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PACIFIC REGION CCG VESSEL CRUISE PLAN

DEPARTMENTS: DFO – OSD; MEAD; US NWFSC-FRAM

SCIENCE CRUISE NUMBER: 2006-25

SHIP'S PATROL NUMBER:

NAME OF SHIP/PLATFORM: J.P. TULLY

SURVEY AREA/AREA OF OPERATION: Load-depart IOS, transit to Pt. Hardy for system calibration and rendezvous with W.E. RICKER then to Queen Charlotte Sound to conduct survey operations. Survey Goose Bank Wheel grid to assess use of multi-frequency acoustics for improved target discrimination of plankton and fish. Conduct inter-ship sounding/bio-sampling with W.E. RICKER. Transit to WCVI for completion of standard OSD lines (TBD) before science crew transfer at IOS.

CRUISE OBJECTIVE[S]:

1. Calibrate ship-mounted EK60 multi-frequency acoustic system.
2. Evaluate use of EK60 systems to improve species discrimination. Data to be used with ecosystem monitoring of QCS sampling grid (PNCIMA-EBSA program development).
3. Conduct acoustic data comparison of multi-frequency integration and TS measurements from ship-mounted J.P. TULLY and W.E. RICKER systems and DAISY.
4. Collect plankton, nutrient, and physical oceanographic data in conjunction with acoustic operations.

DATE: **FROM:** August 15, 2006 **TO:** August 29, 2006

SENIOR SCIENTIST[S]/CONTACT TEL. #'S:

Steve Romaine (250) 363-6868 email: romaines@pac.dfo-mpo.gc.ca

Robert Kieser (250) 756-7181 email: kieserr@pac.dfo-mpo.gc.ca

Rebecca Thomas (206) 860-3289 email: Rebecca.Thomas.noaa.gov

SCIENTIFIC PERSONNEL:

BERTHS REQUIRED: 8+2

(If available, 2 births on crew's deck)

LEG	DATES	ACOUSTICS (0600-2000)	BIOLOGICAL (0800-2000)	OCEANOGRAPHY (2000-0400)	MARINE MAMMAL (0600-2100)	AUXILLIARY as required
1	15 August	Robert Kieser	Steve Romaine	Marty Davelaar	na	Janet Lohead
	IOS (crew/science	Rebecca Thomas	Moirra Galbraith	Alex Hutter		Stephen de Blois
	change)	John Holmes				Stan Tomich
2	17 August	Robert Kieser	Steve Romaine	Marty Davelaar		Stephen de Blois
	calibration Pt. Hardy	Rebecca Thomas	Moirra Galbraith	Alex Hutter		Stan Tomich
		George Cronkite				
	J. Lohead to WER	John Holmes				
3	18-26 August	Robert Kieser	Steve Romaine	Marty Davelaar	na	Stephen de Blois
	QCS (survey ops)	Rebecca Thomas	Moirra Galbraith	Alex Hutter		Stan Tomich



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	PBS-US science transfer	George Cronkite				
	To W.E. RICKER Aug 26	John Holmes				
4	27-28 August		Steve Romaine	Marty Davelaar	na	
	WCVI OSD sampling		Moirra Galbraith	Alex Hutter		
	enroute to IOS					

SHIP EQUIPMENT REQUIRED:

Simrad EK60 sounders
RDI ADCP system
Wet lab/Dry lab/Acoustic lab/Scientific freezers

DECK MACHINERY REQUIRED:

[ATTACH DECK PLAN AT END
OF DOCUMENT]
Conducting wire winch for CTD/Rosette
Conducting wire winch for BIONESS operation

FISHING GEAR REQUIRED:

BIONESS, BIONESS Deck Unit
Bongo Nets

OTHER EQUIPMENT TO BE LOADED:

SPECIAL REQUIREMENTS:

[INCLUDE LAUNCH/SMALL BOAT
REQUIREMENTS AND SPECIAL POWER REQUIREMENTS]
Launch for calibration assistance and at-sea crew transfers (as required with W.E. RICKER)
Ship DOPPLER system requested OFF during all acoustic operations (interferes with SIMRAD EK
system)
CTD/Rosette Unit
CTD Deck Unit
US-NWFSC Video Plankton Recorder (?)

DANGEROUS CHEMICALS:

[INCLUDING MATERIAL
SAFETY DATA SHEETS
AND WHMIS LABELS]

GAS CYLINDERS:

3 tanks CO₂

ACIDS & BASES:

sulphuric acid, 0.5 L
ammonium hydroxide, 2 L

TOXIC:

Formaldehyde, 20 L
Triton, 1L

FLAMMABLES:

Isopropanol, 10L

RADIOISOTOPES:



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[INCLUDING CERTIFICATES]

ANTICIPATED LOADING TIME: ½ day

LOGISTICS:

COMMENCE LOADING [DATE/TIME]: IOS August 15, 2006 0800

SAILING [DATE/TIME]: IOS August 15 1600 to Pt Hardy; August 16 pm rendezvous with W.E. RICKER for science crew (Acoustic) and gear transfer; August 17 Pt. Hardy for system calibration; August 18-26 conduct survey ops with W.E. RICKER on Goose Bank Wheel Grid; conduct OSD sampling WCVI enroute to science crew transfer August 29 IOS.

EXPECTED OPERATIONS PROFILE:

15 hr multi-frequency sounding/sampling (0600-2100)

9 hr ADCP/CTD survey of study area (2100-0600)

[24 HR./12 HR/OTHER]

ADCP/additional oceanographic sampling at night;
night run to daytime acoustic station with 0600 start

RETURNING [DATE/TIME]: IOS August 29, 2006 ~08.00

OFFLOADING: [DATE/TIME]: IOS August 29, 2006 ~08.00

SCIENTIFIC CREW CHANGES:[DATES/TIMES/LOCATIONS]

August 15, 2006 IOS *includes vessel crew change

August 17, 2006 Pt. Hardy transfer with W.E. RICKER; calibration

August 18-26, 2006 possible at sea transfers with W.E. RICKER (TBD)

August 26, 2006 at sea transfer of PBS-US science crew with W.E. RICKER

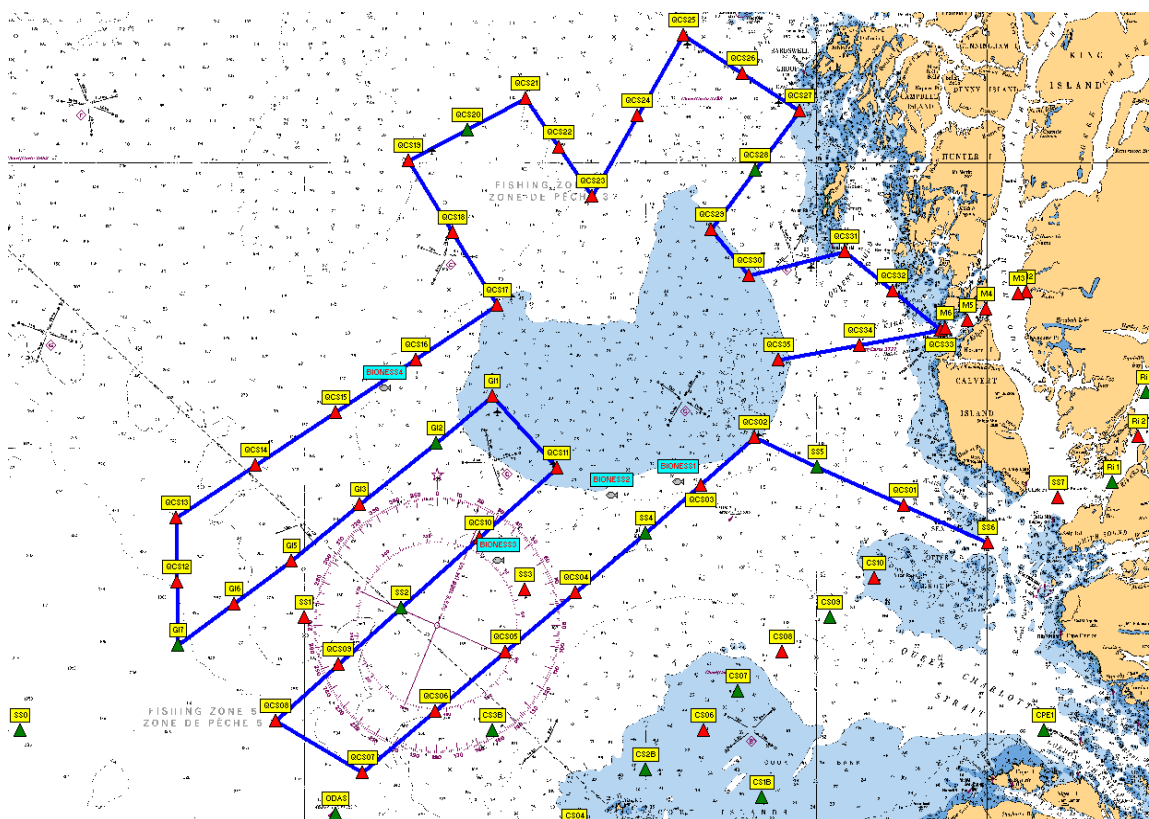
August 29, 2006 IOS-Pat Bay program change

PROPOSED CRUISE ITINERARY:

DATE	OPERATION/EVENT
August 15, 2006	Load vessel IOS, Pat Bay. Depart ~1600 August 15, transit Pt. Hardy.
August 16, 2006	Rendezvous with W.E. RICKER Pt. Hardy (evening) for science crew and gear transfer.
August 17, 2006	Multi-frequency acoustic system calibration Pt. Hardy
August 18-26, 2006	At sea rendezvous (possible science crew transfers) with W.E. RICKER; joint acoustic-bio-sampling program for multi-frequency system evaluation; All PBS-US science crew to return to Pt. Hardy with W.E. RICKER August 26 evening
August 27-29, 2006	OSD sampling WCVI enroute to IOS for August 29 08.00 Science crew change and offload.



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Proposed survey grid for joint J.P. TULLY – W.E. RICKER multi-frequency acoustics and oceanographic sampling stations for J.P. TULLY; W.E. RICKER Hake TS work to be conducted near shelf edge (200m; see Cruise Plan 2006-26).

Red Triangle: CTD station (selected stations TBD will also have rosettes)

Green Triangle: CTD/Bongo station (selected stations TBD will also have rosettes)

Stations along the proposed acoustic transect may be sampled during daytime acoustics or visited during the night (TBD). Ricker and Tully to split nightly CTD work, based on demands. Bongo tows only to be conducted from the Tully.

Additional time series stations are indicated off the acoustic transect. These will be occupied as time permits during the night.

BIONESS stations TBD. Four historical stations have been indicated on the chart above and in the station list below.



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QCS CTD/Plankton Station List

Station	Lat		Long		Event
QCS21	52	6.676	-129	21.139	CTD
QCS23	51	56.469	-129	9.467	CTD
QCS29	51	52.959	-128	48.559	CTD
QCS30	51	48.137	-128	41.915	CTD
QCS33	51	42.402	-128	8.215	CTD
QCS35	51	39.275	-128	36.727	CTD
QCS07	50	55.45	-129	49.831	CTD
QCS08	51	1	-130	5.08	CTD
QCS13	51	22.569	-130	22.603	CTD
GI2	51	30.5	-129	36.9	CTD/Bongo
GI1	51	35.4	-129	27	CTD
GI3	51	24	-129	50.4	CTD
GI5	51	18	-130	2.4	CTD
GI7	51	9	-130	22.2	CTD/Bongo
M2	51	46.46	-127	53.2	CTD
M3	51	46.27	-127	54.6	CTD
M4	51	44.65	-128	0.2	CTD
M5	51	43.4	-128	3.6	CTD
M6	51	42.66	-128	7.4	CTD
Ri1	51	26.4	-127	38.1	CTD/Bongo
Ri2	51	31.25	-127	33.6	CTD
Ri3	51	35.9	-127	32.1	CTD/Bongo
Ri4	51	38.9	-127	26.7	CTD
Ri5	51	40.7	-127	19.9	CTD
SS0	51	0	-130	50	CTD/Bongo
SS1	51	12	-130	0	CTD
SS2	51	13	-129	43	CTD/Bongo
SS3	51	15	-129	21.3	CTD
SS4	51	21	-129	0	CTD/Bongo
SS5	51	28	-128	30	CTD/Bongo
SS6	51	20	-128	0	CTD
SS7	51	24.7	-127	47.6	CTD
CS01	50	34.8	-129	41.4	CTD
CS02	50	40.8	-129	27.6	CTD
CS03	50	45	-129	19.8	CTD
CS04	50	49.2	-129	12.6	CTD
CS05	50	55.8	-129	0	CTD
CS06	51	0	-128	49.8	CTD
CS07	51	4.2	-128	43.8	CTD/Bongo
CS08	51	8.4	-128	36	CTD
CS09	51	12	-128	27.6	CTD/Bongo
CS10	51	16.2	-128	19.8	CTD
CS1B	50	52.8	-128	39.6	CTD/Bongo
CS2B	50	55.8	-129	0	CTD/Bongo



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CS3B	51	0	-129	27	CTD/Bongo
Q19	53	57.6	-133	29.4	CTD/Bongo
R011	54	15	-131	3	CTD/Bongo
W007	53	24.6	-130	45	CTD/Bongo
ODAS	50	51	-129	54.6	CTD/Bongo
QCS17	51	45.075	-129	26.098	CTD
QCS19	52	0.134	-129	41.664	CTD
QCS25	52	13.262	-128	53.457	CTD
QCS27	52	5.36	-128	32.943	CTD
QCS31	51	50.691	-128	25	CTD
QCS11	51	27.869	-129	15.622	CTD
QCS02	51	31.112	-128	40.937	CTD
QCS01	51	23.922	-128	14.719	CTD
QCS03	51	26.088	-128	50.367	CTD
QCS04	51	14.712	-129	12.344	CTD
QCS05	51	8.353	-129	24.729	CTD
QCS06	51	2.021	-129	37.052	CTD
QCS09	51	7.044	-129	53.985	CTD
QCS10	51	20.443	-129	29.272	CTD
GI6	51	13.483	-130	12.414	CTD
QCS12	51	15.761	-130	22.408	CTD
QCS14	51	28.147	-130	8.586	CTD
QCS15	51	33.734	-129	54.572	CTD
QCS16	51	39.309	-129	40.495	CTD
QCS18	51	52.635	-129	33.881	CTD
QCS20	52	3.377	-129	31.417	CTD/Bongo
QCS22	52	1.577	-129	15.335	CTD
QCS24	52	4.858	-129	1.461	CTD
QCS26	52	9.294	-128	43.118	CTD
QCS28	51	59.176	-128	40.718	CTD/Bongo
QCS32	51	46.57	-128	16.607	CTD
QCS34	51	40.809	-128	22.502	CTD
JI22	50	39.8	-129	17.6	CTD/Bongo
CPE1	51	0	-127	50	CTD/Bongo
LQ03	50	39.79	-129	1.86	CTD/Bongo
CPE2	50	43	-128	40	CTD/Bongo
M008	52	28.5	-130	29	CTD/Bongo
BIONESS1	51	26.493	-128	54.322	Historical Station
BIONESS2	51	25.032	-129	5.992	Historical Station
BIONESS3	51	18.168	-129	25.964	Historical Station
BIONESS4	51	36.361	-129	45.879	Historical Station



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WCVI CTD/Plankton Station List

Southern Vancouver Island PLANKTON STATIONS:

A1 (=LC8)	48 29.45	126 07.1	200
A2	48 22.7	126 03.8	400
A3 (~LC9)	48 24.7	126 15.8	900
A4 (=LC12)	48 15.0	126 40.0	>1000
B3	48 51.08	125 39.2	45
B5 (~LC5)	48 40.6	125 46.25	90
B6 (=LC6)	48 36.46	125 54.0	95
B7 (=LCB4)	48 32.0	125 35.5	76
B8 (=LCB3)	48 34.5	125 30.0	120
C1	48 28.93	125 15.3	150
C2 (=LBA2)	48 25.4	125 07.8	115
C3 (=LBA3)	48 23.45	125 20.8	120
E1 (=LBA1)	48 31.7	125 03.8	100

B-LINE

LB1	48 40.40	124 59.48	30	CTD/DO2
LB2	48 39.00	125 02.40	55	CTD/DO2
LB3	48 37.32	125 05.58	92	CTD
LB4	48 35.67	125 08.72	105	CTD/DO2
LB5	48 34.00	125 12.00	95	CTD
LB6	48 32.18	125 15.51	110	CTD/DO2
LB7	48 28.68	125 22.10	152	CTD
LB8	48 25.30	125 28.65	145	CTD/DO2
LB9	48 22.0	125 34.8	135	CTD/DO2
LB10	48 18.57	125 41.35	150	CTD
LB11	48 15.2	125 47.75	200	CTD/DO2
LB12	48 12.92	125 51.9	510	CTD/DO2
LB13	48 10.6	125 56.12	810	CTD
LB14	48 08.48	126 00.0	1180	CTD/DO2
LB15	48 04.36	126 08.46	1450	CTD
LB16	48 00.53	126 17.00	1530	CTD

C-LINE

LC1	48 50.44	125 27.73	90	CTD/DO2
LC2	48 48.68	125 30.95	105	CTD/DO2
LC3	48 46.95	125 34.24	130	CTD
LC4	48 43.43	125 40.8	162	CTD/DO2
LC5	48 39.94	125 47.4	90	CTD
LC6	48 36.46	125 54.0	95	CTD
LC7	48 32.96	126 00.5	125	CTD/DO2
LC8	48 29.45	126 07.1	197	CTD/DO2
LC9	48 25.94	126 13.7	660	CTD/DO2



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LC10	48 22.4	126 20.2	1150	CTD
LC11	48 18.95	126 26.7	1470	CTD/DO2
LC12	48 15.0	126 40.0	?	CTD

G-LINE (ESTEVAN POINT)

LG1	49 20.5	126 35.0	55	CTD/DO2
LG2	49 18.7	126 38.1	105	CTD/DO2
LG3	49 15.0	126 43.7	112	CTD
LG4	49 11.3	126 49.4	146	CTD/DO2
LG5	49 07.4	126 55.3	258	CTD
LG6	49 03.5	127 01.2	866	CTD/DO2
LG7	48 59.4	127 07.2	1061	CTD
LG8	48 55.30	127 13.30	2070	CTD
LG9	48 51.2	127 19.4	~2100	

J-LINE

LJ1	49 44.3	127 02.5	63	CTD/DO2
LJ2	49 42.6	127 05.3	79	CTD/DO2
LJ3	49 39.1	127 11.1	128	CTD
LJ4	49 35.5	127 16.9	154	CTD/DO2
LJ5	49 31.66	127 22.56	?	CTD
LJ6	49 27.9	127 28.58	?	CTD/DO2
LJ7	49 24.05	127 34.72	?	CTD
LJ8	49 20.11	127 40.96	?	CTD/DO2
LJ9	49 16.07	127 47.33	?	CTD

BP-LINE (BROOKS PENINSULA)

LBP1	50 04.8	127 52.8	32	
LBP2	50 04.0	127 54.2	105	
LBP3	50 03.2	127 55.3	172	
LBP4	50 01.4	127 58.1	1106	
LBP5	50 00.0	128 00.0	1230	
LBP6	49 56.2	128 05.5	?	
LBP7	49 52.4	128 11.2	?	
LBP8	49 48.6	128 16.8	?	