Report on the 2024 POGO-SCOR Fellowship Programme

Context: The programme, jointly funded by the Partnership for Observation of the Global Ocean (POGO) and the Scientific Committee on Oceanic Research (SCOR), aims to promote training and capacity development in support of a global ocean observation system. Since its inception in 2001, the POGO-SCOR Fellowship Programme has awarded more than 200 fellowships to early-career ocean scientists, technicians, postgraduate students (preferably at PhD level), and post-doctoral researchers from developing countries and countries with economies in transition. With a vision to advance sustained ocean observations and their applications, the programme enables fellows to undertake short-term placements (typically 1 to 3 months) at leading oceanographic institutions, where they receive training in various aspects of oceanographic observation, analysis, and interpretation.

There is tremendous interest in the fellowship programme at all levels, from young researchers working in oceanographic institutions in developing nations to leading scientists at advanced centres keen to host fellows and establish collaborations. It fills an important niche in capacity exchange through specialised, hands-on training that is not addressed by intensive courses or participation in scientific meetings. The programme helps to strengthen the esprit de corps *among oceanographic institutions worldwide and serves as a valuable stepping stone towards building long-term collaborations.*

Furthermore, the POGO-SCOR Fellowship Programme is increasingly recognised by other organisations as a model for effective capacity development. Its success has inspired the creation of similar schemes by other initiatives, such as the Europe-Africa Marine Network (EAMNet), the EUROMARINE consortium of European Networks of Excellence, the IOCCG Platt Scholarship, and the PML Trevor Platt Fellowship. The POGO Secretariat is frequently approached for guidance on establishing comparable fellowship programmes or for potential partnerships in joint initiatives.

POGO and SCOR wish to commend all members of Review Committees, as well as the supervisors and colleagues at the various host institutions, for their dedication and support. The success of the programme relies heavily on their willingness to devote the time and effort required to provide high-quality training. The fellowship would not be viable without the commitment of these distinguished scientists and their teams.

A recent publication highlights the impacts of the POGO-SCOR Fellowship Programme:

> *Seeyave, S., L.A. Krug, E. Urban Jr., F.A. Beckman, S. Sathyendranath, and E. Twigg. 2025. Developing capacity for ocean science through visiting fellowships. Oceanography 38(1):14–19. https://doi.org/10.5670/oceanog.2025.134.*

1. Selection process

The 24th round of the POGO-SCOR fellowship programme was announced on 26 March 2024, with an initial deadline of 30 April 2024, later extended to 12 May 2024. The call was disseminated through the POGO & SCOR mailing lists (e.g., POGO mailing campaign) and social media platforms (e.g., Instagram). A total of 59 applications were received, with an equitable gender distribution (51% male and 49% female). Applicants represented 23 countries, with regional distribution relatively balanced across Africa (37.3%), Asia (32.2%), and Latin America (28.8%). Proposed host institutions included 46 advanced ocean research centres across all continents, primarily located in Europe (39%) and North America (33.9%) (Figure 1).

Applications were evaluated independently by a committee of ten members, comprising representatives from the SCOR and POGO Secretariats, the SCOR Capacity Development Committee, and two independent reviewers (host supervisors from previous years). Each application was reviewed by three randomly assigned committee members, ensuring no conflicts of interest. Assessments were based on the following criteria:

- Quality of the applicant;
- International experience (with preference given to applicants with limited previous opportunities for long-term or multiple training placements in developed country programmes);
- Quality of the proposal;
- Relevance to POGO, SCOR, and GOOS priority areas;
- Contribution to sustained capacity building at the applicant's home institute;
- Suitability of the proposed host supervisor/institution for the requested training.

Scores were then aggregated, and budgets for the highest-ranked applicants were calculated. The final selection of the five successful fellows was made based on the available budget, while ensuring both geographical and gender balance.

An additional step was introduced in the 2024 selection process. Shortlisted candidates and prospective host supervisors were invited to an informal interview with the POGO Secretariat to discuss the details of the proposed training and to familiarise themselves with the administrative requirements. This meeting also provided an opportunity to clarify outstanding questions regarding the proposal and to ensure mutual understanding of the fellowship's expectations. For many, this served as the first opportunity for direct interaction between the candidate and the prospective host supervisor.
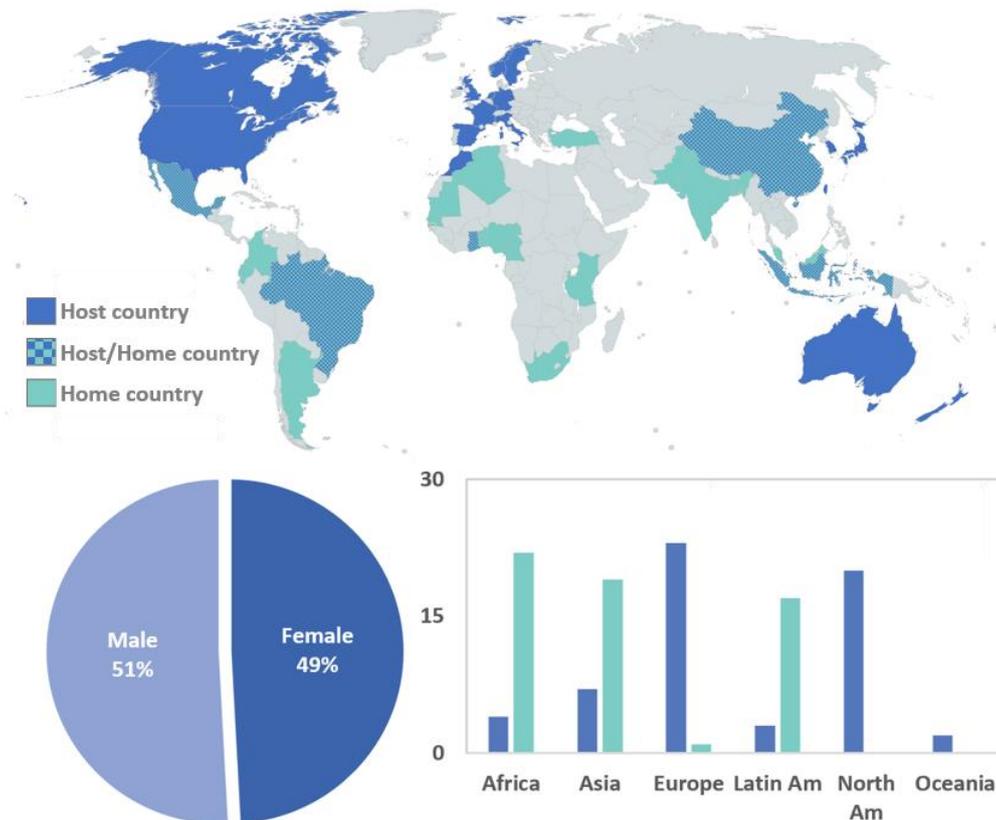

Figure 1 – Demography of 2024 POGO-SCOR Fellowship Programme applications (n=59).

2. Reports submitted by the 2024 POGO-SCOR fellows and their supervisors

2.1. Amirotul Bahiyah

Country of Origin: Indonesia

Host Country: United States

Parent Supervisor and Institute: Prof. Iskhaq Iskandar, **S**riwijaya University, Indonesia
Host Supervisor and Institute: Dr. Janet Sprintall, Scripps Institution of Oceanography, United States
Training topic: Heat Budget Analysis using Argo Float and Ocean-Atmosphere Satellite Data
Training dates: 15/10/2024 – 15/01/2025

Please provide a brief description of activities during the training period.

The heat budget training was conducted over the Maritime Continent using Argo float profiles and surface flux from ERA5 for a long study period from 2005 to 2024. The activities started with a discussion of the theory or concept of ocean-atmosphere heat balance and continued with a heat balance tutorial for Southern Ocean Argo and NCEP/SOC air-sea heat flux data. We applied similar heat balance calculations over the Maritime Continent based on the tutorial. We divide the seas of the Maritime Continent into six major study areas of the Indonesian throughflow, including the southwestern tropical Pacific Ocean, the Mindanao Current Area, the Celebes Sea, the Makassar Strait, the Banda Sea, and the southeastern tropical Indian Ocean. Argo float profiles and daily heat flux components of ERA5 were downloaded based on the restriction period (2005-2024) and areas. Data checks and quality control were applied to all datasets to prevent the recording of errors.

Argo float properties, especially potential temperature, were plotted in the form of time-depth over the study period and daily compilation plots. We also added additional information such as standard deviation on the daily compilation plot, MLD-isopycnal 1025 layer, and temperature fluctuation graph in each thermocline layer. After completing the basic calculation, we proceeded to analyze the ocean heat content using Argo float data. We applied a full heat accumulation integrated from the surface layer to several thermocline layer references, such as MLD, isopycnal 1025, and 250m depth over all 6 study areas. The accumulation is applied to the full heat storage, and then we compare the result by calculating the surface heat flux accumulation over the selected ocean. The comparable result between heat storage and surface heat flux showed their contribution to the heat exchange from the atmosphere to the ocean.

The training, discussion and research activities were carried out in 3 months. We set up a weekly meeting to update the progress. During the discussion, I reviewed my knowledge and gained

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more understanding of how to define ocean properties such as potential temperature, potential density, MLD, ILD, etc. Certainly, the strengthened knowledge is important for preparing more advanced physical oceanographic analyses, especially the heat budget. Through this face-to-face training, I not only got a broader insight into how to get research ideas, process them in a programming language, and solve the research problem, but also built my mentality to be a future researcher by learning the way of Dr. Janet Sprintal's support and supervision. During my program, I also had a great opportunity to disseminate my research results at the AGU2024 Fall Meeting. This program and these experiences were certainly beneficial in developing my research skills as an early career scientist as well as broadening my relationships. As a further step, I will gratefully share the results of the program with my colleagues and research group members in both universities (Diponegoro University and Sriwijaya University).

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

During my three-month training program at Scripps Institution of Oceanography, UCSD, I learned about quantifying ocean heat content and heat budget analysis over the Maritime Continent. Interestingly, we used the long historical Argo Float data from 2005 to 2024 and learned how to prepare the in-situ data and obtain potential density, potential temperature, and heat capacity. We also applied stacking of the Argo Float data to get the daily mean, monthly mean, and seasonal mean. It is important to see the seasonal pattern of OHC and heat budget over the maritime continent. As the program outputs, the research methods are in the process of being written as OHC and heat budget modules in the native language, which include the formula, detailed programming workflow or code, and simple explanation of the calculation. As for the research results themselves, we hope to complete the manuscript under the supervision of Dr. Janet Sprintal and Prof. Iskhaq Iskandar and submit it to a reputable journal. Thus, as part of the outcome program, we can share the knowledge not only locally but also globally through modules and papers.

After returning from the POGO-SCOR training program, I am actively sharing my knowledge and experience with the research groups I am involved with, and I am confident that the knowledge gained from this training can be transferred to both universities through future training, assistance and discussion in related research. By sharing my experiences, junior research group members or students could be motivated to try the next POGO program and/or excited about advancing their skills and relationships through any national/international capacity building.

Please provide your comments on the Fellowship Programme.

The POGO-SCOR Fellowship Program provided me with an invaluable experience by offering an early career scientist from a developing country the opportunity to participate in an international research and training program. Through this program, I gained valuable insights, not only deepening my understanding of ocean properties and their interactions with the atmosphere, but also learning how to develop compelling research topics. In addition, I improved my technical skills in applying quality control measures, developing ocean properties code, and performing

time-scale analysis of data sets using programming languages such as MATLAB and IDL. This program also strengthened my mindset and prepared me to engage in real-world research activities by working with an expert in the field, Dr. Janet Sprintall. She is a model researcher - a humble and supportive supervisor who patiently guided me in areas where I lacked expertise and demonstrated exceptional time management skills. Her mentorship was invaluable as she actively supported my development, including discussing and reviewing my journal manuscript, offering career advice as an early career scientist, and encouraging me to attend and present my poster at the AGU 2024 Fall Meeting in Washington, DC. This program has been incredibly beneficial in enhancing both my soft and hard skills, exposing me to a new environment and climate, and significantly improving my research skills as an early career scientist while expanding my professional network.

Report from Host Supervisor

Please provide your comments on the performance of the trainee

Ami made excellent progress during her POGO-SCOR fellowship period working with me at Scripps. It was a pleasure to work with her. Ms. Bahiyah had a good understanding of the research goals and applied herself diligently to the problem. We worked on using observations from within the Indonesian seas to understand the first order heat balance between air-sea heat fluxes and ocean heat content. Ami demonstrated excellent insight in her ability to interpret these oceanographic measurements and, more importantly, to understand their dynamical context. Ms. Bahiyah is a very hard worker and shows strong initiative. She has both the drive and ambition to study marine science, asking excellent questions and is genuinely inquisitive about the way the ocean works. Ami and I are currently finishing up her analysis research and hopefully this will lead to a publication to an international, peer-reviewed journal.

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.

Yes, I expect this exchange to lead to future collaboration with Sriwijaya University, South Sumatra, Indonesia, Ms. Bahiyah's parent institution. Examples of how this collaboration may be pursued include future exchange visits and perhaps small workshops concerning scientific topics of mutual interest. Ami's parent supervisor Prof. Iskhaq Iskandar and I both now serve (since January 2025) on the CLIVAR Indian Ocean Regional Panel so I am looking forward to having more discussions with him on various possibilities.

I am also looking forward to co-convening a session with Ami on "Air-sea processes in the Maritime Continent" to be held at the Asia Oceania Geosciences Society (AOGS) meeting in Singapore in July 2025.

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Please provide your comments on the Fellowship Programme

The POGO-SCOR fellowship programme provides an excellent and important opportunity to support visits to host laboratories and research institutions to foster the exchange of ideas and encourage the advance of scientific interests. It's a vital programme that supports the training of early career scientists from developing nations in oceanographic observations and infuse in these young scientists the joy of scientific discovery that working in observational marine science can bring.

2.2. Gabriel Gallegos Diez Barroso

Country of Origin: Mexico   **Host Country:** Italy

Parent Supervisor and Institute: Dr. Alejandro Souza, Centro de Investigación y de Estudios Avanzados del IPN, Mexico
Host Supervisor and Institute: Dr. Ivan Federico, Institute for Earth System Predictions, Italy
Training topic: The Yucatan Self circulation under climate change
Training dates: 07/01/2025 – 07/04/2025

Please provide a brief description of activities during the training period

During the training period, I focused on developing expertise with the SHYFEM hydrodynamic model. My activities included generating computational meshes for the Yucatan Shelf region, configuring and applying appropriate boundary conditions, and ensuring a correct and stable setup for numerical simulations. The training culminated in successfully running initial simulations, which produced the first set of results for the region. This hands-on experience significantly improved my technical capabilities in regional ocean modeling.

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

The training has immediate and impactful applications at my parent institution. The implementation of SHYFEM for hindcast and forecast simulations will enhance our understanding of ocean circulation processes in the Yucatan Shelf region. This capability is crucial for ongoing research projects, environmental monitoring, and coastal management strategies. Furthermore, the skills developed through this training will contribute directly to strengthening collaborations with international initiatives such as CoastPredict, particularly in the development of the Yucatan Peninsula Pilot Site.

Please provide your comments on the Fellowship Programme

The POGO-SCOR Fellowship Programme offers a transformative opportunity for early-career scientists. It not only equips participants with advanced technical skills but also fosters international collaboration and professional networking. The support and training provided through the programme are invaluable for building scientific capacity, particularly in regions where enhanced oceanographic expertise is critical for addressing local and global challenges.

Report from Host Supervisor

Please provide your comments on the performance of the trainee

The trainee showed good engagement with the assigned tasks and made solid progress during the exchange. He became familiar with meshing tools and learned how to run the SHYFEM model with growing autonomy. His technical understanding improved steadily, and he interacted constructively with the team.

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

Yes, the exchange has established a solid basis for potential future collaboration. A concrete opportunity could involve the coupling of the circulation model with a biogeochemical model, where both institutions can contribute their respective expertise. This kind of joint work could lead to shared research outputs and possibly collaborative project proposals, reinforcing the connection initiated during the fellowship.

Please provide your comments on the Fellowship Programme

The Fellowship Programme is a valuable initiative that fosters meaningful exchanges between institutions and promotes knowledge sharing. It provides an excellent framework for professional growth, interdisciplinary collaboration, and the development of long-term partnerships. The programme was well-structured and responsive, making the experience enriching for both the host institution and the trainee.

2.3. Esther Karo Oghenede

Country of Origin: Nigeria

Host Country: Ghana

Parent Supervisor and Institute: Dr. Popoola Samuel, Nigerian Institute for Oceanography and Marine Research
Host Supervisor and Institute: Dr. Edem Mahu, University of Ghana
Training topic: Investigating the Sources, Distribution and Ecological Impacts of Microplastics Pollution in Coastal Waters: Ghana Coastal Water as a Case Study
Training dates: 10/09/24 – 10/12/2024

Please provide a brief description of activities during the training period

Upon my arrival, I was warmly welcomed by my host supervisor and her research team, who gave me a thorough introduction to the laboratory, its instruments, and equipment, along with detailed explanations on their usage.

In the following days, I focused on conducting a literature review of microscopic techniques, which provided me with valuable insights into my research project and deepened my understanding of the field. This was followed by a period dedicated to surveying and interviewing members of the local community, helping me gather important contextual data for my project.

As the project progressed, I engaged in sample collection and received training in Geographic Information System (GIS), a tool essential for analyzing spatial data in my research. This process continued as I went for samples collection and underwent additional training on sample treatment techniques to prepare the samples for further analysis.

In the next phase of my training, I received intensive instruction in analytical chemistry techniques, learning how to identify, quantify, and characterize microplastics in the samples I had collected. The subsequent weeks focused on developing my skills in statistics and data analysis, equipping me with the tools needed to interpret the data from my research effectively.

In the final phase of my experience, I consolidated everything I had learned, reviewing the skills and techniques I had acquired. I had the opportunity to ask any remaining questions and made a presentation on my research work to my host supervisor, her research team and department. I completed and submitted my training report to my parent supervisor, and also prepare report as required.

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

The training program has equipped me with valuable skills in statistical data analysis, including the use of tools such as Python and GraphPad Prism, among others. I plan to share this knowledge by training other research officers at my institute. My institute fosters mentorship and capacity building by organizing weekly seminars for all researchers, and I intend to utilize this platform to transfer the knowledge and skills I have acquired through this fellowship program.

Please provide your comments on the Fellowship Programme

This fellowship has undoubtedly broadened my research experience, as it marks the first time, I've travelled outside my home country for a research project. I have gained valuable skills and knowledge in my area of interest, and I'm committed to continuing to build on these skills until I become an expert, with the goal of training others to do the same. I am truly grateful to POGO-SCOR Fellowship for providing this impactful opportunity. My appreciation to POGO CEO (Dr Sophie Seeyave); to (Dr Lilian A. Krug, Karolina Iwaniak and Laura Ruffoni) for their thoughtful check-in to ensure I had a positive experience.

I look forward to more opportunities that will allow me to further develop my skills and become an expert in the field of oceanography and providing solutions to the world ocean pollution.

Special thanks to my host supervisor (Dr Edem Mahu) for her generosity and for allowing me to learn from her extensive knowledge. Her support in providing the necessary laboratory consumables for my research project was invaluable. I can proudly say that Ghana and Africa at large are truly fortunate to have such a passionate and impactful expert in this field.

I would also like to express my gratitude to my parent supervisor (Dr Popoola Samuel), my Head of Department (Dr Shelle ROD), Director of Physical and Chemical Oceanography Department (Dr Nubi O. Ayoola), and my institution (NIOMR) for permitting me to advance my career. Lastly, I deeply appreciate the encouragement and support from my husband (Mr Yemi Afolabi) and my aunty (Mrs Agnes Oladipo) for giving me the go-ahead to pursue this opportunity.

Report from Host Supervisor

Please provide your comments on the performance of the trainee

The training received is essential to the trainee's career. She has learned so much and fast within this fellowship period, from microscopic, sampling, and analytical and statistical techniques, which I believe are essential to her personal and institutional skills. Apart from these core areas, she also participated in other activities in my laboratory, including outreach and literacy to kids through the Future Ocean Leaders Academy Programme.

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

Absolutely. We started discussions on how Esther can start some research in her laboratory on microplastics and develop this field in her institution. This can be pursued through joint projects through other POGO funding initiatives and other funding opportunities

Please provide your comments on the Fellowship Programme

The Fellowship programme is crucial in developing the capacities of young scientists in the Global South and fostering collaborations among institutions. I was, however, expecting that POGO would write officially to my institution, introducing Esther as a POGO-SCOR Fellow who will be receiving training in my department under my supervision, but this was not done. I suggest that in the future, POGO and SCOR will take this step to make this well institutionalized.

2.4. Fernando Becker

Country of Origin: Argentina   **Host Country:** France

Parent Supervisor and Institute: Dr. Silvia I. Romero, Servicio de Hidrografía Naval - CONICET, Argentina
Host Supervisor and Institute: Dr. Andrea Doglioli, Mediterranean Institute of oceanography (MIO), France
Training topic: Analysis of sub-mesoscale structures in the north-western Mediterranean by comparing in-situ and satellite data
Training dates: 24/01/2025 – 24/03/2025

Please provide a brief description of activities during the training period

The POGO-SCOR 2024 Fellowship was an exceptional opportunity that allowed me to deepen my knowledge in the field of physical oceanography. During my two-month stay at the Mediterranean Institute of Oceanography (MIO) in Marseille, I worked with data from the BioSWOT-Med cruise, conducted in April-May 2023, as well as with several remote sensing and in situ datasets. I have had invaluable exchanges with colleagues on analysis techniques, methodologies, and even local life culture in Marseille.

This two-month period enabled me to familiarize myself with the oceanographic characteristics of the study region and to apply a sub-mesoscale eddy detection algorithm of my own, previously applied in the Southwestern Atlantic, using VIIRS and MODIS chlorophyll images. Thus, I have gained further insights into the algorithm's advantages and limitations. Additionally, I worked with various remote and in situ datasets in which I had limited prior experience, including Sentinel-3 images, ADCP data, and SWOT altimetry. The latter represents an innovative remote

sensing tool with the potential to revolutionize sub-mesoscale oceanographic research. Furthermore, during my stay I received the news that my second paper, which I had sent before traveling to France, had been accepted and that I had to make some modifications. Therefore, since I had a deadline, some days and extra time were used to deal with the reviewers' comments.

Beyond expanding my scientific expertise, this experience also helped me build valuable professional relationships. The collaborations established during this period have laid the groundwork for potential future research projects, opening new opportunities for international cooperation.

Overall, the POGO-SCOR 2024 Fellowship Program has been an enriching and formative experience, contributing significantly to my professional and academic growth in the field of physical oceanography. I am sincerely grateful for the opportunities, knowledge, and connections gained throughout this training period.

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

This training has been a unique opportunity to improve my knowledge of satellite image processing, test my own methodologies, and learn to work with other remote and in situ sensing datasets.

Beyond my doctoral research, I am committed to share the knowledge and experience acquired during this fellowship with my colleagues at my home institution the National Hydrographic Office (SHN) and other research centers in Argentina, such as the Center for Marine and Atmospheric Research (CIMA) and the Department of Oceanic and Atmospheric Sciences of the Faculty of Exact and Natural Sciences of the University of Buenos Aires (UBA), where I have been a teaching assistant. I hope to be able to transfer what I have learnt in future subjects to be able to transmit it to future students. My intention is to support future research on the Argentine Sea, to collaborate with research groups specialized in the use of altimetric data and to improve our analytical capabilities in oceanographic data processing.

Additionally, I aspire to foster stronger scientific collaborations between my home institution and the Mediterranean Institute of Oceanography (MIO). Establishing a long-term research partnership could open new opportunities for joint studies, knowledge exchange, and interdisciplinary projects in fine-scale ocean dynamics and the coupling between marine physics and biogeochemistry.

Please provide your comments on the Fellowship Programme

I would like to express my deepest gratitude to POGO and SCOR for their continued support, availability and commitment to fostering scientific development. I am especially grateful for their kindness, willingness to help, and dedication to making the administrative processes as smooth as possible. Being a POGO-SCOR fellow has been an incredibly rewarding experience, and I am

truly honored to have had this opportunity. This fellowship has not only enriched my academic and professional growth, but has also provided me with invaluable connections and experiences. I will wholeheartedly recommend this program to my colleagues, as it has been an inspiring and formative journey.

Report from Host Supervisor

Please provide your comments on the performance of the trainee

I really appreciated Fernando Becker's work during his time at MIO. During the fellowship, we had regular meetings during which Fernando showed me his progress.

The application of the eddy detection algorithm developed by Fernando for the Southwest Atlantic had to be modified to be adapted to the Mediterranean Sea. The results were compared with in situ data from the BioSWOT-Med campaign (https://doi.org/10.17600/18002392) and allowed us to improve our knowledge of the surface circulation of the Northern Balearic Front.

During his stay at MIO, Fernando also worked hard on the revision of one of his articles, demonstrating a great commitment to research work and excellent organisational skills.

Overall, I am very satisfied with the collaboration with Fernando Becker.

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

With Fernando, we expect to finalise a short report on his work at MIO in the coming weeks, which will be a valuable contribution to the BioSWOT-Med programme.

In addition, I intend to continue my collaboration with Fernando and colleagues at UBA in the study of marine circulation on the Patagonian shelf.

Please provide your comments on the Fellowship Programme

The POGO-SCOR scholarship programme is an excellent opportunity for collaboration and training. The administrative tasks are simple and the support provided by the POGO Secretariat is great.

2.5. Michelle Glory G Jonik

Country of Origin: Malaysia   **Host Country:** Taiwan

Parent Supervisor and Institute: Assoc. Prof. Mahadi Mohammad, Universiti Sains Malaysia, Malaysia.
Host Supervisor and Institute: Prof Ching-Nen Nathan Chen Department of Oceanography National Sun Yat-sen University, Taiwan.
Training topic: Understanding Symbiodiniaceae Culture Protocols and Lipid Production to Assess Coral Stressors: Evaluating Nutrient Limitation Through Nutrient-Induced Fluorescence Transients (NiFTs) and Thermal Stress
Training dates: 3/11/2024 – 30/11/2024

Please provide a brief description of activities during the training period

Under Professor Nathan Chen's guidance, I was introduced to the basic steps of lipids extraction from various samples and the subsequent analysis using thin-layer chromatography (TLC). This technique provided valuable insight into the lipid extractions skills which I will apply it on my study. Using proper solvent is important to achieve clear separations in TLC. Professor Chen's emphasis on precision during the extraction process has improved my foundational skills in biochemical analyses.

In the second week, I focused on the extraction and isolation of Symbiodinium species and learned to culture them for proliferation studies. This process deepened my understanding of the symbiotic relationship between corals and Symbiodinium. Professor Chen's expertise in handling these delicate procedures with his own protocols ensured successful culturing, highlighting the importance of maintaining sterile and controlled environments for optimal growth. Based on his findings, the cultures will have better growth under higher salinity 40 ppt compared to 30 ppt.

In the third week, I learned to detect Reactive Oxygen Species (ROS) in coral symbionts using fluorescent dyes. The hands-on experience with fluorescence microscopy was invaluable in understanding the impact of environmental stressors on corals. Also, during this week, my parent institution supervisor visited the host institution. Together, we visited the National Academy of Marine Research in Kaohsiung, where discussions on potential collaborations were held, facilitated by Professor Chen. Additionally, Professor Chen organised a day trip to the National Museum of Marine Biology and Aquarium and Mobitou Park at southern part of Taiwan which offering insights into Taiwan's marine biodiversity and conservation efforts.

In the final week, I was trained in genomic DNA (gDNA) extraction from Symbiodinium culture (Clade D), followed by polymerase chain reaction (PCR) and gel electrophoresis techniques. These

molecular biology skills are essential for investigating genetic variations and adaptations in Symbiodinium. Professor Chen's attention to detail, especially in interpreting gel electrophoresis results, significantly improved my technical proficiency.

The fellowship under Professor Nathan Chen was a comprehensive learning experience, blending hands-on technical training with opportunities for academic collaboration and cultural exploration. His mentorship not only enhanced my scientific skills but also deepened my appreciation for Taiwan's contributions to marine science. The experiences, coupled with visits to key research institutions and natural landmarks, enriched both my professional and personal growth.

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

The training I received will have several practical applications at my parent institution:

- *Lipid Extractions and TLC: I plan to implement lipid analysis techniques in my ongoing studies on coral physiology especially on thermal stress experiment. The ability to characterise lipid profiles will help investigate the metabolic health of coral symbionts under varying environmental conditions.*

- *Symbiodinium Isolation and Proliferation: The protocols for isolating and culturing Symbiodinium will be directly applied to establish a culture system at my institution. This system will enable controlled experiments to study symbiont ecology, stress tolerance, and environmental adaptability. This will ensure us to have a continuous coral's zooxanthellae samples for experiment analysis.*

- *ROS Detection: Fluorescence microscopy and ROS detection techniques will be integrated into my research to assess oxidative stress in corals subjected to environmental stressors such as temperature increment.*

- *gDNA Extraction, PCR, and Gel Electrophoresis: The molecular techniques learned will support genetic studies of Symbiodinium at my institution. These techniques will be instrumental in understanding genetic diversity, adaptation, and symbiotic interactions in coral ecosystems.*

The knowledge and skills gained during this fellowship will not only enhance my research but also enable me to train colleagues and students, fostering a stronger research culture at my institution.

Please provide your comments on the Fellowship Programme

The POGO-SCOR Fellowship is an exceptional programme that provides early-career researchers with the opportunity to gain hands-on training in advanced techniques under the mentorship of esteemed scientists.

Specifically, I found the following aspects highly beneficial:

- *Tailored Mentorship: Professor Nathan Chen's expertise and personalised guidance ensured that the training was aligned with my research objectives.*

- *Collaborative Opportunities: The visit to the National Academy of Marine Research facilitated meaningful discussions on potential joint research projects.*

- *Cultural Enrichment: Field trips to Taiwan's marine landmarks provided a deeper understanding of the region's biodiversity and conservation efforts.*

I strongly recommend the programme to researchers seeking to expand their technical skillset and engage in international collaborations. The experience had a profound impact on my scientific career and personal growth, and I am grateful for the opportunity to have participated.

Report from Host Supervisor

Please provide your comments on the performance of the trainee.

Michelle Jonik was a diligent student with thoughtful curiosity. She had learned many new techniques in four weeks, and explored southern Taiwan during the weekends.

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.

The answer is yes. For example, her university has a marine station equipped with research and living facilities. This offers an excellent opportunity for field trips for students from my university.

Please provide your comments on the Fellowship Programme.

This fellowship was very generous, and the staff was very helpful. I appreciate what you have done.