708	143° 28.522	4148	4.5	5065	✓	MG	☐ ☐	1 sal 2chl
66	P25	07	18:36	BE	ROS	US	50° 0.056	143° 36.204	4115		330-331	2	CI	☒ ☐	loop also 5066 →
			19:14	BO			50° 0.056	143° 36.179		2007	-			☐ ☐	
			19:52	EN			50° 0.081	143° 36.203			-			☐ ☐	
67	Loop 67	07	23:04	BE	LOOP	—	50° 0.054	143° 59.736	4143	5	5067	—	CI	☐ ☐	1 sal, 2 chl
68	LOOP 68	08	04:00	BE	LOOP	✓	50° 0.149	144° 32.588	4126	5	5068	—	CI, LT	☐ ☐	1 sal, 2chl, 1nut
69	P26	08	07:31	BE	BOT	MR	50° 0.012	144° 59.97	4232	200	332-338	7	DC	☐ ☐	shallow TM
			07:55	BO			° 0.011	° 59.96		200	-			☐ ☐	
			07:56	MR			° 0.009	° 59.97			-			☐ ☐	
			08:23	EN			° 0.013	° 59.96			-			☐ ☐	
70	P26	08	08:40	BE	ROS	US	50° 0.02	144° 59.98	4232		339-362	24	MG	☒ ☒	DEEP CAST
			09:53	BO			° 0.00	150° 00.01		4321	-			☐ ☐	D4238 P4319 54218 A10
			11:35	EN			° 0.04	144° 59.92			-			☐ ☐	sal SPIKE log ↓
			:				°	°			-			☐ ☐	

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Bottle Firing Method:

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Time Code:

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CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

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Notes:

Produced by the Water Properties Group, IOS

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event 66: PAR, seapoint, green transmissometer still damaged

DAILY SCIENCE LOG

Month MAY			Year 2024			Vessel LP TULLY			Cruise ID 2024006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
71	P26	08	12:38	BE	NET	/	50° 0 .042	145° 0 .136	4219		/	/	MG	☐ ☐	BONGO
			12:48	BO			° 0.031	° 0.103		250	-			☐ ☐	
			12:53	EN			° 0.34	° 0.081			-			☐ ☐	
72	P26	08	13:07	BE	BOT	/	50° 00.01	145° 00.13	4216		363-368	6	DC	☐ ☐	Deep TM
			13:58	MR			50° 0.07	145° 00.02		1500	-			☐ ☐	MR 30 MIN.
			15:11	EN			50° 00.04	145° 00.01			-			☐ ☐	
73	P26	08	15:24	BE	ROS	US	50° 00.02	144° 59.99	4215		369-371	3	MG	☒ ☒	PAR ON
			15:29	BO			° 00.02	145° 00.05		250	-			☐ ☐	CESIUM BEEP
			15:38	EN			° 00.02	° 00.08			-			☐ ☐	
74	P26	08	17:11	BE	ROS	US	50° 00.05	145° 00.00	4214		375-377	3	MG	☒ ☒	CESIUM SHALLOW
			17:15	BO			° 00.05	° 00.00		150	-			☐ ☐	
			17:23	EN			° 00.04	° 00.00			-			☐ ☐	
75	P26	08	17:33	BE	BOT	MR	50° 00.04	144° 59.99	4215		372-374	7	DC	☐ ☐	DRIFT CHAIN 70M
			17:46	BO			° 00.05	° 59.99		225	-			☐ ☐	BOT EVERY 10M
			18:07	EN			° 00.05	° 59.99			-			☐ ☐	
76	P26	08	18:21	BE	ROS	US	50° 00.049	144° 59.984	4215		378-397	20	MG+CI	☒ ☒	added back greenhous
			18:31	BO			50° 00.049	144° 59.986		600	-			☐ ☐	PAR on
			18:57	EN			50° 00.050	144° 59.979			-			☐ ☐	
77	Loop 77	09	05:01	BE	LOOP	/	49° 49.624	142° 27.381	4016	5	50-77	/	CI	☐ ☐	1 sal, 2 chl

Event Type:

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Event Type:

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CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

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Notes:

Produced by the Water Properties Group, IOS

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Version: 17 Feb 2020

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EVENT 73

UNRAVELLING THE KEVLAR FOR 5M WINCH WHILE EMPTYING THE ROSETTE - CESIUM DEEP

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month May				Year 2024			Vessel JPTully			Cruise ID 2024-006					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
78	Loop78	09	11:27	BE	LOOP	UN	49°42.10	140°37.47	3849	4.5	5078	✓	MG	☐ ☐	1 SAL 2 CHL
79	P21	09	14:58	BE	ROS	US	49°38.03	139°40.01	3931		398-399	2	MG	☒ ☒	loop 1 SAL 2 CHL
			15:28	BO			°38.03	°40.01		1505	-			☐ ☐	PAR on
			15:56	EN			°38.00	°39.99			-			☐ ☐	
80	P20	09	19:43	BE	BOT		49°34.065	138°39.971	3986		400-409	10	DC	☐ ☐	Trace Metals
			20:19	BO			°34.064	°39.859		800	-			☐ ☐	
			20:19	MR			°34.064	°39.859			-			☐ ☐	
			21:03	EN			°34.047	°39.766			-			☐ ☐	
81	P20	09	21:14	BE	ROS	VS	49°34.012	138°39.77	3940		410-428	19	CI	☒ ☒	PAR on, Seapoint
			21:25	BO			49°34.028	138°39.783		600	-			☐ ☐	on w new cable
			21:51	EN			49°34.041	138°39.748			-			☐ ☐	(no spikes over 10m)
82	P20		22:35	BE	NET	✓	49°34.031	138°40.008		250	✓	✓	CI	☐ ☐	pargo VNH
			22:44	BO			°34.002	°39.991			-			☐ ☐	
			22:49	EN			°33.987	°39.962			-			☐ ☐	
83	P20	9	23:03	BE	ROS	US	49°33.99	138°40.00	3940		429-452	24	MLCT	☒ ☒	PAR OFF
		10	00:11	BO			49°34.00	138°39.92		4025	-			☐ ☐	DEEP CAST
			01:34	EN			49°33.978	138°39.952			-			☐ ☐	P 4027 5 3939 D 3957 A 10
84	Loop 84	10	05:34	BE	LOOP	✓	49°42.712	137°37.932	3908	5	5084	✓	CI/LT	☐ ☐	1 sal, 2 chl
85	Loop 85	10	10:58	BE	LOOP	UN	49°54.83	136°08.85	3661	4.5	5085	✓	MG	☐ ☐	1 SAL 2 CHL

Event Type:

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SET = Fish Set

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Notes:

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p11.5/14

event 81: issue seems to be seapoint cable (new from Mac Artney this year started on both
9ps... bad batch?)

DAILY SCIENCE LOG

Month				Year		Vessel		Cruise ID							
May				2024		JP TULLY		2024-006							
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
86	LOOP86	10	19:06	BE	LOOP	/	50°15.075	133°46.286	3246	5	5086	/	CI	☐ ☐	1sal, 2chl
87	LOOP 87	10	23:33	BE	LOOP	/	50°26.298	132°25.839	2475	5	5087	/	CI	☐ ☐	1sal, 2chl
88	SCOTT3	11	09:39	BE	ROS	/	50°50.721	129°29.415	239		/	/	DL	☒ ☒	CTD
			09:43	BO			°50.715	°29.409		230	-			☐ ☐	
			09:47	EN			°50.705	°29.397			-			☐ ☐	
89	SCOTT3	11	09:58	BE	NET		50°50.704	129°29.414	238		-		MG	☐ ☐	BONGO!
			10:07	BO			°50.705	°29.415		230	-			☐ ☐	
			10:12	EN			°50.717	°29.410			-			☐ ☐	
90	CPE1	11	16:22	BE	ROS	/	51°0.018	127°50.235	140		-		DL	☒ ☒	
			16:25	BO			°0.034	°50.276		131	-			☐ ☐	
			16:28	EN			°0.062	°50.334			-			☐ ☐	
91	CPE1	11	16:41	BE	NET		51°0.004	127°50.038	142		-		MG	☐ ☐	BONAP
			16:46	BO			°0.006	°50.015		135	-			☐ ☐	
			16:49	EN			°0.003	°50.008			-			☐ ☐	
92	LOOP92	12	03:57	BE	LOOP	/	50°29.291	126°16.960	355	5	5092	/	CI	☐ ☐	1sal, 2chl
93	LOOP93	12	05:45	BE	LOOP	/	50°22.584	125°46.896	162	5	5093	/	AH	☐ ☐	3H only
94	14	12	12:11	BE	ROS	/	49°57.687	125°8.832	156		/	/	DL	☒ ☒	CTD only
			12:14	BO			°57.699	125°8.825		149	-			☐ ☐	URS HYDRAULICS B62
			12:17	EN			°57.708	°8.792			-			☐ ☐	

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Notes: _____

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DAILY SCIENCE LOG

Month MAY			Year 2024			Vessel J P TULLY			Cruise ID 2024006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
95	12	12	17:10	BE	NET	—	49° 43.61	124° 40.536	355		-		MG	☐ ☐	
			17:23	BO			° 43.656	° 40.540		350	-			☐ ☐	
			17:30	EN			° 43.659	° 40.538			-			☐ ☐	
96	12	12	17:50	BE	ROS	—	49° 43.679	124° 40.535	360		456-471		De	☒ ☐	Altimeter Flashing
			17:57	BO			° 43.673	° 40.541		355	-			☐ ☐	to 60 when
			18:17	EN			° 43.677	° 40.560			-			☐ ☐	Soft bottom
97	CPF2	12	20:15	BE	CTD	—	49° 27.977	124° 29.994	323		—	—	CI	☒ ☒	PAR on
			20:21	BO			° 27.973	° 29.999		321	-			☐ ☐	
			20:27	EN			° 27.976	° 29.995			-			☐ ☐	
98	CPF2	12	20:37	BE	NET	—	49° 27.976	124° 29.997	323		—	—	MA	☐ ☐	Bongo VNH
			20:50	BO			° 27.976	° 29.99		319	4-7-12			☐ ☐	
			20:57	EN			° 27.976	° 27.976			-			☐ ☐	
99	27	13	00:43	BE	ROS	VS	49° 19.058	123° 47.944	344		487-492	6	CI	☒ ☒	PAR on
			00:50	BO			° 19.058	° 47.967		341	-			☐ ☐	
			01:00	EN			° 19.048	° 47.976			-			☐ ☐	
100	GEO1	13	01:49	BE	NET	—	49° 15.015	123° 44.92	400		—	—	MA	☐ ☐	Bongo VNH
			02:04	BO			° 15.035	° 45.006		395	-			☐ ☐	
			02:12	EN			° 15.044	° 45.026			-			☐ ☐	
			:				°	°			-			☐ ☐	

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Notes: _____

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Version: 17 Feb 2020

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month May			Year 2024			Vessel TP Tully			Cruise ID 2024-006						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
101	GEO1	13	02:23	BE	ROS	US	49° 15.016	123° 44.952	400		493-500	8	CI	☒ ☒	chirp & error at
			02:30	BO			° 15.011	° 44.977		399	-			☐ ☐	~390m on ascent
			02:45	EN			° 15.037	° 44.993			-			☐ ☐	
102	42	13	04:44	BE	NET	—	49° 1.765	123° 26.184	319		—	—	MA	☐ ☐	Bongo VNH
			04:55	BO			° 1.789	° 26.229		314	-			☐ ☐	
			05:01	EN			° 1.815	° 26.253			-			☐ ☐	
103	42	13	05:18	BE	ROS	US	49° 1.789	123° 26.280	319		504-518	15	CI	☒ ☒	
			05:24	BO			° 1.778	° 26.294		318	-			☐ ☐	
			05:42	EN			° 1.774	° 26.319			-			☐ ☐	
104	1008 104	13	01:00	BE	LOOP	—	49° 19.060	123° 48.009	344	5m	5104	—	AM	☐ ☐	1x3H sample
105	46	13	01:27	BE	ROS	—	48° 51.363	123° 10.847	181		519-521	—	DC	☒ ☒	Bot. 3 missed
			07:32	BO			° 51.364	° 10.849		179	-			☐ ☐	
			07:37	EN			° 51.366	° 10.848			-			☐ ☐	
106	44	13	07:47	BE	NET	—	48° 51.386	123° 10.81	179	174	—	—	MG	☐ ☐	VNH
			07:53	BO			° 51.386	° 10.81			-			☐ ☐	
			07:56	EN			° 51.390	° 10.807			-			☐ ☐	
			:				° .	° .			-			☐ ☐	
			:				° .	° .			-			☐ ☐	
			:				° .	° .			-			☐ ☐	

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Notes:

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event 104: forgot to log when it happened → sorry it is out of order. One tritium (^3H) sample for CNL from the loop.