

DAILY SCIENCE LOG BOOK

MISSION
NUMBER

2025-001

DATE:

From: 28 February 2025

To: 15 March 2025

VESSEL:

CCGS Sir Wilfrid Laurier

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: FREDERIC HAMILTON First Officer: DAVID TAYLOR

Second Officer: PAIGE HARRISON Third Officer: KATHERINE JOHNS

Fishing Master: _____ Chief Engineer: BRETT WILLIAMS

Mission Participants / Agencies:

DTG-TGS H02, VBC, VCSU

**** 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-NNNN>

MARIE	ROBERT	06-18	516
MOIRA	GALBRAITH	12-24	612
KYLE	SIMPSON	12-24	510
DENIZ	COSKUNER	12-24	609
GARRETT	SHARPE	12-24	647
CHLOE	IMMONEN	00-12	512
MARK	BELTON	00-12	647
DANIELLE	CALDER	00-12	609
KAILER	CLARKE	00-12	612

**** 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 ThinkPad TP2023-04 Dundas

Data acquisition program: Seasave VT

CTD deck unit make: SBE model: SBE II serial number: 0619

Primary CTD

Make: SBE model: 90 serial number: 0585

Primary temperature serial number: 3-2449

Primary conductivity serial number: 4-1764

Secondary temperature serial number: 3-4484

Secondary conductivity serial number: 4-2128

Transmissometer: Wetlabs Model: C-star serial: 1185DR - light broke ad P12

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

Fluorometer: Model Wetlabs ECO Cable gain: — serial: 2216 P, S or NO pump?

Fluorometer: Model — Cable gain: — serial: — P, S or NO pump?

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

PAR sensor: Biospherical Model: QSP-2350 serial: 70614 Surface PAR? Y / N

Other sensors: Valport altimeter serial: 78171 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: — model: — serial number: —

Primary temperature serial number: —

Primary conductivity serial number: —

Secondary temperature serial number: —

Secondary conductivity serial number: —

Transmissometer: — Model: — serial: —

Transmissometer: — Model: — serial: —

Fluorometer: Model — Cable gain: — serial: — P, S or NO pump?

Fluorometer: Model — Cable gain: — serial: — P, S or NO pump?

Oxygen sensor: — Model: — serial: — P, S or NO pump?

PAR sensor: — Model: — serial: — Surface PAR? Y / N

Other sensors: — serial: — 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: General Oceanics, ocean test equipment
Volume of bottles (litres): 10

Rosette/Niskin Bottle Serial Numbers:

- 1: 2016-10-08 2: 2016-10-07 3: 2016-10-06 4: 2016-10-07 5: 2016-10-08
- 6: 2016-10-08 7: 2016-10-09 8: 2016-10-09 9: 2016-10-09 10: 2016-10-09
- 11: 2016-10-09 12: 2016-10-10 13: 2016-10-11 14: 2016-10-11 15: 2016-10-11
- 16: 2016-10-12 17: 2016-10-13 18: 2016-10-13 19: 2016-10-14 20: 2016-10-15
- 21: 2016-10-16 22: 2016-10-16 23: 2016-10-17 24: 2016-10-17

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

Winches:

- 1. Make: HAWBOLDT Model: Serial #: 17024 Used for: CTD / Rosette
- 2. Make: HAWBOLDT Model: Serial #: 107601 Used for: TRAMP METALS
- 3. Make: SWANN Model: 329 Serial #: 1482 Used for: BONNOS

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

ISSUES WITH THE WINCH D16 PHASE AND COUNTER

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 #: brady #2, brother
- Secondary Printer Kit #:
- Software Version:

Thermosalinograph System (SBE21/45):

- Program: SEASAVE Version: 7
- Sampling interval (seconds):
- TSG serial number: 21-3274 + 38-0271
- Fluorometer sensor serial number: 565 3797

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

ADCP Setup:

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

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: silver Sensors:

Others:

Plankton Nets:

Bongo/SCOR #1

Frame Size: cm

Mesh: 236 μm

Flowmeter: 7277

Bongo/SCOR #2

Frame Size: cm

Mesh: μm

Flowmeter: μm

Frame Size: cm

Mesh: μm

Flowmeter: μm

Frame Size: cm

Mesh: μm

Flowmeter: μm

Multinet ☐ BIONESS ☐ Neuston ☐ Others:

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:

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FOR THIS CRUISE

THE ROSETTE WAS LOWERED DIRECTLY TO 10m

PUMPS ON FOR ~30 SECS

THEN ROSETTE UP TO ~3-4m, WHERE ARCHIVING WAS STARTED.

ROSETTES WITH OXY SAMPLING: NISKIN ^{FLUSH/}SOAK TIMES 60s FROM 400 dbar INCL → SURFACE
ALL OTHER NISKINS / CASTS: 30s SOAK/TIME.
FLUSH

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month <u>March</u>			Year <u>2025</u>			Vessel <u>Laurier</u>			Cruise ID <u>2025-001</u>						
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
1	test	1	19:35	BE	ROS	US	48° 20.065	123° 27.802	99		—	24	CI	☒ ☒	test firing on the fly
			19:37	BO			48° 20.063	123° 27.814		93	-			☐ ☐	asc ent
			19:39	EN			48° 20.063	123° 27.843			-			☐ ☐	
2	TEST	1	21:19	BE	NET	—	48° 20.11	123° 27.73	104		—	—	MG	☐ ☐	Bongo VNH
			21:25	BO			48° 20.14	123° 27.73	106	95	-			☐ ☐	
			21:27	EN			48° 20.16	123° 27.72			-			☐ ☐	
3	JF1	1	22:15	BE	LOOP	—	48° 15.99	123° 30.30	?		-	—	DCO	☐ ☐	SAL, NOT, 2xCHL
4	JF2	2	00:20	BE	LOOP	—	48° 18.04	124° 00.08	?		-	—	DCO	☐ ☐	SAL, NOT, 2xCHL
5	JF3	2	02:25	BE	LOOP	—	48° 27.01	124° 30.026	?		—	—	MG	☐ ☐	ISAL INET 2CHL
6	JF4	2	04:18	BE	LOOP	—	48° 32.316	125° 00.026	?		—	—	MG	☐ ☐	ISAL INET 2CHL
7	P1	2	06:30	BE	ROS	US	48° 34.13	125° 30.32	135	125	1 - 4	4	MG	☒ ☒	STOPPED @ 97 NO DEPTH USING ALT
			06:42	BO			° 34.72	° 30.54			-			☐ ☐	
			06:51	EN			° 34.79	° 30.75			-			☐ ☐	
8	P2	2	09:15	BE	NET	—	48° 36.076	125° 59.936	114		—	—	MB	☐ ☐	Bongo VNH
			09:20	BO			° 36.093	° 59.974		104	-			☐ ☐	Loop removed from frame
			09:22	EN			° 36.105	° 59.993			-			☐ ☐	
9	P2	2	09:46	BE	ROS	US	48° 36.022	126° 0.09	119		5 - 17	13	CI	☒ ☒	
			09:49	BO			° 36.018	° 0.12		110	-			☐ ☐	
			10:07	EN			° 36.016	° 0.271			-			☐ ☐	

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
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EVENT 7 @ 90 STOPPED NO DEPTH READING FLUXATING 18M → 140M
ALARM WENT OFF @ 97 STOPPED UP TRYING TO FIX IN 5 MINUTES - TENSION WAS SET TO ALARM @ 100 ALL CLEARED

EVENT 9: new DIC pipette & headspace marker (part of sample tube).
trouble w/ POC & CDM filter. had to use extra TM opti cap

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Month <u>March</u>				Year <u>2025</u>			Vessel <u>Lawrie</u>			Cruise ID <u>2025-001</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
10	P3	3	11:52	BE	ROS	US	48° 37.5	126° 20.108	823		18 - 18	1	CT	☒ ☒	
			12:06	BO			° 37.472	° 20.188		820	-			☐ ☐	
			12:22	EN			° 37.42	° 20.242			-			☐ ☐	
11	P4	3	13:56	BE	NET	/	48° 38.952	126° 40.064	1358		-	-	MB	☐ ☐	Bongo VNH
			14:07	BO			48° 38.955	126° 40.16		250	-			☐ ☐	
			14:11	EN			48° 38.95	126° 40.21			-			☐ ☐	→
12	P4	3	14:46	BE	NET	-	48° 39.039	126° 40.043	1343		-		MB	☐ ☐	Bongo VNH
			15:32	BO			° 39.05	° 40.022		1200	-			☐ ☐	
			15:53	EN			° 39.06	° 39.921			-			☐ ☐	tank break after bongo
13	P4	3	16:38	BE	ROS	US	48° 39.141	126° 40.046	1322	150	19 - 27	9	CT	☒ ☒	HPLC
			16:41	BO			° 39.142	° 40.025		150	-			☐ ☐	
			16:54	EN			° 39.16	° 39.996			-			☐ ☐	
14	P4	3	18:11	BE	ROS	US	48° 38.979	126° 39.952	1345		28 - 46	19	CT	☒ ☒	deep
			18:33	BO			° 38.902	° 39.604		1316	-			☐ ☐	
			19:19	EN			° 38.755	° 38.819			-			☐ ☐	
15	P4	3	20:09	BE	BOT	MR	48° 38.99	126° 39.90	1347		-		PC/KS	☐ ☐	TC
			21:07	BO			° 38.44	° 39.68		800	47 - 56			☐ ☐	ABORTED
			:	MR			° .	° .			-			☐ ☐	WINCH COUNTER NOT
			:	EN			° .	° .			-			☐ ☐	WORKING, SHIP CONTACTED

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EVENT 11 BETWEEN 250 m AND 1200 m BONGOS R Pt. DELAY TO FIX WINCH ~0620-0645
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DAILY SCIENCE LOG

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Month				Year			Vessel			Cruise ID					
MARCH				2025			LAURIER			2025-001					
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							
16	P5	03	00:19	BE	ROS	US	48° 41.25	127° 09.963	2124		57	1	MG	☒ ☒	
			00:49	BO			° 41.25	° 09.88		2005	-			☐ ☐	
			01:25	EN			48° 41.15	127° 09.94			-			☐ ☐	Called for weather
17	P7	03	08:29	BE	ROS	US	48° 46.6	128° 9.812	2536		58	1	CI	☒ ☒	
			01:03	BO			° 46.588	° 9.454		2005	-			☐ ☐	loop sample 5017
			09:39	EN			° 46.552	° 9.1			-			☐ ☐	
18	P8	03	12:22	BE	NET	-	48° 46.928	128° 39.516	2550	250	-	-	MB	☐ ☐	bongo UNH
			12:33	BO			° 46.86	° 39.467		250	-			☐ ☐	
			12:36	EN			° 46.852	° 39.47			-			☐ ☐	
19	P8	03	12:53	BE	NET	/	48° 48.864	128° 39.636	2550		-	-	MB	☐ ☐	bongo UNH
			13:40	BO			° 48.563	° 39.628		1200	-			☐ ☐	
			14:01	EN			° 48.427	° 39.642			-			☐ ☐	
20	P8	03	14:24	BE	ROS	US	48° 48.984	128° 39.978	2550		59 - 82	24	CI	☒ ☒	.
			14:58	BO			° 48.941	° 39.932		2005	-			☐ ☐	
			16:00	EN			° 48.626	° 39.254			-			☐ ☐	
21	P9	03	18:36	BE	ROS	US	48° 51.4	129° 10.021	2382		83	1	CI	☒ ☒	Loop Sample 5021
			19:10	BO			° 51.292	° 9.844		2005	-			☐ ☐	→
			19:46	EN			° 51.204	° 09.733			-			☐ ☐	
			:				° .	° .			-			☐ ☐	

Event Type:

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DRF = Drifter
___ =

Bottle Firing Method:

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

Time Code:

BE = Beginning 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: _____

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This page is for any notes or observations

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event #21 → small salinity spike around 1450 db on downcast



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Ocean Sciences Division, Institute of Ocean Sciences

Month <i>March</i>				Year <i>2025</i>			Vessel <i>Laurier</i>			Cruise ID <i>2025-001</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
							Latitude	Longitude							
<i>22</i>	<i>P10</i>	<i>03</i>	<i>22:10</i>	<i>BE</i>	<i>ROS</i>	<i>US</i>	<i>48° 53.63</i>	<i>129° 39.99</i>	<i>2673</i>		<i>84</i>	<i>1</i>	<i>MG</i>	☒ ☒	<i>#2 SAL - 0.006 DIF</i>
			<i>22:47</i>	<i>BO</i>			<i>° 53.77</i>	<i>° 39.89</i>		<i>2005</i>	<i>-</i>			☐ ☐	
			<i>23:26</i>	<i>EN</i>			<i>° 54.04</i>	<i>° 39.71</i>			<i>-</i>			☐ ☐	
<i>23</i>	<i>P11</i>	<i>04</i>	<i>02:00</i>	<i>BE</i>	<i>ROS</i>	<i>US</i>	<i>48° 56.14</i>	<i>130° 10.10</i>	<i>2786</i>		<i>85</i>	<i>1</i>	<i>MG</i>	☐ ☐	<i>loop 5023 SAL 20HL</i>
			<i>02:35</i>	<i>BO</i>			<i>° 56.38</i>	<i>° 10.19</i>		<i>2005</i>	<i>-</i>			☐ ☐	
			<i>03:12</i>	<i>EN</i>			<i>° 56.55</i>	<i>° 10.28</i>			<i>-</i>			☐ ☐	
<i>24</i>	<i>P12</i>	<i>04</i>	<i>05:46</i>	<i>BE</i>	<i>BOT</i>	<i>MR</i>	<i>48° 58.11</i>	<i>130° 39.63</i>	<i>3231</i>		<i>86-95</i>	<i>10</i>	<i>DC/KS</i>	☐ ☐	<i>TM</i>
			<i>06:36</i>	<i>BO</i>			<i>° 58.25</i>	<i>° 39.28</i>		<i>800</i>	<i>-</i>			☐ ☐	
			<i>06:37</i>	<i>MR</i>			<i>° 58.26</i>	<i>° 39.28</i>			<i>-</i>			☐ ☐	
			<i>07:30</i>	<i>EN</i>			<i>° 58.43</i>	<i>° 39.06</i>			<i>-</i>			☐ ☐	
<i>25</i>	<i>P12</i>	<i>04</i>	<i>08:07</i>	<i>BE</i>	<i>ROS</i>	<i>US</i>	<i>48° 58.221</i>	<i>130° 39.61</i>	<i>3227</i>		<i>96-104</i>	<i>9</i>	<i>CJ</i>	☒ ☒	<i>HPIC, Paraff (deep) dark</i>
			<i>08:10</i>	<i>BO</i>			<i>° 58.217</i>	<i>° 39.63</i>		<i>150</i>	<i>-</i>			☐ ☐	
			<i>08:19</i>	<i>EN</i>			<i>° 58.19</i>	<i>° 39.738</i>			<i>-</i>			☐ ☐	
<i>26</i>	<i>P12</i>	<i>04</i>	<i>08:37</i>	<i>BE</i>	<i>NET</i>	<i>-</i>	<i>48° 58.247</i>	<i>130° 39.776</i>	<i>3237</i>		<i>-</i>	<i>-</i>	<i>MB</i>	☐ ☐	<i>bongo VNH</i>
			<i>08:48</i>	<i>BO</i>			<i>° 58.303</i>	<i>° 39.728</i>		<i>250</i>	<i>-</i>			☐ ☐	
			<i>08:52</i>	<i>EN</i>			<i>° 58.321</i>	<i>° 39.728</i>			<i>-</i>			☐ ☐	
<i>27</i>	<i>P12</i>	<i>04</i>	<i>09:21</i>	<i>BE</i>	<i>NET</i>	<i>-</i>	<i>48° 58.01</i>	<i>130° 40.404</i>	<i>3390</i>		<i>-</i>	<i>-</i>	<i>MB</i>	☐ ☐	<i>bongo VNH</i>
			<i>10:07</i>	<i>BO</i>			<i>° 58.354</i>	<i>° 40.608</i>		<i>1200</i>	<i>-</i>			☐ ☐	
			<i>10:28</i>	<i>EN</i>			<i>° 58.548</i>	<i>° 40.498</i>			<i>-</i>			☐ ☐	

Event Type:

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SET = Fish Set

LOOP = Sea Water Loop
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Bottle Firing Method:

US = Up / Stop (default)
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Time Code:

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Notes:

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EVENT 23 WINCH HAS A PROBLEM AT BLOCK, TIME DELAY TO FIX ~ 20 MIN

event 27 : lost end of red codend (broke off). only got formalin side

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Month <u>March</u>				Year <u>2025</u>			Vessel <u>Lawrier</u>				Cruise ID <u>2025-001</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							
28	P12	4	11:10	BE	ROS	US	48°58.478	130°39.737	3227		105-128	24	CI	☒ ☒	PAR off - deep
			12:05	BO			°58.559	°40.456		3274	-			☐ ☐	DO fuzzy at depth
			13:30	EN			°58.582	°41.512			-			☐ ☐	
29	P13	4	18:48	BE	ROS	US	49°2.706	131°39.673	3035		129-	1	CI/MG	☒ ☒	loop 5029
			19:24	BO			°02.97	°39.10		2005	-			☐ ☐	1st 2CHL
			20:01	EN			°02.19	°38.73			-			☐ ☐	
30	P14	5	00:54	BE	ROS	US	49°07.40	132°39.87	3306		130-153	24	MG	☐ ☐	SALINITY PROFILE
			01:52	BO			°07.59	°39.72		3359	-			☐ ☐	+ CDOM + DOC
			03:31	EN			°08.23	°39.36			-			☐ ☐	P3359 A 10 33308
31	P15	5	08:36	BE	ROS	US	49°12.024	133°39.991	3687		154-	1	CI	☒ ☒	cleaned DO connector
			09:10	BO			°12.148	°39.984		2005	-			☐ ☐	before cast. no par - dark
			09:46	EN			°12.298	°39.957			-			☐ ☐	2nd DO
32	P16	5	14:52	BE	ROS	US	49°16.995	134°39.741	3623		155-178	24	CI	☒ ☒	no PAR - deep
			15:58	BO			°17.433	°39.106		3684	-			☐ ☐	2600b DO spike 33603
			17:34	EN			°18.052	°38.168			-			☐ ☐	36009, 3100+, 860+
33	P16	5	17:49	BE	NET	—	49°17.95	134°38.27	3621		—	—	CI	☐ ☐	bongovNH
			17:59	BO			49°17.95	134°38.10		250	-			☐ ☐	
			18:04	EN			49°17.96	134°38.06			-			☐ ☐	
			:				°	°			-			☐ ☐	

Event Type:

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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
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EN = End Time of Cast

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

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REPLACEMENT DUMMY

after event 28 - ⁴³SBE-0647 SECONDARY DO ON PAR TABLE/CHANNEL TO BE USED ON DEEP CAST, NOT CHANGING CONF FILE

event 32. missed 400m, had to go back down

after event 32. clean both ends of DO, ^{red}trans, green trans, PAR back on for HPLC

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month <u>MARCH</u>			Year <u>2025</u>			Vessel <u>LAURIER</u>			Cruise ID <u>2025-001</u>						
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
34	P16	5	18:19	BE	NET		49° 17.57	134° 38.99	3621		/		MB	☐ ☐	Deep Bongo
			19:05	BO			49° 17.35	134° 38.57		1200	-			☐ ☐	LATE IN C-BOOK CORRECTED TO WRITTEN
			19:26	EN			49° 17.29	134° 38.336			-			☐ ☐	
35	P16	5	20:26	BE	ROS	US	49° 16.99	134° 39.73	3614		179-187	9	MG	☒ ☒	HPLC, PARON
			20:30	BO			° .	° .		150	-			☐ ☐	missed bottom
			20:41	EN			° 17.016	° 39.608			-			☐ ☐	COORDINATES. RED PAR FLOODED →
36	P16	5	21:06	BE	BOT	MR	49° 17.002	134° 39.916	3614		188-197	10	DC/KS	☐ ☐	
			21:55	BO			49° 16.90	134° 39.60		800	-			☐ ☐	
			21:56	MR			49° 16.90	134° 39.59			-			☐ ☐	
			22:12	BE			49° 16.87	134° 39.44			-			☐ ☐	START COMING UP
			22:51	EN			49° 16.81	134° 39.17			-			☐ ☐	
37	P17	6	03:43	BE	ROS	US	49° 21.08	135° 40.01	3640		198	1	MG	☐ ☐	LOOP 5037 1SAL 2CHL
			04:14	BO			° 21.19	° 40.08		2005	-			☐ ☐	NOT TAKEN
			04:51	EN			° 21.27	° 40.22			-			☐ ☐	
38	loop 38	6	06:07	BE	LOOP	/	49° 22.32	135° 53.93	3854	-	/	/	MG	☐ ☐	1SAL 2CHL
39	P18	6	09:17	BE	ROS	US	49° 26.076	136° 39.905	3809		199-222	24	CI	☒ ☒	PAR OFF, cleaned alt.
			10:22	BO			° 26.596	° 39.546		3892	-			☐ ☐	connectors prior to cast
			11:48	EN			° 27.009	° 39.674			-			☐ ☐	bottles 13, 19, 23
			:				° .	° .			-			☐ ☐	leaky. failed spigot here

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between vents 34 & 35, put PAR back on, cleaned both DO connectors, cleaned all transmissometer connectors, found Red trans flooded & no light on.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month March				Year 2025			Vessel Laurier			Cruise ID 2025-001					
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							
40	loop 40	6	13:07	BE	LOOP	-	49° 27.216	136° 57.347	3951	5?	5040	-	MB	☐ ☐	1 sal, 2chl
41	P19	6	16:20	BE	ROS	US	49° 30.014	137° 39.927	3913		223 -	1	CI	☒ ☒	loop 5041 - 1 sal, 2chl
			16:55	BO			49° 30.293	137° 39.65		2005	-			☐ ☐	
			17:31	EN			° 30.603	° 39.467			-			☐ ☐	
42	Loop 42	6	20:20	BE	LOOP	-	49° 32.59	138° 18.02	3960	-	5042	-	MG	☐ ☐	1SAL 2CHL
43	P26	6	22:29	BE	BOT	MR	49° 34.055	138° 39.98	3937	800	224-233	10	KS	☐ ☐	TM →
			23:17	MR			° 34.14	° 39.77		800	-			☐ ☐	
			23:33	BE			° 34.19	° 39.63			-			☐ ☐	Start coming up
		7	00:07	EN			° 34.34	° 38.28			-			☐ ☐	
44	P20	7	00:32	BE	ROS	US	49° 34.16	138° 39.52	3939		234-257	24	MG	☒ ☒	PAR OFF
			01:45	BO			° 34.33	° 39.61		4025	-			☐ ☐	4025 P A410.6 3938 S
			03:28	EN			° 34.91	° 40.23			-			☐ ☐	Next He tapped ship on deployment (no damage)
45	Loop 45	7	08:27	BE	LOOP	-	49° 36.338	139° 18.414	3849	5	5045	-	CI	☐ ☐	1 sal, 2 chl
46	P21	7	10:44	BE	ROS	-	49° 38.156	139° 40.129	3930	250	258 -	1	CI	☒ ☒	loop 5046 1sal, 2chl
			11:19	BO			° 38.360	° 40.662		2005	-			☐ ☐	par off (dark)
			11:54	EN			° 38.572	° 39.875			-			☐ ☐	
47	P22	7	17:54	BE	ROS	US	49° 42.011	140° 39.961	4096	←?	259-282	24	CI	☒ ☒	par off (deep)
			19:00	BO			° 42.156	° 39.960	? →	3958	-			☐ ☐	BOT 23 SPGOT GOOD
			20:39	EN			° 42.805	° 39.82			-			☐ ☐	PAR ON

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Notes:

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EVENT 43 0239 REDEPLOY
BACK TO SURFACE TO ADD RBR TO WEIGHTS + ZERO WINCH FOR SURFACE
ADD IN 50KG WEIGHT

→ EVENT 44 NO BONGO GUSTING TO 45 WITH CROSS BEAM WAVES

DAILY SCIENCE LOG

Month			Year			Vessel			Cruise ID						
MARCH			2025			LAURIER			2025-001						
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
48	LOOP 48	7	21:42	BE	LOOP	/	49° 43.12	140° 50.84	3973	/	5048	/	MG	☐ ☐	1sal 2chl loop 5048
49	P23	8	02:07	BE	ROS	US	49° 46.10	141° 39.96	4054		283-287	5	MG	☐ ☐	DWR SALT CALIB WATER
			02:38	BO			° 46.22	° 40.00		2005	-			☐ ☐	
			03:15	EN			° 46.39	° 39.96			-			☐ ☐	
50	P24	8	09:01	BE	ROS	US	49° 50.202	142° 40.185	3958		288-311	24	CI	☒ ☒	PAR off (deep). bucket on
			10:10	BO			° 50.552	° 39.903	3958	4050	-			☐ ☐	
			11:38	EN			° 50.821	° 39.366			-			☐ ☐	
51	LOOP 51	8	12:29	BE	LOOP	/	49° 51.825	142° 47.02			5051	-	MB	☐ ☐	1 sal, 2chl
52	P25	8	17:16	BE	ROS	US	50° 0.037	143° 36.082	4111		312	1	CI	☒ ☒	loop 5052 1sal 2chl
			17:50	BO			° 0.185	° 35.871		2005	-			☐ ☐	PAR ON
			18:26	EN			° 0.191	° 35.766			-			☐ ☐	
53	LOOP 53	8	19:49	BE	LOOP	/	49° 59.94	143° 48.76	4013		5053	/	MG	☐ ☐	1 SAL 2chl
54	P35	8	22:50	BE	ROS	US	49° 59.94	144° 18.08	4117		313	1	MG	☒ ☒	PAR ON
			23:27	BO			° 59.91	° 18.18		2005	-			☐ ☐	
		9	00:12	EN			° 59.90	° 18.32			-			☐ ☐	
55	P26	9	04:05	BE	BOT	MR	50° 00.21	144° 59.94	4213		314-320	7	KS	☐ ☐	TM
			04:26	MR			° 00.17	° 58.86			-			☐ ☐	
			04:36	BE			° 00.16	° 59.82			-			☐ ☐	
			04:55	EN			° 00.11	° 59.72			-			☐ ☐	

Event Type:

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Notes: _____

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DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month			Year			Vessel			Cruise ID						
MARCH			2025			LAURIER			2025-601						
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							
56	P26	9	05:29	BE	ROS	US	49° 59.89	145° 06.27	4215		321-344	24	MC/CI	☒ ☒	DEEP PAR OFF
			06:48	BO			° 59.99	° 00.01		4317	-			☐ ☐	54216 ALT 9 → P4317
			08:39	EN			50° 0.19	144° 59.706			-			☐ ☐	
57	P26	9	09:35	BE	NET	✓	° 0.224	° 59.863	4202		✓	✓	MB	☐ ☐	bongo VNH
			09:45	BO			° 0.202	° 59.834		250	-			☐ ☐	
			09:49	EN			° 0.182	° 59.805			-			☐ ☐	
58	P26	9	10:04	BE	NET	✓	50° 0.246	144° 59.846	4213		-		MB	☐ ☐	bongo VNH
			10:52	BO			° 0.12	° 59.542		1200	-			☐ ☐	
			11:13	EN			° 0.062	° 59.425			-			☐ ☐	
59	P26	9	12:49	BE	BOT	MR	49° 59.954	144° 59.822	4214		345-350	6	DC	☐ ☐	ALP (Go-FLA)
			12:37	BO			49° 59.876	144° 59.558		1655	-			☐ ☐	TM
			12:38	MR			49° 59.875	144° 59.557			-			☐ ☐	
			13:40	EN			49° 59.861	144° 59.367			351-362-12			☐ ☐	
60	P26	9	13:54	BE	RO	US	49° 59.857	144° 59.491	4214		351-362	12	CI	☒ ☒	PAR ON
			13:57	BO			° 59.868	° 59.498		150	-			☐ ☐	
			14:08	EN			° 59.927	° 59.475			-			☐ ☐	
61	LOOP61	9	17:24	BE	LOOP	✓	50° 0.357	144° 8.159	4210	5	5061	✓	CI	☐ ☐	15AL, 2 CHL
62	LOOP62	9	21:16	BE	LOOP	✓	50° 00.19	143° 05.18	4260		5062	✓	MC	☐ ☐	15AL 2 CHL
63	LOOP63	9	04:33	BE	LOOP	✓	50° 00.14	141° 05.78	3928?		5063	✓	MC	☐ ☐	15AL 2 CHL

Event Type:

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Loop Firing Method:

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NET = Plankton Net Haul
DRF = Drifter
=

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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EVENT 56

ALARM WENT OFF @ 4100 AND CONTINUES SOMETHING IN SHIP'S EQUIPMENT - SCANTROL TC400 ALARMED
SAT FOR ~ 5 MIN

GOING TO 3000 @ 2900 WENT BACK TO 3000 TO TRIP BOTTLE

event 56 possible contamination in rosette bottles from carbon steel that was in shrinky cup bucket →
residue on metal could be sulphates? could be iron?

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month				Year		Vessel		Cruise ID							
MARCH				2025		LAURIER		2025-001							
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							
64	Loop 64	10	08:06	BE	LOOP	-	49°59.818	140°07.126	3963	5	5064	-	CI	☐ ☐	1 sal, 2 chl
65	Loop 65		13:36	BE	LOOP	-	49°59.132	138°37.588	3886	5	5065	-	MB	☐ ☐	1 SAL, 2 CHL
66	Loop 66	10	20:46	BE	LOOP	-	50°05.54	136°38.06	3719		5066	-	MG	☐ ☐	1 SAL 2 CHL
67	loop 67	11	08:46	BE	loop	-	50°32.984	133°26.922	3886	5	5067	-	CI	☐ ☐	1 sal, 2 chl
68	Loop 68	11	13:31	BE	LOOP	-	50°43.825	132°10.454	3788	5	5068	-	CI	☐ ☐	1 sal, 2 chl
69	Loop 69	11	19:19	BE	LOOP	-	50°58.56	130°32.99	2302		5069	-	MG	☐ ☐	1 SAL 2 CHL
70	Scot #2	11	23:30	BE	ROS	US	51°08.03	129°29.27	283		363-375	13	MG	☒ ☒	oxy spike @ 70m ↓
71			23:40	BO			°08.12	°29.27		277	-			☐ ☐	RESTRAT @ 200 ↑ →
71		12	00:11	EN			°08.33	°29.43			-			☐ ☐	
72	Scot #2	12	00:31	BE	NET	-	51°08.48	129°29.61	283		-	-	MG	☐ ☐	
			00:49	BO			51°08.58	129°29.61		250	-			☐ ☐	
			00:54	EN			51°08.60	129°29.60			-			☐ ☐	
73	C104	12	03:02	BE	ROS	✓	51°19.26	129°02.95	258		-	-	MG	☒ ☒	
			03:08				°19.33	°02.98			-			☐ ☐	
			03:13				°19.39	°02.99			-			☐ ☐	
74	CSD9	12	05:48	BE	ROS	US	51°12.42	128°28.01	196		376-385	10	MG	☐ ☐	
			05:53	BO			°12.42	°28.01			-			☐ ☐	
			06:16	EN			°12.33	°27.80			-			☐ ☐	
			:				°	°			-			☐ ☐	

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EVENT 70 + 71

SALINITY CONSISTENTLY -0.009 TO -0.010

PROGRAM CRASH @ 200 M ON THE WAY UP 71 REPRESENTS UPEAST FROM THERE

70 IS THE DOWN CAST PLUS BOTTOM UPTO 200

NISKINS 1-3 in File 70, NISKINS 4-13 in RL 71

File 0071: STATION NAME SHOULD BE SC072, NOT CS09.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month March				Year 2025			Vessel Lawrrier				Cruise ID 2025-001					
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	
75	CS09	12	06:33	BE	NET	—	51° 12.441	128° 28.028	195		—	—	MG	☐ ☐	bongo VNH	
			06:41	BO			° 12.385	° 28.012		185	-			☐ ☐		
			06:46	EN			° 12.383	° 28.013			-			☐ ☐		
76	CPE1	12	09:44	BE	ROS	—	51° 0.052	127° 49.812	156		—	—	CI	☒ ☒	logged wrong depth	
			09:47	BO			° 0.056	° 49.828		147	-			☐ ☐	in seascave file	
			09:50	EN			° 0.064	° 49.849			-			☐ ☐		
77	CPE1	12	10:00	BE	NET	—	51° 0.08	127° 49.899	146		—	—	MB	☐ ☐	bongo VNH	
			10:05	BO			° 0.076	° 49.909		136	-			☐ ☐		
			10:07	EN			° 0.076	° 49.910			-			☐ ☐		
78	LBA-2	12	11:23	BE	ROS	—	50° 54.154	127° 38.49	443		—	—	CI	☒ ☒	logged wrong	
			11:31	BO			° 54.126	° 38.56		433	-			☐ ☐	depth in seascave file	
			11:39	EN			° 54.126	° 38.653			-			☐ ☐		
79	QCS3	12	14:00	BE	ROS	—	50° 43.928	127° 15.299	217		—	—	DC	☒ ☒		
			14:04	BO			° 43.928	° 15.348			-			☐ ☐		
			14:07	EN			° 43.928	° 15.354			-			☐ ☐		
80	QCS2	12	15:17	BE	ROS	—	50° 44.489	127° 2.653	130		—	—	CI	☒ ☒	depth wrong in seascave	
			15:20	BO			° 44.489	° 2.69		119	-			☐ ☐		
			15:22	EN			° 44.492	° 2.742			-			☐ ☐		
			:				° .	° .			-			☐ ☐		

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Version: 17 Feb 2020

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month March			Year 2025			Vessel Lavrier			Cruise ID 2025-001						
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							
81	QCS1	12	16:42	BE	ROS	/	50°40.138	126°46.273	158		/	/	CI	☒ ☒	
			16:45	BO			°40.193	°46.284		143	-			☐ ☐	
			16:49	EN			°40.239	°46.304			-			☐ ☐	
82	LOOP82	12	20:57	BE	LOOP	/	50°22.20	125°39.64	269		5082	/	MG	☐ ☐	ISAC 2ENL
83	14	13	02:04	BE	ROS	US	49°53.06	124°59.85	317		386-389	4	MG	☒ ☒	
			02:11	BO			°53.05	°59.82		310	-			☐ ☐	
			02:26	EN			°53.03	°59.83			-			☐ ☐	
84	14	13	02:28	BE	ROS	US	49°53.02	124°59.86	316		/	/	MG	☐ ☐	BONGO
			02:40	BO			°50.00	°59.89		310	-			☐ ☐	
			02:46	EN			°52.99	°59.94			-			☐ ☐	
85	12	13	04:48	BE	NET	/	49°43.67	124°40.83	359		-		MG	☐ ☐	BONGO
			05:10	BO			°43.75	°40.86		354	-			☐ ☐	
			05:17	EN			°43.77	°40.87			-			☐ ☐	
86	12	13	05:29	BE	ROS	US	49°43.74	124°40.92	353		390-405	16	MG	☐ ☐	CHITO
			05:35	BO			°43.72	°40.93		350	-			☐ ☐	
			06:06	EN			°43.70	°40.94			-			☐ ☐	
87	9	13	07:11	BE	ROS	US	49°35.468	124°38.309	187		406-409	4	CI	☒ ☒	
			07:14	BO			°35.452	°38.266		162	-			☐ ☐	
			07:21	EN			°35.435	°38.182			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
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MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter
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Bottle Firing Method:

US = Up / Stop (default)
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Notes:

Time Code:

BE = Beginning 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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88	6	13	08:24	BE	ROS	US	49° 30.659	124° 27.901	197		410-412	3	CI	☒ ☒	
			08:28	BO			° 30.654	° 27.864		186	-			☐ ☐	
			08:34	EN			° 30.664	° 27.808			-			☐ ☐	
89	CPF2	13	09:18	BE	ROS	/	49° 28.012	124° 30.063	326		/	/	CI	☒ ☒	
			09:24	BO			° 27.992	° 29.999		322	-			☐ ☐	
			09:30	EN			° 27.996	° 29.933			-			☐ ☐	
90	CPF2	13	09:40	BE	NET	/	49° 28.007	124° 29.86	326		/	/	MB	☐ ☐	bongo VNH
			09:53	BO			° 27.933	° 29.833		326	-			☐ ☐	
			09:58	EN			° 27.926	° 29.869			-			☐ ☐	
91	3	13	10:53	BE	ROS	US	49° 26.552	124° 20.106	324		413-416	4	KC	☒ ☒	
			10:59	BO			° 26.552	° 20.076		319	-			☐ ☐	
			11:07	EN			° 26.556	° 20.064			-			☐ ☐	
92	2	13	12:02	BE	ROS	US	49° 24.192	124° 9.498	280		417-419	3	KC	☒ ☒	
			12:07	BO			° 24.161	° 9.466		270	-			☐ ☐	
			12:15	EN			° 24.149	° 9.434			-			☐ ☐	
93	24	13	13:09	BE	ROS	US	49° 30.174	124° 5.952	433		420-423	4	CI	☒ ☒	
			13:17	BO			° 30.186	° 5.958		423	-			☐ ☐	
			13:27	EN			° 30.228	° 5.997			-			☐ ☐	
			:				°	°			-			☐ ☐	

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							Latitude	Longitude							
94	24	13	13:37	BE	NET	—	49°30.30	124°06.03	434		—	—	MB	☐ ☐	Bongo VNH
			13:53	BO			49°30.32	124°06.12		428	-			☐ ☐	
			14:01	EN			49°30.34	124°06.171			-			☐ ☐	
95	CPF1	13	15:12	BE	ROS	—	49°22.111	124°5.052	260		—	—	CI	☒ ☒	
			15:16	BO			°22.116	°5.034		243	-			☐ ☐	
			15:21	EN			°22.099	°5.022			-			☐ ☐	
96	CPF1	13	15:30	BE	NET	—	49°22.092	124°5.027	244		—	—	MB	☐ ☐	Bongo VNH
			15:40	BO			°22.064	°4.964	244		-			☐ ☐	
			15:44	EN			°22.046	°4.964			-			☐ ☐	
97	27	13	17:24	BE	ROS	US	49°19.221	123°47.883	360		424-426	3	CI	☒ ☒	
			17:31	BO			°19.202	°47.842		353	-			☐ ☐	
			17:40	EN			°19.138	°47.814			-			☐ ☐	
98	GE01	13	18:29	BE	ROS	US	49°14.861	123°44.735	400		427-434	8	CI	☒ ☒	CHITO
			18:37	BO			49°14.82	123°44.66		397	-			☐ ☐	
			18:55	EN			49°14.69	123°44.52			-			☐ ☐	
99	GE01	13	19:13	BE	NET	—	49°14.88	123°44.69	400		—	—	MG	☐ ☐	Bongo
			19:29	BO			49°14.80	123°44.64		395	-			☐ ☐	
			19:37	EN			49°14.80	123°44.65			-			☐ ☐	
			:				°	°			-			☐ ☐	

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MARCH			2025			LAURIER			2025-001						
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100	38	13	21:18	BE	ROS	/	49° 12.00	123° 26.44	307		-	/	MG	☒ ☒	
			21:25	BO			° 12.02	° 26.49		302	-			☐ ☐	
			21:31	EN			° 12.03	° 26.52			-			☐ ☐	
101	38	13	21:42	BE	NET	/	49° 12.04	123° 26.61	308		-		MG	☐ ☐	BONGO
			21:53	BO			° 12.03	° 26.64		302	-			☐ ☐	
			21:58	EN			° 12.04	° 26.67			-			☐ ☐	
102	39	13	22:44	BE	ROS	US	49° 09.87	123° 33.10	376		435-437	3	MG	☒ ☒	
			22:51	BO			° 09.89	° 33.14		373	-			☐ ☐	
			23:01	EN			° 09.94	° 33.21			-			☐ ☐	
103	40	13	23:33	BE	ROS	/	49° 08.64	123° 36.87	137		-	/	MG	☒ ☒	
			23:36	BO			° 08.66	° 36.87		132	-			☐ ☐	
			23:40	EN			° 08.69	° 36.88			-			☐ ☐	
104	40	13	23:50	BE	NET	/	49° 08.66	123° 36.81	140		-	/	MG	☐ ☐	BONGO
			23:54	BO			° 08.69	° 36.79		132	-			☐ ☐	
			23:58	EN			° 08.70	° 36.77			-			☐ ☐	
105	42	14	01:11	BE	NET	/	49° 01.84	123° 26.22	325		-	/	MG	☐ ☐	BONGO
			01:22	BO			° 01.83	° 26.23		320	-			☐ ☐	
			01:29	EN			° 01.83	° 26.23			-			☐ ☐	
			:				°	°			-			☐ ☐	

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106	42	14	01:46	BE	ROS	US	49° 01.85	123° 26.27	325		438-453	16	MG	☒ ☒	CHRG
			01:52	BO			° 01.85	° 26.82			-			☐ ☐	
			02:17	EN			° 01.91	° 26.25			-			☐ ☐	
107	Har059	14	07:47	BE	NET	✓	46° 37.004	123° 14.827	230		434-437	14	MB	☐ ☐	bangs V/NH
			07:55	BO			° 37.124	° 14.84		229	-			☐ ☐	
			07:59	EN			° 37.17	° 14.839			-			☐ ☐	
108	Har059	14	08:18	BE	ROS	US	48° 36.923	123° 14.81	233		454-467	14	CI	☒ ☒	
			08:22	BO			° 36.986	° 14.849		223 ⁴⁵	-			☐ ☐	
			08:43	EN			° 37.397	° 15.178			-			☐ ☐	
			:				°	°			-			☐ ☐	
			:				°	°			-			☐ ☐	
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