

CRUISE
NUMBER

9905

DAILY LOG
INSTITUTE OF OCEAN SCIENCES
OCEAN PHYSICS

DATE

Jan. 21 - Jan. 28, 99

VESSEL

J. P. Tully

PROJECT

Georgia Strait / Juan de Fuca
La Perouse / Effingham.

Captain: P. Frost. First Officer: Brian Pennel

Second Officer: _____

Third Officer: _____

Cruise Participants / Agencies: OSAF MEHS

Scientific Personnel: Party Chief: Tom Suhász

Name	Watch	Cabin	Name	Watch	Cabin
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Doug Anderson

Mary O'Brien

Dave Spear

Darven Tuele

Dave Paton

Joe Linguanti

100

1. *What is the purpose of this study?*

Second leg of cruise: _____ Party Chief: _____

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[illegible][illegible][illegible][illegible][illegible]

100

[illegible][illegible]

100

Data logging system: Unit no.:

Program Name: _____

Program version: _____

CTD deck unit make: _____ model: _____ serial no.: _____

Computer make: _____ model: _____ serial no.: _____

1st CTD make: Seabird model: 911 serial no.: 0443

Temperature sensor	serial	model	serial no.:	Secondary
1708	PR1708-013	2045	2038	

coefficients:	slope:	offset:

Conductivity sensor

serial: secondary serial no.: 2120

model: primary 1766

coefficients: slope: _____ offset: _____

Pressure sensor range: 63507 psi serial no.: _____

coefficients: FSP: _____ dB offset: _____

Transmissometer
model: Sea-Tech serial no.: 182D

coefficients: slope: _____ offset: _____

Journal Pre-proof

Date Time (PST)

Jan. 21 0800 - join ship

0900 - leave I.O.S. for test cast with Roseette CTD at a position near the E-Buoy in Sequoia Inlet #001 CTD

- CTD system working with exception that bottle #16 did not trip

- filter water was collected for sediment work

- ship needed to switch launches

1045 - cast + launch work completed we head for bottom sampling and mooring recovery in Georgia Strait.

- ADCP started app 0845 hrs PST

- Thermo salinograph not running because seawater loop pump not functioning.

- 1410 - CM#2 grab to 1210 m on bottom 1421.

- 1605 - on station GSCM3

- using dunking transducer

- ranges 849, 850, 851

- moving closer nearly on top of position

- range 360 m directly on top

- moving off cable to release

- 758, 751 drifting closer

- 694 m range.

1625

1635

- sent BEGH weak (questionable response)

- sent BEGH again (same)

- instrument not communicating anymore.?

- moving closer - onto station.

- sent CDFG 135 m off station

- no responses to ranges

- sent release code BEGH

- no response

- no ranges. } we are 200 m away

- listen with pinger receiver - heard both pingers. - mooring still in place not surfaced.

- recovery will have to be by dragging on another day - tomorrow

1710 - completed Smith-Mc grab to 365 m

DAILY LOG

OCEAN PHYSICS

INSTITUTE OF OCEAN SCIENCES

YEAR 1999			MONTH January			SHIP J.P. Tully			CRUISE 99-05					PAGE 1 OF	
DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS	
21	EBU04	ROS	18:44	BE	1	48 39.35	123 29.82	BE	163						
21	EBU04	ROS		BO	1			BO							
21	EBU04	ROS	18:52	EN	1			EN							
23	V105	ROS	0204	BE	2				57		1-4				
			0214	EN	2	49 11.33	123 17.83			51				Touched Bottom	
23	V104	ROS	0303	BE	3	48 8.74	123 23.37	DGPS	186		6-16			Sample 5 omitted	
				BO	3										
			0318	EN	3	49 8.75	123 23.45							Touched again	
23	V103	ROS	0359	BE	004	49 5.98	123 29.06		344		17-30				
				BO	004										
			04:22	EN	004	49 6.00	123 29.03								
23	V102	ROS	05:04	BE	005	49 4.47	123 32.21	✓	260		31-42			Surface = 2.6	
			0510	BO	005										
			05:25	FW	005	49 4.48	123 32.13								
23	V101	ROS	06:03	BE	006	49 2.89	123 35.32	✓	121		43-49			1.4 gph	
			06:08	BO	006	49 2.89	123 35.31							99059006 DAT not	
			06:16	EN	006	49 2.91	123 35.33							and why 6 already	
						99059007 DAT	Las surface	bottle since program terminated						exceeded! Bottom	
														was triggered.	

CAST TYPE -

BOT -
CTD -
MOR -bottle cast
ctd
mooringROS -
NET -
DRF -rosette
net haul
drifter

USW - sea water loop

TIME CODE -

BE -
BO -
EN -beginning time of cast
bottom time of cast
end of castDE -
MR -
RE -deployment time
messenger release
recover mooring

POSITION CODE -

RAD -
GPS -
LOR -RADAR
GLOBAL
LORAN

Date Time

Jan. 22 0800

- on station GSCM3 50m off site.

- heard both pingers - strong signal from one
- mooring still in position. - second faintly heard.
- moving off app. 1 cable to attempt release.

0815

- at release position.

- ranges - no response. - drifted off
- several attempts - no ranges.
- move closer

0825

- 1 cable off position.

- no ranges

- sent BEGH - received weak confirmation.

- sent BEGH - received weak confirmation.

- nothing on surface

- sent BEGH - receiving weak confirmation.

- no ranges

- sent REGH - again a confirmation.

puzzling
ranges

→ 1550 1559 1571 1576 1579 1586 1593

- moved onto station again.

something at these

- ranges 1168 1163 1161 1163 1165 1166
✓ 1167 1174

- sent BEGH - positive reply. stronger.

- received. 2 sets of range 1150 m and

1500m - conclusion - may be on surface from earliest release this mooring.

- return to mooring site to try and confirm it

0930

- directly over station

- heard 2 pingers clearly listening with pinger receiver
is still in place + not adrift. ∴ the mooring

- we have to drag.

- adjust target position for drag 10% back
along tow position. along

DAILY LOG

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DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
23	G103	RO	07:13	BE	007	49 10.23	123 33.36	✓	376		50-63			Bottle 14 (anyone) did not trip.
		RO	07:22	BO		49 10.18	123 33.37							
23		RO	07:41	EN		49 10.24	123 33.44							2.266
23	IND2	RO	1854	BE	008	49 23.63	122 52.65	✓	221	215	78-89		←	Consecutive #'s out of order due to labels already affixed to G104
		RO	1858	BO	008	23.58	52.68							
		RO	1916	EN	008	23.58	52.61							
		RO	1854	UT		L								
	How 4	BE	2322	BE	009	49 35 56	123 14.60	✓	284		90-102			
		BO	2328	BO	009	49 35 52	123 14 76			280				
		EN	2345	EN	009	49	123							
24	N107	RO	0151	BE	010	49 22.53	123 32.93	✓	51	49	103-107			
			0154	BO	010									
			0158	EN	010	49 22.47	123 32.97	✓						
	N106	RO	0225	BE	011	49 21.38	123 35.05	✓	170		108-117			Started logging before pumpson
			0230	BO	011					166	117 Missed			waited to descend logging
			0244	EN	011	49 21.27	123 34.97	✓						Fired Bottle after stopped
	N106	RO	0245	BE	012				2.4	2.4				Started a 9905012 file to trip the bottle at surface
		BO												On Deck only 9 bottles fired

CAST TYPE - BOT - bottle cast
CTD - ctd
MOR - mooring

ROS - rosette
NET - net haul
DRF - drifter

USW - sea water loop

TIME CODE - BE - beginning time of cast
BO - bottom time of cast
EN - end of cast

DE - deployment time
MR - messenger release
RE - recover mooring

POSITION CODE - RAD - RADAR
GPS - GLOBAL
LOR - LORAN

Bottle log for 9905011 shows 9 bottles fired
9905012 shows 1 miss fire

Date Time

Jan. 23 0845

- in Vancouver harbour dropping
off Dave Paton.

- expecting storm force outflow winds - did not happen

- completed Indian Arm and Howe
Sound stations for Darío

- completed NI Line + GIO4.

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YEAR		MONTH		SHIP		CRUISE		PAGE		OF				
1999		01		Tully		9905								
DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
24	N105	ROS	0316	BE	013	49 19.67	123 38.66	✓	264	260	118-129	108		
			0324	BO										
			0339	EN		19.58	38.67							
24	N104	ROS	0431	BE	014	49 17.9N	123 42.38	✓	298		130-142	13		Cap on nut #8 loose. *SBE deck unit with yellow tag ^{#0425} used up to this point. This unit failed and alternate was substituted and seems to be working. Unit now in use = #0424
				BO	014									
				EN	014									
														
24	N103	ROS	0525	BE	015	49 16.01	123 45.73	✓	418	408	143-158	1516		Y Dottle 788 tripped at 150 m - extra bottle taken
			0536	BO	015	49 16.01	123 45.77							Deck unit 0425 OK. DA
			0555	EN	015	49 15.87	123 46.11							T.J, D.S, H.O. → Suspect.
24	N102	ROS	0641	BE	016	49 14.63	123 48.56	✓	326	335	159-171	13		
			0649	BO	016	49 14.67	123 48.56							
			0705	EN	016	49 14.64	123 48.63							
24	N101	ROS		BE	017			✓	114		172-178	7		
			0742	BO	017	49 13.35	123 51.22							
			0748	EN	017	49 13.34	123 51.23							

CAST TYPE -

BOT -

bottle cast
ctd
mooring

ROS -

rosette
net haul
drifter

USW -

sea water loop

TIME CODE -

BE -

BO -

EN -

beginning time of cast

bottom time of cast

end of cast

DE -

MR -

RE -

deployment time
messenger release
recover mooring

POSITION CODE -

RAD -

GPS -

LOR -

RADAR
GLOBAL
LORAN

Date Time

Jan. 24 0815

- on station GSCM 3-I for recovery

- listening with pinger

↑ N

1320

- drifting over mooring from A → B
- heard both pingers at A. top strong bottom faint.
- at C both pingers were stronger



- at A something? was giving 1170 m range
- at B something was giving 1320 m range
- sent release code at B - received faint intermittent positive release response
- mooring did not rise to surface - no visual contact, no Argos on surface
- we decide to triangulate on the "unknown source"
- using the previous ranges we identify a NE and SE likely spots
- we move closer to NE and received ranges 985 → 995 - we are closer to the unknown source.

0910 - moving closer to unknown source.

0925 - on NE position of unknown source.
- received ranges of app 1270 m - why?

- heard pingers - weaker but still good signals
- we are 1.4 km away - why?

- some thoughts. all our ranges have been app. multiples of the depth.
600 - 700 m 900 - 1000 m 1200 - 1300 m
1500 - 1600 m - this may be some unknown effect - bottom echos

- pingers have unusual range. one is 1/2 watt and colder denser water may enhance range

- double checked position vs. ship's log of deployment ship's position is.

49° 06.259' 123 29.962'

1 minute difference. = $\frac{2}{3}$ nm. We are right here!

Date Time

Jan. 24 1000

- we have alternated IO command units + transducers to eliminate possible command unit faults
- we test our equipment using a release on board $\angle$ release command good
- transpond response good.

1015

- on station recorded in ship's log.

- good pinger signals - both heard

- ranges 525 $\rightarrow$ 522 510 = 370 m

506 = 365 m

501 = 358 m

497 = 352 m

493 =

492 = 347 m

- drifting abnug to south of site.

- moving slightly ahead to be directly over

1035

- trying to be over mooring.

- pingers very strong.

- 383 range 155 m distance

- 385 "

- we close to being on top.

- move off to try and release.

1045

- in release pos.

- range 427 428

- sent BEGH. Confirmed

- Ranges not changing 429

- sent BEGH again Confirmed

- Ranges not changing 427, 428

- send CDEG 421, 420

- sent BEGH, Confirmed 444, 412 200m horizontal

392

- mooring did not surface

- have identified position very closely.

- release is not responding to release

commands but transponding at close range

- tried Directional Pinger Receiver.

steaming a box pattern app 1.5-2

cable distance from the ship

- the DPR - 2 K positioned the mooring within $\frac{1}{2}$ cable of the logged position.

- very close! - the DPR - 2 K has some hope

DAILY LOG

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INSTITUTE OF OCEAN SCIENCES

YEAR			MONTH			SHIP			CRUISE			PAGE		OF	
1999			January			J. P. Tully			9805						
DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS	
24	GICH	ROS	0846	BE	018	49 12.62	123 40.17	✓	390						
		ROS	0854	BO	018	49 12.64	123 40.17			385	64-77	14			
		ROS	0913	EN	018	49 12.65	123 40.24								
25	GID2	ROS	0153	BE	019	49 02.63	123 23.53	✓	249		179 - 190				
			0159	BO	019	11	23.74								
			0215	EN	019	2.58	24.09								
25	GID1	ROS	0304	BE	020	48 58.51	123 16.34	✓	163	154	191 - 200				
				BO	020										
			0319	EN	020	58.52	16.32								
25	MI01	CTD	4:03	BE	021	48 52.39	123 14.56	✓	150						
			4:07	BO	021	48 52.40	123 14.55			140					
			4:09	EN	021	48 52.42	123 14.55								
25	MI02	CTD	4:31	BE	022	48 53.72	123 12.57	✓	140?						
			4:35	BO	022	48 53.70	123 12.54			135					
			4:37	EN	022	48 53.70	123 12.53								
25	MI03	ROS	4:57	BE	023	48 55.17	123 10.75	✓	128		201 - 208	8			
			5:00	BO	023	48 55.15	123 10.75			117					
			5:09	EN	023	48 55.13	123 10.74								

Why these numbers

Bm

Because labels were made up ahead and things did not go as planned - instead of throwing them away we saved them and used them now

CAST TYPE -

BOT -
CTD -
MOR -bottle cast
ctd
mooringROS -
NET -
DRF -rosette
net haul
drifter

USW -

sea water loop

TIME CODE -

BE -
BO -
EN -beginning time of cast
bottom time of cast
end of castDE -
MR -
RE -deployment time
messenger release
recover mooring

POSITION CODE -

RAD -
GPS -
LOR -RADAR
GLOBAL
LORAN~~why these numbers~~

Bm
Because labels were
made up ahead and
things did not go
as planned - instead
of throwing them away
we saved them and
used them now.

Date Time

Jan. 24 1230 - set up for drag ~~#3~~ ^{#1+2} same pattern as before to cover the logged and DPP position. (Jan 22)

1340 - witness buoy + top 2 steel buoy were sighted on surface

- recovered drag - recovered drifting portion.

1430 - all recovered - line cut immediately below instrument # 3705

1445 - back on station to relocate + drag again

- range 420 m, 427 m
- sent BEGH - received positive response
- moving not surfacing
- ranges indicate it is still down.

- standing by

- range 506 m = 365 distance

1635 - #4 drag recovered unsuccessful.

1640 - moved onto site.

- range 363, 363 m. - still on station

- moved off one cable and tried to release again.

1643 - range 400 m.

- sent BEGH 2 times.
- received positive response
- not sighted on surface.
- ranges indicating it is not rising.

- sent CDFG - range 421.

- try again later

- moving to CTD / Rosette stations.

DAILY LOG

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DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS	
25	M104	CTD	5:30	BE	024	48 56.16	123 09.58	✓	120m						
			5:33	BO	024	48 56.15	123 09.56			112					
			5:35	EN	024	48 56.14	123 09.55								
25	M105	CTD	5:54	BE	025	48 57.09	123 08.34	✓	113m						
			5:57	BO	025	48 57.06	123 08.34			108					
			5:59	EN	025	48 57.05	123 08.33								
25	M106	CTD	6:17	BE	026	48 57.95	123 07.13	✓		126					
			6:20	BO	026	48 57.96	123 07.12				121	/			
			6:22	EN	026	48 57.96	123 07.11								
25	M107	CTD	6:42	BE	027	48 58.87	123 05.90	✓		45					
			6:43	BO	027	48 58.88	123 05.90				40				
			6:44	EN	027	48 58.88	123 05.91								
25	S107	CTD	7:28	BE	028	48 55.57	123 00.18	✓		131					
			7:31	BO	028	48 55.55	123 00.18				125				
			7:32	EN	028	48 55.55	123 00.18								
25	S105	CTD	7:59	BE	029	48 53.76	123 02.58	✓	165	155					
			8:04	BO	029	48 53.74	123 02.57								
			8:07	EN	029	48 53.75	123 02.56								

CAST TYPE -

 BOT - bottle cast
 CTD - old
 MOR - mooring

 ROS - rosette
 NET - net haul
 DRF - drifter

USW - sea water loop

TIME CODE -

 BE - beginning time of cast
 BO - bottom time of cast
 EN - end of cast

 DE - deployment time
 MR - messenger release
 RE - recover mooring

POSITION CODE -

 RAD - RADAR
 GPS - GLOBAL
 LOR - LORAN

Date Time

Jan. 25 0800

Mary 652-0326

- on station
- ranges 380, 379, 378, 374
- 370, 368, 365, 363, 358, 357, 355, 351
- passed within 64 m of mooring site.
- finished drag #7 without success
- back on station listening to mooring
- ranges 357, 355, 353, → 348.
- mooring still on station
- moving off for another try.

0930

0950

- completed #8 drag without success
- moved back on station
- ranges 349, 348 m - mooring still on site

1220

- moved off 1 cable.
- range 379, 382 →
- sent BEGH - received positive response
- mooring did not rise.
- ranges 390, 394, not rising
- sent CDFG
- listened with pinger - heard 1 pinger strong signal

Position is: 49 06.344'

123 30.042'

1715

- completed S I Line + heading into 1.O.S. to drop Mary off.

2000

- arrive at 1.O.S.
- Mary leaves by launch.
- Joe, Doug and Darren go ashore to pick up salinity bottles, working salinometer and printer and disks.

2200

- depart for west coast

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25	SI03	ROS	0832	BE	30	48 51.82	123 05.06	✓	162					
25	SI03	ROS	0835	BO	30	48 51.83	123 05.06			153	209-217	9		
25	SI03	ROS	0844	EN	30	48 51.82	123 04.98							
25	SI08	CTD	23:10	BE	31	48 56.42	122 58.84	✓	42					
25	SI08	CTD	23:11	BO	31	48 56.41	122 58.83			35				
25	SI08	CTD	23:12	EN	31	48 56.38	122 58.80							
25	SI06	CTD	23:35	BE	32	48 54.55	123 01.25	✓	153					
25	SI06	CTD	23:39	BO	32	48 54.55	123 01.25			145				
25	SI06	CTD	23:41	EN	32	48 54.56	123 01.24							
26	SI04	CTD	0010	BE	33	48 52.83	123 03.77	✓	157					
26	SI04	CTD	0013	BO	33					153				
26		CTD		EN	33									
26	SI02	CTD	0043	BE	34	48 50.56	123 06.85	✓	219					
26	SI02	CTD	0047	BO	34									Warm, salty layer at bottom
26	SI02	CTD		EN	34									
26	SI01	CTD	0108	BE	35	48 49.17	123 08.75	✓	113	close				
26	SI01	CTD	0111	BO	35	48 49.20	123 08.73							
26	SI01	CTD	0112	EN	35	48 49.21	123 08.71							

CAST TYPE - BOT - bottle cast
CTD - ctd
MOR - mooring
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DRF - drifter
USW - sea water loop

TIME CODE - BE - beginning time of cast
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EN - end of cast
DE - deployment time
MR - messenger release
RE - recover mooring

POSITION CODE - RAD - RADAR
GPS - GLOBAL
LOR - LORAN

Date Time (PST)

- Jan. 26 0800 - just past J-Buoy
- ship gets call for SAR - a Columbia River marker buoy is adrift.
- Tully finds buoy and tows it to Bamfield.
- 1500 - drop buoy off at Bamfield CIG station.
- head for Effingham Inlet station.
- 1700 - complete Effingham stations + head for
- 2400 mooring deployment at AI

Jan. 27 0800 - on station for deployment of mooring
AI-BB-2.

- gale force winds. 4 m seas - marginal
conditions

- set up mooring on deck

1010 - start mooring deployment
- difficulty controlling ship in this weather

1024 - anchor launched at $48^{\circ} 32.393'$
in 506 m water $126^{\circ} 11.943'$

- sounder intermittent and results in overshooting
target of 500 m.
- mooring was observed to submerge

1056 - complete calibration CTD cast near mooring
site

1130 - head into Juan de Fuca Strait. for
- very scary. too rough!

✓ F station CTD's

DAILY LOG

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YEAR			MONTH			SHIP			CRUISE			PAGE		OF	
99			Jan			Tully			9905						
DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS	
27	EFF01	ROS		BE	36	49 5.53	125 11.71	✓	33		218-221				
27			0150	BO	36	5.53	11.71			30					
27			0153	EN	36	5.53	11.71								
27	EFF02	ROS		BE	37	49 4.84	125 10.20	✓	75		222-227				
			0219	BO	37					68					
			0224	EN	37										
27	EFF03	ROS	0241	BE	38	49 4.26	125 9.37	✓	123		228-234			235 Not Collected	
				BO	38					116				Trans Min at 65-70m	
			0252	EN	38									Anoxic Boundary?	
27	EFF04	ROS	0312	BE	39	49 03.15	125 08.58	✓	53						
			0314	BO	39					48					
			0318	EN	39	03.13	0857							Fired 2 bottles at surface ignored 2nd	
27	EFF05	ROS	0332	BE	40	49 02.54	125 09.17	✓	203					Murky bottom trace	
			0336	BO	40					197				Spikes at stops	
			0349	EN	40										
27	EFF06	ROS	0407	BE	41	49 01.79	125 09.16		152					Trouble with buttons, 1/2	
			0411	BO	41	49 01.80	125 09.16			145	252-260			may have detected site. Data	
			0419	EN	41	49 01.78	125 09.16							DA.	

CAST TYPE -

BOT -
CTD -
MOR -bottle cast
ctd
mooringROS -
NET -
DRF -rosette
net haul
drifter

USW -

sea water loop

TIME CODE -

BE -
BO -
EN -beginning time of cast
bottom time of cast
end of castDE -
MR -
RE -deployment time
messenger release
recover mooring

POSITION CODE -

RAD -
GPS -
LOR -RADAR
GLOBAL
LORAN

DAILY LOG

OCEAN PHYSICS

INSTITUTE OF OCEAN SCIENCES

YEAR			MONTH			SHIP			CRUISE					PAGE		OF	
1999			January			Tully			9905								
DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE		LONGITUDE		POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS	
27	EFF07	ROS	0436	BE	42	49 01.27		125 09.41		✓	120		261-268	8			
27	EFF07	ROS	0439	BO	42	49 01.27		125 09.38				115					
27	EFF07	ROS	0444	EN	42	49 01.24		125 09.34									
27	EFF08	ROS	0508	BE	043	49 00.67		125 10.20		✓	84		269-274	6		Topped up oxygen reagents.	
27	EFF08	ROS	0511	BO	043	49 00.68		125 10.20									
27	EFF08	ROS	0516	EN	043	49 00.66		125 10.21									
27	EFF09	ROS	0532	BE	044	49 00.10		125 10.87		✓	59		275-280	6			
27	EFF09	ROS	0535	BO	044	49 00.10		125 10.88									
27	EFF09	ROS	0538	EN	044	49 00.08		125 10.89									
27	EFF10	ROS	0554	BE	045	48 59.83		125 11.23		✓	102		281-287	7		Bottles 1 & 2 are at 75 & 95 m respectively	
27	EFF10	ROS	0557	BO	045	48 59.83		125 11.23									
27	EFF10	ROS	0606	EN	045	48 59.81		125 11.24									
27	EFF11	ROS	0624	BE	046	48 59.09		125 11.05		✓	85		288-293	6			
27	EFF11	ROS	0627	BO	046	48 59.09		125 11.04									
27	EFF11	ROS	0631	EN	046	48 59.08		125 11.02									
27	EFF12	ROS	0705	BE	047	48 58.00		125 10.49		✓	94		294-300	7			
27	EFF12	ROS	0707	BO	047	48 58.00		125 10.50				90					
27	EFF12	ROS	0712	EN	047	48 57.99		125 10.51									

CAST TYPE - BOT - bottle cast
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POSITION CODE - RAD - RADAR
GPS - GLOBAL
LOR - LORAN

DAILY LOG

OCEAN PHYSICS

INSTITUTE OF OCEAN SCIENCES

YEAR 1999			MONTH January			SHIP Tully				CRUISE 9905				PAGE OF	
DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS	
27	EFF3	ROS	07:34	BE	048	48 56.50	125 10.73	✓	107 m		301-307	7			
27	EFF13	ROS	07:37	BO	048	48 56.50	125 10.73			97 m					
27	EFF13	ROS	07:42	EN	048	48 56.49	125 10.76								
	A1	ROS	18:56	BE	49	48 32 20	126 12 29	✓	534	525	308-323	16			
	A1	ROS		BO	49										
	A1	ROS	19:31	EN	49	48 31 86	126 12 13		76 m						
28	JFE7	CTD	0348	BE	050	48 16.30	124 15.01	✓	76	69 m					
	JFE7	CTD	0351	BO	050										
	JFE7	CTD		EN	050	16.33	14.95								
28	JFE6	CTD	0417	BE	051	48 17.72	124 15.04	✓	175						
28	JFE6	CTD	0420	BO	051	48 17.72	124 15.01			169					
28	JFE6	CTD	0423	EN	051	48 17.71	124 14.99								
28	JFE5	CTD	0446	BE	052	48 19.19	124 14.97	✓	214						
28	JFE5	CTD	0449	BO	052	48 19.17	124 14.98			195					
28	JFE5	CTD	0451	EN	052	48 19.16	124 14.99								
28	JFE4	CTD	0515	BE	053	48 21.17	124 14.96	✓	226						
28	JFE4	CTD	0519	BO	053	48 21.17	124 14.96			217					
28	JFE4	CTD	0521	EN	053	48 21.17	124 14.96								

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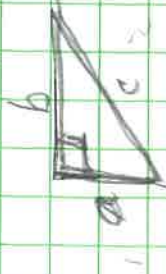
POSITION CODE -

 RAD - RADAR
 GPS - GLOBAL
 LOR - LORAN

Date Time

Jan. 28 0800 - on station JF3B-B for recovery.

$$c^2 = a^2 + b^2$$



- ranges 133, 134 - on top of mooring

0813 - moving off to release position

- range 340 m = 304 m distance

0820 - sent ABC# received positive response

0821 - sighted on surface, - move to recover.

- preparing mooring on deck

1058 - deployed mooring JF3B-B2.

at $48^\circ 12.901'$

$124^\circ 03.310'$

in 141 m water.

- departed for JFD + JFC lines
for CTD's

1630 - dropped Darren + Dave off at Sooke
by launch.

2000 - completed CTD's.

- packing up - heading in

DAILY LOG

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YEAR 1999			MONTH January			SHIP Tully			CRUISE 9905					PAGE OF
DAY (UTC)	STATION ID	CAST TYPE	TIME (UTC)	TIME CODE	STD/HYDRO CONSEC #	LATITUDE	LONGITUDE	POSITION CODE	BOTTOM DEPTH (m)	MAX SAMPLING DEPTH (m)	CONSEC SAMPLE #	# OF BOTTLES	INIT	COMMENTS
28	JFE3	CTD	05:46	BE	054	48 23.21	124 14.91	✓	186 m					where's Joe? → Joe's resting.
28	JFE3	CTD	05:49	BO	054	48 23.22	124 14.89			177 m				
28	JFE3	CTD	05:51	EN	054	48 23.22	124 14.89							
28	JFE2	CTD	06:18	BE	055	48 25.12	124 14.86	✓	142 m					
28	JFE2	CTD	06:22	BO	055	48 25.15	124 14.83			130 m				
28	JFE2	CTD	06:24	EN	055	48 25.16	124 14.84							
28	JFE1	CTD	06:33	BE	056	48 27.21	124 14.91	✓	30 m					
28	JFE1	CTD	06:53	BO	056	48 27.22	124 14.91			20 m				
28	JFE1	CTD	06:54	EN	056	48 27.22	124 14.91							
28	JFD1	CTD	07:59	BE	057	48 23.10	124 00.02	✓	51					
28	JFD1	CTD	08:00	BO	057	48 23.10	124 00.02			43				
28	JFD1	CTD	08:01	EN	057	48 23.11	124 00.02							
28	JFD2	CTD	08:21	BE	058	48 21.79	123 59.96	✓	122 m					
28	JFD2	CTD	08:23	BO	058	48 21.78	123 59.95			115 m				
28	JFD2	CTD	08:25	EN	058	48 21.78	123 59.94							
28	JFD7	CTD	1935	BE	059	48 11.87	123 60.00	✓	55 m					
28		CTD	1937	BO	059	48 11.85	123 60.03			~48				
28		CTD	1938		059	11.84	60.05							

CAST TYPE -

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BE -

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BO -

bottom time of cast

EN -

end of cast

DE -

deployment time

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messenger release

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recover mooring

POSITION CODE -

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YEAR			MONTH			SHIP			CRUISE			PAGE		OF	
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28	JFD6	CTD	20:02	BE	060	48°13.68		123°59.94	✓	113					
28		CTD		BO	060	48°13.67		123°59.97			109				
28		CTD	20:08	EN	060	13.68		59.96							
28	JFD5	CTD	20:32	BE	061	48 15.75		124 00.02	✓	184					
28	JFD5	CTD	20:37	BO	061	48 15.66		124 00.08			180				
28	JFD5	CTD	20:40	EN	061	48 15.62		124 00.07							
28	JFD4	CTD	21:11	BE	062	48 17.73		124 00.05	✓	191					
28	JFD4	CTD	21:15	BO	062	48 17.78		124 00.11			183				
28	JFD4	CTD	21:19	EN	062	48 17.82		124 00.20							
28	JFD3	CTD	21:42	BE	063	48 19.68		123 60.00	✓	168					
28	JFD3	CTD	21:45	BO	063	48 19.68		124 00.01							
28	JFD3	CTD	21:48	EN	063	48 19.65		124 00.05							
28	JFC1	CTD	23:01	BE	064	48 20.28		123 45.26	✓	48					
28	JFC1	CTD	23:03	BO	064	48 20.28		123 45.32			50				
28	JFC1	CTD	23:04	EN	064	48 20.28		123 45.35							
28	JFC2	CTD	23:27	BE	065	48 18.57		123 45.08	✓	172					D.T. doing Oxy's - not on deck, left J.L. alone.
28	JFC2	CTD	23:30	BO	065	48 18.55		123 45.14			166				
28	JFC2	CTD	23:32	EN	065	48 18.54		123 45.15							

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28	JFC3	CTD	01:40	BE	066	48 16.60	123 45.14	✓	183								
28	JFC3	CTD	01:46	BO	066	48 16.69	123 45.30			175							
28	JFC3	CTD	01:50	EN	066	48 16.73	123 45.39										
29	JFC4	CTD	02:14	BE	067	48 14.41	123 45.15	✓	166								
29	JFC4	CTD	02:18	BO	067	48 14.43	123 45.15			157							
29	JFC4	CTD	02:20	EN	067	48 14.45	123 45.15										
29	JFC5	CTD	02:58	BE	068	48 12.43	123 45.03	✓	139								
29	JFC5	CTD	03:02	BO	068	48 12.43	123 45.05			139							
29	JFC5	CTD	03:04	EN	068	48 12.43	123 45.05										
29	JFC6	CTD	03:23	BE	069	48 10.42	123 44.95	✓	52								
29	JFC6	CTD	03:25	BO	069	48 10.43	123 44.95			45							
29	JFC6	CTD	03:26	EN	069	48 10.44	123 44.95										
CAST TYPE - BOT - bottle cast CTD - ctd MOR - mooring ROS - rosette NET - net haul DRF - drifter USW - sea water loop TIME CODE - BE - beginning time of cast BO - bottom time of cast EN - end of cast DE - deployment time MR - messenger release RE - recover mooring POSITION CODE - RAD - RADAR GPS - GLOBAL LOR - LORAN																	