

DAILY SCIENCE LOG BOOK

MISSION
NUMBER

2015-19

DATE:

From: Sept 29/15 to: Oct 4 /15

VESSEL:

Vector

PROJECT(S):

STRAIT OF GEORGIA / JUAN DE FUCA
WATER PROPERTIES SURVEY

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

WaterProperties.ca

Captain: DUNCAN McALLEN
 Second Officer: DUNCAN McALLEN
 Fishing Master: JAMES McALLEN
 First Officer: RYAN GORE
 Third Officer: _____

Mission Participants / Agencies:

[illegible][illegible]

Data logging computer: Vector Laptop
Data acquisition program: Seiswave
CTD deck unit make: SBE model: 11+ serial number:

Primary CTD

Make: SBE model: 9+ serial number: 443

Primary temperature serial number: 2106

Primary conductivity serial number: 2280

Secondary temperature serial number: 2663

Secondary conductivity serial number: 2754

Transmissometer: Wetlabs Model: C-STAR s/n: 1396DR

Fluorometer: Model Seapoint Cable gain: 3X s/n: 3640 P, S or NO pump? P

Oxygen sensor: SBE Model: 43 s/n: 0997 P, S or NO pump? P, S

PAR sensor: Biospherical Model: s/n: 4565

Other sensors: PH s/n: 0692 P, S or NO pump? NO

Other sensors: Altimeter s/n: 1252 P, S or NO pump? NO

Other sensors: s/n: s/n: P, S or NO pump?

Other sensors: s/n: 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: _____ **P, S or NO pump?** _____

Other sensors: _____ **P, S or NO pump?** _____

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

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Page 1 of

Month <u>Sept</u>				Year <u>2015</u>			Ship <u>Vector</u>				Cruise ID <u>2015-19</u>				
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							
30	51	0054	BE	ROS	US	1	48° 39.17	123° 30.69	181		1-9	9	PC/SR	✓	DIC sample has
		0057	BO				39.18	30.69		100					200 µl of H ₂ CO
		0107	EN				39.22	30.66							FL = 4.9
30	58	0252	BE	ROS		2	48 43.035	123 14.375	336	325	—		PC/SR	✓	
		0300	BO				43.055	14.426							
		0306	EN				47.070	14.436							
30	59	0406	BO	NET		3	48 37.592	123 14.555	225	215					
		0410	EN				37.523	14.537							
30	59	0423	BE	ROS	US	4	48 37.793	123 14.587	230		10-23	14		✓	air temp 11°C
		0428	BO				37.666	14.531		225					nutrient for bottle 9
		0443	EN				37.158	14.552							no data
30	60	0532	BE	ROS	US	5	48 33.888	123 12.788	291		24	1		✓	surface bottle
		0539	BO				33.694	12.678		290					triggered for phyto
		0545	EN				33.488	12.618							missed at 5:59

Cast Type:

BOT = Bottle cast, no CTD
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ROS = Rosette plus CTD
SET = Fish Set

USW = Sea Water Loop

MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter

Bottle Firing Method:

US = Up / Stop
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Transmissometer & Fluorometer are to be cleaned before each cast

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depart Pat Bay 16440 - light ans, leave exp.

- ^{with 1} pickle) DIC sample with 2 100 μ l doses - should be 1 100 μ l dose.

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Page 2 of

Month <u>SEP</u>				Year <u>2015</u>			Ship <u>VECTOR</u>				Cruise ID <u>2015-19</u>				
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							
30	61	0624	BE	US ROS		6	48° 29.174	123° 9.763	284				SR	✓	
		0633	BO				28.661	9.385		271					
		0641	EN				28.548	9.354							
30	101	1439	BE	ROS		7	48° 25.44	124° 45.04	236			0	SR	✓	
		1443	BO				25.43	45.05		232					
		1447	EN				25.43	45.06							
30	102	1527	BE	NET		8	48° 30.020	124° 44.077	254				SR		
		1536	BO				30.016	44.088		244					
		1540	EN				30.022	44.086							
30	102	1552	BE	ROS		9	48° 30.01	124° 44.07	254		25-38	14	SR	✓	
		1558	BO				30.01	44.06		250					
		1615	EN				30.02	44.07							
30	103	1648	BE	ROS		10	48° 33.00	124° 43.00	120				SR	✓	
		1650	BO				32.99	43.00		116					
		1653	EN				32.99	43.01							
30	76	1759	BE	ROS		11	48° 31.38	124° 30.01	91				SR	✓	
		1801	BO				31.37	30.01		87					
		1803	EN				31.37	30.01							

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Page 3 of

Month <u>Sept</u>				Year <u>2015</u>			Ship <u>Vector</u>				Cruise ID <u>2015-19</u>				
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							
30	75	1833	BE	ROS	US	12	48° 28.27	124° 32.79	222		39-52	14	SR	✓	lots of Jelly Fish in the area
		1837	BO				28.28	32.80		219					
		1855	EN				28.249	32.802							
30	74	1943	BE	ROS		13	48 25.140	124 35.606	190				PR	✓	
		1947	BO				25.225	35.599		185					
		1950	EN				25.220	35.616							
30	73	2204	BE	ROS		14	48 15.016	124 6.703	160				PR	✓	
		2208	BO				15.032	6.672		159					
		2211	EN				15.034	6.662							
30	72	2246	BE	ROS	US	15	48 18.560	124 4.000	186		53-65	13			
		2250	BO				18.554	3.996		184					
		2306	EN				18.512	3.925							
1	71	0036	BE	ROS		16	48 22.193	123 59.384	102						
		0038	BO				22.188	59.384		106					
		0040	EN				22.184	59.377							

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Version: 7 July 2014

DAILY SCIENCE LOG

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Page 4 of

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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							
1	70	0155	BE	ROS		17	48 19.200	123 43.280	150				R/S/TF	✓	
		0157	BO				19.204	43.284		147					
		0200	EN				19.208	43.315							
1	69	0230	BE	ROS	US	18	48 15.626	123 43.249	177		66-77	12	R	✓	air temp 10°C
		0234	BO				15.640	43.298		174					
		0246	EN				15.643	43.452							
1	68	0317	BE	ROS		19	48 12.216	123 42.992	138				R/S/R	✓	
		0320	BO				12.199	43.130		134					
		0323	EN				12.185	43.186							
1	105	0556	BE	ROS		20	48 11.131	123 19.129	93				R/S/R	✓	
		0559	BO				11.124	19.230		90					
		0600	EN				11.135	19.223							
	ADCP	0638	BE	ROS	US	21	48 14.047	123 17.999	117		78-87		R/S/R	✓	
		0641	BO				14.080	18.126		113					
		0653	EN				14.114	18.239							

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Version: 7 July 2014

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 5 of

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							Latitude	Longitude							
01	104	0742	BE	ROS		22	48° 20.00	123° 18.03	83			0	SR	✓	Changed the
		0744	BO				20.00	18.06		78					bottom o-ring
		0745	EN				20.00	18.07							on bot 11
01	67	0841	BE	ROS		23	48° 22.88	123° 18.08				✓	SR	✓	
		0843	BO				22.88	18.08							
		0845	EN				22.88	18.08							
01	66	0920	BE	ROS		24	48° 19.25	123° 14.10	104			✓	SR	✓	
		0922	BO				19.26	14.10		99					
		0924	EN				19.25	14.11							
01	65	0959	BE	ROS	US	25	48° 15.83	123° 9.79	127		88-97	10	SR	✓	
		1002	BO				15.82	9.78		123					
		1012	EN				15.82	9.77							
01	64	1059	BE			26	48° 12.77	123° 5.77	110			✓	SR	✓	
		1101	BO				12.76	5.76		106					
		1103	EN				12.77	5.75							
01	63	1139	BE	NET		27	48° 13.829	122° 58.500	129			✓	NN		
		1144	BO				13.829	58.498							
		1147	EN				13.834	58.475							

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WaterProperties.ca
Version: 7 July 2014

Notes:

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 6 of

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							Latitude	Longitude							
01	63	1156	BE	ROS	US	28	48° 13.84	122° 58.49	132		98-108	11	SR	✓	
		1159	BO				13.85	58.47		128					
		1212	EN				13.85	58.47							
01	62	1335	BE	ROS	US	29	48° 22.84	123° 2.65	149		109-119	11	SR	✓	
		1338	BO				22.85	2.64		145					
		1352	EN				22.84	2.51							
01	54	1552	BE	ROS		30	48° 26.62	122° 44.23	78		/	/	SR	✓	
		1554	BO				26.62	44.23		73					
		1555	EN				26.62	44.23							
01	53	1727	BE	ROS		31	48° 33.20	122° 44.95	59		/	/	SR	✓	
		1728	BO				33.20	44.95		54					
		1729	EN				33.20	44.95							
01	52	1828	BE	ROS		32	48° 38.84	122° 43.30	84		/	/	SR	✓	
		1830	BO				38.84	43.30		79					
		1831	EN				38.84	43.32							
01	51	2006	BE	ROS		33	48° 46.717	122° 51.625	162		/	/	SR	✓	
		2009	BO				46.710	51.637		158					
		2012	EN				46.686	51.604							

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 Version: 7 July 2014

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 7 of

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							Latitude	Longitude							
01	56	21:23	BE	ROS	US	34	48 46.386	123 1.572	212		120-133	14	R/SR	✓	
		21:28	BO				46.309	1.673		210					
		21:46	ED				46.144	1.674							
01	57	22:22	BE	ROS		35	48 44.048	123 8.093	155				R/SR	✓	
		22:25	BO				44.048	8.153		153					
		22:28	ED				44.090	8.161							
02	47	01:05	BE	ROS		36	48 49.324	123 6.266	184				R/SR	✓	
		00:02	BO				49.362	6.241		182					
		00:12	ED				49.379	6.224							
02	48	00:52	BE	ROS		37	48 51.712	123 3.254	228				R/SR	✓	
		00:56	BO				51.672	3.306		225					
		01:00	ED				51.653	3.295							
02	42	01:37	BE	ROS		38	48 54.901	123 59.670	132				R/SR	✓	
		01:39	BO				54.934	59.702		130					
		01:42	ED				54.917	59.702							
02	44	02:13	BE	ROS		39	48 56.831	123 6.089	119				R/SR	✓	air temp 12°C
		02:16	BO				56.731	6.094		117					
		02:18	ED				56.722	6.092							

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Version: 7 July 2014

DAILY SCIENCE LOG

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Page 8 of

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OCTOBER				2015			VECTOR				2015-19				
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							
02	45	02:47	BE	ROS		40	48 53.824	123 8.276	127		/		R/SR	✓	
		02:49	BO				53.870	8.280							
		02:51	EN				53.860	8.279							
02	46	03:26	BO	NET		41	48 51.278	123 10.609	181				SR		
		03:29	EN				51.276	10.606		171					
02	46	03:39	BE	ROS	OS	42	48 51.313	123 10.710	182		134-145	12	R/SR	✓	
		03:42	BO				51.307	10.726		179					
		03:55	EN				51.298	10.564							
02	106	05:21	BE	ROS		43	49 1.016	123 13.211	74		/		R/SR	✓	
		05:23	BO				1.022	13.206		74					
		05:24	EN				1.025	13.208							
02	107	05:57	BE	ROS		44	48 58.376	123 17.970	179		/		R/TE	✓	
		06:01	BO				58.336	17.928		175					
		06:04	EN				58.352	17.910							
02	43	07:09	BE	ROS		45	49' 0.25	123' 30.12	201		/		SR	✓	
		07:13	BO				0.24	30.11		196					
		07:16	EN				0.23	30.10							

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 Version: 7 July 2014

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 9 of

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							Latitude	Longitude							
2	42	0744	BE	NET		46	49° 1.780	123° 26.125	320				NN		
		0758	BO				49° 1.774	123° 26.060		310					
		0801	EN				1.776	26.046							
2	42	0809	BE	ROS	us	47	49° 1.79	123° 26.06	319		146-161	16	SR	✓	
		0816	BO				1.79	26.04		314					
		0836	EN				1.79	26.05							
2	41	0929	BE	ROS	✓	48	49° 3.31	123° 22.30	240				SR	✓	
		0934	BO				3.32	22.31		236					
		0938	EN				3.31	22.32							
2	108	1000	BE	ROS	✓	49	49° 4.36	123° 19.07	90				SR	✓	
		1002	BO				4.36	19.07		85					
		1003	EN				4.36	19.06							
2	37	1117	BE	ROS	✓	50	49° 13.60	123° 20.71	214				SR	✓	
		1121	BO				13.63	20.72		209					
		1124	EN				13.65	20.70							
2	38	1202	BE	NET		51	49° 11.951	123° 26.387							
		1212	BO				11.926	26.401							
		1217	EN				11.934	26.425							

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Ocean Sciences Division, Institute of Ocean Sciences

Page 10 of

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2	38	1227	BE	ROS	/	52	49° 11.94	123° 26.48	308		/	/	SR	✓	
		1233	BO				11.96	26.46		303					
		1238	EN				11.96	26.44							
2	39	1332	BE	ROS	US	53	49° 9.79	123° 33.10	379		162-178	17	SR	✓	
		1340	BO				9.86	33.13		374					
		1400	EN				10.10	33.12							
2	40	1429	BE	ROS	/	54	49° 8.61	123° 36.82	148		/	/	SR	✓	
		1432	BO				8.61	36.80		139					
		1434	EN				8.60	36.77							
2	GEO1	1538	BE	NET	/	55	49° 14.968	123° 44.944	404		/	/	NN	✗	
		1551	BO				14.964	44.914		390					
		1558	EN				14.954	44.912							
2	26	1635	BE	ROS	/	56	49° 14.31	123° 50.62	264		/	/	SR	✓	
		1640	BO				14.33	50.61		259					
		1644	EN				14.34	50.61							
2	27	1728	BE	ROS	US	57	49° 19.13	123° 47.94	348		179-194	16	SR	✓	bot (16) wasn't tripped.
		1735	BO				19.13	47.92		344					SR
		1755	EN				19.12	47.91							

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Version: 7 July 2014

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 11 of

Month <u>October</u>				Year <u>2015</u>				Ship <u>Vector</u>				Cruise ID <u>2015-19</u>				Page <u>11</u> of <u> </u>	
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									
<u>2</u>	<u>275</u>	<u>1832</u>	<u>BE</u>	<u>ROS</u>		<u>58</u>	<u>49° 21.82</u>	<u>123° 46.54</u>	<u>107</u>		<u> </u>	<u> </u>	<u>SR</u>	<u>✓</u>			
		<u>1834</u>	<u>BO</u>				<u>21.82</u>	<u>46.53</u>		<u>102</u>							
		<u>1836</u>	<u>EN</u>				<u>21.82</u>	<u>46.54</u>									
<u>2</u>	<u>28</u>	<u>1858</u>	<u>BE</u>	<u>ROS</u>		<u>59</u>	<u>49 23.992</u>	<u>123 45.379</u>	<u>130</u>		<u> </u>		<u>Re/SR</u>	<u>✓</u>			
		<u>1901</u>	<u>BO</u>				<u>23.992</u>	<u>45.410</u>		<u>129</u>							
		<u>1903</u>	<u>EN</u>				<u>23.999</u>	<u>45.433</u>									
<u>2</u>	<u>28</u>	<u>1913</u>	<u>BO</u>	<u>NET</u>		<u>60</u>	<u>49 24.018</u>	<u>123 45.615</u>	<u>127</u>	<u>117</u>			<u>SR</u>				
		<u>1915</u>	<u>EN</u>				<u>24.023</u>	<u>45.643</u>									
<u>2</u>	<u>22</u>	<u>22:12</u>	<u>BO</u>	<u>NET</u>		<u>61</u>	<u>49 40.106</u>	<u>124 16.219</u>	<u>350</u>	<u>340</u>			<u>SR</u>				
		<u>22:19</u>	<u>EN</u>				<u>40.094</u>	<u>16.190</u>									
<u>2</u>	<u>22</u>	<u>22:26</u>	<u>BE</u>	<u>ROS</u>		<u>62</u>	<u>49 40.194</u>	<u>124 16.297</u>	<u>351</u>		<u> </u>		<u>Re/SR</u>	<u>✓</u>			
		<u>22:33</u>	<u>BO</u>				<u>40.246</u>	<u>16.244</u>		<u>349</u>							
		<u>22:39</u>	<u>EN</u>				<u>40.286</u>	<u>16.304</u>									
<u>3</u>	<u>20</u>	<u>00 08</u>	<u>BE</u>	<u>ROS</u>		<u>63</u>	<u>49 47.114</u>	<u>124 32.126</u>	<u>316</u>		<u> </u>		<u>Re/SR</u>	<u>✓</u>			
		<u>00 14</u>	<u>BO</u>				<u>47.107</u>	<u>32.119</u>		<u>310</u>							
		<u>01 19</u>	<u>EN</u>				<u>47.083</u>	<u>32.141</u>									
<u>3</u>	<u>19</u>	<u>02:49</u>	<u>BE</u>	<u>ROS</u>		<u>64</u>	<u>50 1.222</u>	<u>124 52.898</u>	<u>220</u>		<u> </u>		<u>Re/SR</u>	<u>✓</u>			
		<u>02:52</u>	<u>BO</u>				<u>1.230</u>	<u>52.892</u>		<u>274</u>							
		<u>02:57</u>	<u>EN</u>				<u>1.250</u>	<u>52.884</u>									

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Version: 7 July 2014

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 12 of

Month <u>OCTOBER</u>				Year <u>2015</u>			Ship <u>VECTOR</u>				Cruise ID <u>2015-19</u>				
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							
3	18	03:37	BE	ROS		65	49 59.179	124 58.908	146				PC/SR	✓	
		03:40	BO				59.194	58.889		143					
		03:43	EN				59.196	58.890							
3	17	04:25	BE	ROS		66	49 58.799	125 4.319	265				PC/SR	✓	
		04:31	BO				58.802	4.306		262					
		04:35	EN				58.832	4.265							
3	16	05:08	BE	ROS	US	67	49 57.778	125 8.714	150		195-205	11	PC/SR	✓	
		05:12	BO				57.750	8.724		149					
		05:23	EN				57.730	8.682							
3	15	06:22	BE	ROS		68	49 51.592	125 1.576	125				PC/SR		
		06:24	BO				51.558	1.550		125					
		06:26	EN				51.523	1.609							
3	14	06:55	BE	NET		69	49° 53.089	124° 59.687	316				NN		
		07:05	BO				49° 53.141	59.766		305					
		07:11	EN				53.179	59.777							
3	14	07:21	BE	ROS	US	70	49° 53.14	124° 59.81	316				SR	✓	
		07:27	BO				53.16	59.81		311					
		07:45	EN				53.21	59.88							

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- station 21 (Campbell River) not accessible. no. 21 23 kts
C. some finger spring

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 13 of

Month October

Year 2015

Ship Vector

Cruise ID 2015-19

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							
3	13	0819	BE	ROS		71	49° 55.36	124° 55.32	234				SR	✓	
		0824	BO				55.31	55.32		229					
		0828	EN				55.32	55.33							
3	10	1009	BE	ROS		72	49° 40.70	124° 47.31	93				SR	✓	
		1011	BO				40.71	47.32		89					
		1013	EN				40.71	47.33							
3	11	1039	BE	NET		73	49° 42.434	124° 43.441	300				NN		
		1050	BO				42.425	43.432		290					
		1055	EN				42.422	43.435							
3	11	1102	BE	ROS		74	49° 42.42	124° 43.42	300				SR	✓	
		1107	BO				42.41	43.42		296					
		1113	EN				42.42	43.42							
3	12	1133	BE	ROS	US	75	49° 43.61	124° 40.85	355		221-236		SR	✓	The rosette came out of the water briefly at the start
		1141	BO				43.63	40.83		350					
		1200	EN				43.67	40.88							
3	9	1253	BE			76	49° 39.31	124° 32.99	340				SR	✓	
		1300	BO				39.31	32.98		335					
		1306	EN				39.31	32.99							

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WaterProperties.ca
Version: 7 July 2014

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 14 of

Month October

Year 2015

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Cruise ID 2015-19

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							
3	9	1346	BE	ROS		77	49° 35.55	124° 38.23	170		237-248	12	SR	✓	
		1349	BO				35.55	38.25		165					
		1403	EN				35.50	38.45							
3	7	1509	BE	ROS		78	49° 34.40	124° 24.23	353				SR	✓	
		1515	BO				34.42	24.23		349					
		1521	EN				34.42	24.27							
3	6	1556	BE	ROS	US	79	49° 30.60	124° 27.80	195		249-261	13	SR	✓	
		1559	BO				30.59	27.81		191					
		1615	EN				30.60	27.88							
3	BS11	1710	BE	CTD		80	49° 29.00	124° 45.95	63	10			NN		SBE
3	BS11	1746	BE	CTD		81	49° 29.00	124° 45.95	63	10			NW		
3	BS11	1755	BF	NET		82	49° 29.00	124° 45.950	63				NW		
		1757	BO				29.012	45.956		53					
		1759	EN				29.012	45.957							
3	BS11	1810	BE	ROS	US	83	49° 29.00	124° 45.98	65		262-269	8	SR	✓	Stayed at the bottom for 3 minutes for camera footage.
		1812	BO				29.00	45.98		63					
		1821	EN				28.99	45.96							

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Version: 7 July 2014

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net 11 → 12

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 15 of

Month <u>Oct</u>				Year <u>2015</u>			Ship <u>VECTOR</u>				Cruise ID <u>2015-19</u>				
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							
3	CPFZ	19:56	BO	NET		84	49 28.003	124 30.017	326	317	—		SR		
		20:02	EN				28.000	30.006							
3	CPFZ	20:13	BE	UN		85	49 27.832	124 29.912	326		—		NN		CTD 25 mtd. log.
3	CPFZ	20:23	BE	ROS		86	49 28.001	124 30.005	326		—		R/SR	✓	
		20:29	BO				27.996	29.999		324					
		20:35	EN				27.995	29.990							
3	4	21:22	BE	ROS		87	49 24.251	124 22.003	343		—		R/SR	✓	
		21:28	BO				24.515	22.082		339					
		21:34	EN				24.512	22.070							
3	3	21:56	BE	ROS	US	88	49 26.633	124 20.203	320		270-285	16	R/SR	✓	no oxygen samples
		22:02	BO				26.652	20.188		317					- no data cast -
		22:09	EN				26.604	20.154							pump off @ depth
3	3	22:13	BE	ROS	US	89	49 26.588	124 20.158	321				R/SR	✓	no oxygen samples
		22:19	BO				26.609	20.174		318					pump on at 10 m
		22:36	EN				26.588	20.152							
3	1	23:31	BE	ROS		90	49 20.279	124 12.090	244				R/SR	✓	
		23:35	BO				20.293	12.055		242					
		23:39	EN				20.297	12.053							

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 Version: 7 July 2014

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238
241
160

the pump stopped pump @ depth - don't cast and bring to surface to check

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 16 of

Month <u>Oct</u>				Year <u>2015</u>			Ship <u>VECTOR</u>				Cruise ID <u>2015-19</u>				
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							
4	2	0031	BE	ROS	US	91	49 24.110	124 9.360	279	275	286-300	15	SM/UTP	✓	
		0038	BO				49 24.100	124 9.293							
		0053	EN				49 24.035	124 9.310							
4	25	01:34	BE	ROS		92	49 27.713	124 7.480	290		✓	-	R/SR	✓	
		01:39	BO				27.713	7.454		285					
		01:44	EN				27.713	7.462							
4	24	02:10	BE	ROS		93	49 30.304	124 6.004	426		✓	-	R/SR	✓	
		02:17	BO				30.300	5.990		422					
		02:25	EN				30.295	5.989							
4	24	02:43	BO	NET		94	49 30.229	124 5.996	426	416			SR		
		02:50	EN				30.300	5.994							
4	CPFI	04:00	BO	NET		95	49 21.962	124 5.089	247				SR		
		04:04	EN				21.947	5.111		235					

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Version: 7 July 2014

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 17 of

Month <u>OCT</u>				Year <u>2015</u>			Ship <u>VECTOR</u>				Cruise ID <u>2015-19</u>				
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							
4	CPFI	04:11	BE	ROS		96	49 21.930	124 5.138	244				R/SR	✓	
		04:16	BO				21.913	5.155		242					
		04:20	EN				21.918	5.162							
4	265	05:42	BE	ROS		97	49 16.715	123 49.502	412				R/SR	✓	air temp 12°C
		05:50	BO				16.736	49.416		407					
		05:57	EN				16.720	16.720							
4	40	07:16	BE	ROS		98	49 8.563	123 36.835	152				R/SR	✓	
		07:19	BO				8.570	36.839		150					
		07:22	EN				8.569	36.839							
4	40	07:32	BO	NET		99	49 8.535	123 36.822	155				SR		
		07:35	EN				8.537	36.813							
4	GI-01	14:01	BE	NET		100	48° 45.812	123 20.522	63				N ²		
		14:03	BO				48° 45.870	123° 20.565		53					
		14:04	EN				48 45.873	123 20.599							

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Version: 7 July 2014

Page 18 of

WaterProperties.ca
Version: 7 July 2014