

DAILY SCIENCE LOG BOOK

MISSION
NUMBER

2019 - 044

DATE:

From:

29 APR 2019

To:

4 MAY 2019

VESSEL:

Neocaligus

PROJECT(S):

NEOCALIGUS CRUISE - SOG Zooplankton

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

WaterProperties.ca

**** 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: 334
Data acquisition program: Seatorm / SeaSave
CTD deck unit make: NA model: _____ serial number: _____

Primary CTD

Make: SBC model: 25 serial number: 33 (2509207-0334)
Primary temperature serial number: 4484
Primary conductivity serial number: 208
Secondary temperature serial number: _____
Secondary conductivity serial number: _____
Transmissometer: _____ Model: _____ s/n: _____
Transmissometer: _____ Model: _____ s/n: _____
Fluorometer: Model ECO FLUO-G4 Cable gain: _____ s/n: 2715 P, S or NO pump?
Fluorometer: Model _____ Cable gain: _____ s/n: _____ P, S or NO pump?
Oxygen sensor: SBC Model: 43 s/n: 1483 (P) S or NO pump?
PAR sensor: _____ Model: _____ s/n: _____ Surface PAR? Y / N
Other sensors: _____ s/n: _____ P, S or NO pump?
Other sensors: _____ s/n: _____ P, S or NO pump?
Other sensors: _____ s/n: _____ P, S or NO pump?
Other sensors: _____ s/n: _____ 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: _____ s/n: _____
Transmissometer: _____ Model: _____ s/n: _____
Fluorometer: Model _____ Cable gain: _____ s/n: _____ P, S or NO pump?
Fluorometer: Model _____ Cable gain: _____ s/n: _____ P, S or NO pump?
Oxygen sensor: _____ Model: _____ s/n: _____ P, S or NO pump?
PAR sensor: _____ Model: _____ s/n: _____ Surface PAR? Y / N
Other sensors: _____ s/n: _____ P, S or NO pump?
Other sensors: _____ s/n: _____ P, S or NO pump?
Other sensors: _____ s/n: _____ P, S or NO pump?
Other sensors: _____ s/n: _____ 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 (e.g., W.E. Ricker)

Rosette Setup:

Number of bottles: _____
Manufacturer: _____
Volume of bottles (litres): _____

Winches:

1. Make: _____ Model: _____ Serial #: _____ Used for: _____
2. Make: _____ Model: _____ Serial #: _____ Used for: _____
3. Make: _____ Model: _____ Serial #: _____ Used for: _____

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):

Oxygen Kit(s):

Make: _____ Model: _____ Kit Number: _____
Make: _____ Model: _____ Kit Number: _____
Comments on performance during cruise (comments should also be reflected in the post-cruise report):

Thermosalinograph System (SBE21):

Program: _____ Version: _____
Sampling interval (seconds): _____
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 #1 Frame Size: 50 cm Mesh: 236 μ m Flowmeter: TSK 7057
Bongo #2 Frame Size: _____ cm Mesh: _____ μ m Flowmeter: _____
Frame Size: _____ cm Mesh: _____ μ m Flowmeter: _____
Frame Size: _____ cm Mesh: _____ μ m Flowmeter: _____

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:

1. 5 L NISKENS
2. _____
3. _____
4. _____
5. _____

★ ALL TIMES LOCAL

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month <u>APRIL</u>				Year <u>2015</u>		Vessel <u>NEOCALIFUS</u>		Cruise ID							
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	GC01	29	14:50	BE	CTD	-	49° 14.985	123° 45.347	406		-	-	MB	☐ ☒	
			14:58	BO			° 14.945	° 45.153		396	-			☐ ☐	
			15:04	EN			° 14.925	° 45.041			-			☐ ☐	
2	GC01	29	15:12	BE	NET	-	49° 14.990	123° 45.370	406		-		MB	☐ ☐	
			15:25	BO			° 14.951	° 45.133		396	-			☐ ☐	
			15:32	EN			° 14.943	° 45.029			-			☐ ☐	
3	GC01	29	15:41	BE	BOT	MSC	49° 14.990	123° 45.352	406		1-8	8	MB	☐ ☐	
			15:57	BO			° 14.928	° 44.993		396	-			☐ ☐	
			16:11	EN			° 14.911	° 44.771			-			☐ ☐	
4	GC01	29	14:51	BE	BOT	POLE	49° 14.980	123° 45.341	406	SRE	9-	1	MB	☐ ☐	
5	40	29	17:45	BE	CTD	-	49° 08.599	123° 36.817	150		-	-	MB	☐ ☒	SRE BOTTLE OIL/HRC/POISON
			17:48	BO			° 08.582	° 36.771		140	-		MB	☐ ☐	
			17:51	EN			° 08.572	° 36.740			-			☐ ☐	
6	40	29	17:54	BE	NET	-	49° 08.605	123° 36.769	150		-		MB	☐ ☐	
			17:59	BO			° 08.595	° 36.737		140	-			☐ ☐	
			18:07	EN			° 08.585	° 36.712			-			☐ ☐	
7	39	30	07:59	BE	CTD	-	49° 09.762	123° 32.876	377		-	-	MB	☐ ☒	
			08:07	BO			° 09.739	° 32.731		367	-			☐ ☐	
			08:13	EN			° 09.693	° 32.557			-			☐ ☐	

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
EN = End Time of Cast

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

DE = Deployment Time
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RE = Recover Mooring Time

Notes:

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START OF 2015-044, TRAFFIC AND SLIGHT ENGINE PROBLEM WITH CAUSED ~ 45 MIN DELAY
LEFT PBS @ ~ 1400

SRE BOTTLE FIRED DURING CTD DEPLOYMENT

ANCHORED OFF OF EAST SIDE OF CARRIOLA

START OF DAY 2

DAILY SCIENCE LOG

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Month <u>APRIL</u>				Year <u>2019</u>			Vessel <u>NEOCALIGUS</u>			Cruise ID <u>2019-044</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
8	39	30	08:07	BE	BOT	MSG	49° 09.747	123° 32.783	377	Ø	10 -	1	MB	☐ ☐	
9	38	30	08:49	BE	CTD	-	49° 12.001	123° 26.424	308		-	-	MB	☐ ☒	
			08:54	BO			° 11.967	° 26.351		298	-			☐ ☐	
			08:59	EN			° 11.934	° 26.313			-			☐ ☐	
10	38	30	09:04	BE	NET	-	49° 12.005	123° 26.410	308		-	-	MB	☐ ☐	
			09:14	BO			° 11.935	° 26.315		292	-			☐ ☐	
			09:19	EN			° 11.902	° 26.272			-			☐ ☐	
11	27	30	11:12	BE	CTD	-	49° 19.105	123° 48.068	348		-	-	MB	☐ ☒	
			11:19	BO			° 19.089	° 47.996		338	-			☐ ☐	
			11:24	EN			° 19.073	° 47.933			-			☐ ☐	
12	27	30	11:14	BE	BOT	MSG	49° 19.101	123° 48.099	348	Ø	11 -	1	MB	☐ ☐	
13	28	30	12:16	BE	CTD	-	49° 24.123	123° 45.351	134		-	-	MB	☐ ☒	
			12:18	BO			° 24.127	° 45.340		124	-			☐ ☐	
			12:21	EN			° 24.131	° 45.327			-			☐ ☐	
14	28	30	12:15	BE	BOT		49° 24.120	123° 45.350	134	Ø	14 -	1	MB	☐ ☐	JUMPED A COUPLE NUMBERS
15	28	30	12:23	BE	NET	-	49° 24.143	123° 45.321	134		-	-	MB	☐ ☐	
			12:28	BO			° 24.148	° 45.301		124	-			☐ ☐	
			12:29	EN			° 24.156	° 45.296			-			☐ ☐	
			:				° .	° .			-			☐ ☐	

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This page is for any notes or observations

ACCIDENTLY EVENT # AS SAMPLE #, SO JUMPED A COUPLE SAMPLE NUMBERS HERE.

DAILY SCIENCE LOG

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Month <u>APRIL</u>			Year <u>2019</u>			Vessel <u>NEOCALIGUS</u>			Cruise ID <u>2019-044</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
6	24	30	14:18	BE	CTD	-	49° 30.344	124° 06.013	428		-	-	MR	☐ ☒	
			14:27	BO			° 30.303	° 06.007		418	-			☐ ☐	
			14:34	EW			° 30.244	° 05.984			-			☐ ☐	
17	24	30	14:40	BE	NET	-	49° 30.344	124° 06.021	428		-	-	MR	☐ ☐	
			14:53	BO			° 30.283	° 05.932		418	-			☐ ☐	
			15:01	EW			° 30.271	° 05.913			-			☐ ☐	
7	IS-2	30	15:58	BE	CTD	-	49° 38.198	124° 05.012	29		-	-	MR	☐ ☒	
			:58	BO			° 38.198	° 05.011		19	-			☐ ☐	
			:58	EW			° 38.198	° 05.011			-			☐ ☐	
19	IS-2	30	16:02	BE	NET	-	49° 38.185	124° 05.007	29		-	-	MR	☐ ☐	
			16:03	BO			° 38.181	° 05.000		19	-			☐ ☐	
			16:03	EW			° 38.178	° 05.001			-			☐ ☐	
8	22	30	17:00	BE	CTD		49° 40.168	124° 16.290	355		-			☐ ☒	
			17:07	BO			° 40.119	° 16.290		345	-			☐ ☐	
			17:13	EW			° 40.089	° 16.299			-			☐ ☐	
21	22	30	16:59	BE	BOT		49° 40.191	124° 16.283	355	Ø	12	1		☐ ☐	
22	22	30	17:19	BE	NET		49° 40.180	124° 16.342	355		-			☐ ☐	
			17:31	BO			° 40.103	° 16.370		345	-			☐ ☐	
			17:37	EW			° 40.082	° 16.379			-			☐ ☐	

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SPIKE IN Temp + SAL @ ~350m

FINISH DAY 2, ANCHORED UP MALASPENA STRAIT

DAILY SCIENCE LOG

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Month <u>MAY</u>				Year <u>2019</u>			Vessel <u>NOGOCALIGUS</u>			Cruise ID <u>2019-0441</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
✓ 23	20	1	8:01	BE	CTD	-	49° 47.202	124° 32.303	310		-	-	MB	☐ ☒	
			8:08	BO			° 47.171	° 32.256		300	-			☐ ☐	
			8:14	EN			° 47.136	° 32.222			-			☐ ☐	
✓ 24	12	1	9:36	BE	CTD	-	49° 43.602	124° 40.776	356		-			☐ ☒	
			9:43	BO			° 43.550	° 40.688		346	-			☐ ☐	
			9:50	EN			° 43.524	° 40.624			-			☐ ☐	
25	12	1	9:34	BE	BOT	MSG	49° 43.629	124° 40.808	356	Ø	13 -	1	MB	☐ ☐	
✓ 26	11	1	10:07	BE	CTD	-	49° 42.403	124° 43.423	301		-		MB	☐ ☒	
			10:13	BO			° 42.343	° 43.363		291	-			☐ ☐	
			10:18	EN			° 42.305	° 43.321			-			☐ ☐	
27	11	1	10:23	BE	NET	-	49° 42.414	124° 43.434	301		-		MB	☐ ☐	
			10:33	BO			° 42.347	° 43.347		291	-			☐ ☐	
			10:39	EN			° 42.327	° 43.310			-			☐ ☐	
✓ 28	9	1	11:31	BE	CTD	-	49° 35.458	124° 38.277	168		15 -	1	MB	☐ ☒	
			11:34	BO			° 35.434	° 38.273		158	-			☐ ☐	
			11:37	EN			° 35.406	° 38.233			-			☐ ☐	
29	9	1	11:31	BE	BOT	MSG	49° 35.458	124° 38.277	168	Ø	15 -	1	MB	☐ ☐	
			:				° .	° .			-			☐ ☐	
			:				° .	° .			-			☐ ☐	

Event Type:

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 =*

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START DAY 3: CALM + CLEAR

SEASAVE TAKING LONG TIME TO OPEN, FLASHING WHEN DISPLAYING ARCHIVED DATA?

PROFILE LOOKS BAD AFTER $\sim 260\text{m}$ ON DOWN CAST, PUMP SHUT OFF?

PROFILES LOOK FINE FOLLOWING THE ABOVE PROBLEM

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Month <u>MAY</u>				Year <u>2019</u>			Vessel <u>NEOALIGUS</u>			Cruise ID <u>2019-044</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
30	6	1	12:38	BC	CTD	-	49°30.607	124°27.790	192		-	-	MB	☐ ☒	
			12:42	BO			°30.586	°27.772		182	-			☐ ☐	
			12:45	CN			°30.573	°27.759			-			☐ ☐	
31	6		12:38	BC	BOT	MSG	49°30.607	124°27.796	192	Ø	16	1	MB	☐ ☐	
32	CPF2	1	13:08	BC	CTD		49°27.977	124°29.998	327		-			☐ ☒	
			13:15	BO			°27.938	°29.966		317	-			☐ ☐	
			13:20	CN			°27.920	°29.958			-			☐ ☐	
33	CPF2	1	13:25	BC	NET	-	49°28.000	124°29.976	328		-		MB	☐ ☐	
			13:36	BO			°27.922	°29.937		318	-			☐ ☐	
			13:42	CN			°27.919	°29.916			-			☐ ☐	
34	CPF2	1	13:49	BC	BOT	MSG	49°27.985	124°30.012	328		17-24	8	MB	☐ ☐	
			14:02	BO			°27.896	°29.987		318	-			☐ ☐	
			14:05	CN			°27.771	°29.963			-			☐ ☐	
35	CPF2	1	14:08	BC	BOT	MSG	49°27.987	124°30.006	327	Ø	25-	1	MB	☐ ☐	SRE. SESTON LEPIDS - MAT
36	BS-11	1	15:24	BC	CTD	-	49°28.980	124°46.041	59		-	-	MB	☐ ☒	
			15:25	BO			°28.983	°46.046		49	-			☐ ☐	
			15:26	CN			°28.985	°46.055			-			☐ ☐	
37	BS-11	1	15:23	BC	BOT	MSG	49°28.980	124°46.042	59	Ø	26-	1	MB	☐ ☐	
			:				°	°			-			☐ ☐	

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Month <u>MAY</u>				Year <u>2019</u>			Vessel <u>NEOCALTEGOS</u>			Cruise ID <u>2019-044</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
38	BS-11	1	15:30	BE	NET	-	49° 28.989	124° 45.972	59		-	-	MB	☐ ☐	
			15:32	BO			° 28.992	° 45.974		49	-			☐ ☐	
			15:33	EW			° 28.995	° 45.976			-			☐ ☐	
39	3	2	7:45	BE	CTD	-	49° 26.598	124° 20.260	324		-	-	MB	☐ ☒	
			7:52	BO			° 26.548	° 20.235		314	-			☐ ☐	
			7:58	EW			° 26.525	° 20.219			-			☐ ☐	
40	3	2	7:44	BE	BOT	MSG	49° 26.610	124° 20.266	324	Ø	27	1	MB	☐ ☐	
41	2	2	8:51	BE	CTD	MSG	49° 24.088	124° 9.303	278		-	-	MB	☐ ☒	
			8:57	BO			° 24.050	° 9.278		268	-			☐ ☐	
			9:01	EW			° 24.004	° 9.285			-			☐ ☐	
42	2	2	8:50	BE	BOT	MSG	49° 24.105	124° 9.312	278	Ø	28	1	MB	☐ ☐	
43	CPFI	2	9:27	BE	CTD	-	49° 21.974	124° 4.988	245		-	-	MB	☐ ☒	
			9:32	BO			° 21.974	° 4.964		235	-			☐ ☐	
			9:36	EW			° 21.904	° 4.938			-			☐ ☐	
44	CPFI	2	9:42	BE	NET	-	49° 21.998	124° 4.981	245		-	-	MB	☐ ☐	
			9:50	BO			° 21.936	° 4.939		235	-			☐ ☐	
			9:54	EW			° 21.909	° 4.910			-			☐ ☐	
			:				°	°			-			☐ ☐	
			:				°	°			-			☐ ☐	

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 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

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→ TIE UP @ FRENCH CREEK WED. NIGHT

DOWNLOADED ALL CANTS FOR THE DAY. UPGRADE FOR EVENT #26 LOOKED BAD,
ALL FOLLOWING CANTS LOOKED GOOD. REPLACED CTD BATTERIES ANYWAYS,
VOLTAGE NOW 13.7V.

→ START DAY 4: CALM & CLEAR

→ SPIKE IN SAGINITY @ ~ 220m SIN. 3

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month <u>MAY</u>			Year <u>2019</u>			Vessel <u>NEOCALIGOS</u>			Cruise ID <u>2019-044</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
19	45	108	2	13:35	BE	CTD	-	49° 04.401	123° 19.051	85	-	-	MB	☐ ☒	
				13:36	BO			° 04.408	° 19.008	75	-	-		☐ ☐	
				13:37	EN			° 04.428	° 19.101		-	-		☐ ☐	
20	46	41	2	13:58	BE	CTD	-	49° 03.313	123° 22.341	245	-	-	MB	☐ ☒	
				14:03	BO			° 03.352	° 22.417	235	-	-		☐ ☐	
				14:07	EN			° 03.387	° 22.487		-	-		☐ ☐	
	47	41	2	14:12	BE	NET	-	49° 03.294	123° 22.306	245	-	-	MB	☐ ☐	
				14:21	BO			° 03.305	° 22.453	235	-	-		☐ ☐	
				14:24	EN			° 03.400	° 22.510		-	-		☐ ☐	
21	48	42	2	14:52	BE	CTD	-	49° 01.820	123° 26.254	321	-	-	MB	☐ ☒	
				14:59	BO			° 01.863	° 26.363	311	-	-		☐ ☐	
				15:04	EN			° 01.899	° 26.491		-	-		☐ ☐	
	49	42	2	15:52	BE	BOT	MSG	49° 01.820	123° 26.254	321	29-	1	MB	☐ ☐	
22	50	46	2	16:48	BE	CTD	-	48° 51.401	123° 10.784	179	-	-	MB	☐ ☒	
				16:51	BO			° 51.424	° 10.767	169	-	-		☐ ☐	
				16:54	EN			° 51.439	° 10.754		-	-		☐ ☐	
	51	46	2	16:48	BE	BOT	MSG	48° 51.405	123° 10.780	179	30-	1	MB	☐ ☐	SRE SESTON LEPENS - MANT
	52	46	2	16:49	BE	BOT	MSG	48° 51.417	123° 10.772	179	31-	1	MB	☐ ☐	ONLY 14PLC + NJDS
				:				° .	° .		-	-		☐ ☐	

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:

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SPECK IN SALINITY @ ~230m SIN 42

