

PRESS KIT · MARCH 2023



RESTITUTION OF THE
**INDIAN OCEAN
EXPEDITION**

OCTOBER - NOVEMBER 2022

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INTRODUCTION

AN EXPEDITION TO UNDERSTAND, SHARE AND MOBILISE

The recent Monaco Explorations Expedition to the south-west Indian Ocean took place from October to November 2022 between Reunion, Mauritius and Seychelles, on board the South African oceanographic and supply ship, S.A. Agulhas II. It brought together more than 150

participants of some 20 different nationalities, including scientists, young researchers, and students from an on-board school, filmmakers and photographers, divers, artists, communicators, and the ship's crew..

THREE MAJOR OBJECTIVES

The objective of the Expedition was to :

Understand through a global and multidisciplinary scientific approach the ecosystemic status and functioning of the explored area to advise the stakeholders through a global scientific approach (Sustainability Science).

Share the issues and knowledge with as many people as possible through an ambitious outreach programme.

Mobilise governments through diplomatic action, by providing information and analysis for sustainable management of maritime spaces.





A HOLISTIC APPROACH

Guided by an Advisory Committee of fourteen international experts, the Expedition implemented a holistic approach based on a multidisciplinary programme including natural and social sciences. It was developed in liaison with the authorities of Mauritius and Seychelles.



A LABELLED EXPEDITION

The Indian Ocean Expedition 2022 is the first element of the "Monaco Explorations" project, endorsed as part of the **United Nations Decade of Ocean Sciences for Sustainable Development 2021-2030**. The Expedition itself is one of the projects endorsed by the **Second International Indian Ocean Expedition (IIOE-2 - 2015-2025)**, a major scientific programme developed over 10 years by the international scientific community to advance knowledge of the Indian Ocean.



2021 United Nations Decade
2030 of Ocean Science
for Sustainable Development





Research Project 1 : the multidisciplinary study of the Saya de Malha Bank

SEE THE INVISIBLE ISLAND...

Monaco Explorations Expedition is now part of the international oceanographic expeditions that have made it possible over the last few decades to gain a better understanding of this vast plateau located on the Mascarene rim, devoid of any landforms and as large as Switzerland: the Saya de Malha Bank. Indeed, there are few opportunities to move large-scale study facilities to this site, which is far from the coast. One of the major contributions of the Monegasque Expedition was to enable eight international scientific teams, and

in particular young researchers from Seychelles and Mauritius, to visit the site. Jointly managed by Seychelles and Mauritius, Saya de Malha is one of the world's largest seagrass beds. Located in the high sea, it is home to little-known ecosystems that are remote and difficult to access, and already under threat from fishing pressure. The scientific results of this Expedition will help to determine whether its situation requires special attention in the medium term and, if so, to identify the management measures to be considered.



Photographic survey and collection of organisms while diving on the Saya de Malha Bank. Indian Ocean Expedition © Sven Bender - Autentic / Monaco Explorations

THE PROMISE OF HIDDEN BIODIVERSITY

What will remain of our passage on this shallow sea in the middle of the ocean? Barely a few traces of our towed gears, quickly erased by the currents that relentlessly reshape the sediments. On the other hand, a magnificent harvest of benthic community specimens spread over five sectors, along a 1,600 nautical mile journey on the Saya de Malha Bank.

What exactly are we talking about? 300 to 400 species of molluscs, around 300 species of crustaceans and a hundred or so species of algae brought on board, sorted and examined with a binocular magnifying glass by our experts from the **Muséum National d'Histoire Naturelle (MNHN)**. Already, three specimens of gastropods and one of crustaceans are considered as new species, i.e. not yet described by taxonomists. Two emblematic species, a gastropod, *Conus primus*, and the clam *Tridacna rosewaterii*, have been "rediscovered" on Saya de Malha.
Remarks by Francis Marsac



△ On the Saya de Malha Bank during the Indian Ocean Expedition - Above: one of the 300 species of molluscs collected Below: this shrimp may be one of the new crustacean species discovered © Grégoire Moutardier - MNHN / Monaco Explorations

... FIRST IMPRESSIONS

Francis Marsac

Leader of this project dedicated to the Saya de Malha Bank and representative of the French National Research Institute for Sustainable Development (IRD) in Seychelles, fisheries expert and oceanographer, offers an initial assessment of the operations carried out in the field.

The Saya de Malha Bank is already far behind the wake of S.A. Agulhas II... The cruise ended in Mauritius on November 22, and the laboratories were emptied of the equipment brought in especially for this project. Measuring equipment, fishing gear and specimens collected were put back into the container and into crates that were unloaded in Cape Town on December 2, the final destination of the Monaco Explorations trip that began on October 3, before being sent to the French laboratories.



△ Francis Marsac (IRD), interviewed by journalist Stéphane Dugast © Nicolas Mathys - Zeppelin / Monaco Explorations

GIGABYTES OF DATA TO ANALYSE



△ Photograph of coral samples collected during a dive on the Saya de Malha Bank © Nicolas Mathys - Zeppelin / Monaco Explorations

Gigabytes of digital data on physico-chemical and biological parameters measured by the CTD in the water column have been stored on the computers. There are also long hours of video footage filmed by the ROV during its seven dives, and images taken by various moored cameras that still need to be processed, which will provide research topics for our young researchers in the region. This precious information on the properties of the water column and the habitats visited, gives context to the floristic and faunistic inventory described above.

¹ ROV : Remotely Operated Vehicle - a remotely operated underwater vehicle for underwater photography and bottom sampling.



▽ Above: Philippe Bouchet © Nicolas Mathys - Zeppelin / Monaco Explorations

Below: in the foreground, Frédéric Ménard (IRD) in the middle of sorting out. Saya de Malha © Didier Théron - Monaco Explorations



Professor Philippe Bouchet,
An internationally renowned malacologist from the MNHN and member of the Expedition, seems to agree :

The potential for discovering other endemic and even new species in our collections is significant. This will keep specialists busy for the next five years, given the size of this harvest. To be followed very closely.



Frédéric Ménard,
A researcher at IRD and specialist in marine ecosystems, wonders about the apparent rarity of megafauna in the area under investigation :

At first sight, Saya de Malha does not meet our expectations. Few big fish, very few sharks, few seabirds. The megafauna is not there. And yet, the seagrass beds are in good health, the fish are present in the coral zones, the mosaic of habitats shelters a fixed fauna

that is not very abundant but diversified and so fascinating, as for example for the sponges, Our plankton nets collected an interesting diversity of organisms living in the water column, and the images brought back by the underwater robot that we deployed on the slope breaks testify to the presence of fish, sharks, corals, gorgonians, crinoids (called "sea lilies").... Should we conclude that there are refuge zones for megafauna that we hardly observe on the plateau? We have a lot of work ahead of us to understand the links between the singular environmental conditions of Saya de Malha and the distribution of the fauna and flora.

THE S.A. AGULHAS II, AN INTERGENERATIONAL LINK

We can be satisfied with this initial scientific assessment. However, the first asset of the Expedition is the human aspect. The scientific team was made up of scientists from Seychelles (including students), Mauritius, France, South Africa, Australia, and Spain. A melting pot of nationalities and skills that worked perfectly. An intergenerational fusion of exchanges, interaction,

mutual aid, and interests that took place after only a few days of learning from each other. In my opinion, Monaco Explorations Expedition contributed greatly to the strengthening of exchanges between Seychellois and Mauritian scientists. They did not know each other very well, and now they have a strong motivation to develop joint projects. concludes Francis Marsac.

THE MAURITIAN PERSPECTIVE THE SEYCHELLOIS VIEWPOINT

As Mauritian scientists, this Expedition has provided us with an exceptional opportunity to build our capacity in the various disciplines of oceanography and to further explore this remote region of Saya de Malha.

participants to take part in marine research on the Mascarene Plateau.

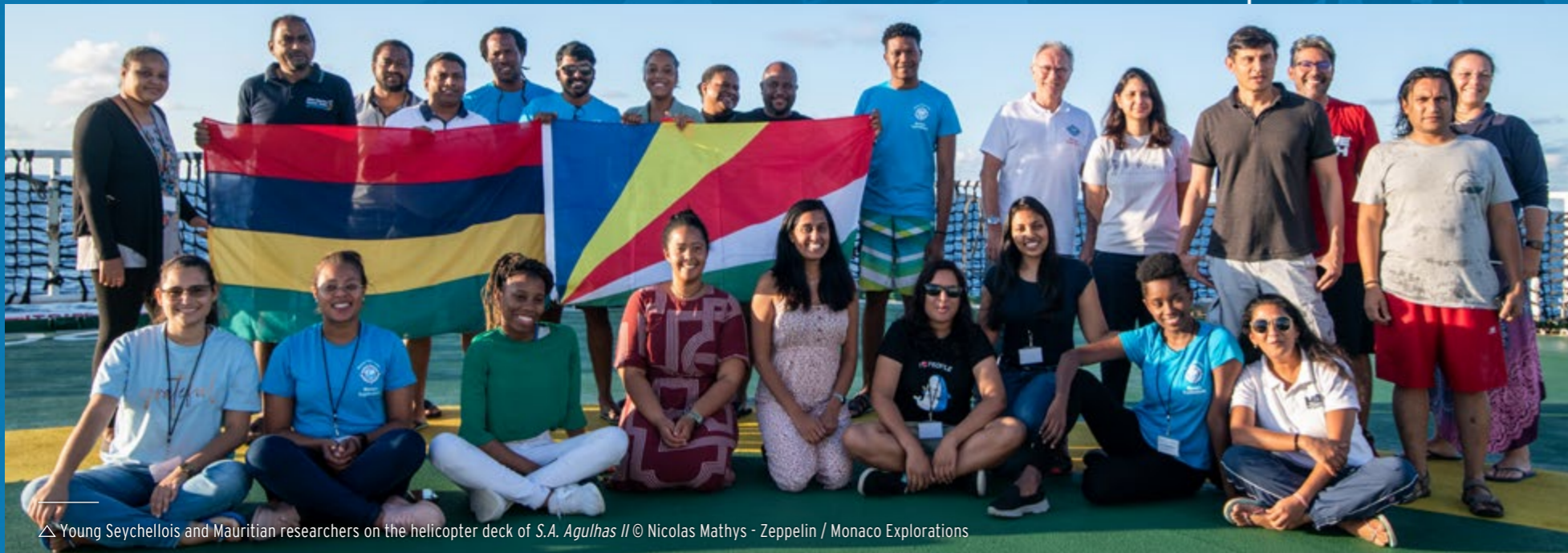
Dass Bissessur. PhD in marine geophysics, Director of the Hydrocarbon/Mineral Exploration Unit. Department for Continental Shelf, Maritime Zones Administration and Exploration, Prime Minister's Office, Mauritius.

Mariette Dine. Seychellois entrepreneur, involved in the development of bioplastics. Graduate of the University of Seychelles in Marine Science and Sustainability.

Monaco Explorations Indian Ocean Expedition was a great opportunity for me and the other Seychellois

◀ One of the divers of the French Museum of Natural History prepares for a deep dive at Saya de Malha

© Nicolas Mathys - Zeppelin / Monaco Explorations



△ Young Seychellois and Mauritian researchers on the helicopter deck of S.A. Agulhas II © Nicolas Mathys - Zeppelin / Monaco Explorations

SUMMARY OF SCIENTIFIC FIELD OPERATIONS

- 25 multi-parameter hydrological stations using a rosette and CTD between 0 and 2,000 m.
- 19 vertical temperature profiles (XBT).
- 5 multinet casts between 0 and 1,000 m.
- 20 bongo nets casts between 0 and 200 m.
- 15 beam trawl transects at depths from 80 to 1,500 m
- 24 dredge transects at depth from 110 to 1,100 m
- 7 suprabenthic sledge transects at depth from 70 to 1,000 m.
- 11 sampling dives between 20 and 60 m.
- 7 ROV exploration dives at depth from 30 to 700 m.



Research Project 2 : microplastic and coral pathogens – Madcaps

The objective of this study was to characterise plastic debris transported by ocean surface currents, potentially inert vectors of coral pathogenic microorganisms, via integrative approaches using state-of-the-art technologies.

△ Deployment of the Manta net from S.A. Agulhas II © Nicolas Mathys - Zeppelin / Monaco Explorations



△ Plastic waste sorting on board S.A. Agulhas II after a Manta net transect © Nicolas Mathys - Zeppelin / Monaco Explorations

SAD OBSERVATION IN ALDABRA

The general circulation of currents around Aldabra causes dense accumulations of plastic waste on this isolated atoll in the middle of the Indian Ocean, yet it too is a victim of this pollution. To determine

the origin of this waste, Gwennais Fustemberg and Vickyria Marillac Fernandes Da Costa carried out 11 transects on land, during which they collected around 20 kg of plastic samples.

SAMPLING OF MICROPLASTICS AT SEA

Present on the first and second leg of the Expedition, the MADCAPS team also collected 60 samples with the Manta net in the open sea underway to collect microplastics and determine their origin

The samples collected and packaged during the Expedition will be subjected in the coming months to metagenomic analyses to detect any pathogenic microbial communities and spectrometric analyses to determine the nature of the plastic debris collected to map the concentrations of this pollution in the south-west Indian Ocean

In pictures : follow the daily life of the MADCAPS team on board the [S.A. Agulhas II](#) here.

Research Project 3 : the study of genetic structure, contamination, and stress levels in marine turtles - GECOS



△ A green turtle returns to the sea at Aldabra after being ringed and numbered. Indian Ocean Expedition © Jérôme Bourjea - Ifremer / Monaco Explorations



△ Biometric measurement of a green turtle in Aldabra © Jérôme Bourjea - Ifremer / Monaco Explorations



△ GPS tagging of a green turtle in Aldabra © Jérôme Bourjea - Ifremer / Monaco Explorations

The main objectives of the GECOS project, which has been developed over the whole of the southwestern Indian Ocean for several years, were, thanks to Monaco Explorations Expedition, to be able to acquire missing data on certain sites such as Aldabra in order to gain a better understanding of the genetic structure of the green and hawksbill turtle populations and to develop indicators of the state of health of these species in order to make them true sentinels of the quality of the environment they visit.

This has now been achieved, as during the five days spent in Aldabra from 20 to 25 October 2022, Jérôme Bourjea's team was able to take samples from around 40 turtles (biometric measurements, biopsies, blood samples and scale samples).

The team took the opportunity to equip two young green turtle individuals with Argos GPS tags so as to be able to track their movements and gain a better understanding of their feeding behaviour within and outside the atoll.

The samples collected were conditioned in liquid nitrogen and then stored at -80°C. In the coming months, after sequencing and analysis of the mitochondrial genomes, but also assaying of physiological parameters, they will allow us to know a little more about the genetic structure of the turtle populations present in Aldabra, their origin, and their degree of contamination and environmental stress. These data will finally be repositioned in a regional context and compared to other sites undergoing contrasting human pressures.



△ Turtle rodeo © Elise Rigot - Monaco Explorations



Research Project 4 : investigating the combined impact of coastal human activities and climate change on marine ecosystems - 4Sea



△ Deployment of the connected board on the Saya de Malha Bank © Nicolas Mathys - Zeppelin / Monaco Explorations

CONNECTED BOARDS TO EXPLORE THE SHALLOW REEF

The 4Sea project, involved in the Indian Ocean Expedition, aimed to unravel the combined impacts of human activities on the coasts and climate change on the marine ecosystems of the western Indian Ocean. The images and data collected with autonomous, low environmental

impact observation systems will, after analysis and processing of the data, enable species and seabed nature inventories, video recordings, bathymetry measurements and the use of photogrammetry to obtain 3D maps of the explored habitats.

SUMMARY OF FIELD OPERATIONS

Aldabra :

30 hours of transects carried out with the connected boards (Autonomous Vehicle for Observation and Cartography) on the reef.

20 drone reconnaissance flights (drone equipped with centimetric GPS and a camera to produce orthophotos).

Saya de Malha :

6 hours of transects collecting bathymetric data.

St Brandon :

16 hours of transects to collect bathymetric data and video for automatic identification of species and habitats.

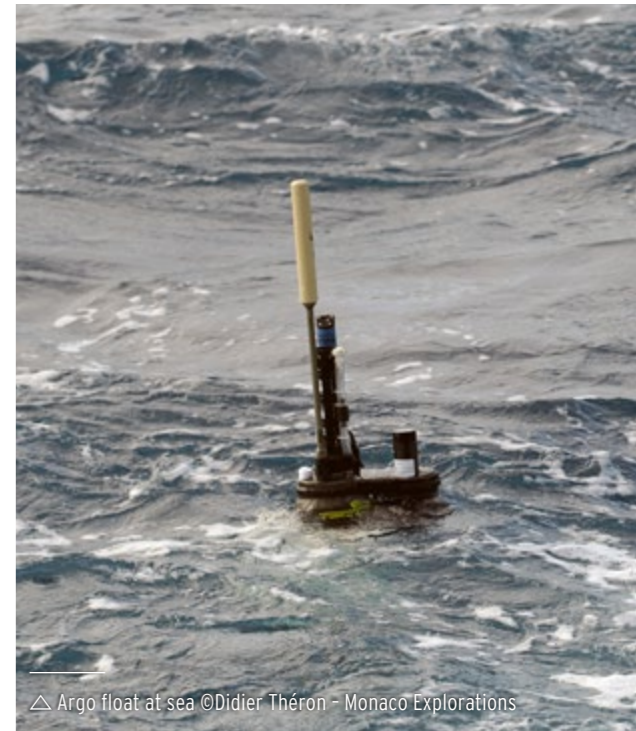
Research Project 5 : extension of the BGC Argo monitoring programme to the area explored by the Expedition



△ CTD cast from S.A. Agulhas II © Filip Kulisev - Amazing Planet / Monaco Explorations



△ Launching of an Argo float © Didier Théron - Monaco Explorations



△ Argo float at sea © Didier Théron - Monaco Explorations

29 floats deployed along the entire route

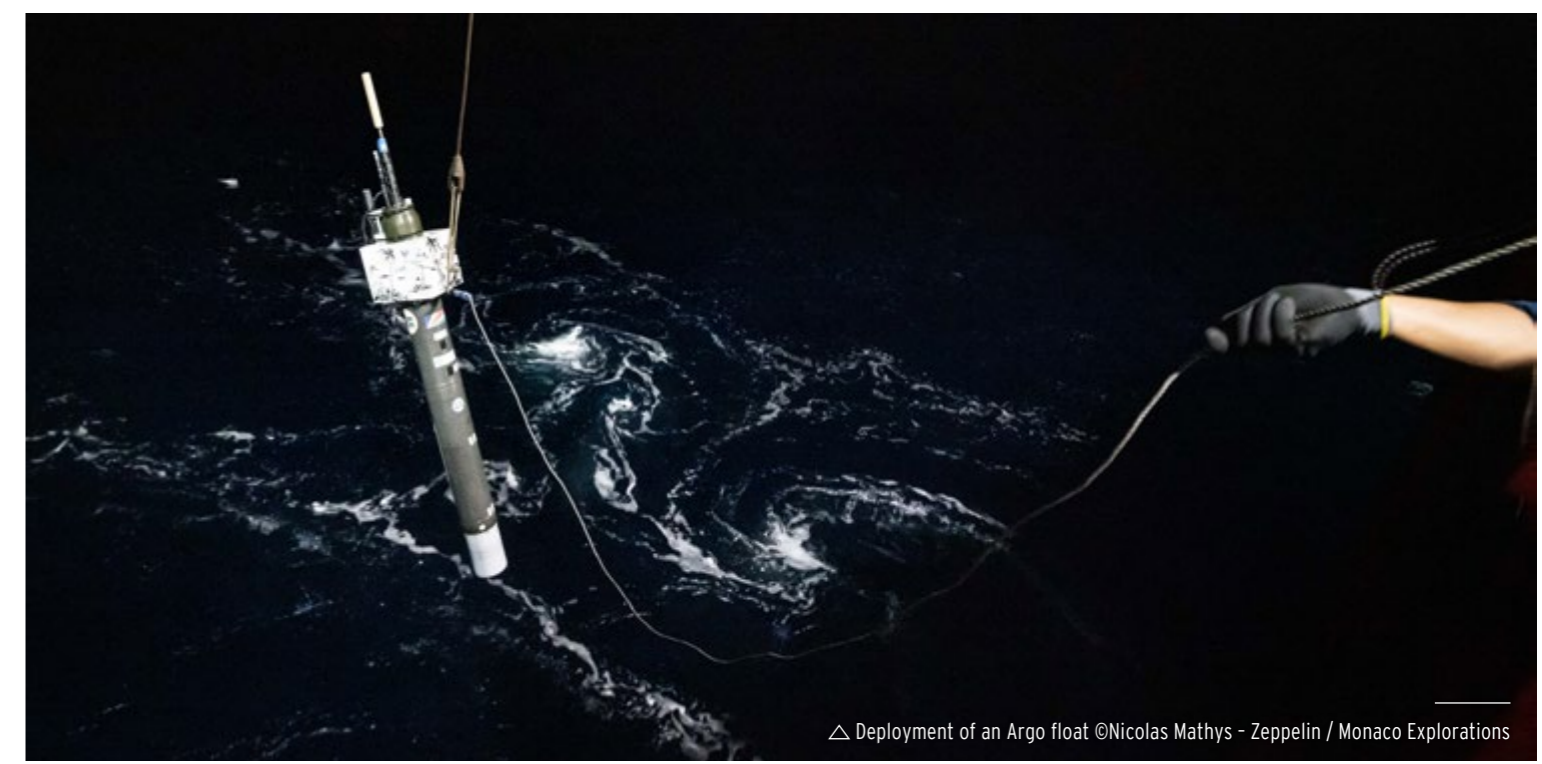
The international BGC Argo programme aims to instrument the ocean with a fleet of 1,000 next-generation profiling floats that will complement the 3,000 profiling floats already drifting in the ocean.

Throughout the Indian Ocean Expedition from Cape Town to Cape Town, Hervé Claustre, co-leader of this international programme, deployed twenty-nine floats with his team during the voyage of *S.A. Agulhas II*. These highly sophisticated instruments will contribute to a better understanding of this region of the Indian Ocean, which until now has been poorly equipped with floats.

5 to 7 years of data transmission

The 29 floats deployed in this hitherto poorly equipped area have an average lifespan of 5 to 7 years. For several years, they will measure physical, chemical, and biological variables essential to understanding the status of the health of the ocean and its response to climate change: temperature, salinity, Ph, oxygen, nitrate and chlorophyll a concentration, suspended particles, as well as illumination.

These data are transmitted each time the float surfaces to the satellites that cover the area and then to the laboratories that process and validate the data. The data is made available to the international community.



△ Deployment of an Argo float © Nicolas Mathys - Zeppelin / Monaco Explorations

Research Project 6 : deployment of surface drifters

Nick D'Adamo, a member of the Expedition Advisory Committee and a researcher at the University of Western Australia's Oceans Institute, co-led the deployment of 19 surface drifters and 4 floats drifting with the currents at 15 m depth during the Expedition, along with IRD researcher Jean-François Ternon and Olivier Desprez de Gesincourt from Météo France. Their function: to acquire surface temperature and

current data from the analysis of their satellite-tracked trajectory to contribute to the accurate observation and modelling of ocean flows, and to study their influence on connectivity (biological, in particular) in the region. This data is also valuable for other projects. Students from the onboard school were also involved in the deployment of the floats.

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In pictures : Nick D'Adamo's explanation of how these surface drifters work and the overall approach of the project can be found here.



△ Deployment of a surface drifter © Tim Teichmann - Autentic / Monaco Explorations



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△ Nick D'Adamo as seen by Rémi Leroy © Rémi Leroy - Monaco Explorations



Research Project 7 : World Coral Conservatory

SUCCESSFUL FIRST FIELD OPERATION IN ALDABRA

Climate change is wreaking havoc on coral reefs around the world. Most scientists believe that at the current rate, corals will not be able to adapt or regenerate. This is why the Scientific Centre of Monaco and the Oceanographic Institute have decided to tackle the problem head on by creating a World Coral Conservatory. The project is as exciting as it is ambitious: we must imagine the "Noah's Ark of corals". During *S.A. Agulhas II's* stopover in Aldabra, the World Coral Conservatory team carried out its first operation and collected 58 colonies

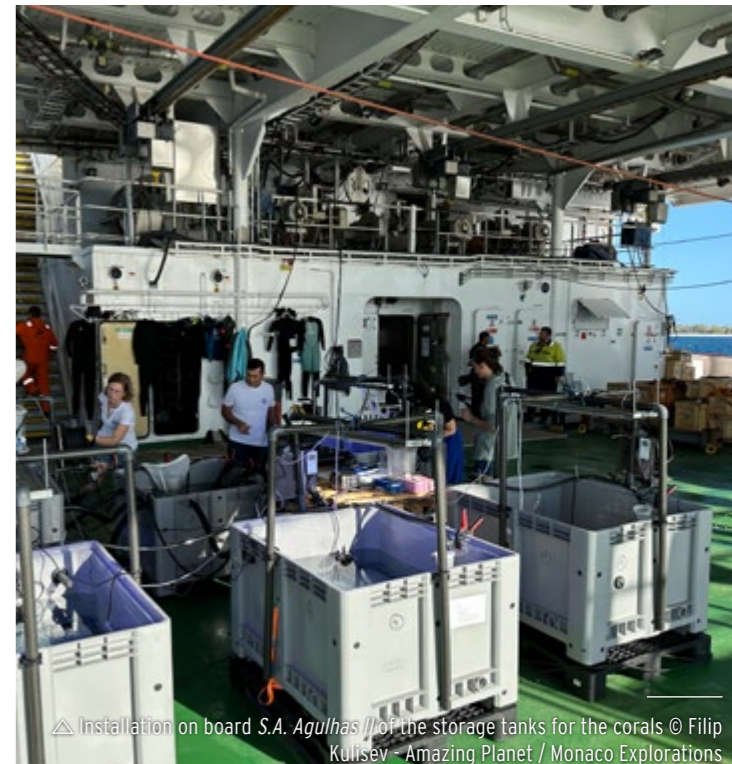
of live corals, no larger than 15 cm, representing 21 species, during seven dives between 19 and 24 October 2022. These colonies, which were stored on deck 3 of the ship in temporary tanks, are destined to be kept in four public aquariums: Nausicaa, Burgers Zoo, Oceanopolis and the Oceanographic Museum in Monaco. They were transferred on 29 October 2022 to holding tanks in Mahe, before being airfreighted to Europe in the following days.



△ Underwater view of the Aldabra reef © Katia Quéméré - Océanopolis / Monaco Explorations



△ Collection of coral colonies. Didier Zoccola, Research Director at the Scientific Center of Monaco © Katia Quéméré - Océanopolis / Monaco Explorations



△ Installation on board *S.A. Agulhas II* of the storage tanks for the corals © Filip Kulisev - Amazing Planet / Monaco Explorations

A good example of collaboration

This operation sealed a close scientific collaboration between Seychelles, France, and Monaco regarding the future of corals, a vital link in the biological balance of the oceans. Olivier Brunel, head of the Aquarium at the Oceanographic Museum in Monaco, and Dominique Barthelemy, head of the Oceanopolis Aquarium in Brest, came to assist Dr Didier Zoccola, a researcher at the Scientific Centre of Monaco, and his team, who were already on board to handle the logistics on site in Mahe and to prepare the transfer of the colonies by plane.



▽ The living colonies collected after the first dive in Aldabra © Filip Kulisev - Amazing Planet / Monaco Explorations



▽ Offloading coral colonies in Mahe © Nicolas MATHYS - Zeppelin / Monaco Explorations



Research Project 8 : coral connectivity and associated invertebrate biodiversity

This Bertarelli Foundation Marine Programme project, led by the Zoological Society of London and the University of Oxford, aims to understand whether these central Indian Ocean atolls and banks (Chagos Archipelago, Aldabra and Saya de Malha) act as a 'steppingstone' for invertebrate (particularly coral) recruitment and biodiversity between the eastern and western Indian Ocean regions.

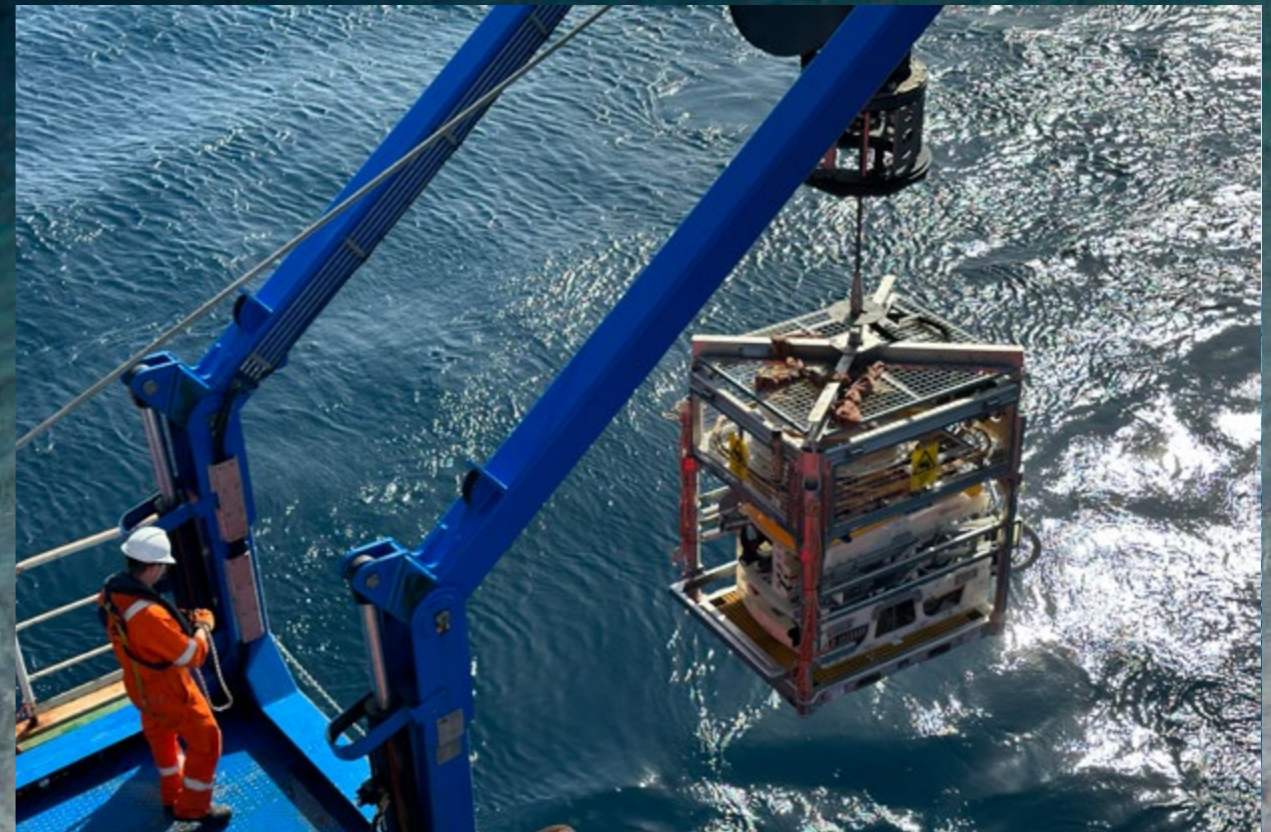
The research focused on the connectivity of coral species present in the Indian Ocean at Aldabra, Saya de Malha and the Chagos Archipelago, as well as the biodiversity of cryptic reef invertebrates in relation to reef complexity. Finally, the team investigated whether the critically endangered Chagos brain coral, *Ctenella chagius*, was present in Saya de Malha.

Samples collected during the Expedition are currently being analysed to answer questions regarding coral connectivity and associated invertebrate biodiversity. Unfortunately, due to weather conditions and diving constraints, further work will be required to determine the presence of Chagos brain coral at Saya de Malha.

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△ One of the fish species observed on the slopes of the Aldabra reef. Depth: 698 meters © Marine Solutions / Monaco Explorations



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SUMMARY OF FIELD OPERATIONS :

- Collection of 20 samples of three widespread coral species.
- Reef mapping and eDNA sampling at 4 sites around Aldabra.
- Video transects conducted by a Mauritian PhD student.
- SIF-led ROV explorations at three sites at depth from 40m to 700m in Aldabra.

ROV AT 700 M DEPTH: A FIRST IN ALDABRA.

The ROV investigations conducted on the slopes of Aldabra reef to a depth of 700 m during the Expedition were a first. Until then, only maximum depths of 250 m had been explored at the Aldabra site. The analysis of the images is ongoing and will undoubtedly provide new information.



SHARING : OUTREACH



The Expedition promoted the exchange and transmission of knowledge with the greatest number of people, through a varied outreach programme. Its various components were aimed at a wide audience: schools, civil society, decision-makers. From onboard stops to remote interactions.

1. The stopovers, moments of exchange and sharing

REUNION ISLAND

The ship's stopover aroused a lot of interest. It enabled Monaco Explorations team to welcome on board journalists and personalities from Reunion Island, school groups and associations throughout the afternoon of 13 October.

Two classes from the Lucet Langenier and Morin secondary schools were able to take part this year in the Oceanographic Institute's **Oceano for all** competition. In addition to a visit to the boat, they also took part in the "Adopt a float" animation, offered by the BGC Argo team, as well as a workshop on plastics led by the MADCAPS project team.

In total, more than 150 visitors were welcomed on board with the help of the crew: the Best Run association, the Sciences Réunion association, the Auteuil apprentices, the maritime apprenticeship school (EAM), a delegation from the National Federation of Maritime Merit, the Léon le Pervenche vocational high school, the Lucet Langenier college and the Morin college.

On this occasion, the class from Mr Stéphane Delebarre's Morin secondary school also adopted one of the BGC Argo floats deployed on the Expedition route as part of the "Adopt a float" educational programme **Adopt a float**.



△ Children from Lucet Langenier College in Reunion Island with the BGC Argo team on S.A. Agulhas II © Stéphane Delebarre / Monaco explorations



△ 7 Mauritian classes were welcomed on board S.A. Agulhas II © Nicolas Mathys - Zeppelin / Monaco Explorations

SEYCHELLES

The S.A. Agulhas II arrived in Port Victoria in the early hours of 29 October and experienced several highlights: the reception on 29 October of a Seychelles delegation led by Seychelles Minister of Fisheries and the Blue Economy, Mr Jean-François Ferrari, accompanied by Mr Flavien Joubert, Minister of Agriculture, Climate Change and the Environment, and a day dedicated to school group visits on 31 October.

On 31 October, the crew, scientists, artists on board and Monaco Explorations team welcomed on board around 200 schoolchildren from various Seychelles islands. This was an opportunity for the Expedition's organisers to showcase both a research ship and a scientific expedition through exchanges with the researchers, students and artists on board. This day was organised with the precious collaboration

of the staff of Seychelles Ministries of Fisheries and Blue Economy, Environment and Education. The groups that were hosted: École Baie Ste-Anne de Praslin, Perseverance Secondary school, International School of Seychelles, La Digue Primary and secondary School, BeauVallon primary school, Anse Boileau Secondary School, Belonie Secondary School, Mont Fleuri Secondary School and the Seychelles Maritime Academy.

On this occasion, Mrs Carol Athanasius' class from Perseverance Secondary School adopted the BGC Argo float given by the Principality to the Seychelles Government as part of the "Adopt a float" educational programme.

MAURITIUS

Two stopovers took place in Port Louis, Mauritius. The first, from 10 to 12 October, marked the official launch of the Expedition. The last, from 20 to 22 November, was the conclusion of the Expedition. These two stops in Mauritius were marked by the reception of the press and official delegations headed by H.E. Marie Cyril Eddy Boissezon, Vice-President of the Republic of Mauritius, Acting President, accompanied by Mr. Sudheer Maudhoo, Minister of Blue Economy, Marine Resources, Fisheries and Maritime Transport and Dr. Rezah Badal, Director General of the Department for the Continental Shelf, Maritime Zones Administration and Exploration, Prime Minister's Office.

Before the official reception on the evening of 22 November, the whole day was devoted to welcoming 180 pupils from seven schools, who were

received for visits and activities by the Mauritian and Seychellois scientists present on board to explain their work and to awaken vocations. This day was organised with the precious collaboration of the staff of the Prime Minister's Office and the Mauritian Education Department. The groups that were hosted: Royal College Port Louis, Mahatma Gandhi Secondary School Moka, Mootoocomaren Sangeelee State Secondary School, Quatre Bornes SSS, Lady Sushil Ramgoolam SSS, Dr Maurice Curé State College, Sir Abdool Razack Mohamed SSS.

On this occasion, these seven classes adopted together the BGC Argo float given by the Principality to the Mauritian Government as part of the "Adopt a Float" educational programme.



2. Inauguration of the Curieuse Marine Educational Area

CHILDREN TAKE ACTION FOR THE REEF

As part of the [Pareo project](#) the educational marine area of [Curieuse Island in Seychelles](#) was inaugurated on 28 October 2022 with the children of Baie Ste-Anne school in Praslin. This coral reef protection awareness project is coordinated by the [French National Research Institute for Sustainable Development \(IRD\)](#), in collaboration with the [Seychelles Parks and Gardens Authority \(SGPA\)](#). It is supported by Monaco Explorations. At the inauguration, Francis Marsac (IRD) officially represented Monaco Explorations, on the eve of the arrival of *S.A. Agulhas II* and the Indian Ocean Expedition to Seychelles. Pascale Chabanet

(IRD), Coordinator of the PAREO project in the south-west Indian Ocean and Anto Suzette, Manager of the Curieuse Island National Marine Park, were present with the children of Baie Ste-Anne school and several representatives of Seychelles Ministry of Education and Environment: Mrs Monique Lesperance, Headmistress of Baie Ste-Anne Primary School in Praslin, Mrs Lynndinna Essack and Mrs Catherine Onezia (Ministry of Education), Mr Terry Mousse and Mr Clive Clarisse (Ministry of Education).



△ The children of the Baie Ste-Anne de Praslin school during the inauguration of the Marine Educational Area
© Nicolas Mathys - Zeppelin / Monaco Explorations



A FIRST IN SEYCHELLES

The concept of an Educational Marine Area was born in 2012 in the Marquesas Islands and consists of students and their teachers managing a small coastal marine area in a participatory manner. This educational and eco-citizen approach aims to raise awareness among youngsters about the protection of the marine environment but also to discover its actors. This is the first time that a marine educational area has been implemented in Seychelles.

The objective of this project, initiated in 2021, is to lead to conservation actions based on solutions envisaged and implemented by the children themselves to forge links between science and society. Over the past few months, the students' activities have been supervised by Lola Massé (Pareo-IRD Project Manager) and Maria Brioche (Education and Awareness Programme Manager at the Seychelles Islands Foundation) within the framework of the Pareo clubs. This programme encourages youngsters to become actors in the protection and good management of their daily environment. It is currently taking place in four islands in the Indian Ocean: Reunion, Mauritius, Seychelles and Moheli in the Comoros.

△ The Marine Educational Area of Curieuse Island
© Nicolas Mathys - Zeppelin / Monaco Explorations

3. The on-board school and the transmission of knowledge on board

THE ON-BOARD SCHOOL

Within the framework of the joint teaching of the Master's degree in Sciences of the Universe, Environment and Ecology (SDUEE), specialising in marine sciences, oceanography and marine environments, given by Sorbonne University and the International Master's degree in marine biological resources IMBRSea of the European Erasmus Mundus programme, 20 students of 11 different nationalities (Belgium, Chile, China, Colombia, France, Germany, Italy, Netherlands, Peru, Turkey and USA) were present on board

during the first stage of the Expedition for the practical phase of their course. Ten young researchers or technical students from Seychelles and Mauritius also benefited from this on-board school.

This unique opportunity allowed them to learn about field science from experienced researchers and to benefit from the transmission of knowledge within the framework of the technical and scientific operations of the various projects.

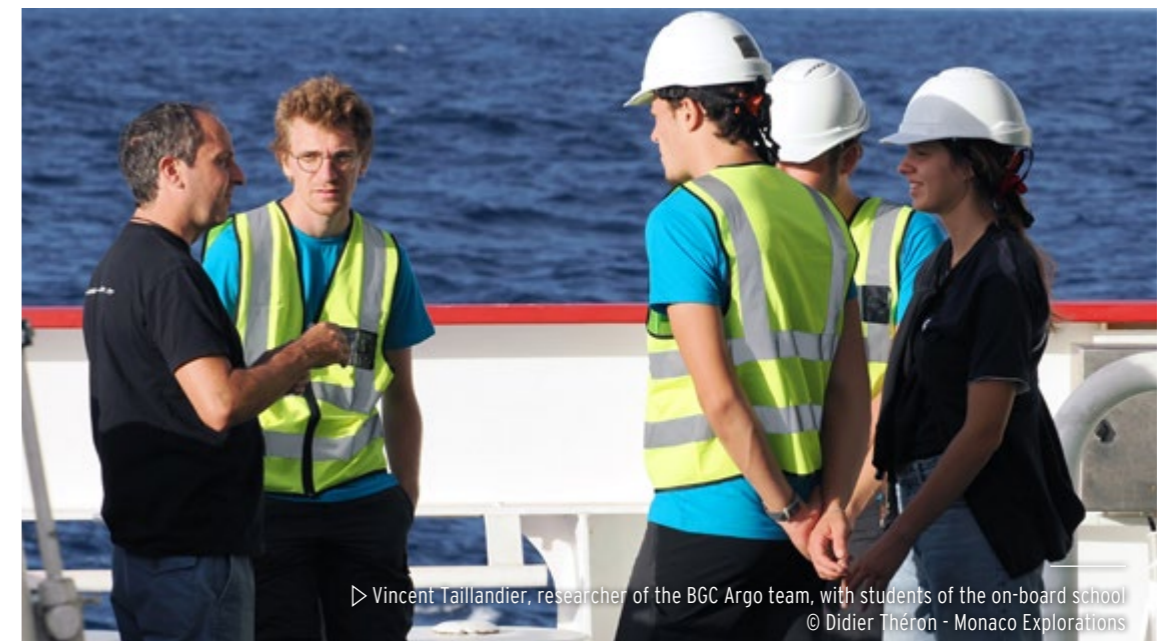


▷ The students of the on-board school adopt one of the floats deployed by the BGC Argo team © Didier Théron - Monaco Explorations



▷ Briefing of the students of the on-board school by the Master of *S.A. Agulhas II*, Knowledge Bengu, in the auditorium © Didier Théron - Explorations de Monaco

In pictures : Find the testimonies of the different actors and participants of the on-board school here.



▷ Vincent Taillandier, researcher of the BGC Argo team, with students of the on-board school © Didier Théron - Monaco Explorations

ON-BOARD TRAINING SESSIONS

During the second part of the Expedition, three training sessions were organised by IRD representatives on the processing and analysis of CTD data, the use of NetCDF files for handling multidimensional scientific data and, finally, in connection with the DiDEM programme, on the

interactions between the law of the sea and marine sciences. The young Seychellois and Mauritian researchers on board during this part were able to benefit, as were the members of the other scientific teams.



▷ Watercolour of a shrimp of the genus *Stenopus* collected in Aldabra
© Rémi Leroy - Monaco Explorations



4. The artists' view

In the great tradition of the scientific explorations of the 19th and 20th centuries, the Monaco Explorations wished to enrich the Expedition with the presence on board of two young artists, Elise Rigot and Rémi Leroy, chosen in May 2022 by a jury composed of Monegasque personalities from the world of culture and art, following a call for an artistic residency on board that brought together more than 60 candidates. Chloé Thibault, an artist dedicated to the MADCAPS project and a comic strip artist, joined the Expedition in Mahe for the second part.

Throughout their stay on board, these young artists looked at the different facets and aspects of the Expedition; the highlights, the places and atmospheres that marked or inspired them, **the human adventure** inherent in a project of this scale, **the ship**, an essential element and character, **the science** carried out at full speed, day and night, at a sustained and demanding pace, **the discovery of exceptional natural sites** such as Aldabra or Saya de Malha, visible and invisible islands, real invitations to travel, to the imagination, but also to reflect on a world confronted with very real environmental issues...

On board they started to produce, participated in the communication and outreach actions of the Expedition. The post-Expedition period will be a time for them to share the results of their creative process.



△ Starfish cushion. Drawing by Chloé Thibault
© Nicolas Mathys - Zeppelin / Monaco Explorations

1.4
Elle est 5 bras
avec des anneaux
voir annelés. Elle est
des pinces, ce qui est au
parfois absents.

1.5
Elles peuvent mesurer
jusqu'à environ 30cm de
diamètre, et se nourrissent
de corail.

1.6
On parle ici de l'espèce
Halimete regularis, qui
a un motif régulier plus
géométrique sur sa face
abaxiale et surtout sur la
face orale.

1.7
Un réseau de plaques en losange bleues
extrêmement caractéristique.

5. The live sessions on board the ship

Despite the sometimes-capricious satellite communication coverage, several exchanges and live interactions were organised between the scientists or artists on board and the rest of the world. 8 live

broadcasts in all enabled the various actors involved to bring the Expedition to life and share it with listeners thousands of kilometres away :



△ Live session with the Indian Ocean Expedition - Oceanographic Museum of Monaco © Michel Dagnino - Oceanographic Institute

▽ The children of the Oceano Club at the Oceanographic Museum live with the scientists on board © Michel Dagnino - Oceanographic Institute



16 october

Fête de la Science in Paris. Exchange between Hervé Claustre, co-leader of the International BGC Argo Programme and the public present at Sorbonne University Paris.

28 october

The children of the Oceano pour Tous club at the Oceanographic Museum in Monaco exchanged with the teams of the BGC Argo, MADCAPS and World Coral Conservatory projects.

7 november

The 6th grade class from the Lucet Langenier College in La Réunion interacted with the MADCAPS project team.

11 november

Ms Gaëla Huet's cycle 3 class, from the Cours St-Maur in Monaco, exchanged views with the BGC Argo team on floats, the MADCAPS team on plastic and the two artists Rémi Leroy and Elise Rigot who presented their work and their approach.

▽ The Madcaps team live with Ms Huet's pupils from the Cours St-Maur in Monaco © Didier Théron - Monaco Explorations



16 november

Interaction and exchange between the students of the Master of Science "Conservation and enhancement of marine resources" (MARRES) of the University of Nice, on a workshop visit to the Oceanographic Museum of Monaco, and the following scientists involved in the study of the Saya de Malha bank: Line Le Gall and Philippe Bouchet (MNHN), Francis Marsac (IRD).

17 november

Interaction in English between Ms Julie Wilson, from 1st B class of the Lycée Le Rebours in Paris and Damaris Landers, accompanied by Bryan Wilson, the two scientists of the research project n°8 on coral connectivity.

21 november

Two directs :
 - Interaction between Ms Wilson's 1st C class and the two artists Rémi Leroy and Elise Rigot.
 - Live recording of three lectures by the team of Seychellois researchers on board (Mariette Dine, Teena Shalma, Camilla Labonte, Rosabella Mangroo) for the Seychellois National Education represented that day by Mrs Lynndinaa Essack in Port Victoria.

△ The artists Elise Rigot and Rémi Leroy performing live with the children of the Oceano for All club at the Oceanographic Museum of Monaco © Didier Théron - Monaco Explorations



MOBILIZE : DIPLOMACY



In terms of diplomacy, the Expedition was coordinated with an official visit to the region by H.S.H. Prince Albert II of Monaco from 24 to 26 October. The Expedition allowed for the strengthening of close cooperation ties between the Government of Seychelles and representatives of the Republic of Mauritius in various forms. Throughout this project, the Principality of Monaco and the Sovereign wanted to closely associate these two States, directly concerned by the issues studied during the Expedition and the existing stakes around the sustainable management of the joint management area of Saya de Malha, with this operation.



The official visit of H.S.H. Prince Albert II of Monaco to Seychelles

At the invitation of the President of the Republic of Seychelles Wavel Ramkalawan, H.S.H. Prince Albert II of Monaco visited Seychelles from 24 to 26 October to conduct an official visit and also to visit the **Aldabra Atoll**, one of the most extraordinary marine and underwater sanctuaries in the world, and one of the 50 **UNESCO World Heritage** marine sites. This invitation followed discussions and contacts made on the occasion of the participation of a Seychelles governmental delegation in the Monaco Ocean Week in 2019.



△ The signing of the agreement between the Scientific Center of Monaco, the Seychelles Islands Foundation and the Oceanographic Institute © Nicolas Mathys - Zeppelin / Monaco Explorations



A visit in three stages.

1ST STAGE : EXPLORATION ON THE ALDABRA ATOLL (24 AND 25 OCTOBER)

Aldabra is a natural jewel but its ecosystem is fragile and under threat with marine debris on its beaches and a coral reef that is suffering from repeated bleaching episodes due to climate change.

H.S.H. Prince Albert II of Monaco. Aldabra. 25 October 2022

Accompanied by a delegation from the Seychelles Government and a Monegasque delegation, H.S.H. Prince Albert II of Monaco spent a day exploring the island and discussing joint actions with the Seychelles Islands Foundation (SIF) and the Seychelles Government. The visit ended with the signing of a letter of intent between the **Seychelles Islands Foundation**, the **Scientific Centre of Monaco** and the **Oceanographic Institute** for scientific collaboration within the framework of the World Coral Conservatory.



△ H.S.H. Prince Albert II of Monaco on Aldabra Atoll © Nicolas Mathys - Zeppelin / Monaco Explorations



△ H.S.H. Prince Albert II of Monaco signs the Argo float given by the Principality to Seychelles
© Nicolas Mathys - Zeppelin / Explorations de Monaco

2ND STAGE : ON BOARD *S.A. AGULHAS II* (25 AND 26 OCTOBER)

H.S.H. Prince Albert II of Monaco and the two delegations accompanying Him embarked on board *S.A. Agulhas II* and spent the night of 25 to 26 October. The programme included a tour of the facilities and laboratories, meetings with the crew and the various scientific teams and

participants in the Expedition, and a presentation of the scientific and artistic projects linked to the Expedition. The Sovereign Prince had the opportunity to exchange with the scientific teams of the Expedition and with the students of the on-board school

A FLOAT HANDED OVER BY THE PRINCIPALITY TO THE SEYCHELLES GOVERNMENT

During his visit on board the *S.A. Agulhas II* from 24 to 25 October, H.S.H. Prince Albert II of Monaco signed the BGC Argo float handed over to Seychelles by the Principality. The Minister of Fisheries and the Blue Economy,

Mr. Jean Francois Ferrari, and the Minister of Agriculture, Climate Change and the Environment, Mr. Flavien P. Joubert, did the same.

3RD STAGE : OFFICIAL RECEPTION AT THE STATE HOUSE (26 OCTOBER)

At the end of this field visit to Aldabra Atoll, H.S.H. Prince Albert II of Monaco was received by the President of the Republic of Seychelles, Mr Wavel Ramkalawan, on Wednesday 26 October in Mahe, at the State House, in the presence of Government Ministers. This was an opportunity for the Monegasque Sovereign to discuss his recent visit to Aldabra as well as the Indian Ocean Expedition conducted in the region by Monaco Exploration, with another highlight to come in the second phase of this exploration after Aldabra: the study of the Saya de Malha bank.

This visit by Prince Albert II of Monaco is important for us. It lays the foundations for a promising scientific collaboration, but it also sends a strong signal to the rest of the world. It is a signal from two countries focused on the ocean and its protection.

Flavien P. Joubert, Minister of Agriculture, Climate Change and Environment of Seychelles. 25 October 2022.



△ H.S.H. Prince Albert II of Monaco with the President of the Republic of Seychelles, Wavel Ramkalawan at the State House
© Nicolas Mathys - Zeppelin / Monaco Explorations



Mauritius : first restitution of the Saya de Malha study

MAURITIUS, OFFICIAL STARTING POINT OF THE EXPEDITION

During the first stopover in Mauritius (10-12 October 2022), which marked the official start of the operation, the objectives of the Expedition were presented to a group of officials and journalists on 11 October by Gilles Bessero, Expedition Leader. Dr M Rezah Badal, Director General of the Department for Continental Shelf, Maritime Zones Administration and Exploration, Prime Minister's Office, particularly stressed the importance of this Expedition for Mauritius, especially for the part concerning the study of the Saya de Malha Bank, an area located outside the exclusive economic zones (EEZ) and jointly managed by Mauritius and Seychelles.



△ Gilles Bessero, Monaco Explorations Director and Marie Cyril Eddy Boissezon, Vice President of the Republic, Acting President © Nicolas Mathys - Zeppelin / Monaco Exploration

LAST STOP AND FIRST ASSESSMENT

The second stopover from 20 to 22 November was the opportunity for Gilles Bessero and Francis Marsac, coordinator of the scientific operations on Saya de Malha, to present a first assessment of the work carried out on the Saya de Malha bank to an official delegation of some 40 participants, led by H. E. Marie Cyril Eddy Boissezon, Vice-President of the Republic of Mauritius, Acting President,

accompanied by Mr Sudheer Maudhoo, Minister for the Blue Economy, Marine Resources, Fisheries and Shipping.

Gilles Bessero had previously been received by the Vice-President of the Republic of Mauritius in a private meeting.

A FLOAT HANDED OVER BY THE PRINCIPALITY TO THE MAURITIAN GOVERNMENT

On the occasion of the restitution of the work presented to the Mauritian authorities on 22 November, the BGC Argo float adopted in the morning by seven schools from Mauritius, was handed over by Gilles Bessero, Chief Operation Officer of Monaco Explorations and Hervé Claustre, co-leader of the international BGC Argo

programme, to Dr. M Rezah Badal, Director General of the Department for Continental Shelf, Maritime Zones Administration and Exploration, Prime Minister's Office. The latter signed it, along with H.E. Marie Cyril Eddy Boissezon, Mr. Sudheer Maudhoo and Ms. Aneeta Goorha, Director of Education.

Saya de Malha is a gigantic herbarium, parts of which should be protected. It is important, not only for us Mauritians but for the whole world.

There are species that are specific to the Saya de Malha area and therefore warrant appropriate protection measures.

M. Sudheer Maudhoo, Minister of Blue Economy, Marine Resources, Fisheries and Shipping, Government of Mauritius. 22 November 2022.

Gilles Bessero, Chief Operation Officer of Monaco Explorations, Expedition Leader. 22 November 2022.



△ Signing by Dr M Rezah Badal of the Argo float given by the Principality to Mauritius © Nicolas Mathys - Zeppelin / Monaco Explorations



FOLLOW-UPS TO THE EXPEDITION

Whether in the field of science, outreach or diplomacy, the Indian Ocean Expedition of Monaco Explorations is seeing many follow-up actions and initiatives.

On the science side

NEWS OF CORAL COLONIES COLLECTED IN ALDABRA

We had left the 58 coral colonies collected in Aldabra in stabulation in Mahe before they were sent to Europe. This was done and done well. Arrived at their destination one week after their collection, these colonies are now perfectly acclimatised in the tanks of the Aquarium of the Oceanographic Museum in Monaco, of Oceanopolis in Brest, of Nausicaa in Boulogne-sur-Mer and of Burgers' Zoo in Arnhem in

the Netherlands.

This first result is encouraging for the continuation of the project and there is no doubt that other operations will be carried out in the coming months to complete this masterstroke and gradually enrich the constitution of this world coral bank.



TWO SPECIAL ISSUES IN PREPARATION

Although the time for the publication of the first scientific results has not yet come, the year 2023 will see, under the aegis of the Advisory Committee, the preparation of special issues of scientific journals that will allow the Expedition's results to be widely disseminated. These publications are

envisaged at the international level (e.g. Aquatic Conservation: Marine and Freshwater Ecosystems) but also at the level of the Indian Ocean region (e.g. Regional Studies in Marine Science).

CURRENT RESEARCH AND FORTHCOMING PUBLICATIONS: SCIENCE ON THE MOVE

The various laboratory research projects will be carried out in the coming months using the samples and data collected during the Expedition by the different scientific teams. They will subsequently be published in scientific journals, which are the only guarantee of the veracity of the results of this Expedition. As they are published, these scientific results will constitute reliable and

useful contributions to decision-making on the concerted and sustainable management of the natural areas explored during the Expedition.





On the outreach side

FEEDBACK AND DISCUSSIONS ON THE EXPEDITION DURING MONACO OCEAN WEEK 2023 (MOW)

As part of Monaco Ocean Week, on 21 March, Monaco Explorations will be presenting the initial results and examining the conclusions of the Indian Ocean Expedition carried out on board *S.A.*

Agulhas II in October and November 2022 between Mauritius, Reunion, and Seychelles, during a day open to the public.



△ Director Harald Pokieser in discussion with his cameraman Sven Bender during the shooting © Didier Théron - Monaco Explorations

A LOOK AT THE DAY'S PROGRAMME

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- A sequence on the importance of regional knowledge and cooperation in a complex geostrategic and socio-economic context.
- A round table on "The Invisible Island - Saya de Malha": an overview, scientific results, presentations on physical and chemical oceanography, biological oceanography and bottom characteristics and benthic biodiversity.
- A round table on the "Visible Islands" studied during the Expedition: Aldabra and Saint Brandon. Some scientists will announce their first results.
- An update on the Expedition's contribution to knowledge of ocean dynamics.
- Sequences on outreach in the field.
- A report on the Expedition by Sylvain Peroumal.
- An exhibition of artistic and audiovisual works related to the Expedition
- **Site de la Monaco Ocean Week**
Site du programme de la journée

A DOCUMENTARY IN PREPARATION

A documentary has been announced for late 2023, early 2024. Currently being prepared, it will retrace the course of the Expedition during these two months, a human and scientific adventure, but also its genesis. This documentary will be produced by the new Monegasque public channel MCR TV, in collaboration with the German company Autentic. It will be directed by Harald Pokieser, producer, director and scriptwriter, author of television series

and nature documentaries. The film will be broadcast internationally.

MAURITIAN, SEYCHELLOIS AND REUNIONESE CLASSES ON THE TRAIL OF THE BGC ARGO FLOATS

During the Expedition, nine classes, seven from Mauritius, one from Seychelles and one from Reunion, adopted three of the twenty-nine floats deployed on the Expedition route as part of the « **Adopt a float** » educational programme developed by the Institut de la Mer in Villefranche-sur-Mer. Although the end of the Expedition coincided

with the start of Seychelles and Mauritius school holidays, the adopted floats were not orphaned because from the end of January, the "Adopt a float" educational team ensured the follow-up of these floats by the teachers and their pupils. The start of this educational programme in Seychelles and Mauritius occurred on Friday 10 February.

MULTIPLE PERSPECTIVES

Elise Rigot, Chloé Thibaut, Rémi Leroy, Nicolas Mathys, Stéphane Dugast, Filip Kulisev... The artists, photographers and authors who were on board during the Expedition are now combining their talents to tell the story of this extraordinary Expedition, to bring it to life, and to let the visitor imagine it through an exhibition. Writing, drawing,

watercolour, sound and photography; five media used to tell an original story, artistic sensibilities turned towards a common cause: the commitment to the protection and sustainable management of the ocean. The first presentation is planned for Monaco Ocean Week and the special day on 21 March 2023.



FOLLOW-UP TO THE LIVE SESSIONS

After having exchanged live but from a distance with the two English scientists Damaris Landers and Bryan Wilson on 16 November, the students of the Parisian high school Le Rebours will soon have the pleasure of meeting the latter in the flesh. At their request, Bryan Wilson has been invited by their English teacher to give a lecture in English

at the school.

The young students from Ms Huet's class from the St-Maur de Monaco course will have the opportunity to share their experience of their live session on 21 March in the Conference Hall of the Oceanographic Museum in Monaco.

THE CLASS FROM THE LUCET LANGENIER SECONDARY SCHOOL IN REUNION ISLAND HAS BEEN SELECTED FOR THE OCEANO POUR TOUS COMPETITION

Ms Delebarre's class, which has been following the work of the MADCAPS project team on plastics, is one of the classes selected to take part in the Oceano for All 2023 competition, launched by the Oceanographic Institute's Events and Education Department. The aim of this scheme is to make

people aware of, love and want to protect the Ocean by involving the younger generation in a collective, creative and committed project. Expected results: a 5-minute report, in which the Expedition and the visit of the *S.A. Agulhas II* will undoubtedly have their place.

EXTENSIONS OF THE **DIDEM PROGRAMME (SCIENCE-DECISION-MAKER DIALOGUES)** SUPPORTED BY MONACO EXPLORATIONS

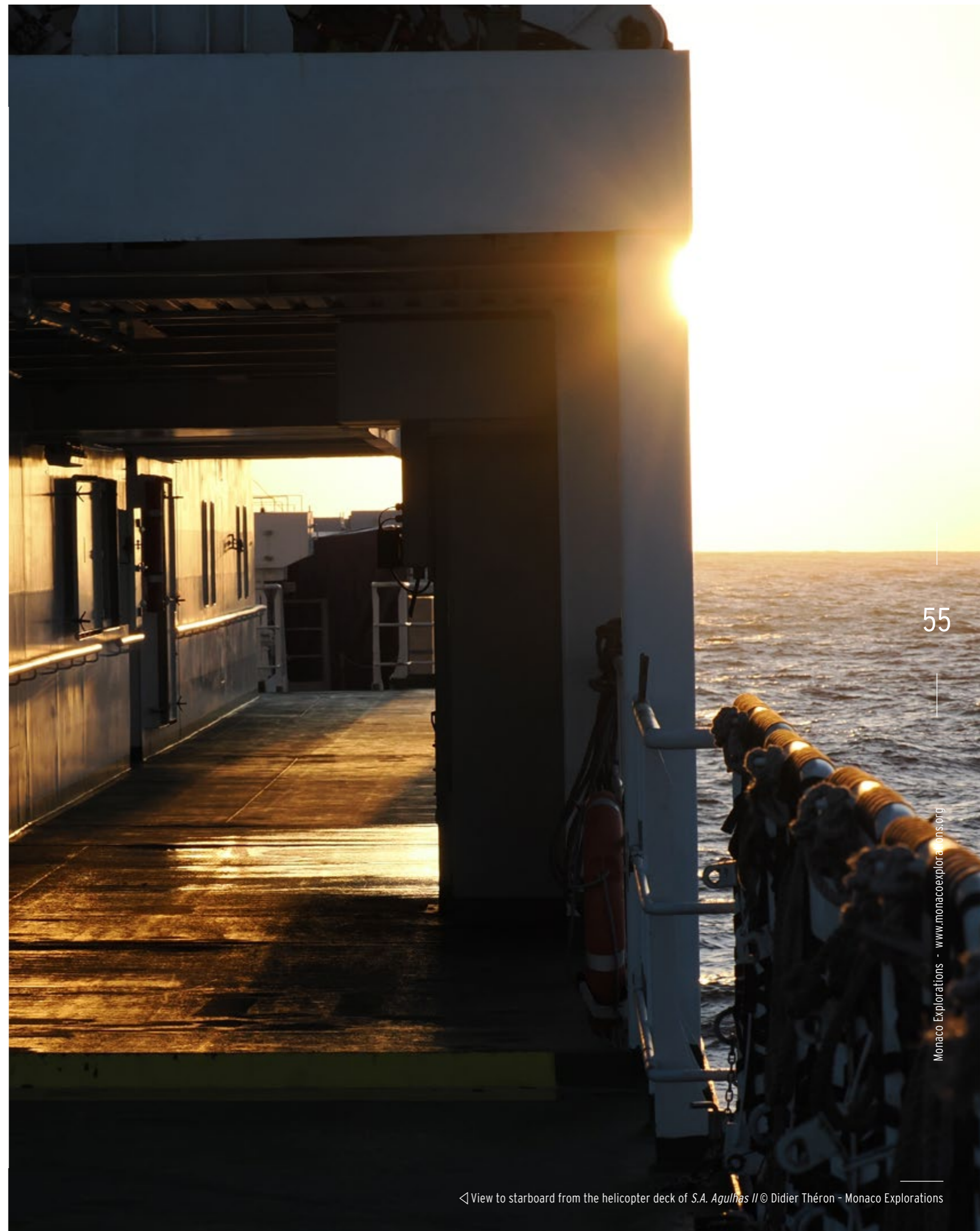
Good news from the two DiDEM projects supported by Monaco Explorations in Seychelles: the three TFO Plastic Waste projects, designed to encourage innovative initiatives to reduce plastic waste, are entering their implementation phase.

As for the Pareo project, the Curieuse Island Marine Educational Area, inaugurated during the Indian Ocean Expedition's stopover in Mahe, has found the support of a Seychelles company and will be able to continue to live and operate in 2023, to the great delight of the children of the Baie Ste-Anne school in Praslin, who are full of ideas and proposals.

PUTTING EDUCATIONAL RESOURCES AND SCIENTIFIC DATA ONLINE

The educational resources produced during the Expedition (images, photos and documents, etc.), as well as the accessible scientific databases linked to the Expedition, have begun to be put online on Monaco Explorations website and will progressively enrich the contents of the **resources page** devoted

to the Expedition over the coming weeks.



On the institutional side

Several important meetings are coming up on the international agenda in 2023 and will be conducive to promoting the Indian Ocean Expedition and its challenges, to exchanges and lobbying of decision-makers by providing them with arguments and decision-making tools to move towards better sustainable management of the ocean, and more particularly of the "invisible island", Saya de Malha, in particular depending on the outcome of the resumed fifth session of the Intergovernmental Conference on an international legally binding instrument on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (the so-called "BBNJ" negotiations) scheduled for 20 February to 3 March.

The International Indian Ocean Conference IOISC 2023 and the sixth meeting of the Advisory Committee of the Second International Indian Ocean Expedition (IIOE-2) were recently held in

Perth, Australia, from 6 to 9 February 2023. On this occasion, Monaco Explorations were invited to present a first report on the Indian Ocean Expedition. Francis Marsac (IRD) and Nick d'Adamo, member of the Advisory Committee, represented Monaco Explorations for this first report to this international body.

Statutory meetings and events of regional organisations (SIOFA, WIOMSA, Conference of the Parties to the Nairobi Convention, etc.) will be used to promote the results of the Expedition.

During the year 2023 and beyond, other official activities of the Sovereign Prince in relation to the objectives of the Expedition, in particular his interventions in various forums dealing with the protection of the Ocean, may illustrate the context in which the political dimension of this Expedition is relevant.



THE PARTNERS OF MONACO EXPLORATIONS



The determination of H.S.H. Prince Albert II to promote sustainable development in the Principality is reflected in the actions of His Government, whether it be the preservation of biodiversity, the management of resources or the implementation of a climate energy plan. The Prince's Government is pursuing an ambitious policy in favour of the preservation of biodiversity, energy sobriety and the fight against plastic waste in the Principality. Amongst these missions, the implementation of numerous international conventions and agreements ratified by the Principality, such as the Kyoto Protocol and more recently the Paris Climate Agreement. Monaco is also a historic member of the Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora, known as CITES^{1*}, which has established a permit system.

Finally, the Principality of Monaco is actively involved in the preservation of the Mediterranean through the RAMOGE agreement, the "Pelagos" sanctuary and the Barcelona Convention, and hosts international bodies whose purpose is to study and preserve the marine environment (ACCOBAMS^{2*}, IAEA environmental laboratories^{3*}, etc.).



The Prince Albert II of Monaco Foundation is an international non-profit organization committed to protecting and advancing global health for present and future generations. Created by H.S.H. Prince Albert II of Monaco in 2006, the Foundation aims to promote a new relationship with nature and the innovations that can accelerate this change. The Foundation aims to foster the development of effective solutions for our planet's biodiversity, climate, ocean, and water resources. It operates in three main geographical areas: the Mediterranean basin, the polar regions, and the least developed countries.



Founded in 1906 by Prince Albert Ist, The Oceanographic Institute - Foundation Albert Ist, Prince of Monaco, has been bringing together scientific, political, and economic players, associations, and the public for 150 years with a single objective: "to make the Ocean known, loved and protected". The Oceanographic Institute is a foundation of public utility in France which, under the impetus of its honorary president, H.S.H. Prince Albert II, contributes to the Principality's commitment to the Ocean. The Institute is responsible for numerous national and international projects (symposiums, exhibitions, educational programmes, etc.) and has an important environmental mediation mission. To this end, it relies on its two establishments - the Oceanographic Museum in Monaco and the Maison de l'Océan in Paris - as well as its digital tools and its off-site activities to disseminate the science of oceanography to as many people as possible, combining it with art, the living world and collective and individual commitment.



Dedicated to scientific research, fundamental and applied, the work developed by the teams of the Monaco Scientific Centre (CSM) are grouped into three departments: Marine Biology, specializing in the study of corals and coral reefs, Polar Biology, specializing in the study of penguin populations and Medical Biology. The primary concern of researchers in these departments is to study the bases of the functioning of organisms in order to better understand, and therefore better anticipate, the effects of environmental stresses (Physiology of Conservation) or therapeutic treatments (Translational Biology). The proximity of researchers favours rich exchanges that should bring new ideas to the boundaries of disciplines. The Centre has had a large international attractiveness with more than 70 employees coming from 15 different countries (including Europe, USA, Japan, Australia, New Zealand, Palau, Brazil, Caribbean, Canada, Oman, Saudi Arabia ...) since 2013, date of installation of the CSM in its new facilities of Quai Antoine I^{er}.



Founded by Prince Rainier III in 1953 and presided over by H.S.H. Prince Albert II since 1984, the Yacht Club of Monaco is a private and exclusive club which today brings together 2,500 members of 81 nationalities, sharing common values around its motto "One Spirit, One Team, One Club".

In accordance with its statutes, this private club has the particularity of being entrusted with a mission of public service delegation, as evidenced by its role as a facilitator of the port and catalyst for all activities related to yachting in the Principality.

The Principality has always been a major destination for yachting. Preserving a certain "Art de Vivre la Mer", safeguarding the environment, honouring the nautical heritage, and promoting the most innovative technologies..., it is through the values of its label "La Belle Classe" and well beyond its circle of members that the YCM unites owners and all those involved in the yachting industry, by offering them a platform for communication and exchange.

The YCM contributes to its promotion and influence with the aim of implementing a policy resolutely focused on environmental protection. Through the "Monaco, Capital of Advanced Yachting" project, the ambition is to position the Principality as an essential stopover for yachting by highlighting the latest technological innovations.



THE PARTNERS OF THE EXPEDITION • ACKNOWLEDGMENTS



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development



2nd International
Indian Ocean
Expedition
2015-2025



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