



Regional Operations Centre
Canadian Coast Guard – Pacific

Page 1

PACIFIC REGION CCG VESSEL -- POST CRUISE REPORT

NAME OF SHIP/PLATFORM: John P. Tully

DATE: FROM: 15 August 2006

TO: 29 August 2006

SCIENCE CRUISE NUMBER: 2006-25

SHIP'S PATROL NUMBER:

CHIEF SCIENTIST[S]: Steve Romaine (250-363-6868), RomaineS@pac.dfo-mpo.gc.ca

AREAS OF OPERATION: Queen Charlotte Sound, Fitz Hugh Sound, Rivers Inlet, Cape Scott and Brooks Peninsula

**INTRODUCTION/
PROGRAM BACKGROUND:**

This research mission allowed the first intercomparison of the Tully's new EK60 multifrequency echosounder unit with the Ricker's EK500 system. The study area of Goose Bank in the Queen Charlotte Sound was chosen to conduct a seven day intercomparison program, that included running both vessels along the same transect lines within minutes of each other. Additional physical and chemical oceanographic data were collected during the program by both vessels. Supplemental biological data were collected on the Tully for plankton using bongo and BIONESS nets plus a Video Plankton Recorder (VPR); fish data were collected using trawls from the Ricker. A full day was also spent in Port Hardy harbour near the beginning of the research mission conducting a calibration of all five of the new EK60's transducers.

Collected EK60 data will be evaluated for multi-species discrimination. Collected acoustic data will be compared to fish trawls and both video and plankton net hauls within scattering layers of interest along various transects within the study area.

CRUISE OBJECTIVE/OBJECTIVES:

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 both acoustic operations and standard time series stations.



Regional Operations Centre **Canadian Coast Guard – Pacific**

Page 2

DAYS ALLOCATED: 14

DAYS OF OPERATION: 14

DAYS LOST DUE TO WEATHER: None

RESULTS:

The new EK60 performed well and gave us new insight for discrimination between different species while using five frequencies. The areas of primary interest during this survey were the drop-off points where bottom depth changed from 100-200 m. These areas showed high scattering on the 120 and 200 kHz sounders and BIONESS trawls through these areas noted concentrations of euphausiids and copepods to collaborate with the observations. The addition of the VPR allowed the observation of animals too fragile to be captured in the BIONESS plus the escape responses of animals (particularly euphausiids and chaetognaths) in front of the BIONESS.

Plankton tows (bongo) and CTD casts will be analyzed and linked in with biomass estimates made from echosounder recordings.

RADIOISOTOPE USE: N/A

Decommission lab and report ANY use to IOS RSO

PROBLEMS [SCIENTIFIC GEAR AND OPERATIONS]:

A number of problems were identified during this research mission. Some of these are simply because the usual personnel were not available to join us for this trip – but there is a need to better document “what to do if” procedures for trouble-shooting equipment issues.

1. We lost two days when we could not get our BIONESS unit working since fuses were constantly blowing in the BIONESS CTD deck unit. Finally we identified that the winch (17027) was wired so that the voltage leaving the CTD deck unit was going directly to the armour on the winch. This problem was solved by using just the CTD winch (17026) for both rosette casts and BIONESS tows.
2. The plastic ball on the top of an un-popped niskin bottle that decided to ‘pop’ while on deck lead to one of the scientists being hit in the mouth and breaking a tooth. This is a problem that has come up before with the niskin bottles on the rosette unit. Seeing that the tripping and release mechanism of the bottles cannot really be changed nor could the wearing of safety gear to reduce this risk, the recommendation is that if a bottle is observed to be ‘un-popped’ when recovered then it should be ‘popped’ safely using a stick from a distance.
3. The bottom skirt on the BIONESS unit came loose near the beginning of the trip. This skirt protects the bottom of the nets on the unit from accidentally becoming pinched on deck. Repairs to the existing skirt or a new skirt is recommended.
4. We could not get the ThermoSaliniGraph (TSG) unit to function at all during the trip. Our initial thoughts were that perhaps the internal lithium batteries were too low and the unit would not send data to the logging computer (a known problem with the SBE19 and SBE25 units). We opened



Regional Operations Centre **Canadian Coast Guard – Pacific**

Page 3

the TSG unit and removed the two lithium batteries and replaced them with four AA batteries, equalling the voltage of the original lithium batteries. This did not solve the problem and despite several emails exchanged between the ship and the water properties group at IOS, we did not fix the unit and therefore did not collect TSG data during the trip.

5. The TSG hose near the intake valve has a small leak that needs some attention that lead to water pooling down the bench and regular mop-up of this water. Likely a new length hose from the bubble trap to the TSG would be best.
6. The EK-60 system, as presently configured on the Tully with the hull mounted transducers, only performed well in low to calm seas. We suffered serious dropout issues on all five frequencies the first 1.5 days out of Port Hardy when seas were moderately rough, thus limiting the effectiveness of this system as a quantitative survey tool (i.e., limiting its use to fair weather and sea conditions). The dropout problem was particularly noticeable when the ship was heading directly into the waves and winds and could be somewhat reduced when travelling relatively parallel to wave crests and troughs. Slowing the ship from 9-10 knots to 5-7 knots in rough seas also did not elevate the problem of drop-outs on all five frequencies. We believe that the forward hull mounting of the transducers is the likely culprit in the dropout problem and one possible solution might be mounting the transducers on a ram. (**see note below*)
7. The EA 600 needs to be synchronized as a slave with the EK-60 (master) if all are to be used simultaneously. We were also unsure if the cabling to synchronize the ADCP with the EK was not completed. (**see note below*)
8. The oxygen kit manual needs some updating to include a proper setup and FAQ section for less experienced users.
9. We ended up putting a small kink into the conducting cable on winch 17026 when switching between the BIONESS and CTD units near the end of the trip. We decided that because the kink was small that we would continue to use the cable without reterminating. The cable will need to be reterminated upon return to IOS.

Please note that a follow-up report on the performance of the EK60 echosounding system will be provided at a later date.

SUCSESSES [SCIENTIFIC]:

1. The EK60 calibration took less than a day to complete, despite this being the first time the calibration had been done.
2. The CTD/Rosette unit worked well without any problems.
3. Once the winch wiring issues were resolved, the BIONESS unit worked without problems. The new nets on the BIONESS also allowed faster wash-down following a tow.
4. The addition of the VPR unit onto the BIONESS unit provided a valuable insight into the animals that are not captured by the BIONESS unit (either too fragile or showing escape responses).
5. The combination study using both the Ricker and Tully allowed the collection of various oceanographic, acoustic, and biological data over a large study area. Workup of these data will give a much better understanding of the local dynamics.



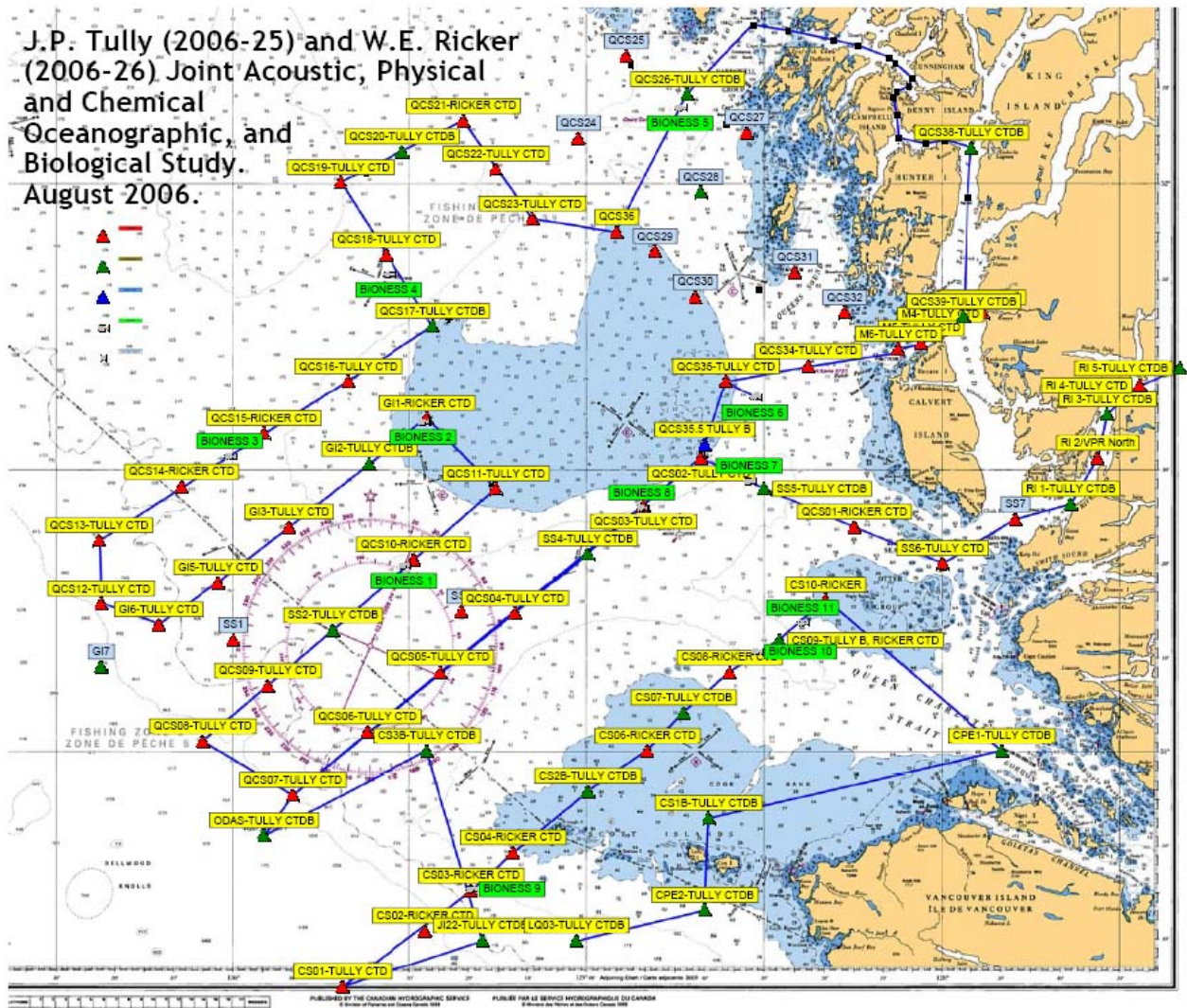
Regional Operations Centre Canadian Coast Guard – Pacific

Page 4

Overall we completed 101 stations (see Figure 1), including 61 CTD's, 27 bongo tows, and 11 BIONESS tows. At select CTD stations we also used the rosette to sample oxygen, salinities, and nutrients.

Figure 1. Stations visited by the Tully and Ricker during this joint survey. Note that the LBP (Brooks Peninsula) line is not shown here.

Red Triangles CTD (may also include rosette)
Green Triangles CTD, Bongo
Blue Triangles Bongo
Fish BIONESS sample (green background)
Stations noted with a blue background were not occupied. This figure does not show Ricker fish set locations.





Regional Operations Centre **Canadian Coast Guard – Pacific**

Page 5

PROBLEMS [SHIP'S EQUIPMENT/ OPERATIONS/PLATFORM SUITABILITY]:

A new seawater pumping system with controls in the lab allows scientists to fine-tune the flow rates into the ThermoSaliniGraph CTD unit (TSG). This same unit also controls the port aft deck seawater supply that was used to wash down plankton nets. The engineers were constantly receiving alarms regarding the overpressurization of the pump and asking scientists to turn down the system after use. A better system needs to be used for the washing of plankton nets or other gear on the aft deck that is independent of the TSG pump.

The heave compensator on the A-frame was not responding correctly. Specifically, the starboard shaft seems to become stuck during casts (likely a combination of seals and lubrication issues) and only the port shaft responds to ship movement. The unit also appears to be stiffer than in the past, which may impact its use in heavy seas.

SUCCESES [SHIP]:

Outstanding cooperation from the officers and crew in addition to the fair to good weather experienced after the first few days made this scientific mission a success. Many thanks to Captain Webb and the rest of the Tully's officers and crew for making this a successful mission.

DELAYS [OTHER THAN WEATHER]:

We were delayed one day due to the Ricker taking longer than expected with their calibration in Port Hardy. Fortunately, the Tully calibration was able to be done in less than a day, thus reducing the impact on the remainder of the program.

SAFETY CONCERNS:

See Niskin bottle concern in Science gear section

HAZARDOUS OCCURRENCES:

None



Regional Operations Centre
Canadian Coast Guard – Pacific

Page 6

EVENT LOG:

<u>DATE</u>	<u>OPERATIONS</u>
15 Aug	Load gear at IOS and depart 20.30
16 Aug	Meet with Ricker in Port Hardy
17, 18 Aug	Conduct acoustic calibrations
19 Aug	Start Goose Bank acoustic grid with Ricker
20-25 Aug	Continue acoustic grid with Ricker, finish at CS10
26 Aug	Transfer personnel to Ricker, sample COPRA stations around Cape Scott
27 Aug	Run CTD/Rosettes/Bongos on Brooks Peninsula line
28 Aug	Transit back to IOS

Steve Romaine

31 August 2006