

# <u>Regional Operations Centre</u> <u>Canadian Coast Guard – Pacific</u>

## PACIFIC REGION CCG VESSEL - POST CRUISE REPORT

## Line P Program – Fisheries and Oceans Canada

NAME OF SHIP/PLATFORM: John P Tully

**DATE:** FROM: 16 June 2020

**TO:** 22 June 2020

SCIENCE CRUISE NUMBER: 2020-028

SHIP'S PATROL NUMBER: 20-04

CHIEF SCIENTIST[S]: Marie Robert

## SCIENTIFIC PERSONNEL:

Female	Male
Moira Galbraith (IOS)	Glenn Cooper (IOS)
Marie Robert (IOS)	Scott Rose (IOS)
Hayleigh Shannon (IOS)	Kenny Scozzafava (IOS)
	Julian Smith (IOS)

**AREAS OF OPERATION:** Saanich Inlet, Strait of Georgia, Juan de Fuca Strait and Haro Strait.

**INTRODUCTION/PROGRAM BACKGROUND:** The Salish Sea survey is a DFO long-term monitoring program that started in 1999 with a purpose to better understand the regional circulation and seasonal variability of the waters of the Salish Sea. The survey consists of sampling about 80 stations using an oceanographic research vessel four times each year: (1) low winter discharge in December, (2) early freshet/spring bloom in April, (3) peak freshet in June, and (4) the end of freshet period September. The past two surveys have not occurred (Dec 2019 due to ship's maintenance) and April 2020 (due to COVID-19) increasing the importance of monitoring in June 2020.

CTD profiles are taken at every station and water samples are collected at standard oceanographic depths at the twenty stations along the deep trench that runs along the main axis of the Salish Sea. The data from these surveys are used by numerical modelers to initialise and calibrate hydrodynamic (flow fields) and biogeochemical (dissolved oxygen and nutrient fluxes) models. The CTD data are used to understand the underwater soundscape of the region and its effect on Southern Resident Killer Whales. Oceanographic conditions are used to assess the survival of out-migrating salmon in the spring, and spawning salmon in the summer and fall. Recent sampling for domoic acid, and the occurrence of harmful algal blooms, is a subject of emerging importance. An increase in zooplankton sampling is a result of an increased emphasis by DFO on ecosystem based management.

**<u>CRUISE OBJECTIVE/OBJECTIVES</u>:** Water properties and zooplankton sampling at ~80 stations in the Salish Sea; servicing of four acoustic moorings for the Southern Resident Killer Whales (SRKW) program at the west entrance of the Strait of Juan de Fuca; deployment of seven moorings for the tracking of tagged chinook salmon.

**<u>CRUISE DESCRIPTION:</u>** This cruise (2020-028) was the first week of a 28-day cruise that is trying to accommodate part of 10 different programs (Chandler, Freshwater, Vagle, Sastri, Robert, Nichol, Young, Sutherland, Covert, Leung). It is the first DFO cruise to be approved since the beginning of the confinement due to the COVID-19 pandemic. It is a very important cruise in many ways; not only because it helps to 'test' all the Safe Work Procedures and Standard of Operations that were developed for work at sea during a pandemic, but also because it tries to rescue part of the field work that had to be cancelled in April and May of this year. Even though the data were collected later than they would ideally have been collected, we gathered some invaluable information regarding the state of the inshore and coastal waters of Vancouver Island.

#### DAYS ALLOCATED:

DAYS OF OPERATION: 7

#### DAYS LOST DUE TO WEATHER: None.

7

#### SAMPLING:

- The survey was 96% successful. Of the 75 planned stations, three could not be completed because of problems with the CTD/Rosette. Five of the regular stations were not included in the original plan because of lack of time.
- Seven moorings were deployed for Cam Freshwater (DFO PBS).
- The four moorings for Svein Vagle's SRKW program were recovered successfully and four new moorings were deployed in their stead.
- The samples collected include:
  - 1) <u>Underway</u>: Thermosalinograph (Temperature, Conductivity, Fluorescence), acoustic sounder, ADCP.
  - 2) <u>"E-data" from CTD</u>: Pressure, Temperature, Conductivity, Dissolved Oxygen, Transmissivity x2, Irradiance, Surface Irradiance, Fluorescence, pH.
  - 3) <u>From the Rosette</u>: Dissolved oxygen, salinity, nutrients, chlorophyll, pigments (HPLC), dissolved inorganic carbon (DIC), alkalinity, phytoplankton.
  - 4) <u>Zooplankton nets</u>: Zooplankton using vertical net hauls (Bongo, 236 μm mesh size, casts to the bottom; and Mini-bongo, 64 μm mesh size, casts to 50 m).

#### RADIOISOTOPE USE:

No radioisotopes were used during this cruise.

#### PROBLEMS [SCIENTIFIC GEAR AND OPERATIONS]:

One computer didn't have a fixed ip address at the beginning of the cruise which makes network communications tricky.

The primary pump on the main CTD was malfunctioning. The replacement pump solved the problem.

The pressure of the main CTD seems to have drifted significantly since its last use in February 2020. The pressure offset was corrected ~24 hours after our departure. Unfortunately the first nine rosette casts had their water samples taken at the incorrect depth.

The CTD computer rebooted itself during a cast. Since there was a computer update pending, we decided to do the update, thinking that it could have been the reason behind the "auto-reboot". It turned out to be a major Windows 10 update that took 55 minutes to complete. At the beginning of the following cast we had an error message while trying to connect to the CTD. Since the error message *looked like* regular error messages ("Data acquisition cancelled. Failed to initialize water sampling or 911 pump control"), although it was behaving slightly differently than what we normally see, we assumed that there was a problem with the CTD/Rosette package. We checked and cleaned all the connectors, with no success. We tried the spare pylon, with no success. Since the primary pump had been changed that morning, we put the original pump on the CTD, with no success. We tested a new CTD, a new Deck Unit, a new Virtual Port switchbox. Nothing worked. We tried the spare CTD computer, but it was not configured properly. Finally we could keep working by using the old Tully laptop. It turned out that the Windows 10 update had reset all the Comm Ports and other setups we need to communicate with the CTD. This update cost the cruise three hours, and three stations (of which was an important rosette station), showing the importance of doing all the updates at the beginning of every cruise, and of having a back-up computer that is truly 'plug and play'.

The transducers that were given us to release the SRKW moorings either came with too short cables, or not enough power. We had to communicate with them from the small boat, and even then we had to be very near the mooring. Hopefully next time we'll have the right connectors to use the hull transducer.

## SUCCESSES [SCIENTIFIC]:

For the second time we used the label printing system developed by Mark Belton. This new system is fantastic. Even though no one currently on board was part of the February cruise when the system was used for the first time, the label and sampling log system is so user friendly that it was used by all without any issues.

Despite having to deal with the COVID-19 Safe Work Procedures we were able to perform all our tasks without any inconveniences.

Although at first we could not establish communication with the first of four SRKW moorings, all four were recovered and deployed without any trouble.

We deployed the seven moorings for Cam Freshwater in the evening without any issues.

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

There was an issue with the sewage system when we first got onboard which delayed our departure by a couple of hours.

There were some issues with the hydraulic of the A-frame during which time (~30 min) the bongos were just hanging off the stern.

A supply fan control circuit overheated and smoked.

The Palfinger davit is still non-operational on the Tully. Fortunately the weather was good during the SRKW mooring work as we had to use the small boat to communicate with the moorings. This will be an issue for the August cruise as we need to bring our chemistry container on the half-deck where the small boat currently resides.

## SUCCESSES [SHIP]:

All the electronic/networking setup worked flawlessly, which was a relief since there is no IT tech on board for this cycle.

The ship is well provided with hand sanitizer stations in strategic places and reminders everywhere to wash our hands. Also the availability of the digital thermometer to monitor our temperature twice a day is much appreciated.

Since ONC were on board the Tully during the first few days of June, we still had access to the high broadband internet connection. This turned out to be essential for the transfer of files to IOS in order to troubleshoot our CTD pump issues, but also for sending reports (words and videos) of how activities took place on board with the COVID-19 special restrictions and work procedures. It shows once again that a good internet connection is essential for doing our work.

## **DELAYS [OTHER THAN WEATHER]:**

~ 3 hours total for the sewage system, hydraulic and control circuit issues mentioned above.

~ 3 hours for the problems with the CTD/Rosette mentioned above.

#### **SAFETY CONCERNS:**

None.

## HAZARDOUS OCCURRENCES:

None.



## EVENT LOG:

Monday 15 June:	2100: the cruise gets approved.
Tuesday 16 June:	"Team B" (the stand-by crew) loads the science gear in the cube van and forklifts some cages and the rosettes to the jetty. Tully crew loads the winches. LB crane at ~1530.
Wednesday 17 June:	"Team A" (those sailings) get screened and accepted on board. Team B brings the cube van.
	Load the gear on board the vessel. Safety meeting at 1330. Science meeting at 1600. Leave
	Pat Bay at 1800. Saanich Inlet cast.
Thursday 18 June:	Fire and boat drill at 1000. Stations 24, 22, 19, 18, QU-39, 17, 16, 12. Stations 13, 14 15
	cancelled because of CTD / computer update problems.
Friday 19 June:	Stations 11, 10, 9, 8, 7, 6, CPF2, 3, 4, 1, 2, 25, CPF1, 28, 27.5, 27, 26.5, 26, GEO1.
Saturday 20 June:	Stations 40, 39, 38, 37, 41, 42, 43, 109, 46, 45, 44, 50, 49, 48, 47, 56, 57, 58, Gl01, SC04, 59, 60.
Sunday 21 June:	Stations 61, 62, 63, 64, 65, 66, 67, 104, adcp, 105, 68, 69, 70, 70, 71, 72, 73. Deploy seven
	moorings for Cam Freshwater.
Monday 22 June:	Stations 103, 102, 101, 74, 75, 76. Recover and re-deploy SRKW moorings at Port Renfrew,
	Swiftsure 1 and Swiftsure 2 for Svein Vagle. Start La Perouse cruise 2020-005.
Tuesday 23 June:	Recover and re-deploy La Perouse mooring for Svein Vagle.

#### SUMMARY/FINAL COMMENTS:

- First of all, many, many thanks to Kim Houston, Michel Breton, Neil Dangerfield, Peter Chandler, and everyone else at IOS who fought very hard for this cruise to happen. It was not an easy battle, but you guys never gave up and here we are. Thank you.
- A huge thank you to "Team A", those who accepted to quarantine for two weeks and offered to be part of this cruise. Thanks not only for being out here, but also for all the work you're doing while on board. We are a smaller science crew than usual with more work to perform than usual, for a longer time than usual, and you're all doing an amazing job.
- Thanks to "Team B", those people from IOS who stepped forward to be on stand-by and quarantined for two weeks in case one of us wouldn't be able to sail at the last minute: Peter Chandler, Michael Arychuk, Mark Belton, Danielle Caleb, and Nina Nemcek. Thanks for being on stand-by, for the quarantine, and for loading the science gear.
- Thank you to all the people at IOS who we contacted during the cruise for some help of one kind or another: Germaine, Peter, Lucius, Steve, Nina, Kelly, Caitlin, Svein. Much appreciated.
- And finally thank you to the whole Tully crew for letting us sail with you guys, for constantly cleaning, for giving up your "regular seat" in the mess so we can respect the regulatory social distancing, for providing the thermometer so we can monitor our temperature twice each day, for all the hand sanitizer dispensers; and for helping us with all our work, as always!