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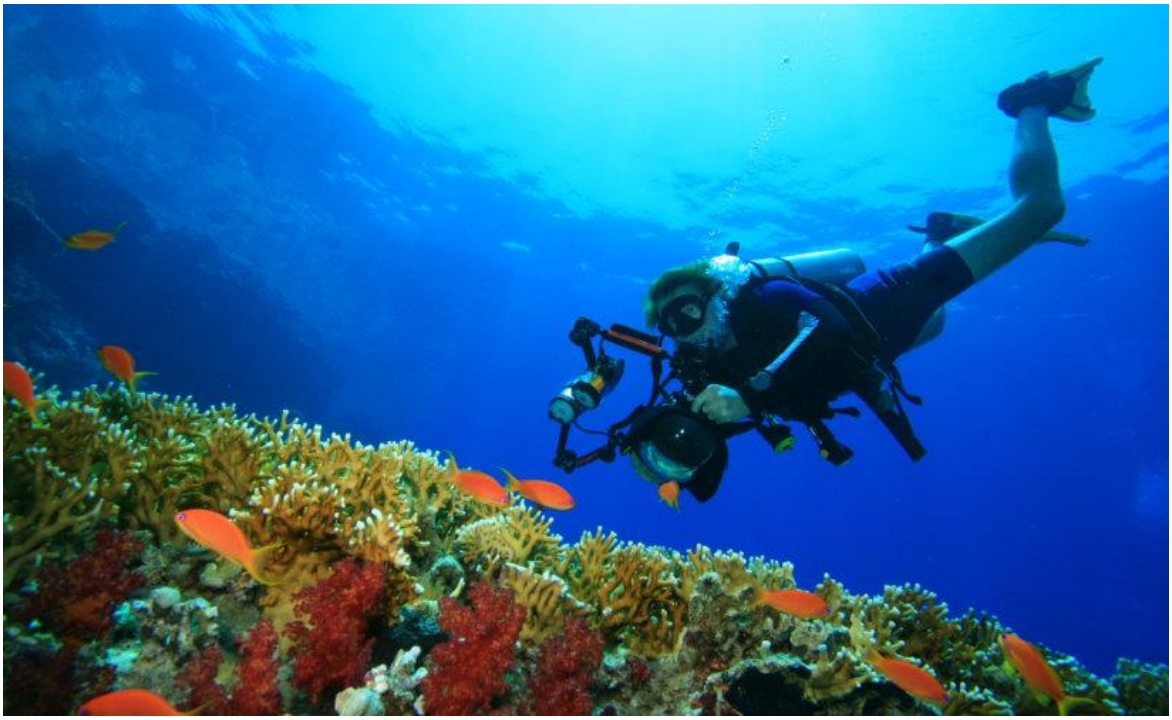
THE LAST CORALS



A 52' documentary

Director: Fabiano D'Amato

Teaser « The last corals » :

https://vimeo.com/464949232

Password : redsea

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PITCH

In the politically turbulent waters of the Red Sea, a major scientific expedition led by Switzerland sets out to study corals that are resistant to global warming. A human and scientific adventure in one of the world's most beautiful seas, to go beyond national borders to ensure the protection of priceless ecosystems.

SYNOPSIS

In 2017, Professors Anders Meibom of the EPFL and Maoz Fine of the University of Bar Ilan in Israel, make a major scientific discovery: while the world's large coral reefs are dying due to global warming, those in the Red Sea are resisting major temperature increases. Their conclusion is indisputable. By the end of the century, Red Sea corals are likely to be the only corals capable of surviving climate change.

This discovery leads to the creation of the "Transnational Red Sea Center" at the EPFL in 2019. Supported by the Department of Foreign Affairs, this initiative aims to promote diplomatic and scientific collaboration between the countries bordering the Red Sea, in order to better study their corals, but also to protect them against the many human threats they face. This is not only in the interest of the region, but also of the whole world.

This long-term project is being developed initially through laboratory experiments on the resistance of Red Sea corals to global warming. The research project continues with the launch of a major expedition to the Red Sea in the summer of 2021. On board the Swiss sailing ship Fleur de Passion, ***The last corals*** follows this historic expedition and tells the scientific and human adventure of a team led by Anders Meibom. Thanks to scientists' research, we discover the importance of corals for a large part of humanity, the threat to them, as well as the hope brought by Red Sea corals and their characteristics.

But the expedition also takes place on another level, as it requires the agreement of countries that often maintain conflictual relations.

Alongside the voyage of the Fleur de Passion, we are therefore following the efforts of Can Tutumlu, representative of the FDFA (Federal Department of Foreign Affairs), involved in negotiations between Red Sea countries - a difficult but indispensable diplomatic work to ensure the success of the expedition and the effective protection of the priceless marine ecosystem that the nations share.

Diplomatic negotiations, expedition contingencies and scientific discoveries intertwine narratively, making The Last Corals a dense narrative, nourished by the challenges of the fight against the effects of global warming, scientific diplomacy, and peace efforts in the Middle East.

PRODUCTION NOTE

What about solutions? Or at least hopes for solutions?

At the beginning of the project, our meeting with **Emmanuel Gétaz**, producer at Dreampixies, and **Fabiano d'Amato**, director, with whom we worked on the documentary project "*Grock, shadows and lights of a legendary clown* " (broadcast by Arte, 2019), and the desire to work together again..

Emmanuel and Fabiano have decided to look for topics related to climate and nature, where solutions exist to counteract or correct current problems. These solutions are partial, uncertain, but they appear thanks to the research of science. They are highly topical and often still need to be verified. Like them, it seemed important to us to document this research and to decipher the hopes that it can eventually generate, knowing that the concretisation is another step, also to be documented.
It is also necessary to be able to bring a camera into the laboratories, or to accompany expeditions whose constraints do not always allow a film crew to be present.

Thanks to his contacts, Fabiano D'Amato was able to negotiate in advance his participation in an important multinational scientific research expedition planned for the summer of 2021, piloted by the EPFL (Ecole Polytechnique Fédérale de Lausanne) and which is part of the "scientific diplomacy" that the Swiss Federal Department of Foreign Affairs (FDFA) has put in place.

The subject, **the survival of corals in the context of global warming**, is highly topical and the whole world has heard about it.
Over the past 240 million years, corals have evolved to become one of the most important and complex ecosystems on the planet. Coral reefs are home to more than 4,000 species of fish, 700 species of coral, and thousands of other plants and animal life forms. Scientists estimate that, in total, more than one million species of plants and animals are associated with the coral ecosystem.
Coral reefs are highly productive ecosystems. Not only do they support biodiversity, but they are also of immense value to humanity. Corals provide an estimated $375 billion worth of resources and services each year and support more than 850 million people around the world through food and employment.

It is undoubtedly a subject that still touches people because of the beauty and vulnerability of this organism, which reminds us of the fragility of underwater habitats that have been put to the test for decades.
But unlike the many documentaries that exist on the degradation of corals, our proposal develops a narrative, at least part of which is more positive, without being naïve.

The main protagonist, Anders Meibom, is charismatic and extremely clear in his words and scientific explanations. You can find out more about him in the teaser based on location and

archive footage and an interview in English. Please note that Anders Meibom also speaks French, which will be requested for the documentary if necessary.

The second main character, Can Tutumlu, a diplomat with the FDFA, is also charismatic and exciting to listen to as he explains the problems he has to solve.

Fabiano D'Amato is very experienced for this kind of project, having already participated in scientific expeditions on several occasions. His knowledge of the constraints, but also of the potential of life on board a boat, is invaluable. His mastery of sound recording and his complicity with his cinematographer, **Jonathan Stoppele**, guarantee quality filming, knowing that the Fleur de Passion can only reserve two places on board for our team (these two places are confirmed in the letter of support, in the appendix, written by the Pacific Foundation, owner of the boat)..

As far as the FDFA is concerned, several contacts have taken place with Mr Can Tutumlu, including a meeting. However, as a matter of principle, the FDFA only confirms in writing a possible collaboration when a production company can prove that a broadcaster is officially involved.

Chez Goyaves, the productions pushed us very early on towards social and environmental issues, and our editorial line has always been animated by the desire to make known, to share with the spectators the realities of other countries, other cultures and major ecological issues.

In fact, we recently launched Goyaves Green, our label that groups together all consulting and content production activities related to social and environmental responsibility, and very generally to actions and reflections on ethics and sustainable development.

We hope that we can awaken your interest with this project.

Frédéric Malègue

TREATMENT

« Initially there was a lot of confusion. The corals would not die, contrary to what we had predicted. »

In a university building in Eilat, Israel, Anders Meibom wanders alone around an impressive array of aquariums containing corals. The 50-year-old EPFL professor tells us how what the most important discovery of his scientific career is undoubtedly took place.

« Maybe there was a problem with the equipment, the temperature measurements could be wrong... But we checked everything several times and finally had to admit that the results were right. The corals were resistant. And then there was like an explosion in our heads. We realized that this was a discovery that went far beyond our personal interest, beyond our own laboratory. The reefs of the Red Sea might be the only ones capable of surviving climate change by the end of the century. It was 2017, and for my colleague Maoz Fine and myself, it was becoming essential to continue to study and, above all, protect these corals. »

THE LAST CORALS

EPFL, Lausanne
In his office at EPFL, Anders Meibom, a biochemistry specialist and professor at EPFL since 2012, takes some binders, on which you can read "Red Sea Simulator" and "Transnational Red Sea Center". He puts them in his backpack. Behind him, a piece of coral is placed on a shelf next to a meteorite fragment.

He puts on his backpack and leaves the office with a heavy suitcase.

Cointrin Airport, Geneva
Anders presents himself at the check-in of the company El-Al, bound for Eilat. He walks through the corridors leading to the plane.

Eilat, Israël
Eilat, in the south of Israel, a seaside resort like so many others, with its large hotels along fine sandy beaches and clear, lively waters. Anders leaves his hotel and heads towards the coast.

Through the taxi window, Anders points to a large building near the seafront.
« *This is where we made our discovery about the resilience of Red Sea corals. …*»

Red Sea Simulator Laboratory, Eilat, Israël

The taxi drops Anders in front of the university building. Inside is the aquarium system, known as the "Red Sea Simulator". Maoz Fine, professor at the University of Bar-Ilan, warmly welcomes Anders, before giving him the latest information about the upcoming expedition. In a few days, they will cross the border into Jordan to board a Swiss sailboat, the *Fleur de Passion*, in Aqaba for a 3-month expedition in the Red Sea.

Anders inspects the Red Sea Simulator device, which consists of 88 aquariums containing corals. Surrounded by students from different universities, he explains to them the importance of these ecosystems.

Red Sea Simulator

« *Coral is something abstract for many people. We don't realise that they are living organisms, which are indispensable for the good health and natural balance of the oceans. Reefs are a place of life for countless species of fish, crustaceans, mollusks... They are ecosystems that allow many coastal communities to feed themselves, but are also, of course, a magnet for tourists. Some corals are even used for the development of medicines.* »

He heads for an aquarium full of discoloured corals. Anders describes the phenomenon of bleaching, which is caused by excessively high temperatures that cause the expulsion of algae from the corals. They become very vulnerable to various stress factors and other diseases, which can lead to their death.

« *These phenomena are multiplying everywhere, from the Great Barrier Reef to the reefs of Belize. Constant global warming often prevents corals from surviving these incidents, leading to the disappearance of entire reefs.* »

Red Sea Simulator Laboratory, Eilat, Israël

The group stops in front of a student from the Bar Ilan University, who manipulates an artificial arm at the end of which a small camera films closely the evolution of the corals in the aquarium. The student comments on his work.

« Here we simulate the future temperature and acidity conditions that the Red Sea reefs will have to face to study their resistance and capacity to adapt. And we observe how they react. »

Anders explains that it was in this way that he and Maoz arrived at their discovery, which turned out to be fundamental.

Red Sea Simulator

« We put corals taken from a nursery off the coast of Eilat under pressure. We rigorously raised the temperature. And to our surprise, they would not die. Test after test, the results were clear; these corals are resistant to temperatures that should in theory kill them. »

In front of Red Sea Simulator Laboratory, Eilat, Israël

A few days later, at dawn, Anders and Maoz, with the help of the students, loaded scientific material into a vehicle of the University of Bar-Ilan. It was time to head for Aqaba for the final preparations on board the *Fleur de Passion* before the expedition began. The van loaded, with Maoz at the wheel, the two professors set off.

Israel-Jordan border

Arriving at the border, Anders and Maoz are stopped by Jordanian border guards. Only 15km separates Eilat from Aqaba, but because of this custom crossing it is common for the journey to last several hours. Passing scientific equipment makes it even more difficult.

The two professors take out all the papers they have at their disposal to justify their trip: letters from the EPFL, the University of Bar-Ilan, but above all from the FDFA. While a border guard takes the documents, a second one opens the safe to inspect the equipment and a third one asks us to stop filming.

On the road to Aqaba, Jordan

An ellipse. From the back window of the van, we can see the Jordanian Israeli border moving away. With a smile, Anders explains that thanks to the letter from the FDFA, they were only at customs for two hours.

« *Without this document, I don't dare imagine how long they would have kept us*. »

The vehicle continues its way to the port of Aqaba.

Reception hall of the Port of Aqaba, Jordan
The van stops in front of the port's VIP reception hall, where Jordanian secret agents stand guard. Anders and Maoz present their identity papers and enter the building.

In the hall, a podium faces two hundred seated people. Ignazio Cassis, head of the FDFA, is accompanied by representatives from Egypt, Jordan and Saudi Arabia. He climbs onto the podium and delivers a speech.

He stresses that the discovery of Anders Meibom and his Israeli colleague Maoz Fine is of great importance.

Following their discovery and faced with the urgent need to protect the corals of the Red Sea, the EPFL launched the "Transnational Red Sea Center" project with the aim of creating a real scientific collaboration between the coastal countries of this region to ensure the conservation of their reefs. The Swiss Federal Department of Foreign Affairs quickly decided to support the project.

« *A country like Egypt, for example, earns more money from tourism in the Red Sea than from the pyramids. It is now necessary to be able to map the entire reef of the Gulf, and eventually the entire Red Sea. Thus, a series of expeditions will be launched, first in the Gulf of Aqaba, to observe and collect coral samples, to understand whether all are resisting climate change in the same way and to identify the other threats (pollution, overfishing...) which weigh on them. Switzerland wants to contribute to the success of the Transnational Red Sea Center and of this expedition by making its scientific and diplomatic capacities available*. »

He then wished the Fleur de Passion boat and its crew a safe journey.

When the speech is over, a charismatic man in his forties, impeccably dressed, walks up to Anders and greets him warmly. It is Can Tutumlu, a representative of the FDFA, who is leading the negotiating efforts of the Transnational Red Sea Center. The two men have been working together on this project from the very beginning, and the launch of the expedition is a small consecration for them.

Of Ticino origin, Can speaks with a slight Italian accent and asks Anders if he is ready to leave. With a smile, the EPFL professor replies that he is very relieved that the day of departure has finally arrived.

Port of Aqaba, Jordan
On a quay in the port of Aqaba, scientists and crew members complete the loading of material on board the Fleur de Passion. Anders and Can head towards the sailboat and meet its skipper, to whom he introduces Can. He explains to him that the FDFA representative is one of the thinkers behind the strategy recently established by the Confederation called Science for Diplomacy and Diplomacy for Science.

« Organising an expedition such as this is a complicated task. It involves crossing the maritime borders of four countries with often tense diplomatic relations. We do scientific diplomacy… »

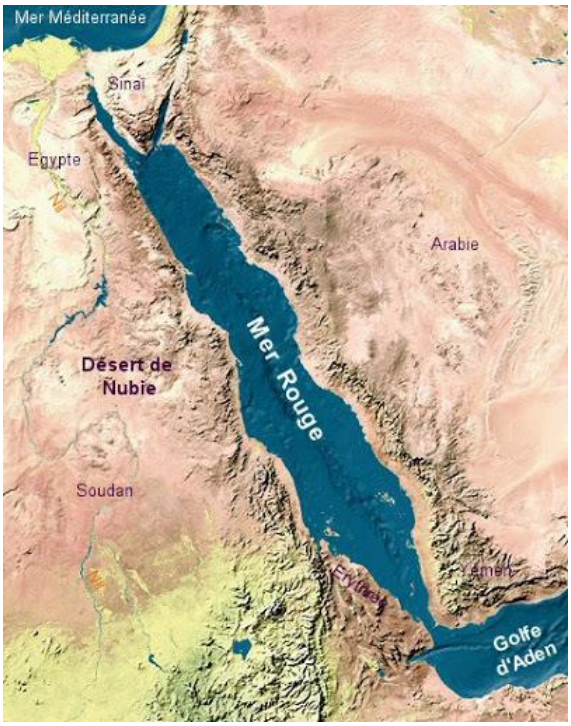
Although Can has been working on the launch of this expedition for years, he has never yet had the opportunity to see the Fleur de Passion. At the same time as the visit, the skipper gives a briefing on the history of the boat.

Inside the *Fleur de Passion*, port of Aqaba, Jordan
Now 80 years old, the *Fleur de passion* belongs to the Fondation Pacifique, based in Geneva, and is the largest sailing ship to sail under the Swiss flag. Built in Germany during the Second World War, she was used for military purposes until the end of the conflict. Today, the Fleur de Passion is a scientific ship, having sailed around the world for four years on the Ocean Mapping Expedition, an expedition during which scientists took turns on board to study the oceans and seas of the world.

Meanwhile, the scientists and crew members finish loading the equipment.

Press room of the Port of Aqaba, Jordan
In front of some journalists, Anders switches on a projector and projects a map of the Red Sea on a screen. He summarises the purpose of the expedition and the route he will take them from Jordan to the Saudi and Egyptian coasts.

« *As some of you may know, the exciting thing about corals in the Gulf of Aqaba is their genetic history.* »



Red sea

Anders points Yemen on the map, south of the Red Sea and up to Aqaba.

« To get here, the ancestors of today's corals migrated as larvae from the southern end of the Red Sea. On this journey they had to cross the warmest part of the sea, between Yemen and Eritrea. Only those larvae able to survive these very high temperatures continued northwards and eventually populated the Gulf of Aqaba. This resistance was then transmitted from generation to generation. »

Anders looks at his audience with a smile.

« I find it fascinating. During this expedition and those of the next few years, we're going to make the opposite journey, to check whether these larvae have indeed populated the entire Red Sea according to this hypothesis, making all the reefs resistant to global warming. »

Aboard the *Fleur de Passion*, Port of Aqaba, Jordan

The departure has finally arrived. From the deck, Anders watches the crew cast off and the *Fleur de Passion* leaves the harbour. The yacht enters the bay and passes by a place popular with divers. At a depth of 5 meters, the wreck of a tank on which a colony of coral has developed.

Port of Aqaba, Jordan

Can Tutumlu watches the sailboat leave. He explains that for these first three months of navigation, it was necessary to obtain the authorisations of the Egyptian, Jordanian and Saudi authorities to be able to navigate in their waters and collect corals.

« Each of these countries sees the Red Sea as its own and they are all convinced that they are doing what is necessary to study or protect the parts that belong to them. But the discovery of the resistant corals was made in Israel... Now, 50 years ago, Egypt and Jordan were at war with Israel. A form of cold war continued between them for decades. »

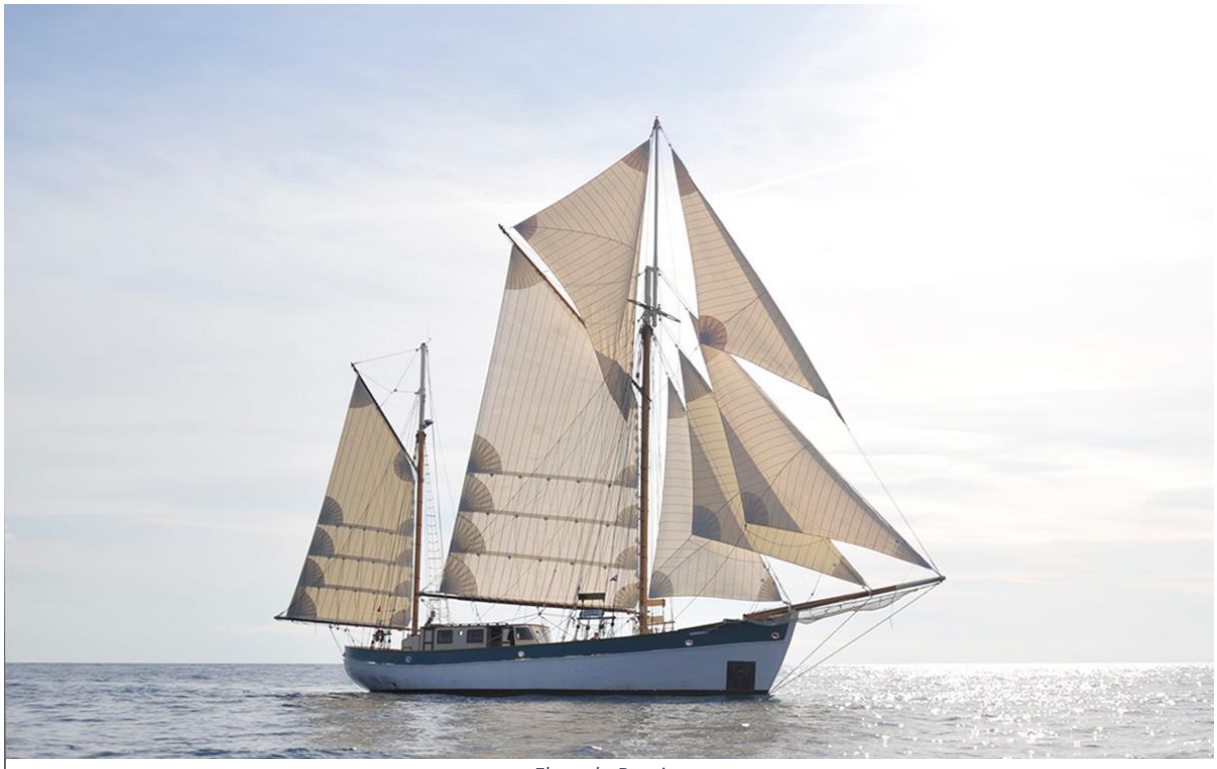
Through archive footage, the Six Day War comes to life again; clashes between tanks in the Sinai, blockade of the Red Sea by the Egyptian navy …

« *We have to be very pragmatic, which is why we decided to launch the expedition from Jordan. We don't want to protect the corals just to protect the corals. We need everyone to understand the economic interest of the reef. What happens in one country will inevitably affect the corals in another. We are not naïve; we do not intend to negotiate a lasting peace between the countries of the Red Sea thanks to corals. But it is important for us to at least be able to achieve a serious and strong collaboration through science. To contribute to this, our neutrality is a real asset.* »

In the distance, the *Fleur de Passion* has hoisted its sails and turned towards the open sea before disappearing from the sight of Can Tutumlu.

On the deck of the *Fleur de Passion*

On the ship, Anders drinks coffee with an Egyptian scientist. He tells her that before he started working on the problem of corals some fifteen years ago, his specialisation was meteorites. He went from space to the ocean a bit by chance, discovering a scientific study describing how coral skeletons could reveal the history of the evolution of sea temperatures. Anders was able to demonstrate errors in this study and from that moment on, he became passionate about corals.



Fleur de Passion

Until now, however, much of his work has been done in the laboratory or during near-shore dives. This is his first expedition at sea and he approaches it with impatience and a little apprehension.

Dining room of the *Fleur de Passion*

The sun sets over the sea. Scientists and crew members gather in the dining room to share their first meal on board. Some already know each other, others are getting to know each other. Conversations are relaxed and are conducted in English in a symphony of different accents. Once the meal is over, Anders stands up, welcomes everyone on board and reminds them that the team on board will be confined at sea for almost 3 months, with only a few stopovers planned. The navigation will often take place under very high temperatures, difficult conditions but essential to study the resistance of the corals.

Then he indicates that work will begin the next day. He wishes everyone a good first night.

Aboard the *Fleur de Passion*

The next morning. The anchor was dropped. On the starboard side, part of the scientific team throws an instrument known as the CTD into the water. It consists of a rosette of several tubes that open at different depths to collect water samples.

At the same time, on the port side, we prepare for the first dive. Anders puts on his wetsuit. The divers check their neighbour's equipment and, equipped with net bags, knives and water-resistant notebooks, step onto the ladder. Some carry cameras.

Once underwater, they swim beside the CTD and head towards the coral reef, which lies 5 meters below the surface. The visibility is perfect, the coral appears to be in very good health and an impressive amount of diverse fish form clouds around the reef. Some harmless black tip sharks can even be seen.

While some divers take notes or photos, others take coral samples and put them in their bags.

Once the operation is over, they return to the Fleur de Passion. Taking off his wetsuit, Anders can't hide his smile.

« The density and diversity of the coral we have seen here is impressive. Seeing reefs in this state, knowing what is happening with so many other reefs in the world, always gives a little hope. »

FDFA Office, Bern
Can Tutumlu's office is located on the top floor of the FDFA (Federal Department of Foreign Affairs) building at Bundesgasse 28 in Bern. Situated under the roof and enjoying beautiful light, the place is almost warm, contrasting with the traditional image people have of a government office. With a map of the Red Sea on the wall behind him, Can tells us about his work in negotiations.

« Crossing a maritime border may seem easy. There are no customs, there's no indication that you've just crossed into another country. In an ocean, these areas can be difficult to control. But not in the Red Sea, even less in the Gulf of Aqaba which is very narrow and where coastal countries are very distrustful of each other. Making people understand that a ship is going to cross their maritime zone to analyse the quality of their waters and take samples of their corals is not easy, believe me. It took months of discussions, convincing each country that the operations will be exactly the same as in their neighbours, that everything will be done in total impartiality. It's a job that requires a lot of patience. »

Aboard the *Fleur de Passion* - maritime border between Jordan and Saudi Arabia
On the *Fleur de Passion*'s GPS screen, the Saudi border is approaching. Anders and a few other scientists are standing next to the skipper, their eyes glued to the screen. There is a certain tension in the air.

Anders looks out to sea, in the direction of the ship's direction of navigation.

« There is a certain absurdity in thinking that we will soon be crossing a border, there is nothing here to indicate that. The reef over which we are sailing does not suddenly stop at the border. »

On the GPS, the border is almost crossed. Voices are heard on the radio, first in Arabic. The skipper answers in English and after a short exchange in which he gives all the required identifications, the conversation ends. He turns and smiles towards the scientists. The border has been crossed.

Aboard the *Fleur de Passion* – Saudi waters
As the days go by, we discover Swiss, Israeli, Egyptian, Jordanian and Saudi scientists sharing the restricted space on board the ship. Beyond cultural differences, they each have to adapt their way of working in order to collaborate in the best possible way.

As Anders explains, scientific communities regularly make efforts to work together on studies or share data. However, the methods and technical means available differ from one country to another and scientists often find themselves under political pressure, limiting the effectiveness of any collaboration.

« *This is one of the reasons why we created the Transnational Red Sea Center. The scientific communities of the Red Sea coastal countries are aware of the value of their reefs and the importance of collaborating to study and protect them. Our ambition is therefore to ensure that science can go beyond political borders and that a culture of open exchange can be established between scientists from all these countries».*

End of the day on the *Fleur de Passion* - Saudi waters

Every day, some coral samples collected during dives are frozen. At the end of the expedition, they will be sent to laboratories for genetic analysis. The other samples are placed in the few aquariums on board the yacht. For the duration of the voyage they will undergo the same tests as those carried out by Anders and Maoz in the Red Sea Simulator. The water temperature will be gradually increased to test their resistance to heat build-up. This way, by the end of the expedition, scientists will already have an overall idea of the health and distribution of corals in this part of the Red Sea.

***Fleur de Passion* – half of the trip**

The sailboat reaches the mouth of the Gulf of Aqaba. Soon begins the second half of its journey in Egyptian waters. But before crossing the border, *Fleur de Passion* still sails along the empty and a priori deserted Saudi coast. One of the Saudi scientists points to a flatter area on the coast.

« This is where my country will build the city of Neom. A gigantic futuristic metropolis that aims to attract investors and tourists. And which will depend on the good health of the Red Sea for its success. »

FDFA Office, Bern

Can Tutumlu explains how the Neom project became an argument in the negotiations with Saudi Arabia.

« For some years now, Saudi Arabia has been trying to diversify its

Projet NEOM

economy so as not to depend so much on oil. The Neom project is an important example of these efforts. »

We see pictures of the visit to the future site of the city, which the Kingdom had organised for Can and other members of the FDFA during their discussions. For the moment, there are nothing more than a few dirt roads along the coast.

« We have therefore put the emphasis on this. To develop tourism in Saudi Arabia, it is imperative to ensure the good health of the corals. For several years now, the Kingdom has proved its credibility in the scientific field thanks to the studies made at the University of Jeddah. But collaboration with its neighbouring countries has always been very timid, or non-existent. They had to be convinced that opening the door to a real discussion with Egypt, Jordan and Israel was in their common interest. What is happening in Egypt will spill over into Saudi waters and vice versa. In view of the gigantic investments envisaged in Neom, it is necessary to collaborate. »

Aboard the *Fleur de Passion* – Egyptian waters

As the *Fleur de Passion* has just passed through Egyptian waters, a motorboat is approaching the sailboat at full speed. On board are the threatening and impatient Egyptian coastguards. They are not aware of the expedition and communication between them and the crew is very tense. Despite the papers and authorisations given to them by the skipper, the coastguards remain very suspicious and threaten to confiscate everything they have on board.

Scientists are very worried, especially Anders. Things can't happen like this so close to the end. He immediately calls Can in Bern to hold a conference call. The latter calls his contacts in Egypt. The tension is palpable in his voice.

The coast guard is waiting. They finally receive a call, nod and signal to the skipper that he can leave. Everyone on board can breathe again. Relieved, Anders calls Can back to thank him.

Aboard the *Fleur de Passion* – Egyptian waters

Over the following weeks, Fleur de Passion continued to evolve along the coast. Operations continue on board, often in leaden heat. Some tensions emerge when the CTD is damaged. But a repair in less than two days helps to calm spirits.

When a thunderstorm appears in the distance one evening, a certain anxiety is felt on board. The sails are lowered, and everyone takes refuge inside. A strong wind sweeps across the Gulf of Aqaba, causing the sailboat to sway. Anders looks particularly worried, not to mention the seasickness he feels coming on board. When the wind finally calms down and gives way to a heavy downpour, everyone enjoys it. This life-saving rain is welcome after weeks of heavy heat and everyone is on deck, in a scene that becomes poetic.

Aboard the *Fleur de Passion* – Egyptian coasts

At the Egyptian tourist town of Lagona, *Fleur de Passion* comes across a small local fishing boat, which is quickly approaching.

The Egyptian scientist of the expedition, from the bridge, begins to talk with the fisherman, who explains to her that he has always lived along this coast, in a small village north of Lagona. He survives thanks to fishing, but recently things have become much more difficult, there are fewer fish in the sea.

The fisherman does not know what this is due to. He has noticed large fishing boats and more and more tourist boats, so he thinks it must have had an impact. After telling his story, the fisherman insists on offering one of the groupers he managed to catch early that morning.
Following this encounter, the Egyptian scientist and Anders decide that it would be interesting to make a dive here. The CTD is launched.

The divers soon notice that the reef has been severely damaged. Dead corals lie on the ground, others, still attached to the reef, have been broken. There are far fewer fish in this area. This is in stark contrast to what has been observed since the beginning of the expedition. The divers bring several samples back on board.

Aboard the *Fleur de Passion* – Egyptian coasts

Several scientists returning from diving exchange their impressions. The corals do not seem to have undergone a bleaching phenomenon, so global warming is in principle not the direct cause of their death. At first glance, some have been damaged by boats getting too close to the reef. Land-based sources of pollution may also be one of the causes of their degradation.

Despite the hope provided by the resilient corals of the Red Sea, the discovery of this section of the reef in such poor health is an important reminder that where climate change is not killing these corals, direct human activities are still contributing to it.

FDFA Office, Bern

For Can, this is where one of the major challenges of the Transnational Red Sea Center and the diplomatic strategy of the FDFA lies.

« These corals are priceless, and we must protect them. Apparently, their greatest threat comes from overfishing and tourism. But this threat also comes from land-based activities, such as agriculture, mining and industry, which dump waste and toxic products into the seas. And here our work becomes delicate. Not all Red Sea countries are equally responsible. Some have stricter environmental laws, stricter controls on fishing and tourism. Our mission is to stop these threats at source. The results of the expedition will reveal, perhaps, that one country is polluting more, or that ships from another country are responsible for overfishing. We will then have a delicate negotiation job to do, where we will have to take each country separately and ask them for protection actions, which will not necessarily be the same as those asked of their neighbours. This will take years. But if we don't do it, it's almost useless. »

Overfishing in the Red Sea

Aboard the *Fleur de Passion* – Egyptian waters

There is only a week's sailing left before arriving in Aqaba. Anders observes the coral samples they have collected during various dives in Egypt. For several days they have been exposed to very high temperatures in the aquariums on board.

He is pleased to observe that these corals, like most of those sampled throughout the trip, do not suffer from bleaching.

As the expedition draws to a close, scientists aboard the Fleur de Passion can now confirm that the resistant corals, initially discovered in Israeli waters, are present along the Gulf of Aqaba. This result is becoming a major argument for the protection of these reefs.

Few operations are now planned before arrival in Aqaba. The atmosphere on board is relaxed, the scientists are starting to prepare the material that will have to be unloaded at the quayside and are making sure that all the coral specimens that have been collected are ready to be sent to the laboratory as soon as possible.

Aboard the *Fleur de Passion* - Egyptian waters
The sailboat passes the Egyptian city of Nuweiba. Anders thinks back on the expedition.

« *Science has a very important role in society, but it cannot survive on its own. Too often, the results of our research, of our work, remain confined within the confines of scientific communities. This makes it difficult to understand the usefulness of what we do. Science must not escape from the "real" world, it must take into account our social and political realities. This is how we can bring about change. And it is my hope that the Transnational Red Sea Center and the Red Sea expeditions can make a real difference.* »

Someone on board is pointing at Nuweiba. He says that according to legend and some pseudo-scientific studies, it was here that Moses split the Red Sea in two to allow the Israelites to flee.

Anders bursts out laughing.

« *The parting of the Red Sea is the last thing I want at this moment.* »

Eilat Coast, Israel
Anders is surrounded by several students at the seaside in Eilat. He explains the conclusions of the expedition they have just completed.

« *The results were rather positive, most of the corals we collected proved to be resistant, as we had hoped. But this is only the beginning. Over the next two years we will explore the rest of the Red Sea. It will be important to see what we can find in the*

south, between Yemen and Eritrea. This is the region where the sea is the warmest... In temperature, but also politically..... »

He turns to the students with a smile on his face.

« I hope that some of you will be on board during these upcoming expeditions. »

One of the students asks Anders how all this research could help save other corals around the world.

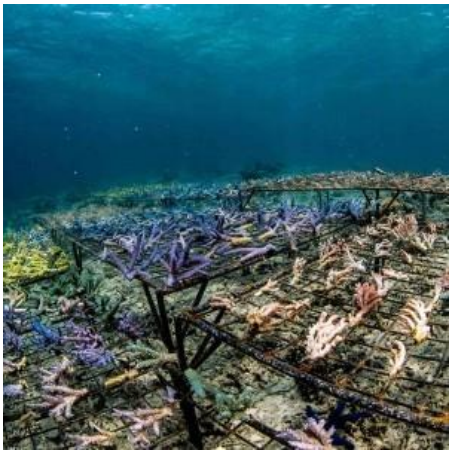
« Depending on what we discover in the next few years, we might consider planting Red Sea corals in other parts of the world, with the aim of repopulating dying reefs. Just here, 100 meters from the coast, we have nurseries where we grow corals that we use for our tests. These same corals can represent real hope. Let's go and see them. »

On the beach, Anders and the students put on their wetsuits and prepare their diving equipment. They enter the sea, until the water reaches their necks. They put on their masks and disappear underwater.

Very quickly, a few meters below the surface of the sea, nurseries appear. This "coral farm" is made up of metal rods of various shapes, on which fragments of coral are attached or hung, to let them grow before being analysed in the laboratory or replanted elsewhere.

Swept by the currents, the corals oscillate back and forth. Under the light of the sun shining through the waves, the scene becomes hypnotic.

On the images of the nursery corals
END CREDITS



Corals nursery

DIRECTION

The subject

I have been interested in ocean-related problems for several years and this interest has led me to make several films on subjects such as the survival of corals in Fiji, the setting up of marine protected areas in French Polynesia or seaweed aquaculture in Zanzibar. In addition to this, there is the film After the Flood on the consequences of rising sea levels, which is currently at the beginning of filming.

I heard about the Red Sea expedition and the Transnational Red Sea Center through Samuel Gardaz, vice-president of the Pacific Foundation (who owns the sailboat Fleur de Passion), whom I have known for several years. In addition to the obvious potential to tell the story of a great scientific discovery and to follow a human adventure aboard a sailing ship, what interested me was the geopolitical dimension and the place of science in diplomacy.

Being in regular contact with marine biologists, they have often shared with me the questions they have about the usefulness of their work and a certain frustration that their research does not have a real impact on socio-political decisions today. Moreover, as the debates on climate change often reveal, the positions taken by the scientific communities are often questioned by certain political leaders.

Thus, telling the story of a scientific expedition in one of the most beautiful seas in the world and bringing it to life in the context of a sensitive geopolitical reality highlights exciting issues. It explores the usefulness of science and its potential to cross borders to bring about real collaboration between countries to protect the environment they share.

Early in my research, I met and interviewed Anders Meibom at the EPFL, who confirmed his interest in participating in this documentary. He was a great help in establishing contact with the FDFA.

At a meeting in Bern, followed by a few telephone conversations, diplomat Can Tutumlu told me about the ambitions of the FDFA and the diplomatic challenges they face. He and FDFA spokesman Pierre-Alain Eltschinger undertook to inform me of the next steps in the negotiations and to give me access to them (be it conferences, meetings with leaders or other events) whenever possible.

It was therefore with concrete contacts and solid foundations that I began to develop the idea of the film.

The dispositive

During my career, I had the opportunity to make two documentaries during scientific expeditions at sea. The first experience lasted one month aboard the Marion Dufresne, one of the largest French scientific ships, with a team studying a seamount 700 km off the coast of Madagascar. The second expedition took place for a week on board a smaller vessel on Curacao. The ship had a submarine at its disposal to search for deep-sea corals. Two projects of different size and ambition, but which allowed me to develop a very good experience of filming in particular conditions and a good understanding of how the days on board scientific vessels unfolded. They also revealed to me the potential of this environment to tell human stories in immersion.

It is therefore mainly in this way that I wish to tell the story of The Last Corals. The expedition to the Red Sea will be the common thread of the film, which will be followed chronologically since its departure from Aqaba. By developing a close relationship with Anders and the other scientists, we will be able to follow and understand the operations and experiments carried out on board, but also to capture the human dimension of such a journey: the tensions, the moments of calm, the shared joys…

It is planned that scientists from the various countries bordering the Red Sea will be present on board the *Fleur de Passion*, which will also allow parallels to be drawn between the microcosm of the expedition and the political situation surrounding it.

We will dive into the waters of the Red Sea to discover the beauty of its reefs and its biodiversity, but also to witness the threats to this ecosystem, be it the consequences of pollution, overfishing, etc. These underwater shots will allow some lyrical but also symbolic sequences, such as this image of the wreck of a tank now transformed into a coral reef.

The expedition will take about three months. My cinematographer and I plan to organise three or four filming trips aboard the Fleur de Passion, during the first and last part of the expedition, and during one or two key stages in the middle of it. However, a member of the Pacific Foundation on board the yacht will document the entire voyage and give us access to her filmed footage, allowing us to integrate into the narrative any important events that take place during our absence.

I do not wish to use a narrative voice-over, but rather to convey all the information useful to the understanding of the film primarily through conversations between the characters, in action, supplemented by in situ interviews. These moments in front of the camera should also allow the characters to open up and reveal their emotions

during the adventure. I will never be present, neither on screen nor on sound, so these exchanges will be between protagonists and spectators.

A few rare archives illustrating past tensions and conflicts between the countries of the Gulf of Aqaba will make it possible to put into images the political context of the region and show the evolution of the relations between these nations, which today manage to collaborate with a common environmental goal.

Treatment of the main characters

As the main protagonist, Anders will weave the red thread of the film. I would follow him from his first movements upstream of the expedition, capturing his exchanges with students, colleagues and crew members in immersion. To complete the information collected in this way, I would do interviews in situ, and often in the action.

At the same time, I would follow the negotiations undertaken by diplomat Can Tutumlu and his team. I will conduct interviews with Can in his office in Bern, which will become sequences that will run throughout the film. These interludes will be used to summarise the challenges, obstacles and successes of the negotiations, thus always placing the work of the scientists in the geopolitical context.

The film crew

As space on board the *Fleur de Passion* is limited, it will be necessary to work in a reduced team for filming on the boat. The Pacific Foundation is committed to ensuring us two places on the boat during the periods when we wish to embark. I will therefore work with a cinematographer and I will be in charge of directing and sound recording, an area in which I am at ease, thanks to my experience in this role on Daniel Schweizer's last two feature-length documentaries, as well as on most of my previous work. Having acquired a solid experience in underwater filming, I would also be in charge of capturing underwater images.

Should we be on board the Fleur de Passion during exceptional events that require the intervention of the FDFA, for example if the coastguards were to prevent the boat from crossing a border, we will have a B team at our disposal who will be able to film Can Tutumlu's work in Switzerland, simultaneously. A parallel editing between what the two filming teams will have filmed at the same time and in different places will then bring out a strong dramatic potential.

CV FABIANO D'AMATO – *Author / Director*

CV EMMANUEL GETAZ – *Producer Dreampixies*

CV GOYAVE – *Producer*

FABIANO D'AMATO - Réalisateur

Nationalités : Italie & USA / né le 17.02.1986
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ETUDES
University of Westminster, London / Bachelor in Film and TV Production

FILMOGRAPHIE SELECTIVE

Réalisateur

Grock, ombres et lumières d'un clown de légende (2019) – *ARTE / RTS – 52'*
Documentaire explorant la vie parfois controversée du célèbre clown suisse Grock (co-réalisateur)

A Common Challenge (2019) – *IUCN - 14'*
Documentaire sur le lien entre aquaculture et conservation marine à Zanzibar

At The Edge of Light (2019) – *Sagax Entertainment - 13'*
Documentaire suivant une expédition à la recherche des coraux profonds des Caraïbes

Te Tai Nui A Hau (2018) – *PEW – 26'*
Documentaire sur un projet d'aire marine protégée en Polynésie Française

The Last Frontier (2017) **–** *IUCN – 26'*
Documentaire suivant une expédition scientifique sur un mont sous-marin dans la haute-mer de l'Océan Indien

Rockin' In The North (2013) **-** *D'AmatoFilms (CH) - 28'*
Documentaire explorant un petit village suédois coincé dans la culture Rockabilly des années 50

Monteur

Indiens en Sursis (2012) **-** *RTS (Temps Présent) / Réalisé par Daniel Schweizer* **-** *28'*
Reportage sur les menaces qui pèsent sur les Indiens d'Amazonie

Assistant Réalisateur

Amazonian Cosmos (2019) **–** *Amka Films (CH) / Réalisé par Daniel Schweizer – 75'*
Long-métrage documentaire suivant le regard d'Indiens d'Amazonie sur notre monde occidental

Trading Paradise (2016) - *HesseGreutert Films (CH) / Réalisé par Daniel Schweizer – 78'*
Long-métrage documentaire révélant les conséquences de l'extraction de matières premières dans le monde et l'implication de la Suisse dans cette problématique

Dirty Gold War (2014) - *Rita Productions (CH) / Réalisé par Daniel Schweizer - 75'*
Long-métrage documentaire sur l'or et son exploitation destructrice, de l'Amazonie aux Andes

CV Emmanuel Gétaz

Né en 1965 à Lausanne, Emmanuel Gétaz crée en 1983, avec un ami d'enfance, le Cully Jazz Festival, aujourd'hui le deuxième festival de jazz de Suisse.

En 1989, il fonde une agence de management artistique, puis il rejoint le Montreux Jazz Festival, comme bras droit de Claude Nobs durant 10 ans.

Il devient ensuite le producteur exécutif du Spectacle d'Ouverture d'Expo.02 avant de créer en 2003 Dreampixies, société de production audiovisuelle.

Il co-écrit le scénario, assure la production musicale et la coproduction de « **Retour à Gorée** », avec Youssou N'Dour (réalisation de Pierre-Yves Borgeaud - 2007).

Primé à de nombreuses reprises (Prix du meilleur documentaire au Pan African Film Festival de Los Angeles 2008 et Prix du meilleur documentaire suisse au festival Visions du Réel de Nyon 2007, entre autres), ce film est distribué internationalement.

Emmanuel Gétaz a également co-écrit et co-produit le documentaire musical avec Gilberto Gil « **Viramundo** » (réalisation de Pierre-Yves Borgeaud - 2012). Coproduit par la SRG SSR, ARTE et Orange Cinéma Séries, le film est également coproduit par Urban Factory et distribué par Urban Distribution International. Le film est sorti en salles en Suisse, France, Grande-Bretagne, Irlande, Belgique, Hollande, Luxembourg, Pologne, Italie, Portugal, Lituanie, Etats-Unis et Brésil.

Emmanuel Gétaz a co-écrit et produit « **Foot FM** », documentaire de télévision sur le football féminin (réalisation Régine Boichat - 2015) coproduit par la SRG SSR.

Il a co-écrit et produit le documentaire de cinéma **« Jean Ziegler, l'optimisme de la volonté** » (réalisation Nicolas Wadimoff - 2016), en sélection officielle à Locarno en 2016 (distribution suisse : Frenetic, ventes internationales : Autlook Filmsales).

Il a co-écrit et produit « **Inside Risk** » documentaire de télévision avec proposition d'interactivité (réalisation Edouard Gétaz - coproduction SRG SSR et RTBF - 2018)

Il a co-produit « **Grock, ombres et lumières d'un clown de légende** » documentaire de télévision (réalisation Alix Maurin/Fabiano D'Amato - 2019) coproduit par la SRG SSR et ARTE.

Il a co-écrit et produit « **Citoyen Nobel** », documentaire de cinéma (réalisation Stéphane Goël - 2020) sur le Prix Nobel de Chimie 2017 Jacques Dubochet, coproduit par la SRG SSR (distribution suisse : Agora Films, ventes internationales : Sweet Spot Docs)

Emmanuel Gétaz a produit cinq courts-métrages de fiction, « **Ecce Umbra** » (Franck Hoursiangou – 2014), « **On n'est pas ici pour être mort-vivant** » (Régine Boichat – 2014), « **Blind date à la Juive** » (Anaëlle Morf – 2015 – 150 sélections officielles, 30 prix), « **Tonnerre de Brecht** » (Nicolas Rohrer – 2016) et « **Tout se Mérite** » (Pierre Amstutz Roch – 2019).

GOYAVE FILMOGRAPHY

GOYAVE has been collaborating for 20 years with the main French television channels in the production of documentaries, reports and short fiction films. Since its creation, Frédéric Malègue, producer and director, has always shown his willingness to open the viewers to the realities of other countries and cultures. In addition to short films on Beirut and the Tunisian revolution, he has produced various documentaries in Vietnam, India, Palestine, Venezuela, Chile and the Dominican Republic.

Selective filmography

Claude Sautet, calm and dissonance (documentary by Thomas Boujut and Amine Mestari, 52', 2020)
Prebuy ARTE France.

Rigour and perfectionism. These are undoubtedly two of the words that best define Claude Sautet.
This meticulous, almost maniacal care, which gives him absolute control over the smallest detail, is his trademark. It also reveals another aspect of his personality, that of a sensitive being, perpetually prey to doubt. Claude Sautet has nourished all his films with himself.

Grock, shadows and lights of a legendary clown (Documentary by Alix Maurin and Fabiano D'Amato, 52', 2019)
Creative Documentary - HD - Coproduction Screenshot Productions, DreamPixies, Broadcasted Arte and RTS

How did the famous Swiss clown Grock reign for half a century on all circus and music-hall stages, to the point of becoming one of the most famous artists in the world? Thanks to the man behind the mask, Adrien Wettach, the other side of the virtuoso clown, that of an entrepreneur who was a precursor of show business, who turned his character into a product. At the risk of going astray during the Second World War.

Johnny Clegg, the White Zulu (Documentary by Amine Mestari, 52', 2019)
Documentary music - HD - Coproduction Screenshot Productions, Arte Broadcasting, International Sales Arte Distribution

With the hit "Asimbonanga", the South African musician Johnny Clegg became a star. He had the courage to unite blacks and whites by mixing English and Zulu, African rhythms and rock and became the symbol of the anti-apartheid struggle. This film tells his story and that of his music which espouses the history of South Africa and his long journey towards freedom.

Vietnam War, at the heart of secret negotiations (Documentary by Daniel Roussel, 52', 2014)

Documentary history - HD - Coproduction Al Di Sopra Production and Arte France, Diffusion Arte, Public Senate
- Grand prix of the Pessac Festival 2014
- FIGRA Nomination in the category Land(s) of History

From 1970 to 1973, the American and North Vietnamese delegations met in the greatest secrecy, in the suburbs of Paris, to prepare for peace. A plunge into history with, as a bonus, excerpts from these bitter negotiations.

Les Niños du kitesurf (Documentary 26' by Frédéric Malègue broadcast on France 3 programme Thalassa, 2012)

A Frenchman saves young delinquents from the favelas of the Dominican Republic by teaching them kite surfing, more than a sport, a promise of employment and social status...

Des Étoiles et des Hommes (Documentary by Samuel Albaric and Pierre François Didek, 52', 2009)
Immersion Documentary - HD - Coproduction CEA, Diffusion Cinécinéma, CNDP
- Nancy Researchers' Film Festival, France (April 2009)
- FICFA, Canada (September 2009)
- Let's find out in Oullins, France (November 2009)
- RISC Festival in Marseille, France (November 2010)

On the occasion of the International Year of Astronomy in 2009, this Documentary proposes to take us behind the scenes of one of the largest astrophysics services in 2009 (The SAP) and to discover, behind the research itself, those who drive it forward.

Gaza Memories (Documentary by Samuel Albaric, 46', 2007)
Documentary - DVCam
- Images in library in Paris, France (2008)
- Tiburon International Film Festival (TIFF), USA (March 2008)
- Brooklyn International Film Festival, USA (May/June 2008)
- Soleluna doc Fest in Palermo, Italy (July 2008)
- International New Generation Film Festival in Lyon, France (September 2008)
- Festival des libertés in Brussels, Belgium (October 2008)
- Arab Film Festival in San Francisco, USA (October 2008)
- Interviews Belfort International Film Festival, France (November 2008)
- FIPA, International Festival of Audiovisual Programmes in Biarritz, France (January 2009)
- Al Ard Doc of Sardinia, Italy (February 2011)

The film is a succession of phone calls between Wissam, a young Palestinian, and Sam, a young French director. Together they evoke memories of a phantasmagorical Gaza where bakers seduce young girls and vegetable sellers take us into the fabulous world of the Djinns.

Hacienda Redemption (investigation, 35 ', 2006)

> *In Santa Teresa, Venezuela, Alberto Vollmer has set up a rehabilitation center for young people used as paid assassins by Venezuelan mafias..*

APPENDIX

Letter of support Pacific Foundation

FONDATION
PACIFIQUE

A qui de droit

Genève, le 6 octobre 2020

Objet: soutien du projet de documentaire télévisé à bord de *Fleur de Passion*

Madame, Monsieur,

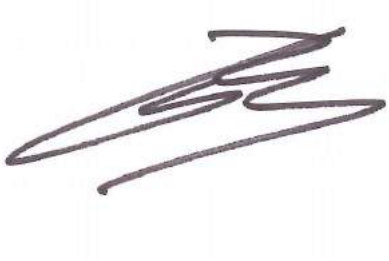
Par la présente, la Fondation Pacifique atteste être en lien avec M. Fabiano D'Amato dans le cadre de la préparation de son projet de documentaire télévisuel à bord du voilier suisse *Fleur de Passion* dans le cadre de l'expédition en mer Rouge en partenariat avec l'EPFL, qui doit démarrer en 2021 dès lors que toutes les conditions essentielles le permettent.

Dans cette perspective, la Fondation Pacifique confirme mettre tout en œuvre pour permettre à M. D'Amato de mener son projet à bien au plus juste de ses objectifs en même temps que ceux-ci tiendront compte des exigences de l'expédition et de ses missions.

Nous nous tenons à disposition pour plus ample information.

Avec nos meilleures salutations,

Samuel Gardaz
Vice-président pour les affaires publiques
Membre fondateur



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