IOS
Institute of Ocean Sciences
Sidney, B.C., Canada

Plankton Net Tow Log Sheet

Cruise #: 2017-49 **Vessel:** NGOCALLUS **Page:** 1 of 2

Project(s): ZOOPLANKTON SURVEY **Contact:** KELLY YOUNT

TSK Serial #: 7292 **RBR serial #:** 79105

Time offset = + **hrs = UTC (please record local time for samples)**

Date: 12JUL2017	Station: GEO1		Time: 1615	**LOCAL**	
Net Event # 3	CTD # 1				
Latitude: 49 deg	15 14 N min.dec	Longitude:	123 deg	47.82 W min.dec	
Wire out: 390	Wire angle: 0		Bottom Depth: 400		
Net Type: Bongo	Tow Type: VNH				
Flow start 02239	Flow end 04062		Flow = frozen		
			Non-flow = pickled		

Notes: ALL SAMPLES COLLECTED FOR NON-FLOW METER SIDE, OTHER SIDE TO BRIAN HUNT LAB

Date: 13JUL17	Station: ~~28~~		Time: 0909	**LOCAL**	
Net Event # 6	CTD # ~~5~~				
Latitude: 49 deg	23.99 N min.dec	Longitude:	123 deg	45.51 W min.dec	
Wire out: 124	Wire angle: ~10		Bottom Depth: 134		
Net Type: Bongo	Tow Type: VNH				
Flow start 04062	Flow end 04808		Flow = frozen		
			Non-flow = pickled		

Notes:

Date: 13JUL17	Station: 24		Time: 1129	**LOCAL**	
Net Event # 8	CTD # 7				
Latitude: 49 deg	30 33 N min.dec	Longitude:	124 deg	6 31 W min.dec	
Wire out: 115	Wire angle: ~5		Bottom Depth: 425		
Net Type: Bongo	Tow Type: VNH				
Flow start 04808	Flow end 06991		Flow = frozen		
			Non-flow = pickled		

Notes: LARGE JAR

Date: 13JUL2017	Station: IS-2		Time: 12:50	**LOCAL**	
Net Event # 10	CTD # 9				
Latitude: 49 deg	38 18 N min.dec	Longitude:	124 deg	99 W min.dec	
Wire out: 20	Wire angle: 0		Bottom Depth: 30		
Net Type: Bongo	Tow Type: VNH				
Flow start 06991	Flow end 07059		Flow = frozen		
			Non-flow = pickled		

Notes:

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Cruise #: 2017-47 **Vessel:** NEOCALIGUS **Page:** 2

Project(s): Zoo Survey SoG **Contact:** Kelly Young

TSK Serial #: 7292 **RBR serial #:** 79108

Time offset = + hrs = UTC (please record local time for samples)

Date: 13JUL17	Station: 22	Time: 1413 LOCAL
Net Event # 12	CTD # 11	
Latitude: 49 deg	40 29 min.dec N	Longitude: 124 deg 16 39 min.dec W
Wire out: 343	Wire angle: Ø	Bottom Depth: 353
Net Type: BonGo	Tow Type: VNH	
Flow start 07039	Flow end 08662	Flow = frozen
		Non-flow = pickled (circled)
Notes:		

Date: 13JUL2017	Station: 11	Time: 1715 LOCAL
Net Event # 15	CTD # 13	
Latitude: 49 deg	42 53 min.dec N	Longitude: 124 deg 43 12 min.dec W
Wire out: 280	Wire angle: ~ 5-10	Bottom Depth: 290
Net Type: Bongo	Tow Type: VNH	
Flow start 08662	Flow end 09821	Flow = frozen
		Non-flow = pickled (circled)
Notes:		

Date: 14JUL2017	Station: BS-11	Time: 0833 LOCAL
Net Event # 17	CTD # 16	
Latitude: 49 deg	28 99 min.dec N	Longitude: 124 deg 45 96 min.dec W
Wire out: 48	Wire angle: Ø	Bottom Depth: 58
Net Type: Bongo	Tow Type: VNH	
Flow start 09821	Flow end 10061	Flow = frozen
		Non-flow = pickled (circled)
Notes:		

Date: 14JUL2017	Station: CPF2	Time: 1015 LOCAL
Net Event # 19	CTD # 18	
Latitude: 49 deg	28 13 min.dec N	Longitude: 124 deg 29 88 min.dec W
Wire out: 315	Wire angle: Ø	Bottom Depth: 325
Net Type: Bongo	Tow Type: VNH	
Flow start 10061	Flow end 11910	Flow = frozen
		Non-flow = pickled (circled)
Notes: LARGE JAR		

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Cruise #: 2017-47 **Vessel:** Nereus **Page:** 3

Project(s): Zoo Survey SoG **Contact:** Kelly Young

TSK Serial #: 7752 **RBR serial #:** 7908

Time offset = + **hrs = UTC (please record local time for samples)**

Date: 14JUL2017	Station: CPF1		Time: 1230	**LOCAL**	
Net Event # 21	CTD # 20				
Latitude: 49 deg	21.97 N min.dec	Longitude: 124 deg	5.19 W min.dec		
Wire out: 235	Wire angle: ~5		Bottom Depth: 245		
Net Type: Bongo	Tow Type: VN				
Flow start 11910	Flow end 14081		Flow = frozen		
			Non-flow = pickled		

Notes:

Date: 14JUL2017	Station: 40		Time: 1523	**LOCAL**	
Net Event # 23	CTD # 22				
Latitude: 49 deg	8.75 N min.dec	Longitude: 123 deg	36.94 W min.dec		
Wire out: 133	Wire angle: 5-10		Bottom Depth: 133		
Net Type: Bongo	Tow Type: VN				
Flow start 14081	Flow end 14712		Flow = frozen		
			Non-flow = pickled		

Notes:

Date: 14JUL2017	Station: 38		Time: 1643	**LOCAL**	
Net Event # 25	CTD # 24				
Latitude: 49 deg	12.10 N min.dec	Longitude: 123 deg	26.52 W min.dec		
Wire out: 290	Wire angle: 0		Bottom Depth: 300		
Net Type: Bongo	Tow Type: VN				
Flow start 14712	Flow end 16079		Flow = frozen		
			Non-flow = pickled		

Notes: Removed large jelly 'Moon Jelly' - used large jar.

Date: 14JUL2017	Station: 41		Time: 1813	**LOCAL**	
Net Event # 28	CTD # 26				
Latitude: 49 deg	3.45 N min.dec	Longitude: 123 deg	22.67 W min.dec		
Wire out: 235	Wire angle:		Bottom Depth: 245		
Net Type: Bongo	Tow Type: VN				
Flow start 16079	Flow end 18192		Flow = frozen		
			Non-flow = pickled		

Notes:

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Cruise #: 2017-49 **Vessel:** Neocaligus **Page:** 4/

Project(s): Fall Survey SoG **Contact:** Kelly Young

TSK Serial #: 7292 **RBR serial #:** 79108

Time offset = + **hrs = UTC (please record local time for samples)**

Date: 15 JUL 2017	Station: 46		Time: 0840	**LOCAL**	
Net Event # 30	CTD # 29				
Latitude: 48 deg	51 39 N min.dec	Longitude: 123 deg	10 71 W min.dec		
Wire out: 166	Wire angle: 5-10		Bottom Depth: ~~~ 176		
Net Type: Bongo	Tow Type: VN/H				
Flow start 18192	Flow end 19021		Flow = frozen		
			Non-flow = pickled		

Notes:

Date: 15 JUL 2017	Station: 59		Time: 1134	**LOCAL**	
Net Event # 32	CTD # 31				
Latitude: 48 deg	36 62 N min.dec	Longitude: 123 deg	14 76 W min.dec		
Wire out: 215	Wire angle: ~~0~~		Bottom Depth: 235		
Net Type: Bongo	Tow Type: VN/H				
Flow start 19021	Flow end 20732		Flow = frozen		
			Non-flow = pickled		

Notes: LARGE JAR

Date: 15 JUL 2017	Station: SC04		Time: 1441	**LOCAL**	
Net Event # 37	CTD # 35				
Latitude: 48 deg	43 53 N min.dec	Longitude: 123 deg	24 92 W min.dec		
Wire out: 80	Wire angle: 0		Bottom Depth: 90		
Net Type: Bongo	Tow Type: VN/H				
Flow start 21268	Flow end 21911		Flow = frozen		
			Non-flow = pickled		

Notes:

Date: 15 JUL 2017	Station: CBE2		Time: 1342	**LOCAL**	
Net Event # 34	CTD # 33				
Latitude: 48 deg	44 23 N min.dec	Longitude: 123 deg	34 54 W min.dec		
Wire out: 55	Wire angle: 0		Bottom Depth: 60		
Net Type: Bongo	Tow Type: VN/H				
Flow start 20752	Flow end 21268		Flow = frozen		
			Non-flow = pickled		

Notes:

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Cruise #: 2017-49 **Vessel:** NG Calcus **Page:** 5

Project(s): Zoo Salish Sea **Contact:** Kelly Young

TSK Serial #: 7292 **RBR serial #:** 79108

Time offset = + hrs = UTC (please record local time for samples)

Date: 15JUL2017	Station: GI-01	Time: 1518 **LOCAL**
Net Event # 39	CTD # 38	
Latitude: 48 (deg) 45.64 (min.dec) N	Longitude: 123 (deg) 20.63 (min.dec) W	
Wire out: 55	Wire angle: 0	Bottom Depth: 65
Net Type: Bongo	Tow Type: VNH	
Flow start 21911	Flow end 22438	Flow = frozen
		Non-flow = pickled (circled)

Notes:

Date:	Station:	Time: **LOCAL**
Net Event #	CTD #	
Latitude: (deg) (min.dec) N	Longitude: (deg) (min.dec) W	
Wire out:	Wire angle:	Bottom Depth:
Net Type:	Tow Type:	
Flow start	Flow end	Flow = frozen
		Non-flow = pickled

Notes:

Date:	Station:	Time: **LOCAL**
Net Event #	CTD #	
Latitude: (deg) (min.dec) N	Longitude: (deg) (min.dec) W	
Wire out:	Wire angle:	Bottom Depth:
Net Type:	Tow Type:	
Flow start	Flow end	Flow = frozen
		Non-flow = pickled

Notes:

Date:	Station:	Time: **LOCAL**
Net Event #	CTD #	
Latitude: (deg) (min.dec) N	Longitude: (deg) (min.dec) W	
Wire out:	Wire angle:	Bottom Depth:
Net Type:	Tow Type:	
Flow start	Flow end	Flow = frozen
		Non-flow = pickled

Notes:

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Cruise #: **Vessel:** **Page:**

Project(s): **Contact:**

TSK Serial #: **RBR serial #:**

Time offset = + **hrs = UTC (please record local time for samples)**

Date:	Station:	Time: **LOCAL**
Net Event #	CTD #	
Latitude: deg min.dec N	Longitude: deg min.dec W	
Wire out:	Wire angle:	Bottom Depth:
Net Type:	Tow Type:	
Flow start	Flow end	Flow = frozen
		Non-flow = pickled

Notes:

Date:	Station:	Time: **LOCAL**
Net Event #	CTD #	
Latitude: deg min.dec N	Longitude: deg min.dec W	
Wire out:	Wire angle:	Bottom Depth:
Net Type:	Tow Type:	
Flow start	Flow end	Flow = frozen
		Non-flow = pickled

Notes:

Date:	Station:	Time: **LOCAL**
Net Event #	CTD #	
Latitude: deg min.dec N	Longitude: deg min.dec W	
Wire out:	Wire angle:	Bottom Depth:
Net Type:	Tow Type:	
Flow start	Flow end	Flow = frozen
		Non-flow = pickled

Notes:

Date:	Station:	Time: **LOCAL**
Net Event #	CTD #	
Latitude: deg min.dec N	Longitude: deg min.dec W	
Wire out:	Wire angle:	Bottom Depth:
Net Type:	Tow Type:	
Flow start	Flow end	Flow = frozen
		Non-flow = pickled

Notes:

Neocaligus Cruise IOS 2017-49
12-16 July 2017

Table 1. Sampling stations

Station	lat	lat mins	long	lon mins	Depth (m)	Samples
CBE2	48	44.22	-123	34.45	65	CTD, net
SC-04	48	43.50	-123	25.00	90	CTD, net, phyto, chl-a
GI-01	48	45.86	-123	20.53	65	CTD, net
46	48	51.4	-123	10.8	176	CTD, net
41	49	3.3	-123	22.3	245	CTD, net, phyto, chl-a, SAL*
40	49	8.6	-123	36.8	146	CTD, net
38	49	12	-123	26.4	300	CTD, net, ~~SAL*~~ already Sal
GEO1	49	15	-123	45	400	CTD, net, phyto, chl-a, SAL*
CPF1	49	22	-124	5	245	CTD, net
28	49	24.1	-123	45.3	134	CTD, net, chl-a (already have)
CPF2	49	28	-124	30	325	CTD, net, SAL* -
BS-11	49	29	-124	46	58	CTD, net
24	49	30.3	-124	6	425	CTD, net, SAL*
22	49	40.2	-124	16.3	353	CTD, net, ~~SAL*~~ already have
11	49	42.4	-124	43.4	290	CTD, net, phyto, chl-a
IS-2	49	38.2	-124	5	30	CTD, net
If timing allows:						
59	48	36.96	-123	14.978	225	CTD, net

*Note: really only need one deep SAL reference sample per day, but 5 locations indicated where it's deep enough for a good reference. Where the SAL is taken *depends on the route taken during the cruise.*

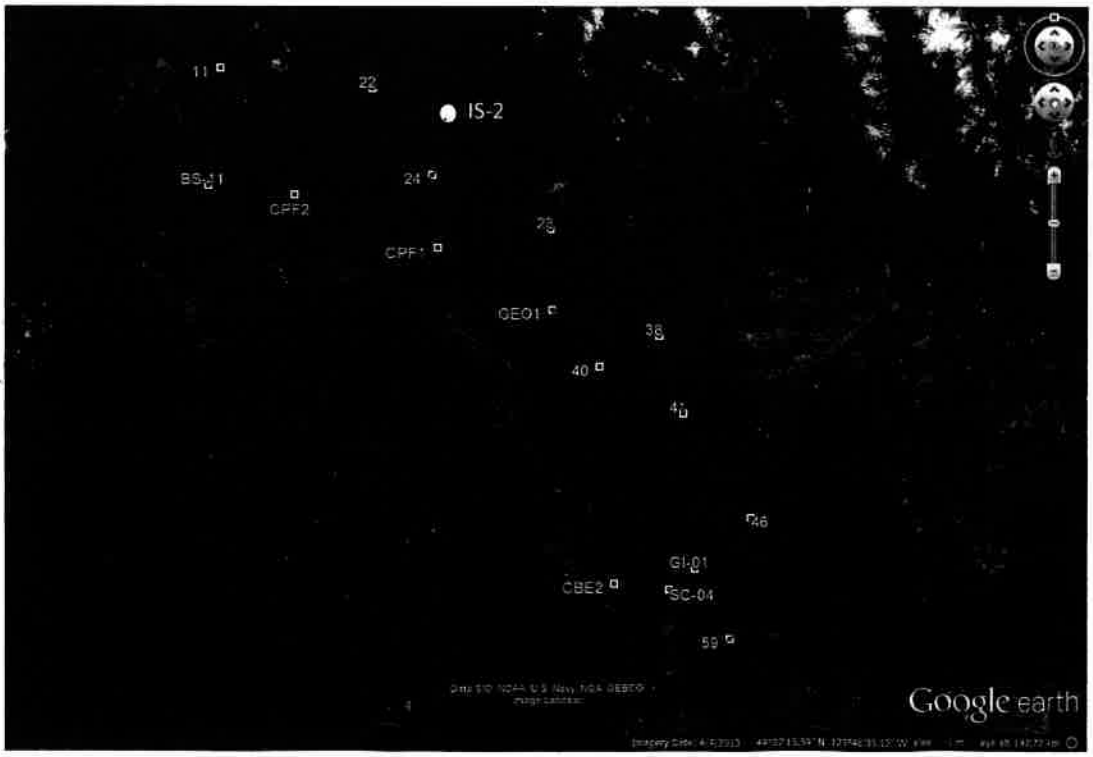

Figure 1. Station locations for IOS 2017-47 Strait of Georgia zooplankton surveys.

At each station, collect:

- Full depth CTD profile including oxygen and fluorometer, using SBE 25+ CTD with SBE 43 DO and Wetlabs fluorometer sensors. **2 minute soak at start** (Turn on, down 10m and up, wait remaining time and start). **Note:** CTD fluorometer usually has an end cap that needs to be removed before the first cast!
- Full depth (10m off bottom to surface) zooplankton tow, using Bongo net with 250um black mesh. Preserved in 10% buffered formalin. Upcast speed approx. 1 m/s (with electric winch, will be slightly slower. Should not be less than 0.5 m/s). Net equipped with a TSK flowmeter and a RBRSolo that logs the net casts (depth and time).
- **NEW for Brian Hunt:** one side of bongo to be preserved in 10% buffered formalin, the other side to be processed for fatty acids/stable isotopes. Sample to be size-fractionated and each fraction transferred to whirlpak and frozen at -80C (dry shipper).

At select stations, collect:

Salinity (SAL) – at least one deep water (>200m) salinity sample (in duplicate) per day (approx.), using 1 L Niskin attached 1m above CTD to collect a near-bottom salinity sample during CTD cast (CTD sensor check). Record sample number, depth collected in log.

- To be collected at stations: 41, 38, GEO1, CPF2, 22, 24.

Phytoplankton (phyto) – surface phyto sample preserved with Lugol's, collected with 1 L Niskin at surface; for taxonomy. Do not rinse jars (pre-filled with Lugol's). Record event number, sample number in log.

- To be collected at stations: SC-04, 41, GEO1, 11
- Stations chosen because: SC-04- close to Lou Hobson's station (historical site); 41 in plume; GEO1 for central; 11 for northern

Chlorophyll-a (chl-a) – Chl-a samples taken at surface and 5 m, at same stations as the phyto plus at Halibut Bank buoy (49.34,-123.72, near station 28). For comparison with Wetlabs fluorometer and for satellite and buoy data comparisons.

Water sampled with 1 L Niskin, 60-240 ml water (depending on how much phytoplankton is in the water; need some colour on the filter) filtered (in duplicate) with 140 ml syringe and 25 mm GF/F filters (same method as Citizen Science program). Store filter in scintillation vial and freeze at -20 °C (fridge freezer) until analyzed. *Record the sample number with the depth and volumes filtered in the cruise log*. Make sure labels have sample number and volume filtered as well.

- To be collected at stations: SC-04, 41, GEO1, 11, 28

Housekeeping

- There are 2 logs to fill out: cruise log and plankton log. Please fill out the cruise log with all events that occur, and give each event a number. Record BE, BO and EN time (note what time zone you are using! Eg: use local time if you want, but indicate so in the log and be consistent for the entire trip). **Check that the GPS has the correct time (needs to be manually changed between Daylight.ST and PST. Plankton log – enter information for all plankton tows.
- Upload the CTD data at the end of the day. Make sure the laptop has the correct date and time before uploading. Upload the files individually (don't do as a batch). When uploading the file, name them with standard format names such as 2017-07-0001.hex (or .xml for SBE25+) for event #1. Put location, station name, and bottom depth in the header (comments box) of the file, using the format in the "CTD Header.txt" file on the CTD laptop (the leading * and following : plus N and W are needed for processing)
- View the CTD data in Seasave to make sure everything looks good.
- Also check that the batteries have enough voltage, change if they drop below 10V (for SBE25+).
- Update the electronic cruise log (excel file) daily. Back up all files to USB.
- Run the Oziexplorer program with the GPS puck on the bridge every day, logging the cruise track and saving one per day.

→ Dock - DECKHAND

→ CORD → ENGINEER

→ COLLIN → COOK

→ BRIAN → CPT