NF-POGO JAMSTEC Visiting Fellowship for

Ship-board Training on the GO-SHIP P4W Expedition

Fellowship Report

Name of Trainee: Johana Ermelinda Lucero

Name of Supervisor (Parent Institution): Dra. Elena Susana Barbieri

Supervisor (Host Institution): Dr. Shinya Kouketsu

Dates of Training: 30th March 2025 - 16th May 2025

Topic of Training: Expedition in the tropical northwest Pacific Ocean observing a variety of Essential Ocean Variables. This will contribute to the GO-SHIP observation network, which aims to monitor long-term changes in ocean properties across all major ocean basins.

Section A

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

I participated in the GO-SHIP P04W expedition aboard the R/V Mirai from 3rd April to 11th May 2025, which aimed to collect high-quality data along 10ºN in the western tropical North Pacific. This expedition is part of the international GO-SHIP program and targets long-term changes in ocean circulation, water mass properties and biogeochemical fluxes.

During this cruise, I was a member of the sampling team. We worked from 2 a.m. to 2 p.m. and were responsible for the following activities:

- CTD setting: At each station, I assisted with the preparation and deployment of the CTD-rosette system. This involved checking that each Niskin bottle was correctly set: the caps had to be open, with the air vents tightly closed, and the lanyard hooks positioned outward to allow correct triggering at depth. We also cleaned the bottles and the external surfaces of the sampling frame with acetone to prevent contamination. These procedures were essential to guarantee accurate and reliable water sampling throughout the cruise.

- Basket preparation: Before each CTD cast, we prepared 36 sampling baskets, each containing the bottles and materials required for the analysis of specific parameters (e.g pH, D.O, nutrients, salinity, TA, and others). One basket was prepared for each Niskin bottle, clearly labelled to indicate the type of sample to be collected at the corresponding sampling depth. This approach ensured an efficient and organised sampling process.

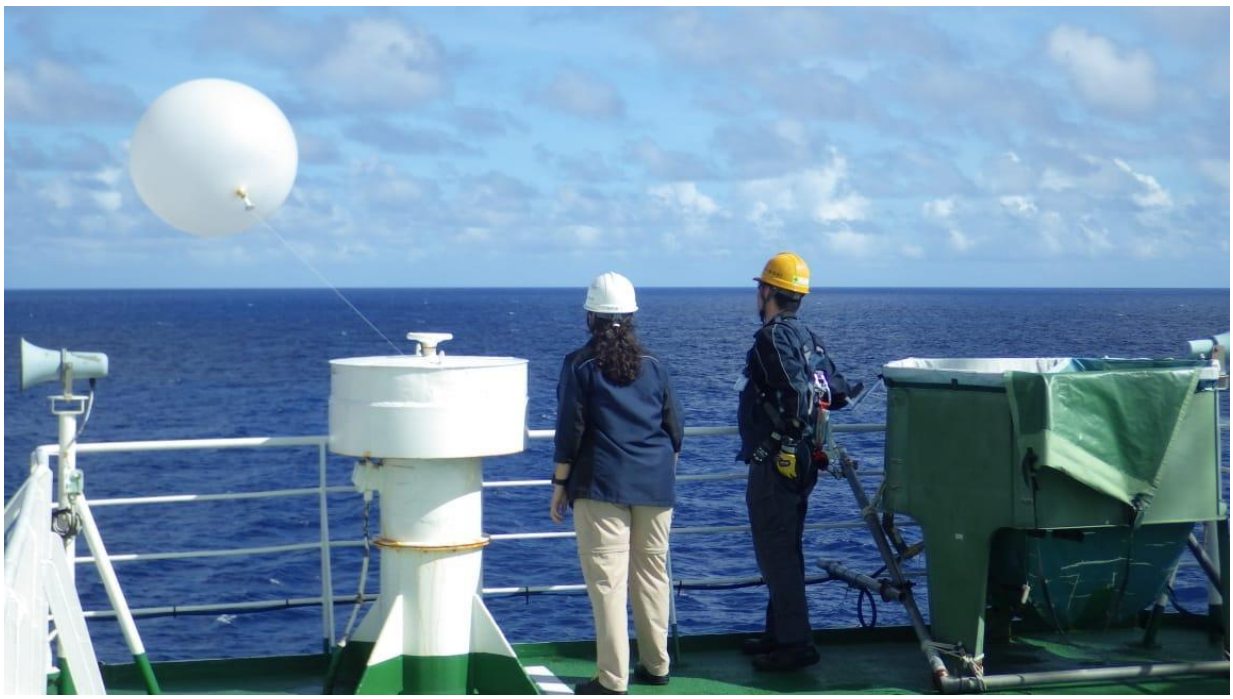
- Routine sampling: Once the CTD rosette was back on deck, we participated in the collection of water samples for multiple parameters, following strict protocols and order of priority. My first responsibility was to collect and hand samples for dissolved oxygen (D.O.). For this parameter,

we first performed a leak check of each Niskin bottle, followed by the measurement of temperature during D.O. sampling. Once sampling from all Niskin bottles was completed, we started with the collection of samples for chlorofluorocarbons (CFCs), and we finished with the routine basket.

The routine sampling included 20 different parameters, each with its specific handling requirements: D.O., CFCs, Methane (CH4), Salinity/Density, pH, Urea, Total dissolved inorganic carbon (TC), Radiocarbon (14C), Total alkalinity (TA), Organic alkalinity, Chlorophyll-a (Chl-a), Total Iodine-129, Nutrients, nitrate-silicate (NO3-SI), Microbial abundance, Dissolved organic carbon (DOC), Fluorescence dissolved organic matter (FDOM), Coloured dissolved organic matter (CDOM), Tritium and Microbial analysis.

- Special cast sampling: In addition to routine sampling, we conducted *special casts* dedicated to extended biogeochemical and isotopic analyses. These included Bio-SCasts, which involved the collection of samples for up to 16 different parameters related to biological and microbial processes. We also supported sampling efforts from external research groups. For example, we occasionally collected samples for the University of Tokyo, targeting isotopes such as I-129, U-236, and Th-220/230. Similarly, we performed specific casts for researchers from the University of Denmark, focusing on U-233, U-236, Cs-135, and Cs-137.

- Control and transport of samples: After collection, we ensure the safe handling of all samples by thoroughly cleaning each bottle and transporting them to the appropriate laboratories. Samples were processed or stored under specific temperature and light conditions, depending on the requirements of each parameter.
- Extra activities in laboratories: In addition to my sampling duties on deck, I participated in various laboratory tasks such as labelling the sampling materials, cleaning glassware, assisting with radiosonde sampling, and performing basic analysis such as NO_3. I also had the opportunity to learn about other analyses in laboratories such as CFC, FDOM, and CDOM from technicians and researchers.



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

The training I received during the MR25-02 cruise was highly valuable and directly applicable to both current and future research at my parent institution in Argentina. Firstly, the hands-on experience with CTD-rosette operations, strict sampling protocols, and contamination control measures will enhance the methodological rigour of our sampling efforts in Patagonian and South Atlantic coastal environments.

One of the most important aspects I aim to incorporate into my research is the application of detailed, parameter-specific protocols. I was trained to pay close attention to critical factors such as the proper rinsing of sample bottles, the elimination of air bubbles in certain samples (e.g., dissolved oxygen, pH), and the appropriate time to let the water flow before beginning to fill a container. These procedures - often overlooked- are essential to ensuring data quality. I intend to implement these seemingly minor, yet fundamental, practices consistently in all future sampling activities.

Furthermore, this fellowship introduced me to several parameters that I had not previously considered, but now recognize as potentially valuable for my research objectives. I am considering the incorporation of them into my routine sampling and analytical workflows in the near future.

3) Please provide your comments on the Fellowship Programme.

The POGO Fellowship Programme provided an outstanding opportunity for both professional and personal development. Participating in the GO-SHIP P04W cruise aboard the R/V Mirai was an enriching experience that allowed me to engage in high-level oceanographic research while learning from leading scientists and technicians from around the world.

The training was hands-on, comprehensive, and well-organized, covering both technical and methodological aspects of oceanographic sampling. Working side by side with experienced professionals allowed me to strengthen essential skills such as sampling precision, contamination control, time management, and effective teamwork under demanding conditions. I also had the opportunity to contribute meaningfully to the sampling process and to understand the broader scientific goals behind each measurement.

Beyond the technical training, the programme fostered an environment of collaboration, cultural exchange, and scientific dialogue. The support provided by both POGO and JAMSTEC was exceptional, from logistical coordination to onboard mentoring. This fellowship has not only deepened my knowledge and confidence in oceanographic fieldwork but has also inspired me to adopt and promote international best practices in my future research.

I am sincerely grateful for having had the opportunity to be part of this initiative, and I highly recommend the POGO Fellowship Programme to other early-career researchers looking to expand their skillsets and strengthen their engagement with the global scientific community.

PRINT NAME

Johana E. Lucero

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Date: Puerto Madryn, Argentina. June 19th 2025.

Section B

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

Please note that this form will be passed on to the parent supervisor and trainee and when complete will be made publicly available on the OTP website;

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

Ms. Lucero participated in our observations with great enthusiasm. In particular, she quickly became adept at CTD and water sampling operations. Her involvement was a tremendous asset to our cruise. Not only did she support the water sampling activities crucial to this expedition, but her proactive attitude and warm smile also uplifted the spirits of the researchers and technicians around her.

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.

Currently, we have a team studying the relationships between ocean physical variability, the distribution of dissolved substances, and marine ecology. Her expertise in the roles of viruses within the marine environment is particularly fascinating, and we see potential for future collaboration. As a first step, we provided her with an overview of our project sharing the details of our unique project.

3) Please provide your comments on the Fellowship Programme.

The Fellowship Programme has been immensely valuable to us. The trainee tackled her work with outstanding motivation and made a tangible contribution to our observations. Moreover, her interactions with the ship's researchers, technicians, and crew brought us great joy. We sincerely hope that she has taken away many benefits from this experience.

We would also like to extend our deepest gratitude to all those who supported the Fellowship Programme—POGO, her supervisor, and her home institution among them.

PRINT NAME

Shinya Kouketsu

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Date: Yokosuka, Japan. June 19th 2025.

SECTION C

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

Please note that this form will be passed on to the host supervisor and trainee and when complete will be made publicly available on the OTP website;

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

As the doctoral supervisor of Johana Lucero and a former alumni of the POGO–JAMSTEC programme, I am deeply grateful and wish to once again acknowledge the excellence of both institutions in delivering international training initiatives. These programmes provide unique opportunities for students from a wide range of countries, particularly those where funding limitations often hinder participation in such events.
Moreover, the training fosters interdisciplinary collaboration among students from diverse cultural and academic backgrounds, encouraging the exchange of perspectives through shared routines and experiences, and promoting mutual understanding and cultural exchange.
I remain fully available for future collaborations, and I would like to express my sincere appreciation for this opportunity while fully endorsing the report submitted by Ms Lucero.

PRINT NAME

Elena S. Barbieri (PhD)

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Date: Puerto Madryn, Argentina. June 19th 2025.