





2021 United Nations Decade of Ocean Science for Sustainable Development

«Today more than ever, we have a responsibility to work to bequeath a sustainable world to our children.»

Ghislain BARDOUT - Founder & Director UNDER THE POLE





## CONTENTS

The oceans biodiversity is in danger

Understanding the underwater ecosystems of the mesophotic zone (30 - 200m)

The United Nations Decade of Ocean Sciences for Sustainable Development

### UNDER THE POLE IV • DEEPLIFE

Exploration & research at the leading-edge of underwater diving

Living & observing the ocean submersed

New sailboat for oceanographic diving down to 200m

12 years of expeditions and world renowned expertise

## A WORD FROM THE FOUNDERS

«What do we do? Do we stop now, or do we continue on the path we have been heading since 2008 with UNDER THE POLE? And if so, what's next? What's our purpose? What is our end goal? And how grand are our ambitions?

We asked ourselves these fundamental questions over the last few months on a daily basis. As we have at each crossroad in life, where passion, work, friends and family intimately blend. These are the types of questions you ask yourself in your early forties. At this time in our lives we look back on our past accomplishments to uncover the essence of future projects. But in an era of growing awareness and youth protesting for change, the Coronavirus crisis has acted as an electroshock. In this unique year our questions and our actions have taken on new meaning influenced by the collective responsibility required to create a sustainable society.

What can we do? What move do we make on this vast chessboard? How can we be the most useful, and how can we contribute to solving humanity's greatest challenge?

We believe in the power of exploration, which characterizes so well the human being. To push oneself to reach further and answer this eternal question: what lies beyond? We also believe that this quest for knowledge is enhanced when it serves everyone for the collective good. That is when we find the purpose we have been seeking.

Over the past 13 years, with UNDER THE POLE, we have led numerous expeditions to explore the submarine habitat. Some of these pioneering expeditions have stood out due to the rarity of the images brought back. Others stand out because of the value of the scientific work carried out, or the technological innovation produced, in an environment where man can only stay on borrowed time: the ocean. These expeditions have all aimed to extend the amount of exploration and research time. Exploring through polar and tropical environments that are seldom visited because of their difficult access has made each an unusual experience. To succeed required unconventional resources. While objectives evolved over time, our values remained: curiosity, team spirit, sharing, respect, authenticity and excellence. Beyond these values lies UNDER THE POLE's most unique strength: family. This originality, which appeared to be the only way to carry out our expeditions together and to reconcile them with a perennial family life, brings a personal touch that impregnates the whole team and places human relations at the heart of the project. It is certainly all of the above that allowed UNDER THE POLE to carve its path and to continue to exist and inspire.

This singularity combined with our passion is a strength, which presents itself as an opportunity that resonates with the United Nations 2021-2030 Decade of Ocean Sciences for Sustainable Development. The unique expertise of UNDER THE POLE makes us capable of carrying out an ambitious global program aimed at deepening scientific knowledge of the oceans mesophotic zone. This zone which is between 30 and 200m deep, is largely unknown although it plays a fundamental role in the oceans balance. In this dossier we present to you a program for the preservation of the oceans: the DEEPLIFE program.

Today, our greatest motivation to act for the planet are our children Robin and Tom. But far beyond our two boys, it is all of our children we are thinking about. Now more than ever, we have a moral responsibility to work towards leaving them a sustainable world, a world of peace.»

> Emmanuelle & Ghislain BARDOUT Founders & Directors UNDER THE POLE July 2020

«But what lies beyond?»



# A FACT:

### THE OCEANS BIODIVERSITY IS IN DANGER

The Earth is a miracle, 71% covered by oceans earning it the nickname Blue Planet. A prodigious life support that directly feeds 2 billion people and provides 50% of the Earth's oxygen, but exploring it is so complex that only 5 to 10% is known. The marine environment remains, in many ways, as enigmatic as space. Thousands of species, ecosystems and the intimate workings of the marine environment remain to be discovered and understood.

For a long time we have acted as if the resources of the oceans and their capacity to absorb our waste were limitless. But we now know that their entire function is being disrupted by our activities and their consequences, even down to the deepest depths.

Global warming, overfishing, pollution... We might have thought that the distance of certain ecosystems from the human influence would be enough to preserve them. This is not the case. The life cycles of our planet are all interconnected and the oceans are the receptacle. The polar bear has become one of the most contaminated animals on the planet from chemical pollution carried by the ocean currents and food chain, coral is among the most affected by global warming, and plastic is found inside creatures from the abyss, even in the Marianas Trench.

In 2015, the Living Planet Index linked to the marine environment indicated a 49% decline in species populations between 1970 and 2010. In other words, the planet has lost half of its animals linked to the marine environment in only 40 years. The current rate of extinction is 100 to 1,000 times higher than the natural extinction rate\*.

Entire ecosystems are being destroyed or largely degraded before ever being studied. Species disappear before they have even been listed, taking with them the source of crucial balance and knowledge.

The biodiversity of deep-sea marine ecosystems, invisible from the surface, unknown, unexplored, is disappearing with the general indifference. However, as light decreases and we enter the twilight zone (or mesophotic zone), we see species living there and participating in the balance of the planet, and ultimately our lives.

Affected by ocean temperature and acidification, overfishing, invasive species, waste, chemical pollution, mining, oil and gas exploitation... this biodiversity is threatened along with the capacity for marine ecosystems to connect life between the surface and the depths\*\*, and also to regulate the climate. A whole chain of life depends on these mesophotic creatures and we know nothing about them.

\* WWF, Living Planet Oceans Report, 2015. \*\* Soares MDO, Tavares TCL, Carneiro PBDM. Mesophotic ecosystems: Distribution, impacts and conservation in the South Atlantic. Miscellaneous Distrib. 2019; 25: 255-268



From knowledge to conservation

---

Nature can regain its natural balance if you release the pressure in time. It has been observed that since the introduction of their protection in 1986, the humpback whale population has grown by 93%\*.

\* WWF 2020



# **A CONSERVATION ISSUE:**

### UNDERSTANDING THE UNDERWATER ECOSYSTEMS OF THE MESOPHOTIC ZONE (30 - 200M)

Only a better understanding of the balances that govern our oceans will make it possible to meet the modern ecological challenges. There is an urgent need for discovery, science, and measures to protect the ocean. Without the ocean, no life would have ever existed on Earth.

#### A PRIORITY EXPLORATION AREA: THE MESOPHOTIC ZONE

In the vastness of the oceans, the area between 0 and 30m depth has begun to reveal its secrets, and the abyss stimulates curiosity. But what about the ocean ecosystems that connect them? Those where the light decreases. Where the rocks, the crypts and the drop-offs form a mosaic of seascapes composed of coral forests, sponge aggregations, macro-algae, oceanic islands, underwater mounts and canyons.

The mesophotic zone - located between 30 and 200m depth - is a habitat for species of economic and ecological importance and a place of refuge for shallow population species. They fuel fishing, leisure and tourism industries. They are a potential source of discovery for new medicines and other natural products, and protection against coastal erosion and storms\*. We are also only just beginning to understand their crucial role in regulating the global climate.

\* Baker, E.K., Puglise, K.A. and Harris, P.T. (Eds.). (2016). Mesophotic coral ecosystems - A lifeboat for coral reefs? The United Nations Environment Program and GRID-Arendal, Nairobi and Arendal, 98 p.

#### THE DIVER: AN ASSET FOR EXPLORING THIS FRAGILE AREA

Scientific inventory and sampling of species is generally based on trawling or dredging, which destroys the seabed and remains imprecise. It is possible to use underwater robots, but this alternative is complex, expensive, rarely effective and generally not suitable for research in the twilight zone. These techniques do not allow delicate samples to be taken or access to crevices and cavities.

In contrast, the diver allows fine observation, precise and fast sampling and incomparable flexibility. The plurality of their senses, the finesse of their movements and their capacity for analysis make humans indispensable as a tool for correctly understanding the underwater ecosystems.

But diving in the mesophotic zone requires unique expertise and the very latest technologies. As a result, scientific exploration of the mesophotic zone is at its beginning, even though it is essential and has an exceptional potential for discovery. Thus, this collaborative model combining UNDER THE POLE's diving skill with scientists provides an answer to the need for accurate knowledge of the oceans.

#### HOW IS DEEP SEA LIFE AFFECTED BY CLIMATE CHANGE?

The speed of climate change is profoundly affecting the distribution and survival of species, leading to fundamental changes in the structure and function of ecological communities within the planet's ecosystems. However, we only have a fragmented view of the life of marine organisms, mainly in the surface zone, while life below 30-40m remains largely unexplored due to legal, administrative, technical and logistical difficulties in reaching these deeper zones. Surprisingly, recent discoveries have revealed an unexpected abundance of life and diversity in certain deep environments, unknown until now due to lack of study.

Today, aware of the potential of these ecosystems in terms of biological, chemical and genetic diversity, but also of their functions for surface ecosystems, we have become convinced that it is crucial to study them better and, above all, to develop an understanding of the sensitivity of these organisms to the changing environment.

There are however several challenges associated with determining deep marine lives sensitivity to climate change such as the major gaps in terms of diversity of life at present, access to these deep zones and the functional role of these organisms in the ecosystem.

«We invite the ocean scientific research community to focus its attention on the twilight zone [or mesophotic zone] during the United Nations Decade of Ocean, which runs from 2021 to 2030.

In the spirit of the UN's Sustainable Development Goals, we must seize the opportunity to establish a global policy to protect this vast ecosystem for present and future generations.»

A. Martin & alii, Study the twilight zone before it is too late, Nature, Vol 580, 26-28, 2020.



# THE UNITED NATIONS **DECADE 2021-2030 OF OCEAN SCIENCES** FOR SUSTAINABLE DEVELOPMENT

UNDER THE POLE · DEEPLIFE · 2021-2030 has been recognized as an official project of the United Nations Decade for Ocean Science for Sustainable Development (2021-2030). The decade aims to promote synergies, partnerships, public awareness, education and an effective sciencepolicy interface, with the ultimate goal of enabling joint and enhanced action for the ocean.

#### SUSTAINABLE DEVELOPMENT GOALS (SDGS)

Through its missions, UNDER THE POLE is committed to the preservation of the oceans and their biodiversity. In this respect, its action is in line with the UN's SDGs for 2030, which highlights that water, biodiversity, the ocean, and the climate are intrinsically linked and allow the maintenance of life on Earth. SDGs 14 - life below water - recalls that concerted action at all levels is needed to preserve the health and integrity of the ocean, its ecosystems, and its contributions to our societies and the rest of the living world. One of the major measures indicated by SDGs 14 is to «deepen scientific knowledge, strengthen research resources and transfer marine technology» (objective 14.8).



United Nations Decade of Ocean Science for Sustainable Development

#### COMMITMENT OF ECONOMIC ACTORS TO BIODIVERSITY

Economic actors are also called upon to get involved in the framework of the SDGs, but also in the framework of the CBD (United Nations Biodiversity Conference) and its «Cancun Business and Biodiversity Pledge» in 2016, where it encourages them to take concrete measures that provide solutions for the conservation of biodiversity, its sustainable use and the fair and equitable sharing of the benefits resulting from genetic resources:

- «Promote awareness of the values of biodiversity among (their) employees, directors, shareholders, partners, suppliers, consumers and the business and financial communities
- Act as ambassadors for responsible biodiversity management focus on economic opportunities and solutions, help to strengthen and spread the business case for integrating biodiversity considerations into business decision-making
- Take action to mobilise resources to support these concrete actions for biodiversity and help, where appropriate, to record and make a census of these resources.»

Source : www.cbd.int/business/pledges/pledge-fr.pdf

«In 2017, at the occasion of its 72<sup>nd</sup> Session, the United Nations General Assembly (UNGA) announced the launch in January 2021 of the United Nations Decade of Ocean Sciences for Sustainable Development (2021-2030), following the Decade for Biodiversity which will end in December 2020. This decision confirms the growing interest of the international community for the oceans and the recognition of its major role in climate regulation, and calls for the support of ocean sciences to implement the Paris Agreement and achieve the Sustainable Development Goals set by Agenda 2030.»

Ocean & Climate Platform, www.lemonde.fr, November 15, 2019.



# UNDER THE POLE • DEEPLIFE • 2021-2030

### PRESENTATION

AN OCEANOGRAPHIC EXPLORATION PROGRAM FOCUSED ON KNOWLEDGE AND CONSERVATION

> Armed with his experience of expeditions, deep scientific diving in areas difficult to access, and with the desire to put the exploration of the oceans at the service of the common good, UNDER THE POLE has started in 2020 the research program DEEPLIFE 2021-2030, dedicated to the exploration of the mesophotic zone of the oceans down to 200m depth, for scientific knowledge and conservation purposes.

Inspired by the successful collaboration model led by UNDER THE POLE - CNRS - CRIOBE around the coral study program DEEPHOPE in 2018-2019, DEEPLIFE is based on strong international scientific partnerships. It implements state-of-the-art diving resources, including CAPSULE underwater habitats, operated from an oceanographic sailing vessel - the «WHY NOT» - specially designed for scientific diving and dedicated to the DEEPLIFE program. The first scientific campaigns have started in 2022.

The research programs carried out and the geographical areas studied will be defined in collaboration between UNDER THE POLE and a Scientific Council made up of international researchers.



### THE DEEPHOPE RESEARCH PROGRAM

The «DEEPHOPE» mission (UTP/CRIOBE/ CNRS) - focusing on mesophotic coral reefs between 0 and 174m in depth - was carried out on 12 islands of the 5 Polynesian archipelagos, between July 2018 and June 2019. After 800 dives, the constitution of the largest collection of mesophotic corals in the world, the discovery of new coral species, and the ascent of the deepest coral sample in the world from 172m to the Gambier, this scientific program has enabled a new vision of the reef.

«Scientifically, this DEEPHOPE project will forever mark the history of our knowledge of mesophotic reefs thanks to the intense program of deep

dives conducted by the UTP team and will be a reference in the world of coral reef exploration and discovery.» Laetitia HEDOUIN, CNRS - CRIOBE - Scientific Director DEEPHOPE - June 8, 2020

«The DEEPHOPE program is the most intense and effective program ever carried out to date. The scientific results that are emerging and their scientific impact are clearly of primary interest on a global scale.»

Michel PICHON, World-renowned coral expert - 2019

# UNDER THE POLE • DEEPLIFE • 2021-2030

### OBJECTIVES

#### SCIENTIFIC RESEARCH

The scientific objective of DEEPLIFE is to discover marine life in the 30-200m deep zone, in diverse and original geographical regions, to identify its vulnerability to climate change and ultimately to propose appropriate management and conservation measures for this particular and largely unexplored marine area.

Through collections, aquarium experiments, chemical, genetic, physiological and ecological analyses, DEEPLIFE's data set will eventually provide a more precise identification of regions and ecosystems at high risk from climate change (hotspots of sensitivity). This will allow the appropriate protective mitigation and management actions adapted to (or integrating) these deep sea ecosystems to be put in place, which today are too often ignored by conservation measures.

During a world tour sailing from the polar regions to the tropics and the temperate regions, this research program is based on 4 main objectives:

- Explore and discover the genetic, chemical, and biological marine diversity in the deep zone between 30 and 200m
- Study in particular the marine animal forests, and estimate their role in biodiversity conservation and global climate regulation
- Evaluate tolerance of deep-sea organisms to climate changes
- Understand the vulnerability and resilience of these deep-sea ecosystems in the face of climate change and identify «hotspots of sensitivity» vs. «resistance».

#### INNOVATION

Innovation by UNDER THE POLE aims at inventing, testing, and developing operational environmentally friendly tools dedicated to underwater exploration; and improving the conditions for scientific research. DEEPLIFE is focused on:

- The development of the CAPSULE program with the construction of a second underwater habitat and the implementation of diving protocols in the 50-80m zone
- Support of the dives through a research program in medicine and hyperbaric physiology
- The development and construction of a new oceanographic vessel the WHY NOT adapted for diving research in the mesophotic zone.

#### AWARENESS

As knowledge - which prevails over any action - only takes its full meaning if it is shared. The aim of UNDER THE POLE is to disseminate the knowledge acquired and to carry its recommendations through educational, awareness-raising and protective actions, with the aim of making the greatest possible contribution to the preservation of the oceans and, more globally, to the emergence of a sustainable world. On DEEPLIFE, this work is directed towards:

The education of young people, in conjunction with other actors from the associative sector and the National Education. Benefiting from dedicated human and financial resources, the objective is to create specific and adapted educational content in French and English (logbooks, job descriptions, videos and educational sheets, dedicated web pages...) and to organize meetings in schools throughout the expedition.



The awareness of the general public, through an inspiring approach based on field experience, science and pedagogy, in order to encourage the adoption of the behaviors essential to the conservation of the oceans. The objective of maximum dissemination will use all useful means of communication, in particular the production of excellent documentaries (VOD, National Geographic, etc.) and book writing (fine books, popular science books, children's books), the creation of exhibitions, media interventions, the animation of conferences...

The dependence of the second s



#### The awareness of decision-making authorities to the issues and protection measures - Advocacy

The objective is to work with political decision-makers to adopt the necessary protection and management measures, based on recommendations drawn from scientific findings, whether at regional, governmental or international level.

In particular, UNDER THE POLE develops its commitment to the Ocean & Climate Platform, which promotes reflection and exchanges between the scientific community, civil society and political decision-makers, at the international level. This coalition brings together research institutes, non-governmental organizations, higher education institutions, aquariums, representatives of the private sector and French and international institutions.

#### THE IMPORTANCE OF EDUCATION

Education enables both children and adults to become active participants in the transformation of the societies in which they live. Learning inculcates values, attitudes, behaviors and knowledges that enables individuals to learn to live together and in balance with their environment, in a world that is characterized by diversity and pluralism.

«Promoting a common knowledge base on climate changes and leveraging local, indigenous and scientific types of knowledge is conducive to public awareness, understanding and social learning about the specificities of local risks and possible responses to them. This type of investment can help develop, and in many cases transform existing institutions and to put in place measures for an enlightened, interactive and adaptive governance.»

IPCC, 2019: Summary for Policymakers, IPCC Special Report on Ocean and Cryosphere in a Changing Climate [edited by H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Minten- beck, M. Nicolai, A. Okem, J. Petzold, B. Rama and N. M. Weyer], in print. C.4.4

# UNDER THE POLE • DEEPLIFE

### EXPLORATION & RESEARCH AT THE LEADING EDGE OF UNDERWATER DIVING

20m

R



### WHY NOT

Oceanographic sailing ship, the WHY NOT is a research platform at the leading edge of diving, designed to allow exploration of the mesophotic zone from 0 to 200m, in all oceans and in all seasons. Equipped with two fast boats, a marine biology laboratory and a decompression chamber, it is the operational hub of the UNDER THE POLE expeditions.

### CAPSULE -50m

Real underwater habitats dedicated to underwater observation and science, the «CAPSULE» allows divers to live under the sea continuously over periods of several days. With no impact on the environment and operated autonomously from the WHY NOT, they will be deployed where time and discretion are required.

### **DIVERS**

11

To study the underwater environment between the surface and 200m of depth, UNDER THE POLE divers use a variety of high-performance recycling suits equipment that work with breathing mixtures based on oxygen, helium and nitrogen. When combined with a underwater scooter, they can then dive for several hours, deep, and move quickly over long distances, even with heavy equipment. These techniques open up new fields of possibilities for scientific knowledge of the oceans.

### SCIENCE

The mesophotic (or twilight) zone - located between 30 and 200m deep - is both a habitat for species of economic and ecological importance, and a place of refuge for populations of shallow species. It is a priority study area with a high potential for discovery but is not well known because of the complexity of the resources required for its study. Previous UNDER THE POLE expeditions have demonstrated the effectiveness of research programs involving divers and scientists.

### AWARENESS AND PRESERVATION

The knowledge acquired in the field, testimonies, scientific assessments and recommendations are transmitted to civil society, to the world of education and political institutions. By joining forces with other actors involved in the protection of the marine environment, the objective is to work towards the preservation of the oceans.

20m

## UNDER THE POLE • DEEPLIFE

CAPSULE: LIVING & OBSERVING THE OCEAN SUBMERSED FOR 24 HOURS A DAY

> In order to push back the limits of time and to have an innovative tool adapted to scientific research and passive observation of the underwater environment, UNDER THE POLE has developed CAPSULE.

A real underwater observatory offering a 360° panoramic view, it is a light living cell, with no impact on the environment (passive, immobile, no noise emissions, no engine, no link with the coast and with reduced space requirements). The dives in the CAPSULE program are made at saturation\*, but the concept has been revisited with the latest technologies to make it a simpler and a more economical tool than the heavy means used by the oil industry. It thus allows the repetition of stays in total and continuous immersion for several days, with a diving capacity up to 35m with one CAPSULE and up to 80m with two CAPSULEs. Entirely developed by UNDER THE POLE, its engineering and construction required a dedicated design office and 3 years of work. Successfully tested from August through November 2019 on its first campaign in French Polynesia, CAPSULE is now an operational technology.

Its concept will be further developed on DEEPLIFE, with the construction of a 2<sup>nd</sup> CAPSULE and diving campaigns carried out where passive, long-term underwater stays, enable the acquisition of knowledge that would otherwise be impossible.

\* Saturation diving differs from incursion diving and allows divers to evolve without time limits at a given depth, their decompression time (ascent time involving stops) being fixed once their body is at saturation.

# UNDER THE POLE • DEEPLIFE

## WHY NOT: NEW OCEANOGRAPHIC SAILBOAT FOR DEEP DIVING

A true oceanographic vessel with vellic propulsion looking towards the future, WHY NOT is a research platform at the cutting-edge of diving designed to allow exploration of the mesophotic zone from 0 to 200m across the oceans in all seasons.

- Aluminum schooner with polar capacity
- Length: 35m, width 9m
- 100m<sup>2</sup> of solar panels, two diesel-electric engines, two wind-turbines.
- Autonomy of 3 months in normal operation and 9 months over a polar wintering period
- Accommodation: 15 to 22 people (deep-sea divers, scientists, sailors, engineers and technicians, photographers and film-makers, doctors, cooks... but also intellectuals, influencers, artists, journalists...).
  On board, each member of the UNDER THE POLE team has a specialty but remains versatile, being able to combine several positions.

-----

. . . . . . . . . . .

Im

## A NEW SHIP TO CREATE OPTIMAL RESEARCH CONDITIONS

UNDER THE POLE's 12 years of expeditions have enabled us to identify the limits of the WHY (ship of previous expeditions) and to imagine solutions that meet the needs of research conducted from repetitive deep dives. It thus integrates means for in situ experimentation with a marine biology laboratory, a strong operational capacity in deep diving, adapted workspaces and a maximum level of safety.

- Wet and dry scientific laboratory, aquariums, -20°C and -80°C freezers
- Decompression chamber, infirmary and physiology laboratory
- High storage capacity in O<sub>2</sub> / He diving gas (for long and isolated missions)
- Capacity of two underwater habitats CAPSULE
- Boarding capacity of two fast boats: a 6.60m semi-rigid and a 4.20m semi-rigid
- Media studio

Its development began in 2020 (Cabinet Verdier-Beaufort), its construction will begin in 2021 and its first assignment will take place in the spring of 2023.









# **UNDER THE POLE**

## 12 YEARS OF EXPEDITIONS AND WORLD RENOWNED EXPERTISE

UNDER THE POLE is an underwater exploration program, which combines scientific research, innovation and awareness, at the service of better knowledge and conservation of the oceans.

Driven by a pioneering spirit and internationally recognized for its expertise, UNDER THE POLE organizes innovative diving expeditions in extreme environments, particularly deep and polar environments.

UNDER THE POLE is characterized by a global management of the programs (definition, organization, means, expedition progress and development), long missions and ambitious scientific collaboration with internationally renowned research institutes, in order to carry out studies that are both innovative and hold the promise of discoveries for mankind, and hope for the conservation of the planet and in particular, the oceans.

>> <u>www.underthepole.org</u>

#### SINCE ITS CREATION IN 2008, UNDER THE POLE HAS CARRIED OUT THREE MAJOR PROGRAMS:



UNDER THE POLE has already brought together 250 team members and 300 partner companies and research institutes. At the helm is a couple who have turned their passion for exploration into a profession and a way of life.

Our values: curiosity, team spirit, sharing, respect, authenticity and excellence.

#### SCIENTIFIC ADVICE

Made up of international researchers, it defines the research programs carried out, the geographical areas studied and validates UNDER THE POLE's scientific communication.

#### A TEAM AT SEA

Formed around a team of divers specialized in deep scientific diving, it brings together researchers, sailors, technicians and engineers, doctors, cooks, photographers, film teams...

#### A SHORE TEAM

The onshore base controls the smooth running and enhancement of shipments from Concarneau, France. It has the necessary resources in administration and finance, scientific coordination, logistics and technology, communication and events, education and awareness.

#### FOUNDERS AND DIRECTORS OF UNDER THE POLE EXPEDITIONS

#### EMMANUELLE PÉRIÉ-BARDOUT

41 years old Navigator Polar regions expert

#### **GHISLAIN BARDOUT**

40 years old Mechanical engineer EPFL Diving expert









«Our vision: human exploration of the underwater environment, a prodigious source of inspiration and an indispensable tool for a fair knowledge of the oceans, is a powerful lever for the emergence of a sustainable world.»

Ghislain BARDOUT







«Let's give regulatory authorities the keys to protecting the oceans.»

Emmanuelle PÉRIÉ-BARDOUT



## SUMMARY

The biodiversity of deep-sea ecosystems, invisible from the surface, unknown, unexplored, is disappearing in the general indifference. However, as the light decreases and we enter the twilight zone (or mesophotic zone, between 30 and 200m), species are living in this area of the deep sea and participate in the balance of the planet, and ultimately our lives.

Affected by the temperature and acidification of the oceans, overfishing, invasive species, wastes, chemical pollution, mining, oil, gas... This biodiversity is under threat and with it the capacity of marine ecosystems to connect life between the surface and the depths, and also to regulate the climate.

The urgency is for knowledge and protection.

With this in mind, UNDER THE POLE's expertise appears as an opportunity that resonates with the United Nations Decade 2021-2030 for Ocean Sciences for Sustainable Development.

Relying on its experience of expeditions, deep scientific diving in hard-to-reach areas, and with the aim of putting ocean exploration at the service of the common good, UNDER THE POLE will launch the DEEPLIFE 2021-2030 research program in 2020, dedicated to the exploration of the mesophotic zone of the oceans down to 200m in depth, for the purposes of scientific knowledge and conservation.

# CONTACT

#### UNDER THE POLE

- contact@underthepole.com
- +33 2 98 10 72 05
- 1 rue des Senneurs, 29900 CONCARNEAU, France

www.underthepole.org

© UNDER THE POLE - February 2022 / Photos: © UNDER THE POLE