FONDATION PACIFIQUE

V CENTENARIO 1ª VUELTA AL MUNDO

THE OCEAN MAPPING EXPEDITION
In the wake of Ferdinand de Magellan

PRESS RELEASE

Back in Seville after 4 years in the wake of Magellan / Elcano The Ocean Mapping Expedition lays the groundwork for an unprecedented mapping of the human impact on the oceans

The Swiss expedition led by Fondation Pacifique, engaged since 2015 in a world tour aboard the sailing ship *Fleur de Passion* to study micro-plastic and noise pollution, monitor greenhouse gases and observe the impact of climate change on corals,
As well as raise awareness of sustainable development issues, completed its journey on September 4, 2019 in Seville after an adventure of more than 1600 days.

500 years after Magellan and Elcano, *The Ocean Mapping Expedition* brings back the bittersweet fruits of its quest for "today's spices" between science and environment, education and culture: omnipresent microplastic pollution, unexpected concentrations of greenhouse gases, to name but a few, a new horizon proposed to 60 teenagers who have embarked on a socio-educational framework, and the opportunity offered to 20 cartoonists to illustrate the "shrinking of the world".

While the expedition mitigates our ignorance of the exact magnitude of the human impact on the oceans, it confirms the multidisciplinary potential of a sailboat such as *Fleur de Passion* as a perfect platform for oceanographic research. This augurs well for the current challenges, which will require the smart commitment of civil societies, especially in the context of the 2021-2030 United Nations Decade of Science for Sustainable Development.

Download media material on https://omexpedition.ch/index.php/fr/the-return-media

Geneva/Sevilla, September 11, 2019 - After four and a half years, more than 1600 days, and 76'000 km across the globe, almost twice the circumference of the Earth, *The Ocean Mapping Expedition* has completed its world tour in the footsteps of Magellan / Elcano, Wednesday, September 4, 2019 evening. The 33m Swiss sailboat *Fleur de Passion*, the logistics platform of the expedition aiming to better understand the human impact on the oceans and raise awareness of sustainable development issues, berthed in Seville along the Muelle de las Delicias (Wharf of Delights), where she set sail on April 13, 2015. An official ceremony and public welcome took place on Friday, September 6 at 11am on this same Quai des Délices then at the Aquarium, to celebrate this return in the presence of the Mayor of the City of Seville and the vice-president of the region of Andalusia, at the invitation of the Embassy of Switzerland for Spain and Andorra.

" 500 years ago, the majority of the world was still unknown to us, " says Pietro Godenzi, president of the Fondation Pacifique, a Geneva non-profit organization that leads the expedition. " The explorers of the day traveled by boat or on foot to distant lands with immense courage, conviction and inner strength to accomplish discoveries that marked their time and sometimes the next. "

" Today, every corner of the world is visible by just clicking on a keyboard ... except the seabed, " he notes. The world has changed dramatically and pristine nature is drastically reduced. From a planet considered "infinite" at the time, we know today that it is limited with dwindling resources, shrinking spaces and that in one way or another, we more than ever need to find new ways to "live

together". That was all the ambition at the heart of The Ocean Mapping Expedition, beyond its formal missions, " adds Godenzi who, as one of the four skippers who took turn at the helm of the boat during the whole expedition, was on board when leaving Seville.

At the end of a human adventure mixing science and environment, education and culture, *The Ocean Mapping Expedition* demonstrated what a traditional sailboat can bring to the scientific community in terms of collecting reference field data, in addition to more classic oceanographic research boats. Throughout its journey, the expedition conducted four long-term programs 1) on meso and microplastic pollution and 2) sound of the oceans, 3) monitoring of concentrations of greenhouse gases on the surface of the oceans and 4) observation of the state of health of the corals. She also led 5 one-off missions, including a mapping project for the Great Barrier Reef.

" It has been very rewarding to measure the genuine interest of our scientific partners in all that a traditional sailboat like *Fleur de Passion* was able to provide to them in their respective fields of research," says Samuel Gardaz, Vice President of Fondation Pacifique for public affairs. Including in countries as maritime as Australia or Spain. "

"*Fleur de Passion* is by nature relatively slow, silent and non-polluting, she has been perfectly able to make long ocean crossings as to get closer to the coast or coral reefs. She has thus been the ideal logistics platform for implementing the programs of our scientific partners, whether it deals with surface water samples taken by the crew or the implementation or maintenance of high-tech equipments installed on board by our partners ", continues Gardaz.

The Micromegas plastic pollution mapping program, in partnership with the Oceaneye association in Geneva, revealed the almost omnipresence of meso and microplastic particles in the 169 surface water samples analyzed to date, out of the 208 total collected throughout the expedition.

" More than 90% of the samples contain polymers in the analyzed dimensions, from 1.0 to 5.0 mm for micro-plastics and more than 5.0 mm for meso-plastics, " explains Pascal Hagmann, Oceaneye's director. The results obtained reveal a great disparity in the geographical distribution of these pollutants. Patagonia, Papua New Guinea and the Pacific Islands between Polynesia and New Caledonia have low levels of pollution. The northwestern coast of Borneo, the Atlantic coasts of South America, the northeastern coast of Australia, the coasts of Mozambique and South Africa are moderately affected areas.

The South Pacific and the Indian Ocean, on the other hand, are highly polluted areas identified by the expedition, which was relatively expected as these are areas of waste accumulation. Other areas not subject to concentration phenomena have also been found to be heavily polluted, mainly in South-East Asia.

" The high concentrations of plastic pollutants we have measured in the ocean gyres during *The Ocean Mapping Expedition* confirm and clarify the studies carried out in recent years by other scientific teams, continues Hagmann. We also expected to find plastics in Southeast Asia, a very densely populated region with insufficient waste management. Nevertheless, in-situ measures were lacking until then, as this region is currently little or not studied. Our preliminary results show that the concentrations of plastic pollutants in this geographical area are equivalent to those measured in oceanic gyres, even in the absence of accumulation phenomena related to marine currents ".

The *20,000 sounds under the seas* program, in partnership with the Laboratory of Applied Bioacoustics (LAB) of the Technical University of Catalonia, BarcelonaTech (UPC) was the first project that aimed at sensitizing the world population to the alarming issue of ocean noise by

building up a noise map of the oceans based on the underwater recording carried out by *Fleur de Passion*.

" While deep-sea observatories have been playing a key role in the assessment and monitoring of ocean acoustic changes, no effort had yet been invested in providing a global picture of underwater noise based on *in situ* measurements at sea from a moving platform, " says Prof Michel André, director of the LAB and in charge of the program.

" The data gathered have contributed to our understanding of the acoustic load of the oceans by providing essential knowledge on how artificial noise is distributed at large temporal and spatial scales ", he adds.

" *The Ocean Mapping Expedition* crossed areas, particularly in the South Pacific, where shipping noise or other noises from human activities have not yet reached critical levels and that could be considered as “zero level of pollution” areas, below 70 dB re 1 microPa^2/Hz, probably encountered before the industrialisation of the ocean resources exploitation started a century ago, when ocean noise was only produced by marine organisms, " explains Prof André.

" Conversely, the *expedition* measured broadband source levels (20–1000 Hz) as high as 189 dB re 1μPa @ 1 m from modern commercial ships (~50,000 gross ton container ships traveling at speeds of 20 knots) along *Fleur de Passion*’s route across Southeast Asia, constituting the loudest noise levels recorded during the whole expedition ".

" Commercial ships carrying a wide variety of cargos travel the world ocean and constitute a major contributor to ocean noise. Ships’ propulsion systems and other machinery generate underwater noise at low frequencies (20–500 Hz)".

" Although the data provided by a moving platform must be considered acoustic snapshots, it will help building models to predict future changes in the marine environment, in particular in the Arctic and Antarctic regions, where the ice is still preventing the massive introduction of anthropogenic noise from industrial operations that will inevitably look for the last unexploited resources of the planet ", concludes André. The four-year acoustic data can be found on http://omexpedition.listentothedeep.com

The coral health observation program, conducted since spring 2017 in partnership with the CoralWatch initiative from the University of Queensland in Brisbane, has conducted a total of 1865 observations on 28 reefs in 6 countries between Australia and Madagascar, sometimes in remote areas for which there were no data. On average, the observed reefs were in good health, with the notable exception of the Australian Great Barrier Reef, which was the victim of a second bleaching episode while the expedition was reaching the region, between April and June 2017.

The live habitat mapping mission of a portion of the Great Barrier Reef, conducted in May-June 2017 in partnership with the Remote Sensing Research Center (RSRC) at the University of Queensland in Brisbane, has collected 12,000 photographies taken during 59 underwater transects on 17 selected coral reefs, over a cumulative distance of 40 km, as part of the development of a coral reef mapping tool involving the largest oceanographic institutions in Australia. This operational tool is now being implemented globally as part of the larger Allen Coral Atlas project (allencoralatlas.org).

" The arrival of *Fleur de Passion* on the Great Barrier Reef was timely because she provided a unique opportunity for us to collect the field data we needed to complete our mapping tool, " says

Dr. Chris Roelfsema, RSRC chief and who himself participated in the mission with researchers from his team.

The Winds of Change program, launched from the Philippines at the end of 2017 in partnership with the University of Geneva, has made it possible to conduct an unprecedented continuous monitoring of the concentrations of greenhouse gases on the surface of the oceans thanks to the methane and carbon dioxide analyzer installed on board Fleur de Passion in Mactan. Over 30'000 km and thanks to readings taken every minute from a sensor located at 16 m above the sea surface on the mizzen mast (aft), this pioneering monitoring program notably revealed that the Indian Ocean and the Atlantic Ocean could be unexpected reservoirs of greenhouse gases.

With a second set of equipment installed in Dakar in April 2019, *The Winds of Change* has also been able to measure the stable isotopes of carbon in methane and carbon dioxide, their "fingerprint", and to better understand their origin, natural or anthropogenic.

" Several exciting findings were reveled from the project and data collected, say Prof. Daniel McGinnis and Dr. Daphné Donis from the University of Geneva, in charge of the program. We've been able to identify emission hotspots in sensitive coastal regions with shallow waters. These could be attributed to larger inflows from land coupled with agricultural and cultural land use leading to an increase of organic matter and nutrient input into these coastal region.

" Conversely, we were surprised with lower than expected methane and carbon dioxide concentrations in the open oceans including the Indian and the South Atlantic. Values suggesting that there may be even unrecognized sinks of these gases in the regions, " add the two researchers.

" The Winds of Change program was a great success in many aspects. Long time series of excellent methane and carbon dioxide data were collected in critical regions. These will provide an important benchmark for future measurements as well as for updating the atmospheric greenhouse gas budgets, " also says Prof McGinnis.

" The project was a proof of concept mission as well, to hopefully encourage others to follow in our footsteps. Sailboats are the ideal platform for such program as they minimize engine contamination that could interfere with the measurements. We hope that a fleet of sailboats with such instrumentation will be navigating the world's oceans. For now, we are focusing on expanding the project with a four-year mission to the Arctic with our partners at Fondation Pacifique, " concludes McGinnis.

" It may seem paradoxical that a Swiss expedition aboard a sailboat contributes to a better understanding of the oceans," concedes Samuel Gardaz. But the paradox is only apparent. There is a strong emotional connection between the worlds of mountains and oceans, and Switzerland has a great tradition of navigators. As for Geneva, which is our "home port" and whose authorities support us, it is open to the world and its challenges. "

" If we've been ourselves inspired in this adventure by great names of exploration and navigation from the past, we hope to inspire similar, multidisciplinary initiatives that contribute to a more peaceful relationship between humans and the planet, adds Pietro Godenzi. For this is precisely the spirit of the 2021-2030 United Nations Decade for the Ocean Sciences for Sustainable Development, which will open soon: that all the stakeholders from the civil society are mobilizing for the oceans, so in the end for other human beings whose fate depends on this vital environment."

As part of the socio-educational part of the expedition, 60 teenagers and young adults in total have embarked on the *Youth at Sea* program, in partnership with the Association Pacifique in Geneva. Girls or boys, in pairs or in groups of 5-7, these youngsters experienced life at sea for two months minimum, sometimes up to four months, as full-fledged ship's apprentices.

" In contact with life on board and the demands of sailing on a « working boat », these young people were invited to explore the hight seas, others and themselves," says Pietro Godenzi, who has accompanied several of them as one of the skippers who took turn at the helm. All have forged the new horizons they needed to find a new course, once back to Earth. "

"Throughout *The Ocean Mapping Expedition*, the *Fleur de Passion* sailboat has been the ideal setting to allow these youngsters to confront the strict rules dictated by navigation, especially on the high seas , to help them overcome their fears of the unknown and engage them back into a positive dynamic. "

Finally, also protagonists of the adventure, 20 designers have taken turn "in residence" aboard *Fleur de Passion* as part of the cultural program I*n the mirror of Magellan*: 10 women and 10 men, mainly from Geneva or Switzerland, who were invited to chronicle the expedition in the purest tradition of the marine painters of the past, but also to tell in their own way today's world and its stakes in light of that of 500 years ago. A selection of their drawings, sketches, watercolors and other comics is presented as part of the exhibition *Nuestra isla de las especias*, hosted at the General Archives of the Indies in Seville from September 6, 2019 to March 31, 2020.

***

About the Fondation Pacifique

The Fondation Pacifique is a non-profit Swiss-based non-profit organization based in Geneva. It was created in 2007 by a handful of men and women driven by a strong entrepreneurial spirit at the service of the community. Since its creation, it designs, organizes and conducts at sea aboard sailing ship *Fleur de Passion* thematic expeditions combining scientific research programs, cultural projects, socio-educational and environmental awareness. Its ambition is to contribute to a better knowledge of the human impact on the oceans and to invite to the reflection on the place of the man on the planet sea by allowing everyone to embark as a crew member and to participate to the expedition. To this end, his expeditions are conducted in a multidisciplinary spirit and experience sharing, and are accompanied by communication actions for the general public.

Fondation Pacifique

9bis, rue de Veyrier, 1227 Carouge - Suisse
www.fondationpacifique.org / www.omexpedition.ch / www.facebook.com/omexpedition
Media contact: Samuel Gardaz, vice-president for Public Affairs, founding members
samuel.gardaz@fondationpacifique.org / +41 76 563 65 43

***The Winds of Change* program**
University of Geneva, Faculty of Science
Department F.-A. Forel for Environmental and Aquatic Sciences (DEFSE)
www.unige.ch/forel/en/physique-aqua/
Media contact: Prof Daniel F. McGinnis, head of the Aquatic Physics Group
daniel.mcginnis@unige.ch / +41 78 848 38 02

***20,000 sounds under the sea* program**
Technical University of Catalonia, BarcelonaTech (UPC)
Laboratory of Applied Bioacoustics (LAB)
www.lab.upc.es
Media contact: Prof Michel André, director
michel.andre@upc.edu / +34 93 896 7299/ 7200

***Micromégas* program**
Association Oceaneye, Geneva
www.oceaneye.eu
Media contact: Pascal Hagmann, director
pascal.hagmann@oceaneye.ch / +41 78 637 16 73

The Ocean Mapping Expedition

En partenariat avec

Avec le soutien officiel de

Arrivée à Séville avec le soutien de