DAILY SCIENCE LOG BOOK

MISSION NUMBER: 2015-03

DATE: From: March 5 2015 to: March 12, 2015

VESSEL: VECTOR

PROJECT(S): WC- DC

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

WaterProperties.ca

Captain: ______ First Officer: ______
Second Officer: ______ Third Officer: ______
Fishing Master: ______

Mission Participants / Agencies: ______

Scientific Personnel: Chief Scientist: Svein Vagle. (D).

Name	Watch	Cabin	Name	Watch	Cabin
Charles Hannah	W				
Steve Lepage	N				
Lucius Perrault	D	D.			
Kenny Scozzafava	D	D			
Jody Klymak	D	D.			
Di Wan	N				
Cindy Wright	N				

Second leg of Mission: Chief Scientist: ______

Name	Watch	Cabin	Name	Watch	Cabin

Data logging computer: ______
Data acquisition program: Seasave
CTD deck unit make: SBE model: 11 serial number: 0619.

Primary CTD
Make: SBE model: 9 serial number: 506
Primary temperature serial number: 5013
Primary conductivity serial number: 3394
Secondary temperature serial number: 1763
Secondary conductivity serial number: 2023
P = 0506.
NOT SURE WHICH IS 1° or 2°
Transmissometer: Yes Model: Wetlabs s/n: 1396 DR
Fluorometer: Model Seapoint Cable gain: 30X s/n: 3642 P, (S) or NO pump?
Oxygen sensor: Yes Model: 43 s/n: 1438 (P), S or NO pump?
PAR sensor: Yes Model: Bios 200645 s/n: 4565
Other sensors: altimeter PSA 916 s/n: 1252. P, S or (NO) pump?
Other sensors: span s/n: 16504 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: ______
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: ______
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): ______

Rosette Setup:
Number of bottles: 24
Manufacturer: /
Volume of bottles (litres): 10L

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: Standard IOS Model: _____ Kit Number: Blue
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: _____
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)

Test cast @ Chatham Point

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

Additional Comments:
Rushed to depart to make tides

30 sec b/w bottle.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 1 of _____

Month March **Year** 2015 **Ship** VECTOR **Cruise ID** 2015-03

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information: Latitude	Positional Information: Longitude	Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
06	Chpl	15:20	BE	ROS	U	01	50° 20.784	125° 25.878			2-14	13	[illegible]	✓	test / training cast
		15:26	BO				50° 20.764	125° 25.891	332	330					→
		15:45	EN				50° 20.726	125° 25.944							
06	NA	18:16	BE	MVP		02	50 28.3846	126 07.5610	310		—				start MVP trial
		19:00	EN				[illegible]	[illegible]							003 File
	NA	21:25	BE	MVP		3	50 [illegible]	126 [illegible]	172		—				
		22:55	EN				50 40.518	127 03.702	160		—				
06	NA	23:30	BE	MVP		4									
			EN				[illegible]	[illegible]	[illegible]		—				
7	H-DEEP	15:28	BE	CTD		05	52 44.593	129 54.220	260		—				deck press -0.47 surface pres 1.0
		15:33	BO				52 44.592	129 54.211		256					
		15:38	EN				52 44.592	129 54.200							
07	HEC1	16:24	BE	ROS		06	52 49.986	129 51.741	139		14-30				see sampling notes *
		16:28	BO				52 50 015	129 51.734		136					
		16:42	EN				52 50 089	129 51 758							
	HGC	16:50	BE	NET		07	52 50 124	129 51.705	140						
		16 52	BO				52 50 134	129 51 701		100	UNIT 100-0				
		16 54	EN				52 50 142	129 51 702							

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Notes: _____

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Version: 7 July 2014

This page is for any notes or observations

→ depth shallower than expected :: bot 1 fired @ 330 m and we ended up with one fewer bottle closed. I failed to change firing order in order to skip bottle 1. 13 instead of 14 bottles closed (1–13) but this means that bot 2 on labels are really from bot 1 and so on. Labels Δ on samples.

→ Bottle 9 did not fire. Lanyard was clear from being hung up. We believe the trigger may have been sticky.

HEC deep - first cast didn't turn pumps on
- reeled cast - over wrote file

Bottle 9 did not fire again! - all chemistry taken from 10

HEC 1 = labels called
H-Deep

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month	March	Year	2015	Ship	Vector	Cruise ID	2015-03

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information: Latitude	Positional Information: Longitude	Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
07	HCC1	17:11	BE	SBE25		08	52 50.214	129 51.804	140						turbidity test
		1713	BO				52 50.228	129 51.809		20	—				surface bucket
		1718	EN				52 50 270	129 51 802							immediately after
07		1740	BE	MVP		09	52 49.197	129 53.440	217						
		2012	EN				52 53.96	129 32.07	316						Files 0036-0078
07	CA-D1	20:26	BE	CTD		10	52° 53.75	129° 32.126'	320	315					
		20:32	BO				52° 53.750'	129° 32.110'							
		20:38	EN				52° 53.755'	129° 32.095'							
07		20:50	BE	MVP		11	52 53.420	129 32.497	288						file 0078
08		0032	EN				52 49.561	129 43.541							
08		02:55	EN	DRF		12	52° 49.567	129° 43.279	198		—	–	All		#146, 149, 148, 145, 1[illegible] 190 GPS fell off 191
		03:00	BE	MVP		13	52 49.630	129 42.745	198						
		03:40	EN				52 49.1304	129 42.0200	180						
08	CS-84	04:50	BE	ROS	US	14	52 53.987	129 23.976	253	248	41-52	12		✓	
		04:58	BO				52 53.987	129 23.990							
		05:19	EN				52 54.020	129 23.944							
	SC-74	06:23	BE	ROS	US	15	53 0.683	129 15.959	378	374	53-66	14		✓	
		06:32	BO				53 0.677	129 15.959							
		06:54	EN				53 0.696	129 15.906							

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stn CAD1 → Niskin Firing test for #9. After finding a black sticky substance on trigger for bottle 9,
event 10 → we cleaned it as best as possible and fired bottles at end of cast to see if 9 would close. It did but Lucius observed that Niskin 10 potentially closed before 9 as if the bump from 10 closing, triggered 9 to close. Will test again @ next std cast.

5 surface circ trackers
1 Davis drift

Event 12 → #190 - Davis float deployed without gps mounted. Deployed #191 as a replacement

Event 14 → Sample #s 31-40 were mistakenly skipped. No samples exist under those numbers.

→ Niskin #13 was fired as a backup for Niskin 9 in case it did not close. 9 did close so 13 was not used.
↳ 20 m ↳ 20 m.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month MARCH **Year** 2015 **Ship** VECTOR **Cruise ID** 2015-03

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information Latitude	Positional Information Longitude	Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
08	—	06:04		DRF	SCT	16	52 58.0413	129 15.169	—	—	—				Drifters: 150, 151, 152, 153, 154
	SC-69	07:30	BE	ROS	US	17	53 4.806	129 19.604	689	685	67			✓	
		07:45	BO				53 4.8[illegible]	129 19.72[illegible]							
		07:59	EN				53 4.805	129 19.895'							
08	DC-66	09:13	BE	CTD		18	53° 11.982'	129° 32.554'	281	282					
		09:26	BO				53° 11.994'	129° 32.519'	287						
		09:32	EN				53° 12.008'	129° 32.497'							
08	PC-73	10:36	BE	CTD		19	53° 16.695'	129° 43.314	180						
		10:41	BO				53° 16.686'	129° 43.313'	182	180					→
		10:44	EN				53° 16.680'	129° 43.302'							
08	ES72	12:03	BE	CTD		20	53° 06.296'	129° 34.025'	174	172					
		12:08	BO				53° 06.311	129° 34.016'							→
		12:12	EN				53° 06.3	129° 34.022'							
08	—	14:01		DRF	SCT	21	53° 11.9966'	129° 25.1393	—	—	—				DRIFTERS: 160-164
08	SC 61	14:07	BE	ROS		22	53° 11.992'	129° 25.158'	510						
		14:22	BO				53° 11.963'	129° 25.214'		505					
		14:40	EN				53° 11.987'	129° 25.049							

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Notes: _____

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PC73: Oxygen Sensor looks noisy (not sure when it started) - D.W.

same for ES72 - D.W.

DAILY SCIENCE LOG

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Month 03 March **Year** 2015 **Ship** VECTOR **Cruise ID** 2015-03

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08	SC61	14:49	BE	NET		23	53 11.974	129 25.025	512						
		14:57	BO				53 11.95	129 25.05		250	—	—			250-0 VNH.
		15:01	EN				53 11.95	129 25.074							
08	SC61	15:13	BE	SBE25		24	5311.95	129 25.13	512						turbidity
		15.16	BO				53 11.986	129 25.13		20			CUDICH DW		~32 samples by bucket
		15:19	EN				53 11.98	129 25.121							immediately after
08	—	17:18		DRF		25	53°9.996'	129° 11.3709'							Yellow + green + wood
08	PBS76	17:51	BO	GRAB		26	53°22.110	129° 09.838'	395						
08	DOUG45	18:23	BE	ROS		27	53°22.234'	129° 11.693'	462						
		18:32	BO				53°22.217'	129° 11.773'		458.5					
		18:54	EN				53° 22.210	129° 11.704			92-106	15	cw low lights	✓	
		19:36	BE	MVP		28	53 16.97	129 8.55							
09		01:40	EN				53 56.997	128 40.944							
09	DOUG4	02:00	BE	ROS	US	29	53 55.636	128 42.209	218	213	107-126	20	KS CP SP, SV	✓	
		02:03	BO				53 55.631	128 42.135							Bad altimetry readings
		02:22	EN				53 55.631	128 42.145							
	DOUG4	02:39	BE	NET	—	30	5355.617	128 42.213	218						
		02:46	BO				5355.614	128 42.198		200	—				SOR VNH
		02:51	EN				5355.609	128 42.202							

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Notes: _____

Winch started to make really loud noises under load.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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							Latitude	Longitude							
09	DOUG4	03:03	BE	SBE25		31	53 55.615	128 42.221	217						turbidity cast
		03:06	BO				53 55.619	128 42.239		20	—	—			+3L bucket immediately after
		03.10	EN				53 55.62	128 42.227							
09	Doug 11	04:03	BE	ROS	US	32	53 49.802	128° 49.374	319	317	127-139	13	WS, LF, SP, CW, SV	✓	
		04:11	BO				53 49.807	128 49.345							
		04:32	EN				53 49.709	128° 49.289							
09	Doug 16	05:41	BE	ROS	US	33	53 46.793	128° 54.719	385	380	140-152	13	WS, LF, SP, CW, SV	✓	"New" winch
		05:50	BO				53 46.787	128° 54.702							
		06:11	EN				53 46.754	128° 54.762							
09	FOC-1	07:02	BE	ROS	US	34	53 43.730	129° 2.657	344		153-176	24	CW, SH, LW	✓	
		07:11	BO				53° 43.726'	129° 2.682'		342					
		07:27	EN				53° 43.708'	129° 02.652'							
09	FOC1	0835	BE	NET	—	35	53 43.720	129 02.691	344		—	—			VNT
		08:42	BO				53 43.726	129 02 695		250					
		08:48	EN				53 43 741	129 02.71							
	FOC1	09:00	BE	SBE25		36	53 43.727	129 02.697	344						turbidity study
		09:01	BO				53 43 726	129 02 693		20					bucket taken
		09:05	EN				53 43 724	129 02 694							immediately after

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This page is for any notes or observations

Winch sounds worse. Decided to swap winches after Dougll cast.

DAILY SCIENCE LOG

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Month | **Year** | **Ship** | **Cruise ID**

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information: Latitude	Positional Information: Longitude	Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
9	FOC1	09:15		DRF		37	53 43.715	129 02.771	—	—					surfdrifters
9	DOUG26	09:59	BE	ROS		38	53 40.440	129 07.328	401		177-190	14	CH, CW DW	✓	
		09:10	BO				53 40.430	129 07.314		393					
		09:30	EN				53°40.427	129° 07.310			191-202	12	CH, CW DW		
9	DOUG31	10:30	BE	ROS		39	53°36.674	129° 12.812'	295						
		10:40	BO				53°36.672'	129°12.784'		290					
		10:57	EN				53° 36.656	129° 12.744							
9	SILL01	11:36	BE	CTD		40	53°35.966'	129° 12.776'	180				CH, CW DW		
		11:43	BO				53°35.960'	129° 12.757'		178					
		11:48	EN				53° 35.959'	129° 12.745'							
9	SILL02	12:04	BE	CTD		41	53°34.988	129°12.709'	274				CH, CW DW		
		12:13	BO				53°34.996	129°12.733'		269					
		12:17	EN				53°34.990'	129°12.750'							
09	KSK1	14:02	BE	CTD		42	53°29.209'	129°12.533'	373				CH, CW DW		went to 400m
		14:11	BO				53° 29.200'	129°12.568'		368					[illegible]
		14:18	EN				53° 29.226'	129° 12.516							back to surface restarted
09	DOUG40	14:38	BE	ROS		43	53° 26.761	129° 12.644'	396		203-216		CH. CW DW		
		14:48	BO				53° 26.765	129° 12.646		391					
		15:08	EN				53°26.771	129° 12.578							

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Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information: Latitude	Positional Information: Longitude	Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
09	PBS82	15:44		GRAB		044	53 26.903	129 12.479	399	399	—				Support & habitat classification.
09	PBS83	16:17		GRAB		045	53 28.624	129 13.685	346	346					
09	PBS84	17:03		GRAB		046	53 32.769	129 11.509	320	324					
09	PBS85	17:10		GRAB		047	53 34.571	129 12.627	294	296					
09	SILD	13:15	BE	MVP		48	53 34.492	129 12.707	296						
10		00:50	EN	MVP		48	53 34.785	129 12.00	296						
10	DC-26	03:59	BE	CTD	—	49	53 34.270	128 51.028	160	155	—		SP, KS, SV	✓	
	DC-26	04:03	BO	CTD			53 34.272	128 51.026							
	DC-26	04:09	EN	CTD			53 34.284	128 51.053							
10	DC-26	03:50		SURFACE BUCKET		50	53 34.270	128 51.028							
10	GC-31	04:55	BE	ROS	US	51	53 31.490	128 43.513	205	201	217				
	GC-31	05:01	BO	ROS			53 31.5	128 43.507			218 - 227		SP, KS SV	✓	
	GC-31	05:17	EN	ROS			53 31.486	128 43.518							
	GC-31	04:09		SURFACE BUCKET		52	53 31.490	128 43.510			229				
	GC-38	06:03	BE	CTD		53	53 27.008	128 36.013	240	237			SP, KS SV	✓	
	GC-38	06:10	BO	CTD			53 27.000	128 36.019							
	GC-38	06:16	EN	CTD			53 27.005	128 36.026							
	GC-38	06:01		SURFACE BUCKET		54	53 27.011	128 36.017			230		KS		

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Made a first faulty drop with syringe still left on.

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							Latitude	Longitude							
10	GC44	07:01	BE	CTD		55	53° 25.987	128°26.958'	408				DW, CH, CW		
			BO				53° 25.976'	128°26.881'		403					
			EN				53°25.960'	128°26.842'							
10	GC44	07:28		surface bucket		56	53°25.985'	128°26.950'							
10	GC51	08:11	BE	ROS		57	53°28.307'	123°18.852'	497		231		CW, CH		
		08:28	BO				53°28.302	128°18.847'		492	232-247		DW, CH, CW		
		08:48	EN				53°28.297'	128°18.854'							
10	GC60	09:50	BE	CTD		58	53°25.697'	128°05.407'	266				DW, CH, CW		
			BO				53°25.693'	128°05.413'		260					
			EN				53°25.679'	128°05.413'							
10	GC60	0952		surface Bucket		59	53°25.694'	128°05.408'			248		CW		
10	GC68	1050	BE	CTD		60	53°20.639'	127°59.566'	227						
		1058	BO				53°20.606'	127°59.560'		222			CH, DW, CW		
			EN				53°20.654	127°59.552							
10	GC68	10:50		surface bucket		61	53°20.654'	127°59.552'			249		CW, CH		
10	GC74	11:58	BE	CTD		62	53°15.798'	127°55.464'	139				CH, DW, CW		
		12:03	BO				53°15.793	127°55.488'		135					
		12:07	EN				53°15.792'	127°55.493							
10	GC74	12:00		surface Bucket		63	53°15.791'	127°55.464'					CW		

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Notes: _____

Transmissometer & Fluorometer are to be cleaned before each cast

CTD event 62 was accidentally labelled as cast 074. Event 74 will therefore be skipped to avoid overwriting CTD file.

74 ↔ 62

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month MARCH **Year** 2015 **Ship** Vec. (m) (m) **Cruise ID** 2015-03

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information Latitude	Positional Information Longitude	Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
10	GC74	12:15	BE	NET		64	53°15.7962	127°55.5054	140				CH, DW CW		
		12:19	BO				53°15.7979	127°55.5056		130					
		12:21	EN				53°15.7959	127°55.5062							
10		1428	BE	MVP		65	53°16.19'	127°56.18					JMR		
		21:07	EN	MVP		65	53 33.447	128 58.103	240						
		18:15		DRIFTERS		66	53 26.06	128 27.59							#175 - 179
10	FISH TRAP SITE	21:15	BE	MVP+ADCP		67	53 33.447	128 59.153							300kHz ADCP Fish trap SITE
11		02:04	EN	MVP+ADCP			53 32.221	129 00.408							
11		02:55		DRIFTERS		68	53 32.221	129 00.408	29						#65 - 169
11		02:56		CASTAWAY		69	53 32.221	129 00.403	29						
11	UC-31	03:19	BE	CTD	—	70	53 32.214	128 59.742	41	35	—	—	SP, HS, LP SV	✓	
	UC-31	03:22	BO	CTD			53 32.212	128 59.742							
	UC-31	03:24	EN	CTD			53 32.212	128 59.744							
	UC-31	03:26		CASTAWAY		71	53 32.212	128 59.744	41						
	UC-43	03:59	BE	CTD		72	53 29.020	128 58.615	106		—	—	SP, HS SV	✓	
	UC-43	04:02	BO	CTD		72	53 29.018	128 58.608							
	UC-43	04:06	EN	CTD		72	53 29.020	128 58.603							
	UC-43	04:07		CASTAWAY		73	53 29.020	128 58.604					LP		
						74									Skimpy #74 See comments for #62

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Notes: _____

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DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month MARCH **Year** 2015 **Ship** Vector **Cruise ID** 2015-03

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information: Latitude	Positional Information: Longitude	Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
11	UC-45	04:36	BE	ROS	US	75	53 26.014	128 55.502	393		250-262	13	SP, KS SV	✓	
	UC-45	04:47	BO	ROS			53 26.020	128 55.552		387					
	UC-45	05:08	EN	ROS			53 26.022	128 55.525							
	UC-45	05:10		CASTAWAY		76	53 26.021	128 55.525	393						
	UC-50	05:49	BE	CTD	—	77	53 21.120	128 54.343	467		—	—	SP, KS SV	✓	
	UC-50	06:05	BO	CTD			53 21.000	128 54.222		460					
	UC-50	06:15	EN	CTD			53 21.013	128 54.254							
	UC-50	06:16		CASTAWAY		78	53 21.013	128 54.254	466				SP		
	UC-52	06:36	BE	CTD		79	53 19.032	128 54.688	512	500	—	—	SP, KS SV	✓	
	UC-52	06:47	BO	CTD			53 19.105	128 54.656							
	UC-52	06:56	EN	CTD			53 19.084	128 54.659							
	UC-52	06:58		CASTAWAY		80	53 19.033	128 54.652	507						
11	FR-56	07:27	BE	ROS		81	53° 16.904'	128° 52.506'	458~440		263-277		DW, CW CH	✓	
		07:38	BO				53° 16.892'	128° 52.502'		435	varying				
		08:00	EN				53° 16.884'	128° 52.510'							
11	MR-58	0828	BE	CTD		82	53° 18.031'	128° 57.073'	487				DW, CH CW	✓	
		0841	BO				53° 18.017'	128° 57.040'		482					
		0849	EN				53° 18.012'	128° 57.047'							
		0851		CASTAWAY		83	53° 18.037'	128° 57.064'	487				CH		

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Notes: _____

Had to stop lowering CTD at ~200m to allow the ship to reposition in strong current

MK58: bottom lanyard/endcap closed during cast but the bottle itself during trip. There is quite a bit of slack-line. That lanyard

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page _____ of _____

Month	Year	Ship	Cruise ID

Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
11	MR-58	0852		DRF		84	53°18.0373'	128°57.0644					CH		
11	MR53	0932	BE	CTD		85	53°18.287	129°04.206'	435				DW CH CW	✓	
		0942	BO				53°18.281'	129°04.224'	440	435					
		0951	EN				53°18.288'	129°04.226							
	MR53	0952		CASTAWAY		86	53°18.288'	129°04.226	447				CH		
11	WC50	10:20	BE	ROS		87	53°17.800'	129°08.774'	516				DW CH CW	✓	
		10:30	BO				53°17.791'	129°08.850'		511					
			EN				53 17.749	129 8.808							
11	Survey G	14:44	DE	MVP		88	53 46.53	128 49.92							File 539.
		17:00	RE	MVP			53 19.54	129 10.245	408						Recovered MVP
							HEADING TO PORT ALBERNI								
							END OF SCIENCE								

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Produced by the Water Properties Group, IOS

WaterProperties.ca
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