2026 NF-POGO–GEOMAR Shipboard Training Fellowship onboard the M217 cruise

Fellowship Report

Name of Trainee: Rafaela Rizzi

Name of Supervisor (Parent Institution): Dr. Fabrício Sanguinetti Cruz de Oliveira (Federal University of Rio Grande, Brazil)

Supervisor (Host Institution): Dr. Marcus Dengler (GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany)

Dates of Training: 12.02.2026 – 07.03.2026

Topic of Training: Boundary Circulation off Angola and Benguela Niños (BOCABENO)

Section A

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

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

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

During the training period, I was part of the watch system, working a 4-hours-on / 8-hours-off shift, and actively participating in oceanographic operations. Although I had previous experience with research cruises, this was the first time I was directly involved in all stages of conductivity-temperature-depth (CTD) stations, from the full preparation of the rosette to the control of operations during deployment and recovery. This included checking sensors, preparing the Niskin bottles prior to each cast, and monitoring hydrographic profiles in real time, ensuring the proper functioning of the system and the quality of the data being acquired. After the full preparation of the rosette, I, together with the other members of the shift, was responsible for data acquisition and logging in the CTD laboratory, as well as for communicating directly with the winch operator to guide the descent and ascent of the instrument. A particularly valuable aspect of this experience was learning how to use real-time hydrographic data (temperature, salinity, oxygen, and fluorescence) to guide water sampling decisions and select representative water sampling depths based on the vertical structure of the water column. I also collected water samples for dissolved oxygen and salinity analyses, following strict protocols to ensure sample integrity, particularly by minimizing bubble contamination. In the laboratory, I further developed my experience with oxygen analysis using the Winkler method, gaining hands-on practice in system calibration and sample titration for dissolved oxygen determination. This

also enabled direct comparison with CTD sensor data, contributing to data quality assessment and sensor calibration.

In addition, I followed the preparation and deployment of Argo floats, representing my first practical contact with autonomous observing systems. I also gained initial exposure to operations involving microstructure measurements and mooring systems, including their recovery and deployment, which contributed to a broader understanding of different observational strategies in physical oceanography. Finally, I became familiar with sensor calibration procedures (such as Submersible Ultraviolet Nitrate Analyzer, SUNA), and participated in scientific seminars and a Python course, further strengthening my background in oceanography.

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

Throughout my academic background, I have worked mainly with remote sensing, numerical models and reanalysis datasets. This training was therefore essential to expand my experience with in situ data acquisition and to better understand the full workflow, from data collection to analysis. The experience gained with CTD operations, together with the comparison between observational and laboratory data, provides a solid basis for data validation and interpretation, as well as for integrating different data sources with greater confidence. I intend to apply this knowledge both in supporting field campaigns and in data processing and analysis, contributing to ongoing and future activities within my research group. This experience may also open opportunities for future collaborations with other institutions. I also plan to share this experience with colleagues and students through knowledge exchange, especially with early-career students who often have limited exposure to ship-based activities, which is quite common in the Brazilian context. Overall, this training contributes not only to my scientific development but also to strengthening the group's capacity to work with observational data and to participate in future collaborative efforts.

3) Please provide your comments on the Fellowship Programme.

I believe the programme provides a truly unique and well-structured training opportunity, offering experiences that would be difficult to access in other contexts. The strong emphasis on hands-on activities, particularly during onboard operations, was especially valuable and greatly enhanced the overall learning experience. Beyond the technical aspects, interacting with researchers from different institutions and fields contributed significantly to knowledge exchange and expanded perspectives. In particular, having the opportunity to work alongside highly experienced oceanographers was extremely valuable, as I was constantly learning from their expertise and practical approach in the field. As a result, this experience had a very positive impact on my development, strengthening my practical skills and reinforcing my motivation to pursue a scientific career. I believe experiences like this can be truly transformative for early-career researchers, helping to expand horizons, encourage critical thinking, and advance ocean sciences in a collaborative and international context.

PRINT NAME

Rafaela Rizzi

Date: April 7th, 2026

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.

Rafaela Rizzi demonstrated a strong intellectual curiosity regarding the operation of ocean observatories and the methodologies used in oceanographic data sampling. She carried out all assigned tasks with a high degree of reliability and responsibility. Owing to her strong command of English and her inclusive, collaborative approach, she played a key role in fostering effective teamwork among the students and other participants on board. During the cruise, Rafaela focused part of her training on the Winkler titration of water samples. She carried out this task to an exceptionally high standard and made a significant contribution to the generation of a highly accurate reference dataset for the calibration of oxygen sensors on the CTD system. In addition, she gained experience in the post-processing and calibration of CTD data. While on watch, she actively contributed to the deployment and recovery of various observational platforms, including CTD systems, Argo floats, and moorings. She consistently demonstrated initiative and a willingness to assist wherever needed. During the regular seminars, she actively contributed to discussions and participated thoughtfully in the exchange of ideas.

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.

There has been previous collaboration between the Institute of Oceanography at the Federal University of Rio Grande (FURG) and my research unit at GEOMAR. However, no direct collaboration has taken place with Rafaela's department at FURG to date. During the fellowship programme, no interactions were established with other staff from her department, and the data collected during the cruise are not directly aligned with Rafaela's research focus. Nevertheless, the potential for future collaboration remains.

3) Please provide your comments on the Fellowship Programme.

The NF-POGO Fellowship for Ship-board Training is an ideal program for students from developing countries and from countries in transition to experience oceanographic data collection at sea and to interact with researchers, technicians and students from developed countries. This experience as such is in many aspects of great benefit for the fellow's career. The targeting of post-graduate students is exemplary due to their high level of receptiveness and professional qualification. Despite some gaps in knowledge of the fellows that we were happy to address, a prominent outcome of the NF-POGO-GEOMAR Fellowship program was that we learned from each other while advancing our knowledge about ocean science integrated in the cultural and political dimension of the human, country and ocean interactions.

PRINT NAME

Marcus Dengler

Date: April 15th, 2026

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?

I fully agree with the comments provided. Based on my knowledge of Rafaela's academic and professional profile, she has a solid background and training in oceanography and is a responsible, dedicated, and highly motivated individual, with a strong interest in expanding her knowledge. She consistently demonstrates commitment to her work and a proactive attitude towards learning, which aligns well with the positive feedback reported in the activities she undertakes. Regarding future collaboration between the Institute of Oceanography at the Federal University of Rio Grande and GEOMAR, we remain open to strengthening scientific exchange and jointly exploring relevant research topics, in particular in physical oceanography, with potential collaborations to be developed in the context of future research projects.

[redacted]

PRINT NAME

Fabricio S C Oliveira

Date: April 16th, 2026.