

2021 NF-POGO-Eurofleets + Visiting Fellowship for Shipboard Training

Fellowship Report

Name of Trainee: Joseph Sebastian

Name of Supervisor (Parent Institution): Dr. K. Ajith Joseph

Supervisor (Host Institution): Dr. Marie Storr Paulsen and Dr. Hans Jakob Olesen

Dates of Training: 02/11/2021 to 17/11/2021

Section A

(To be completed by the fellow)

It is the responsibility of the trainee to forward this form to the host and parent supervisor, and to submit a fully completed version to the POGO Secretariat. Please note that the complete report will be made public on the OTP website; Private comments should be included in a separate confidential form.

1) Please provide a brief description of activities during the training period:

The primary aim of BITS (Baltic International Trawl Survey) is to provide independent data collection of different categories of fish especially Codfish. An initial introduction was conducted by the host supervisors to identify fish from the fish stock and to take individual samples of cod to determine age composition, sex, and maturity as well as various growth parameters. During the entire course of the survey, we found twenty-two different species like cod, herring, sprat, plaice, icing, flounder, etc.

I took part in acoustic observations before each trawling started. With regard to trawling, routine acoustic measurements are made of all fishing stations as well as stations with a low oxygen concentration where, no fishing takes place for that reason. Acoustic integration is done as a standard procedure at all stations to verify any fish biomass over bottom areas.

The onboard acoustic observations helped to determine temperature, salinity, and oxygen concentration at fishing stations. These determinations are made with the CTD (Conductivity, Temperature, and Depth) instrument. We have taken CTD calibration samples at selected stations identified by ICES (International Council for the Exploration of the Sea).

These are stations where the oxygen content measured at the associated CTD station is lower than 1.5 ml O₂ / l. The acoustic measurement is made in the same trawling track as originally planned i.e., a distance equivalent to half an hour trawling at normal speed.

When the oxygen content at the bottom is lower than 1.5 ml O₂ /l, visual observation is made on the echo sounder about how the fish are positioned at the bottom. If there are no fish within ten meters above the bottom, we performed an acoustic measurement in the same haul where we are fishing. If there are fish at the bottom or up to ten meters above the bottom, this can result in catching fish. In case there is no trawling, only acoustic survey, the operation is registered as a zero move. This is done by introducing the acoustic station in the SIS (Ship Information System).

2) What applications of the training received do you envision at your parent institution?

I used one hydrographic instrument (Echosounder) and one oceanographic instrument (CTD) during the shipboard training. Both instruments are essential in my profession. The training was an excellent platform to apply the theoretical knowledge that I received from the current course. The professional experience I gained will be extremely helpful in my professional studies in the field of hydrography.

CTD is an oceanographic instrument used to determine the physical properties of water. The unit consists of sensors to measure Conductivity, Pressure and Temperature. The goal of descriptive physical oceanography is to obtain a clear and systematic description of the oceans - sufficiently quantitative to permit us to predict with reasonable certainty, some aspects of their behaviour in the future. During the training, I understood how to obtain a systematic, quantitative description of the character of the ocean waters, their geographic distribution, and their movements. In the field of hydrographic surveying, it is very important to understand before deploying any underwater equipment, the physical properties of the water.

I have done further investigation on the research topic 'How does change in oxygen level in the water affect the marine species?' using the CTD data.

The other hydrographic instrument I used onboard is an echosounder (scientific echosounder). It is an instrument used for measurement of the physical and biological components of water. We collected the sounding data with an echosounder at each acoustic station. This is the data I used for identifying the objects in the water column (fish and plankton). I used the sounding data for analyzing the presence, abundance, distribution, and acoustic characteristics of different variables. Echosounder data is the tool I used for understanding the ocean terrain. The sounding data was useful to understand the bottom substrate class (e.g., sand, mud, rock). The resulting analysis can be used to generate GIS data layers for these variables.

3) Please provide your comments on the Fellowship Programme.

The expedition onboard RV DANA was an astounding opportunity during my studies and provided me with a deep knowledge of hydrographic/ oceanographic equipments CTD and Echosounder. Also, it is a great opening for me to do research in the future. I am grateful to my university Professor Dr. Harald Sternberg (HafenCity University), parent supervisor Dr. K. Ajith Joseph (Director, NERCI), onboard scientists Dr. Marie Storr Paulsen and Dr. Hans Jakob Olesen (DTU), and the great support of POGO members. I would like to point out, there was excellent rapport between POGO and me during the entire period of the fellowship. The training environment onboard RV DANA was outstanding— friendly, supportive and motivating.

The training helped me explore and enhance my skill and professional knowledge. Moreover, I strongly believe that the training and the experience I gained during the shipboard training fellowship program will be a milestone in my career. I am grateful to everyone who supported my professional endeavours.

PRINT NAME

JOSEPH SEBASTIAN

Date:16/12/21

Section B

(To be completed by the host supervisor and returned to the trainee)

Please note that the complete report will be made public on the OTP website; Private comments should be included in a separate confidential form.

1) Please provide your comments on the performance of the trainee.

The activities the trainee participated in during the Baltic international trawl survey (BITS) included:

Fish lab.: Sorting catch at the conveyer belt, weighing, cutting otoliths and measuring fish.

CTD room: Participating in running the CTD (from control room), withdrawing CTD data from the system.

Acoustic/Sonar room: Participating in recording and withdrawing data from the echo sounder/sonar system.

The Trainee also started analysing on the CTD data and the sonar recordings while on board Dana.

The Trainee participated in all activities with great enthusiasm and also joined in the social activities on board.

2) Is this exchange likely to lead to future collaboration with the trainee's parent institution? If so please give example(s) of how this collaboration may be pursued.

It is possible that the exchange could lead to a future collaboration on observation technology. However, the Observation Technology group on DTU Aqua has not yet confirmed this.

3) Please provide your comments on the Fellowship Programme.

I am positive about the program that makes it possible for students to come to other countries and institutes getting new insights and inputs thereby increasing their knowledge and at the same time opening the doors for possible future collaboration between institutes.

PRINT NAME

Dr.Hans Jakob Olesen, Denmark Technical University

Date: / /

SECTION C

(To be completed by the parent supervisor and returned to the trainee)

Please note that the complete report will be made public on the OTP website; Private comments should be included in a separate confidential form.

1) Do you agree with the above comments and do you have any additional feedback you wish to provide?

Yes, I fully appreciate and agree with the above comments as such training programmes would definitely help and motivate the trainees to utilise the skills they learned for successful adoption in their ongoing higher studies. Additionally, the trainee has developed a confidence to get engaged in field studies and observations using oceanographic equipments.

PRINT NAME

Dr.Ajith Joseph Kochuparampil, Nansen Environmental Research Centre India (NERCI)

Date: 28/04/2022