THE OCEAN, OUR COMMON PROJECT

BY ROMAIN TROUBLÉ, GENERAL SECRETARY OF TARA EXPEDITIONS

At the dawn of this new century, nearly seventy years after the United Nations was founded, where is the humanitarian vision that inspired the world’s leaders in the postwar years?

Undoubtedly the last fifteen years have been dominated by the digital revolution and Asia’s rise to take centre stage in world politics. These events have changed our view of the world and place the short, medium and long-term reflections of our leaders at the mercy of the rolling news agenda. Inequalities of every kind, widening on a daily basis from one continent to the next, encourage segregation and the development of a diverging world. And yet science, not to mention common sense, teaches us that climate change and population growth, which we are already experiencing, concern us all whether we live in developed or developing countries.

Such challenges require a comprehensive and concerted response from the international community.

Given the current situation it might seem inappropriate, even ridiculous, and the preserve of a handful of impassioned idealists to be worrying about the ocean. Well, perhaps this ocean, this vast expanse which connects mankind and covers three quarters of our planet, could be a source of inspiration for us. After all, freedom and the common good, ideas shared by all peoples, were undoubt-edly the inspiration that in 1982 gave rise to one of the most ambitious treaties ever signed: the Convention on the Law of the Sea.

I believe that, despite our diverse interests, the ocean can reunite us once again through not only its symbolic value but also its vastness. It is blindingly obvious that, by size alone, the ocean plays a key role in creating the conditions necessary for life on Earth, such as the air we breathe...

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KEY DATES IN THE STORY OF THE TARA

SINCE 2003 TARA EXPEDITIONS HAS BEEN STUDYING THE IMPACT OF CLIMATE CHANGE ON THE OCEANS.

2015

MAY

Initial major results of the Tara Oceans expedition published in the scientific journal "Science".

MAY-NOV. 2014

Tara Mediterranean expedition

Scientific mission to study plastic pollution in the Mediterranean and raise awareness of local environmental issues.

SEPT. 2009-DEC. 2013

Tara Oceans and Tara Oceans Polar Circle expeditions

Thirty month scientific expedition around the world to study plankton ecosystems and their sensitivity to climate change, sails around the Arctic Ocean for scientific and educational reasons.

SEPT. 2006-FEB. 2008

Tara Arctic expedition

Drifts 507 days and 2,600 km across the Arctic Ocean for the European research programme DARWIN.

2004-2006

Carries out six missions in Greenland, Antarctica, Patagonia and South Georgia.

JAN. 2005

Artists Sebastião Salgado and Pierre Huyghe join the Tara in the Antarctic.

The Brazilian photographer for his project Genesis and the French artist for his film "A Journey That Wasn't".

NOV. 2004

Expedition to South Georgia with the Montagnes du Silence group of deaf and hearing climbers as they follow in the footsteps of Ernest Shackleton.

JUNE-SEPT. 2004

Researchers of the Arctic Ecology Research Group (GREA) join the Tara to assess the situation northeast of Greenland.

13 OCT. 2003

The Seamaster becomes the Tara with Stéphane Bourgeois and Agnès Troublé.

DEC. 2001

Tragedy occurs when Sir Peter Blake is killed in Brazil, during an expedition with the Seamaster.

1999

Legendary yachtsman Sir Peter Blake changes her name to Seamaster.

1990-1996

With the Antarctic, Jean-Louis Stéphane undertakes various missions to Antarctica, Patagonia and Spitsbergen.

1989

Explorer Jean-Louis Stéphane has the Antarctica built at the SFCN shipyard from a design by Luc Bouvet and Olivier Petit.
nearly eighteen months since the conclusion of Tara Oceans, the most extensive plankton study ever undertaken across the world’s seas, five articles published in the scientific journal Science are revealing the secrets of the 35,000 samples collected during the expedition. At every level these results have changed forever our understanding of the marine ecosystem.

PLANKTON: LIFTING THE LID ON A MYSTERIOUS WORLD

May 22, 2015 will forever remain a key date in the history of Tara Expeditions. On that day a certain nervous excitement tinged with relief affected all the researchers connected with the Tara Oceans expedition. Why? Because it was the official release of the results of the expedition undertaken by the schooner from 2009 to 2013. Five articles describing in detail the expedition’s findings were published in a special edition of the world-renowned scientific journal Science. The figures are mind-boggling. At the microbial level alone no less than forty million genes were sequenced and most of these were previously unknown to science (mostly viruses and bacteria).

As for the eukaryotes—organisms whose DNA is contained within the nucleus, unlike bacteria—nearly a billion DNA barcodes drawn from the sequences indicated the existence of 150,000 different genetic types. And as several species might belong to the same genetic type, the number of planktonic eukaryote species could exceed one million despite only 11,000 having been described to date! Moreover, the biodiversity of these species is much greater than previously thought, and far exceeds that of bacteria. Better still, the analyses are reaching saturation point so that each new sample is producing fewer and fewer new genes. In other words, the teams working on Tara Oceans have succeeded in doing what they set out to do: collect virtually all the plankton species living on our planet.

A WORLD OF INFINITE INTERACTIONS

This observation is not, in fact, confined to the field of oceanography. For the very first time a major ecosystem has revealed itself in its virtual entirety. If we take the example of a forest, we are familiar with all its principal organisms but what do we know about the viruses in the soil, the small parasites and the intestinal bacteria of the various animals that inhabit it?

Thanks to the discoveries of Tara Oceans, the upper layer of the ocean has become the first major ecosystem to be described in its virtual entirety.
in its largest mammals. It is the first of its kind and gives, without a shadow of a doubt, a better understanding of how ecosystems work. It also gives us insights into evolution and ecology. Especially since the researchers aboard the Tara didn’t restrict themselves to listing the organisms living just under the surface of the ocean; instead they also tried to understand how they interact with each other through the use of complex computer models that were validated by the results drawn from the samples. Initial observations show that environmental factors (pressure, salinity, etc.) had less influence than expected on the spatial organization of species; but above all this pioneering mapping of interactions between plankton species reveals that parasitism is the most widespread mode of interaction, ahead of predation, symbiosis and even competition. Foremost what this means is that when a central species—one that is parasitized by many others—disappears, numerous other species are affected.

TENS OF MILLIONS OF GENES SEQUENCED

In addition to the “plankton fishing”, each sampling operation carried out during Tara Oceans was an opportunity to measure a large number of the water’s physicochemical parameters: salinity, pressure, temperature and quantity of light. This data was aligned with the results of the vast gene sequencing of the plankton. Conclusion? It’s mainly temperature that determines the composition of species at any given point. This information might appear to be of capital importance in this period of climate change but it is just one of many discoveries unveiled on 22 May 2015 in the journal Science. Distribution of plankton across the oceans, mode of spreading viruses through currents, description of microbial communities in the ocean: listing the many scientific advances published is, truth be told, a difficult task. All these results, however important they may be, are merely the first step in this hitherto ignored field. We can safely say that plankton has many more secrets for us to discover. All the more so because tens of millions of sequenced genes resulting from the Tara Oceans expedition, amounting to 80% of all the marine genes deposited in data banks, are already online and available to scientists the world over.

In the coming years and decades the scientific community will surely continue to provide us with insights into the mysterious world of plankton. Major discoveries of the future that share a common starting point in the shape of a grey and orange schooner called Tara... ¬

Y.S.

TARA IN FIGURES

10 EXPEDITIONS over 12 years
320,000 KILOMETRES sailed across the globe
350 PERSONS of 40 NATIONALITIES have taken part in expeditions aboard the Tara
2,000 DAYS of expedition time
40 COUNTRIES CROSSED
75 LABORATORIES and SCIENTIFIC INSTITUTES involved
21 FIELDS of scientific research: marine biology, molecular biology, taxonomy, oceanography, bioinformatics, biogeochernistry, genomics, imaging, ecology, modelling, microbiology (bacteriology and virology), meteorology, energy budget, nivology, glaciology, zoology, ornithology, archaeology, geology, chemistry.
THE OCEAN IN THE 21ST CENTURY

"THE OCEAN IN THE 21st CENTURY" WAS AN OBVIOUS CHOICE FOR THE TITLE OF THIS TENTH ISSUE OF TARA EXPEDITION NEWS. THERE'S A "HIGH SEAS EMERGENCY" IN PROGRESS. THE OCEANIC MASS OF OUR PLANET THAT REGULATES THE CLIMATE ON A GLOBAL SCALE IS SUFFERING FROM WARMING AND ACIDIFICATION. THESE UPHEAVALS AFFECTING THE OCEANS LEAD IN TURN TO AN EROSION OF MARINE BIODIVERSITY. TORRENTIAL RAINS AND PERIODS OF DROUGHT, HURRICANES AND DEVASTATED REGIONS: THE SITUATION HERE ON EARTH IS STARTLING BY ANYONE’S ASSESSMENT.

A COMPLEX SPIRAL OF EVENTS IS PROVOKING SERIOUS CHANGES IN THE CLIMATE. THE TIME HAS COME TO ACT WITH DETERMINATION AND COURAGE, TO FORGE AHEAD AND MAKE THOSE DIFFICULT DECISIONS. WITH SCIENCE HELPING US SEE MORE CLEARLY, IT’S UP TO US TO OPEN WIDE OUR EYES!

M.T.

CO2 CLIMATE SYSTEM P. 6-7
ARCTIC POLAR RESEARCH P. 8-9
INTERVIEW ANNE HIDALGO: "EVERYBODY SHOULD BE CONCERNED ABOUT CLIMATE CHANGE " P. 10-11

Expedition schooner Tara under full sail, taking science to the high seas. © F. Latreille / Tara Expeditions
CLIMATE SYSTEM: HIGH SEAS EMERGENCY

CLIMATE IS REGULATED PRIMARILY BY THE EARTH’S OCEANIC MASS. AND YET THE MUTATIONS AFFECTING THE OCEAN ARE STILL NOT BEING TAKEN SUFFICIENTLY INTO CONSIDERATION DURING CLIMATE TALKS. BUT VOICES CALLING FOR RAPID CHANGE ARE MAKING THEMSELVES HEARD.

To better understand how the ocean regulates our climate we first need to look at the fundamental role it plays in our survival. For a start, it regulates the Earth’s temperature by absorbing, storing and transporting, through marine currents, the heat of the sun and, through the greenhouse effect, 93% of the excess heat generated by human activity. As a result its influence is unquestionably a key factor in the evolution of our planet’s climate. And when you take into account its ability to absorb the carbon dioxide (CO₂) that our activities also produce, it becomes clear that, in addition to being the world’s thermostat, it is also a massive carbon pump. While the oceans amount to seventy percent of the Earth’s surface, they absorb a quarter of the CO₂ humans discharge into the atmosphere every year and more than half of the oxygen we breathe.

Moreover this increase in temperature means that the ocean’s water is expanding which, combined with the thaw of glaciers and continental ice, translates into a rise in sea levels (the GIEC, France’s intergovernmental panel on climate change, predicts a rise of between 26 and 82 cm by 2100). The absorption of CO₂ engenders, for its part, a change in the chemical make-up of the sea: pH values decrease and the water becomes more acidic. When this happens scientists have observed a decrease in the number of carbonate ions that marine plants and animals use to grow skeletons, shells and other calcium-based structures. Imagine a world without familiar foodstuffs such as oysters, mussels and other molluscs and crustaceans...

This latter point underlines the impact such threats have on the evolution of life on Earth. The strain our way of life is placing on marine ecosystems is increasing.

"CO₂ absorption engenders a change in the chemical make-up of the sea"

*Launched during World Oceans Day* (Paris, 8 June 2015), the Ocean’s Call for Climate aims to mobilize and call the general public to witness the grave and irreversible changes affecting the ocean. *© guillaumebounaud.com*
Not only are the seas warmer and more acidic, they are also being depleted of oxygen. Earth’s great ocean is truly under pressure. So what of the consequences? We can expect marine diversity to weaken as organisms struggle to adapt their feeding habits, their development and organization. Eventually these changes will deplete ecosystems which means, in short, declining food resources for human populations. Is our lack of knowledge about these processes preventing us from coming to grips with the question of ocean sustainability? And when we put into the mix the effects of overfishing and pollution, the seriousness of the situation is only too apparent. The ocean can no longer provide and produce as it once did, and it’s a negative trend. Food safety is an emerging issue, in particular in the vulnerable populations of the South where fish is the main source of animal protein.

A WAKE-UP CALL FOR THE OCEAN

As for coral reefs, those oases of life whose environmental and economic value is estimated to be twenty-seven billion euros per year, they are beginning to disappear in various parts of the globe. Not only do they protect coastlines and provide as it once did, and it’s a negative trend. Food safety is an emerging issue, in particular in the vulnerable populations of the South where fish is the main source of animal protein.

"We used to think the sea was infinite, but the fact is we have reached certain limits and we now need to change our view of the oceans."

Romain Troublé

view of Romain Troublé in this period of debate and expectations surrounding COP21. Romain's commitment draws on a thorough knowledge of marine environments and his experience as a sailor: "We are overfishing certain species and yet we know absolutely nothing about eighty percent of the marine biomass. Science, medicine, industry, energy production and pharmaceuticals are all sectors that could benefit from taking a sustainable approach to these unexplored resources. "But are we embarassing on a lost cause? Not yet. On the contrary, in June 2014 Tara Expeditions and a handful of partners set up the Ocean & Climate Platform to press international decision-makers, countries, governments and large organizations on the issues facing the oceans. Since then more than sixty entities have joined the platform so that, today, its members include scientific research institutes, non-governmental organizations and leading members of civil society and the economic world. The platform’s five key proposals call for: the strengthening of the ocean’s capacity to mitigate climate change through the creation of protected marine ecosystems that function as carbon sinks; more research into how the climate and the ocean interact; finance for coastal regions to encourage them to adopt sustainable solutions for marine and coastal biodiversity; and measures to encourage the development of innovative solutions in the sectors of energy, food and shipping. Similar to all ecosystems, the ocean is capable of adapting but the speed of change is too fast for certain species. Which is why it is important to highlight the notions of time, of protecting vulnerable zones and of resilience that the platform conveys through its policy recommendations and the Ocean’s Call for Climate.

Launched during World Oceans Day, a UN initiative held in Paris on 8 June 2015, the Ocean’s Call for Climate aims to mobilize and "call the general public to witness the grave and irreversible changes affecting the ocean. " It’s a question that continues to be absent from international climate talks. The aim is to increase the pressure on political decision-makers and major economic players on the eve of the United Nations’ twenty-first climate conference (COP21). And with the hope that, little by little, all the parties will get on board. •

ANNE-SOPHIE NOVEL

Learn more: Ocean & Climate Platform Studies

www.ocean-climate.org

HIGH STAKES AT THE COP

Annual meeting of the 195 countries signed up to the UN’s Convention on Climate Change, the Conference of the Parties to the United Nations (COP) allows member states to negotiate and define their contribution to tackling climate change. COP21, also known as "Paris 2015 ", is the twenty-first conference of its kind. It aspires to be the successor to the Kyoto Protocol. Delegates, ministers and heads of state must reach a consensus on reducing greenhouse gases, implement actions to mitigate the effects of climate change and finance programmes to help vulnerable populations adapt. By the end of the summit the 195 countries will, it is hoped, have come to a binding agreement which will take effect in 2020.

Seawater expands as the temperature of the oceans rises and CO₂ absorption engenders changes to its chemical make-up. The result is a never-ending cycle of disruption among coastal and marine ecosystems. © Ocean-climate.org

One of the aims of the Ocean & Climate Platform, launched in 2014, is to facilitate our understanding of interactions between the ocean and the climate through, in particular, educational materials. © Ocean-climate.org
July 2015, the Tara in her element during a campaign of research along the east coast of Greenland. © F. Aurat / Tara Expeditions
POLAR RESEARCH: ICE IN THE WATER

LIKE A WHALE IN MIGRATION, THE POLAR SCHOONE RO TARA RETURNED TO SERVICE IN THE ICE SHEETS IN 2015; DESTINATION GREENLAND, DESIGNED FOR THE ICY POLAR SEAS, SHE SPENT LAST SUMMER IN THE ELEMENT SHE KNOWS BEST.

Sea ice, or how the Tara went back to fundamentals. Already back in 2004 our favourite polar sailing boat, under her then new owners Étienne Bourgois and Agnès Troublé (agines b), undertook an initial research expedition to Greenland in partnership with the Arctic ecology research group GREÂ. Étienne Bourgois, Jean Collet and ornithologists Olivier Gilg and Brigitte Sabard took part in this first voyage. In early July 2015 they decided to renew acquaintance with the east coast of the great white island in order to study its fauna and collect information which could then be compared with the data of eleven years ago.

TARA ARCTIC: A FIRST SINCE THE DRIFT OF THE FRAM IN 1893

Nearly ten years ago the Tara’s first polar mission, known as Tara Arctic (2006–2008), was directed by Jean-Claude Gascard, oceanographer at the Pierre and Marie Curie University, CNRS research director, and coordinator of the European scientific programme DAMOCLES (2005–2010). It was a massive expedition which involved the ship drifting with the polar sea ice in order to study the effects of global warming around the North Pole, a feat last attempted in 1893 by the Norwegian explorer Fridtjof Nansen and his sailing ship the Fram.

After fifteen months locked in the ice pack, the Tara finally broke free and was able to head home with a scientific treasure trove of data collected from the atmosphere up to a height of 1,500 metres and from the freezing Arctic Ocean down to a depth of 4,000 metres. Air and water temperature, pressure, salinity, wind force and the ice sheet were all closely monitored in real time.

ICE COVER

In 2013, in association with CNRS research director Éric Karsenti at the European Molecular Biology Laboratory (EMBL), Tara Expeditions concluded an extraordinary adventure that was Tara Oceans with a second Arctic drift, known as Tara Arctic (2016–2018), directed by Jean-Claude Gascard, oceanographer at the Pierre and Marie Curie University (Paris), shares this aim. She studies interactions between sea ice and the polar oceans. Satellite observations of the cryosphere over the last thirty-five years show a large decrease in the summer range of Arctic sea ice. In 2012, which saw a record minimum for the period, ice cover was estimated to be diminishing at a rate of fourteen per cent per decade. "Over the last ten years we’ve talked a lot about the reduction in ice volumes, which became apparent from ice thickness data collected in the late 1990s," explains the CNRS research director. "Even though the quantity of perennial ice seems to have stabilised in the last two or three years, we cannot yet say if the trend has been reversed or not because we lack perspective. In recent winters the reduction in ice cover has been much less significant despite sectors such as the Barents Sea seeing ice range retreat at a rapid rate."

LOOKING TO THE OCEAN AND ICE FOR CLIMATE PREDICTIONS

The stakes are high in this Atlantic sector of the Arctic Ocean where fishing interests and all kinds of prospecting activities exert immense influence. In summer it’s the atmosphere which contributes to the thaw of surface ice, while in winter the ocean is instrumental in subglacial thaw. "The climate is first and foremost the atmosphere," confirms Marie-Noëlle Houssais. "While the ocean is covered with ice it is isolated from the atmosphere but once the lid comes off, the ocean finds itself once again in contact with the atmosphere and this can lead to intense exchanges of heat and humidity."

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Climate prediction is one of the most important issues of our day. We know that data for climate predictions can be found in the ocean and, consequently, sea ice.

world of plankton. In short, Tara Oceans has changed the way we study the oceans and assess climate change. With sound knowledge of polar regions in mutation and ever-increasing scientific expertise, which has met with a positive response from the world’s research community, Tara Expeditions intends to establish itself as an international voice on environmental issues. For Étienne Bourgois, the founder of Tara Expeditions, and Romain Troublé, the organization’s general secretary, the aim is to raise awareness not only of the ocean but also of sea ice.

Marie-Noëlle Houssais, specialist in polar oceanography and sea ice at the Oceanography and Climate Laboratory (LOCEAN) of Pierre and Marie Curie University, shares this aim. She studies interactions between sea ice and the polar oceans. Satellite observations of the cryosphere over the last thirty-five years show a large decrease in the summer range of Arctic sea ice. In 2012, which saw a record minimum for the period, ice cover was estimated to be diminishing at a rate of fourteen per cent per decade. "Over the last ten years we’ve talked a lot about the reduction in ice volumes, which became apparent from ice thickness data collected in the late 1990s," explains the CNRS research director. "Even though the quantity of perennial ice seems to have stabilised in the last two or three years, we cannot yet say if the trend has been reversed or not because we lack perspective. In recent winters the reduction in ice cover has been much less significant despite sectors such as the Barents Sea seeing ice range retreat at a rapid rate."

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TARA ARCTIC: PLANNED FOR 2019–2021

Tara Expeditions’ policy recommendations, which call for the ocean to be recognized as a key factor in the climate system, draw their inspiration from the expertise of scientists. This sound basis allows the organization to position itself as a consultative body for international institutions. After launching the High Seas initiative and being granted UN observer status, Tara Expeditions can now expect to be accepted as an observer to the Arctic Council.

In the meantime the Tara has been preparing her return to the polar ice pack. A second Arctic drift, following on from the one which began in 2006, is already scheduled for 2019–2021.~
**ANNE HIDALGO: "EVERYBODY SHOULD BE CONCERNED ABOUT CLIMATE CHANGE"**

PARIS MAYOR ANNE HIDALGO HAS WORKED TIRELESSLY TO COMBAT CLIMATE CHANGE AND REDUCE GREENHOUSE GAS EMISSIONS IN THE FRENCH CAPITAL AND ITS SURROUNDING REGION. IN THIS INTERVIEW SHE TALKS ABOUT HER COMMITMENT.

![Image of Anne Hidalgo](https://example.com/image)

**TARA EXPEDITION NEWS:** Paris is a densely populated city where housing inequality is a factor in human vulnerability to climate change, and where the question of air pollution is often on the agenda. What are you, mayor, doing to tackle the effects of climate change on Paris?

**ANNE HIDALGO:** For many years now Paris City Council has been active in the fight against climate change and its effects on the quality of Parisians’ lives. The City of Paris has put together an ambitious Climate Plan (see feature box below) which aims to achieve its goals by 2020. It is absolutely necessary that we implement innovative policies to reduce greenhouse gas emissions. Paris is also committed to the concept of the circular economy. It’s a practical project for society that we should implement as quickly as possible in order to produce without destroying, to consume without wasting and to recycle without polluting. A major consultation initiative for Greater Paris, *Les États généraux de l’économie circulaire du Grand Paris*, was launched in March 2015 and this was the first step towards achieving a circular economy across a region as vast as the capital. This consultation brings together active parties and mobilizes them in a collaborative approach which embraces the French government, the Regional Council, local authorities, charities, businesses and the academic world.

If we are to combat climate change we have no other choice than to change how we do things, how we produce and consume. Two thirds of greenhouse gas emissions come from urban zones. That fact places particular responsibility on major cities. I submitted to Paris City Council in February 2015 a plan to combat air pollution—and this has been one of the main goals of my term in office—which includes measures to discourage the use of polluting vehicles. Paris is also committed to the concept of the circular economy. It’s a practical project for society that we should implement as quickly as possible in order to produce without destroying, to consume without wasting and to recycle without polluting. A major consultation initiative for Greater Paris, *Les États généraux de l’économie circulaire du Grand Paris*, was launched in March 2015 and this was the first step towards achieving a circular economy across a region as vast as the capital. This consultation brings together active parties and mobilizes them in a collaborative approach which embraces the French government, the Regional Council, local authorities, charities, businesses and the academic world.

The City of Paris adopted its climate plan on 1 October 2007 as an active response to global warming. Objectives of the plan are to reduce by a third energy consumption and overall greenhouse gas (GHG) emissions by 2020—compared to 2004 figures—and to reduce by three quarters GHG emissions produced by activities in the region of Paris by 2050. Another aim of the plan is to ensure a third of the energy used by the city’s vehicles comes from renewable sources. Other goals include a reduction in the production of waste by 2020, limits on heat loss, widespread energy performance inspections, the renovation of energy-hungry housing and 100,000 new residential buildings by 2050, and initiatives to encourage Parisians to undertake specific works in their homes. The "One Parisian, One Tree" initiative to plant approximately two million trees in developing countries is one of the most symbolic measures included in Paris’s climate plan.

When it comes down to it, isn’t the hardest part finding the right way to pass these measures?

Climate change is a fact and everybody is affected by it on a daily basis. Take for example air pollution. At a local level we observe that citizens are willing to accept strong measures, and actually call for them each time there’s a peak in pollution. I think that when faced with such issues concerning public health, elected decision-makers are responsible for setting, through a democratic process, ambitious but realistic goals. And this is what Paris Council has done! But allow me to remind you that Paris cannot achieve this transition to a green economy alone. We need support from the French State because some of the regulatory tools we require depend upon decisions taken at national level and by other authorities. I believe we need to federate people more and more around a common course of action.

How much, do you think, citizens should be doing? And what should businesses, in particular those on the front line which pollute the most, what should be their contribution?

Everybody should be concerned about climate change. We have been reaching out to the inhabitants of Paris through, for example, a public conference on reducing pollution. But businesses must also take responsibility and make real the transition to a green economy. Many of them have already demonstrated their capacity for developing low-carbon solutions. I am convinced that local authorities and businesses must work together to find appropriate and environmentally-sound solutions that reconcile economic
development, employment, and protecting resources and the health of our citizens. We need to implement, together, this win-win economic model worthy of a modern major city. On the line are the future of Paris and the well-being of Parisians.

What exactly does "Paris, Climate Capital" entail?

Paris was chosen to host the twenty-first climate conference of the United Nations (COP21) and, in light of this, we must be exemplary in our role as a green capital committed to tackling the effects and causes of climate change. If the challenges are concentrated in the cities, then the cities must be capable, or so it seems to me, of pooling their energies to produce solutions. Every day innovative actions are implemented in and by cities. The Air Pollution Plan implemented by me, as well as the Consultation for a Circular Economy in Greater Paris, both show our determination in this area. We didn’t wait for the COP before starting to adapt and take action. This is an unprecedented opportunity to bring together the various active parties, to send out a message of hope for the future.

What do you think of the efforts of Tara Expeditions?

I have been following the Tara since the start of her adventures. Hers has been a marvellous adventure because she has brought to our citizens a greater understanding of the issues relating to climate change. The Tara has been careful to combine scientific rigour and information, in particular through numerous cultural and educational actions.

In raising the awareness of the current environmental crisis affecting the oceans, and of the necessity to tackle it, the Tara has become a major player.

"Businesses must also take responsibility and make real the transition to a green economy. Many of them have already demonstrated their capacity for developing low-carbon solutions."

Anne Hidalgo

INTERVIEW BY ANNE-SOPHIE NOVEL
MICROPLASTICS: LUCKLESS OCEANS

THE OCEANS HAVE BECOME RUBBISH DUMPS. SOME OF THE RUBBISH COMES FROM MARITIME ACTIVITIES HOWEVER EIGHTY PER CENT OF WASTE DISCHARGED INTO THE SEA COMES FROM THE LAND, TRANSPORTED BY SEWAGE SYSTEMS, RIVERS, WIND AND STORMS. BUT WORST OF ALL, THE VAST MAJORITY OF THE FLOATING DETRITUS IS PLASTIC.

The Seventh Continent. That’s the name often given to this ocean of plastic pollution which floats on every sea, not only on the surface but also at depth. It’s an invisible environmental catastrophe in a faraway place, but very real and extremely noxious. Marine pollution by debris can be described thus: all solid material, whether manufactured or processed, that has been discarded or flushed into a marine or coastal environment.

COSMETICS, TOOTHPASTE, WASHING MACHINES...

Each year between ten and twenty million tonnes of waste is discharged into the oceans and the fact is eighty per cent of it is plastic. Moreover, world production of plastic material has been increasing relentlessly over the last decades, amounting to 280 million tonnes in 2012. The volume absorbed by the sea is quite simply unimaginable. Today’s oceans are rubbish dumps. Through the combined action of the sun, oxidation and water currents some of this plastic waste degrades into very small pieces, microplastics, often less than five millimetres in size.

They comprise a wide range of particles that vary in size, shape, colour, density, chemical composition and source. In the form of tiny particles, known as primary microplastics, they can enter the marine environment in various ways, such as through our cosmetics, toothpastes, washing machines or industrial applications (pellets, balls, textile fibres, paint).

Eighty-eight per cent of the surface of the ocean is polluted with such tiny fragments...
Secondary microplastics, derived from the breakdown of larger plastic debris, are much greater in volume because the fragmentation process is, over time, infinite as more and more micro- and nano-particles are released into the environment. It will take hundreds of years for them to disappear. Numerous expeditions have set out across the globe to collect samples and measure the concentration of these fragments. The results show that they are today omnipresent in the marine environment, at the surface and at depth, on the coast, in estuaries, in the open sea, in the most distant parts of the globe, from the equator to the poles.

It is estimated that eighty-eight per cent of the surface of the ocean is polluted with such tiny fragments. As most microplastics are floating debris, they are borne along by currents and the wind, and accumulate on the surface of the sea. In addition, because of the rotation of the Earth, vortices (or gyres as they are more commonly known) develop in the major oceans and concentrate these billions of plastic fragments into vast patches of pollution. Immense areas covered in plastic have been found, the most impressive being the "Great Garbage Patch" of the North Pacific which was discovered in 1997. In this zone, which is thirty metres deep and covers a surface area of 3.4 million square kilometres (roughly six times the size of France), there is ten times more plastic than plankton. This "plastic soup" is ingested by fish and even plankton, the very basis of our food chain.

TOXIC SUBSTANCES

Unlike the Pacific, no permanent structures have been observed in the Mediterranean Sea. However the Med is one of the most polluted expanses of water in the world and the concentration of microplastics is on the same scale as that of the North Pacific. Nearly 250 billion plastic particles float on its surface, amounting to an estimated weight of 500 tonnes.

Plastic debris are an acknowledged threat and are considered to be pollution, and their importance is only going to grow as the twenty-first century progresses. Plastics are chains of polymers made from both organic and inorganic materials such as carbon, silicon, hydrogen, oxygen and derivatives of oil, coal and natural gas. Common plastic materials in use today are polystyrene (PS), polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC) and polyethylene terephthalate (PET), and these account for ninety per cent of production worldwide. These plastics all have particular properties. Some are inert while others contain substances added during the manufacturing process (plasticizers, fillers, colouring agents, fireproofing agents, stabilizers) which make the product more durable or improve its resistance to degradation and the effects of heat. The danger is that once they have entered the environment, these materials release chemicals such as phthalates and bisphenol A (BPA), substances greatly used as plasticizers. Worse still, plastics are veritable sponges when it comes to soaking up persistent organic pollutants (POPs). These POPs are complex molecules of anthropic origin—in other words, linked to human activity—such as pesticides, combustion products and industrial chemicals.

INTERACTIONS WITH LIVING ORGANISMS

Thesenoxious substances are very resistant to biodegradation, which means they remain in the environment for a long time before becoming harmless. Organisms on the surface of the microplastics absorb these contaminants, while additives contained in them—that is the plastics—are released into the marine environment. As a result they can accumulate in living tissue at every stage of the food chain (the process of biomagnification) and thus find their way into humans (bioaccumulation).

Some of these additives are endocrine disruptors whose toxicological consequences on biodiversity, food safety and human health are only now coming to light. While macroplastic fragments floating in the sea directly affect marine birds and turtles (more than 100,000 marine animals die each year as a result of suffocating in plastic bags or mistaking waste for prey, and swallowing it), microplastics are a far more complex type of pollutant, invisible and difficult to deal with. And because they are so small, they also absorb toxins and can then be ingested by all types of filter feeders, such as sponges, combustion products and industrial chemicals.
TAKING INSPIRATION FROM THE EXPEDITION THAT TOOK THE TARA TO THE MEDITERRANEAN SEA, AND THE CHILDREN’S BOOK THE RAINBOW FISH, SIXTEEN BUDDING ARTISTS IN THE LITTLE SCHOOL OF KERNASCLÉDEN (BRITTANY) PUT TOGETHER A SPECIAL ANIMATED FILM. TARA EXPEDITION NEWS LOOKS BACK AT A WONDERFUL COLLABORATION BETWEEN A BRETON SCHOOL AND THE SCHOONER TARA.

MAY SCIENCE SAIL ON !

Certainties and beliefs are not allowed aboard the Tara... Indeed, they stay behind on the quayside for one simple reason: they hinder your progress when you’re sailing on the sea of knowledge. On a ship devoted to science, such as the Tara, scientific thought is driven by questioning and the freedom to reflect and discuss. If two researchers don’t agree, that’s not a conflict but a source of progress. None would ask the other to "take them at their word". Instead, collected data, analysis, experiment and results will have the final word. Or maybe they won’t... and in that case we have to admit that "we still don’t know..." Sometimes a result calls everything we know into question. That’s not a failure, on the contrary it’s an opportunity to ask a new question and take things further. And so it is with science, according to a universal method, that can be shared with all, in a give and take of ideas and facts, through thoughts and actions, where every step is making headway for humanity.

GÉRARD BONHOURRE

Former General Inspector of France’s Department of Education

www.taraexpeditions.org

JANUARY 2015

Why don’t we make an animated film about the sea? Aureole, the teacher, Boats the idea. Everyone agrees it would be a good idea to do a film about the Tara combined with one of their favourite stories: The Rainbow Fish by Swiss author Marcus Pfister. The film's background is laid out on a low table. A piece of blue fabric represents the rolling sea. A red and white lighthouse is made from cardboard. A few houses. Five paper boats, including an orange one, the Tara. Behind the camera and stationed around the background, the children work together to bring their story alive, frame by frame. They use a simple mobile phone to record the voice-over. "Me, I made Tara and I know the text by heart," says Eurydice proudly (she's still at nursery level and hasn't started learning to read yet). Poetic it may be, but the story finishes on an environmental note: "Take care of the Earth, the priciest planet!"

JUNE 2015

At last, it's time for the young artists to set out for the Breton port of Lorient to meet their favourite boat of all: Tara. ¬

ANNA DÉNIAUD GARCIA
Journalist

An animated film by the children of Kernascléden School in Kernascléden:

"We spent the entire year working on the adventures of the Tara, expedition schooner based in the Breton port of Lorient. We invented a story which combined with one of their favourite stories: The Rainbow Fish by Swiss author Marcus Pfister. The film’s background is laid out on a low table. A piece of blue fabric represents the rolling sea. A red and white lighthouse is made from cardboard. A few houses. Five paper boats, including an orange one, the Tara. Behind the camera and stationed around the background, the children work together to bring their story alive, frame by frame. They use a simple mobile phone to record the voice-over. "Me, I made Tara and I know the text by heart," says Eurydice proudly (she's still at nursery level and hasn't started learning to read yet). Poetic it may be, but the story finishes on an environmental note: "Take care of the Earth, the priciest planet!"

NOVEMBER 2014

After a seven-month expedition in the Mediterranean Sea the Tara returned to Lorient. But for the little school of Kernascléden the adventure continues. Hungry to learn more, the young mariners decided to follow the Tara’s past expeditions Tara Oceans and Tara Oceans Polar Circle. Once a week, while the younger ones are resting, the older pupils discuss the schooner’s other trips across the world’s seas: "Why does ice thaw?... "Why didn’t the ice break the Tara into pieces?" They ask questions and look for answers in books and especially on the Internet. And they dream too. "I would have loved to have seen the bears, because they are beautiful," beams 7 year old Tifenn. After sailing across the world’s oceans, without ever leaving terra firma, the pupils have only wish: to step aboard the Tara! Unfortunately the schooner is undergoing works and will be closed to the public over the winter. They will have to be patient... As a consolation Marion Lauters, cook on the Tara, paid them a visit. It was a memorable event and the pupils discovered some secrets about the schooner. Sh...

SCAN THE LINK BELOW TO WATCH THE VIDEO

www.taraexpeditions.org

BACK TO SCHOOL 2014

The single class school of Kermathias in the Breton village of Kernascléden got involved in the Tara Mediterranean expedition thanks to their new teacher Aurore Guigny. To get an idea of the many miles already covered by the scientific schooner, the pupils made a special animated film. Tara Expedition News looks back at a wonderful collaboration between a Breton school and the schooner Tara.

Five paper boats, including an orange one. © A. Deniaud / Tara Expeditions

TARA JUNIOR IN FIGURES

Tara Arctic 2007–2008: 4,500 STUDENTS involved
Tara Oceans 2009-2012: 19,000 YOUTHS involved throughout France and 5,000 CHILDREN visit the schooner in ports across the world.
Paris in 2012: 3,500 CHILDREN visit the ship
Tara Mediterranean in 2014: 3,300 CHILDREN visit the ship

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When Étienne Bourgois started Tara Expeditions in 2003 his idea was to make the education of young people one of the project’s main priorities. By 2006, in partnership with Éducation Nationale, France’s department of education, educational materials based on the Tara were being distributed to teachers. The same year a website was set up by the Paris branch of the CRDP (Regional Centre for Educational Materials) which focused entirely on the Tara Arctic expedition. It contained information about the polar regions and the expedition, and a forum where scientists, sailors and children could come together as part of classroom projects. Since then we have developed educational initiatives ourselves, such as content, worksheets and materials designed by teachers and education professionals, and these are distributed freely on the Internet. We also welcome school groups aboard while in port, visit classrooms, take part in videoconferences, and more.

And these initiatives continue to expand with exciting new educational themes and campaigns on topics such as marine biodiversity, plankton, polar environments, the climate, plastic debris and coral reefs.

XAVIER BOUGEARD
Education officer for Tara Expeditions

ALL ABOARD KIDS!

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Education officer for Tara Expeditions

Tara Junior

"ASK FOR TARA JUNIOR!"

Not only does Tara Junior explain environmental issues to the youngest in society, it also gives children and teenagers the chance to follow what’s happening on the ship in real time. In the latest edition you’ll find articles on coral reefs, marine biodiversity, plastic pollution, the ocean and the climate.

Young fans of the Tara, aged between 8 and 12, will find in this latest issue of Tara Junior facts about the boat, her past expeditions and learn almost all there is to know about the climate, plankton, marine biodiversity, plastic pollution and the most recent discoveries made by researchers working with the scientific schooner. This brand new issue is bursting with games, quizzes, pictures and drawings, experiments, accounts and interviews. In particular, Jean-Yves Duho’s illustrations make the newspaper for budding “Taranauts” easy to read and understand and, above all, fun! Not only that, Tara Junior No. 3 is thoroughly interactive and includes a map showing the Tara’s expeditions and missions. Numerous QR codes link to digital content such as videos, slideshows and particularly pertinent websites. An exciting way of discovering the project or learning more after a visit aboard the schooner herself! Suitable for all children and teenagers who love the sea.

Available on request, get your copy by writing to: education@taraexpeditions.org

In the course of her major expeditions the Tara has sailed almost 320,000 kilometres around the globe since 2003. © Graphics by laniak.com / Tara Expeditions

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agnès b. AND MALIK NEJMI:
"TARA, AN ENDURING AWAKENING TO ART AND THE BEAUTY OF THE WORLD"


YAMINA BENAÏ: The work you, agnès b., have helped to achieve through the Tara’s expeditions since 2003—at a time when environmental issues were less frequently discussed—is symbolic of your enduring role as a pioneer. Indeed, it has been a recurrent theme in your professional career since the opening of your first shop in 1974, and when your art gallery Galerie du Jour was unveiled in 1984. Your journey is synonymous with an unwavering open-mindedness, where does it come from?

agnès b.: This propensity certainly lies in the fact that I grew up surrounded by humanists. My parents, first of all, because they initiated me into classical culture, not only into music, art and literature, but also into being receptive to any form of creative expression and to otherness in general. My teachers were an additional influence. These were educators who had a broad spectrum of cultural insight, who displayed an open-minded approach, and who were generous in their sharing of knowledge. You could probably add to this equation some personal attributes: curiosity and a love of creation, combined with the sheer delight of living among a group of people of different generations. All of this encourages me to be permanently mindful of the beauty in this world, whether natural or man-made. Fostering greater awareness and preserving this beauty for future generations is therefore essential. As such, the Tara crystallizes my sensitivity for the planet, for art and artists, the true guardians of this world.

"Tara crystallizes my sensitivity for the planet, for art and artists, the true guardians of this world."

agnès b.

YAMINA BENAÏ: From the very beginning of these scientific expeditions you have been inviting aboard, for one or two-week residencies, various artists such as Sebastiaõ Salgado, Pierre Huygues and Xavier Veilhan. Among these we can include Malik Nejmi whom you personally invited to join the Tara Mediterranean expedition. A French artist born to a Moroccan father, Nejmi seems to touch on something in you which is beyond the realm of his work. He touches on a country which you discovered about forty years ago, which you not only hold close to your heart but also assist by being a sponsor and a benefactor to Tangier’s film library.

agnès b.: Indeed, my first stay in Morocco was work related. I was fabric dyeing in Casablanca for the Pierre d’Alby clothing brand. I learnt a lot with Youssef, a dyeing craftsman in the workshop. Since then I have frequently returned to the country and each journey has turned out to be a rich human and cultural experience. So when I discovered Tangier about twenty years ago, I decided to help preserve the film library, headed back then by artist Yoi Barrada. Cinema is a medium which I greatly appreciate as it enables one to convey aesthetic emotions to a very wide audience. Similarly the Tara, throughout her port visits, conveys messages to adults and children alike, whilst always being careful to ensure an educational approach that truly reflects the research undertaken.

agnès b.: The schooner’s watchword is “economy”, not only in her equipment but also the consumables she carries, such as, for example, fresh water. We never lose sight of our environmental purpose. Each project is linked to a specialist laboratory which selects the scientists who will join the crew to carry out the research and sampling operations. The collected samples are then sent off for analysis in the laboratories of various countries, and each expedition gives rise to journal articles and conferences. Tara Expeditions purpose is, obviously, to raise...
awareness but her remit is also to come up with answers to the pressing issues of the coming two decades. We are pleased to learn that, from 2016, single-use plastic shopping bags will be banned from retail shops in France. A real contribution can be pinned on each expedition. After exploring the Arctic, our meeting with CNRS research director Éric Karsenti encouraged us to work on plankton, those invisible ecosystems which do so much for us every day. Éric would go on to be scientific director of the resulting Tara Oceans expedition.

After investigating the extent of plastic pollution in the Mediterranean Sea, our next mission will be devoted to studying coral reefs in the Pacific Ocean and Asia.

YAMINA BENAI: Not simply a communicator of the scientific knowledge gained at sea, the Tara also conveys the ocean’s natural wonders through the eyes of artists who sail aboard her. From their observations come artworks steeped in their unique sensitivity and imagination. Malik Nejmi, apparently agnès b. gave you a specific theme for reflection, the notion of “intimacy”. So what do you take from this unusual experience of having to share the daily lives of sailors and scientists during a five-day journey from Barcelona to Tangier?

MALIK NEJMI: The theme given to me by agnès b. provided a starting point from which I literally sailed. I exploited all the markers aboard, all the human data shared by crew members and scientists alike. Conditioned by my own feelings, it was like a journey of initiation straight to the heart of my father’s native land. It was also a symbolic yet powerful immersion into the sea, the realms of its beauty, its infinite yet treacherous nature. From the outset, an atmosphere of goodwill reigned on board. It immediately removed any distracting thoughts and allowed me to go straight to the essential: my creative work. While on the Tara I decided to focus on the notion of wonder triggered by the idea of a journey from one universe to another, a return to my father. I invited each person aboard to pose in my cabin, to close their eyes and think of the most wonderful thing they had seen during the expedition. I filmed each of them for one minute, thus delivering and sharing a moment of intimacy and wonder which each viewer can reinvent at will. The resulting video (An Odyssey, 16 minutes) is, perhaps, akin to a scientific dream. On the strength of this experience, one recurring thought became an integral part of the video: “I have never been happier on earth than at sea.”

INTERVIEW BY YAMINA BENAI

"While on the Tara I decided to focus on the notion of wonder...I invited each person aboard to pose in my cabin, to close their eyes and think of the most wonderful thing they had seen during the expedition."

Malik Nejmi
The Mr Goodfish programme was launched through the charity Réseau Océan Mondial. It encourages the general public, and the fishing industry as a whole, to adopt a positive and sustainable approach to the consumption of sea-related produce. At a time of increasing public awareness of the benefits eating responsibly can have on health, well-being and the environment, Mr Goodfish is encouraging consumers to buy fish direct in order to preserve our marine resources. The objective is clear: reduce the impact of fishing and overfishing and, therefore, human pressure on unsustainable fishing reserves.

Mr Goodfish’s network of hundreds of partners (distributors, fishmongers, restaurants...) translates into a long list of marine products that take into account seasonal availability, fish sizes and the health of fish stocks. For the more daring and creative mind, the organization also offers simple yet inventive recipes developed by famous chefs. This charity is truly aptly named.

Plankton Planet is a pilot project close to Tara Expeditions’ heart, not only in its scientific scope but also in the citizen responsibilities it encourages among sailors. Tara Oceans sequenced a vast number of plankton samples taken from 200 different points across the globe between 2009 and 2012. Given that plankton is the only continuous ecosystem on the surface of the Earth, pursuing plankton sampling operations is critical if we are to understand it. With Plankton Planet, the adventure sails on. More and more leisure sailors are committing to sampling plankton whilst following a simple, affordable, yet rigorous protocol. These enthusiasts, whether beginner researchers or old hands, have a legitimate place in the domain of “citizen science” and help structure a network of international sailors. Oceanography like this is founded on an inexpensive and non-polluting network which acts in close cooperation with international scientists who subsequently analyse samples and measure plankton biodiversity and how it changes over time and space. A useful tool for predicting the evolution of the oceans. Following in Tara Oceans footsteps, this is an encouraging initiative which aims to preserve the memory of our oceans for many generations to come.

In 1997, when setting sail for California after a yachting race, oceanographer and yachtsman Charles J. Moore made a startling discovery along the subtropical gyre in the North Pacific: the infamous “Seventh Continent”, a trash vortex floating on the water’s surface. He was astonished to find himself surrounded by millions of tons of translucent flotsam—bottle fragments, bottle caps, cans, carrier bags—in a swirling plastic soup which was virtually invisible and therefore not detected in satellite photographs. Since then, he has devoted his energies to cleaning up the oceans. Founder and research director of the Algalita Marine Research and Education Foundation (California), Charles Moore works with many scientists and together they have carried out about fifteen expeditions at the heart of this swirl of plastic debris (at the surface or at depth) in the Pacific Ocean. Moore is very active and has written numerous articles and books, the best known being Plastic Ocean. He is spearheading the fight against plastic debris and their impact on marine life and in particular on whales, dolphins and turtles. In California, Algalita organizes a forum each year on Plastic Ocean Pollution Solutions (POPS) and raises awareness among youths about the devastating effects of their cans and bottled drinks.
**COOPERATION IN HIGHER WATERS**

**THE TARA’S EXPEDITIONS HAVE LED TO SCIENTIFIC DISCOVERIES, SOME SIGNIFICANT. TODAY, THE FOCUS IS ON SETTING UP A PARTICIPATIVE PROGRAMME FOR SHARING DATA IN COOPERATION WITH SEVERAL DEVELOPING COUNTRIES.**

Scientists have clearly demonstrated that climate warming is happening and that human activity has, over the last few decades, had profound consequences on marine biodiversity. Researchers are flagging up, among other things, that zones of acidification are increasing in size and that there are areas of the ocean with little or no oxygen content. Climate change is gaining speed, so it is vital that we understand more about plankton biodiversity, its dynamics, and its ability to adapt to changes in the physico-chemical composition of the ocean.

The Tara Oceans expedition in 2009–2013 provided an opportunity to sample, in a systematic and holistic manner, the plankton ecosystems of the world’s oceans. Samples were collected and a near-comprehensive inventory of the biodiversity of all these organisms was successfully completed in most of the world’s oceans. A considerable number of new genes and species was discovered and identified. Since the publication of the initial results from Tara Oceans in May 2015 (in a special issue of *Science*), Tara Expeditions’ objective has been to find new partners to develop the study models and indicators which are necessary for observing marine biodiversity and to improve to an even higher degree the significance of the results produced. The identification of new research directions should allow us to collate new and better detailed information on plankton ecosystems and how they evolve in reaction to climate change and the impacts of human activity. This programme will be carried out with the participation of scientists from Brazil, Argentina, Chile, Senegal and South Africa. From a scientific standpoint, researchers have stated that new connections, indicators and scientific models could be built from the scientific results of the Tara Oceans expedition.

However, once again efforts are hindered by the lack of communication channels between researchers and decision-makers. And yet such channels are key to promoting these models and indicators and, above all, getting UN agencies to apply them. Actions must be implemented soon if we are to identify existing needs in ocean management processes. For instance, it is imperative that we identify critical zones where marine biodiversity must definitely be protected. The UN Special Observer Status granted to Tara Expeditions will ensure the continuous monitoring of ongoing negotiations relating to High Seas issues, from climate change to biodiversity. To be continued...
ÉTIENNE BOURGOIS: "TARA EXPEDITIONS IS ALSO THE SCIENCE OF SHARING!"


TARA EXPEDITIONS NEWS: You are a company boss, managing director of agnès b., with a workforce of 2,200 throughout the world, and the co-founder and chairman of Tara Expeditions. What drives your commitment to the oceans?

ÉTIENNE BOURGOIS: In the beginning the Tara was a very personal project. I bought the boat with Agnès Troublé because, for both of us, the sea and the vessels that sail upon it are first and foremost part of our family history, a real passion. And then I felt the best thing to do was to let the project develop until it outgrew me. That’s now the case and this has been instrumental in the project’s long-term success. For Agnès the Tara has been very important, and still is. She has been closely—and courageously—involved in the funding of fundamental research and work on environmental issues, which is unusual for a fashion designer. It is essential that these initiatives continue to receive funding. My role as company head is very time-consuming, no doubt about it, but the Tara gives me extra energy. And then there’s Romain Troublé, he’s giving 150% to Tara Expeditions. As does the entire team.

What are your thoughts, in a few words, on the last twelve years and the dozen or so expeditions that the Tara has undertaken in collaboration with scientific teams?

I think it’s been very positive. Right from the start — back in 2003—we chose to focus on science, to launch major research programmes based on extensive expeditions. The schooner Tara is a cornucopia, a mixture, a meeting point for scientists, artists, authors and children. Each expedition is unique, usually complicated to set up, and every time each one is, as far as I’m concerned, a beautiful adventure. However the Tara is foremost a polar vessel and I was determined to embark on an Arctic drift, an operation for which she was designed, and this came about in 2006–2008. We took an interest in the Arctic early on. It was the year of the record thaw, during International Polar Year (IPY), and we had become conscious of how essential the Arctic really is. We also went to Antarctica to study plastic pollution. (By the way, when the results on plastic pollution in the Antarctic come out they will undoubtedly make as much media noise as our assessment of the serious problem of plastic pollution in the Mediterranean.) We have also been looking at plankton and how it affects climate. And for us there has definitely been a before and after Tara Oceans (2009–2013). There is yet another facet to the Tara expeditions, and that’s adventure. The schooner is reviving the eighteenth century ideal of a beautiful adventure. However the Tara is about science but she’s also, I believe, the symbol of the Tara expeditions, and that’s adventure. The schooner is reviving the eighteenth century ideal of expedition making. When you’re at sea, heading into the ocean, there are no borders.

With the Tara making the cover of Science, are we witnessing the end of one cycle and the start of a new adventure?

We set out, with Tara Oceans, in early 2009 on an expedition which lasted three years, and these articles came out in 2015. Of course the crew of the Tara and the scientists who took part in the expedition are absolutely delighted with this recognition from such a prestigious journal. For my part, while we were waiting for the results to be published, I was dying to learn more. Despite the samples being collected using very sophisticated equipment, the analyses are in fact undertaken, not aboard the Tara, but in shore-based laboratories, and it takes a long time. There’s the expedition and scientific phase, and then you publish the results. And here we are with this issue of Science whose impact has been pretty overwhelming, as far afield as Asia.

Your emotion is palpable…

Yes, because even at our humble level we can contribute to the progress of knowledge. I’ve been told that these publications, in Science, could be a reference for what’s happening in the oceans for years to come.

There’s a symbol in the fact that we’ve made our contribution with the Tara, with a sailboat and budgets which have sometimes been barely enough to take to sea. It’s marvellous. It’s recognition for team work. Working with the scientific community is, I have to say, an immense pleasure and that is a source of motivation too.

Tara Expeditions is at sea or ashore, an extraordinary human adventure…

Yes, and we saw this during the 2014 mission to the Mediterranean where we made numerous port visits to meet the people and lend our support to actions on the ground. These countries are sometimes unstable so you can easily imagine the populations’ priority is not the climate and yet we found that ordinary people were just as preoccupied as us about environmental issues. So yes, the Tara is about science but she’s also, I believe, the humanitarian sailing ship of the present and the future! Many major cities are built on the coast. Pollution, global warming, access to clean drinking water and desertification are issues that affect the two billion humans who live less than 100 kilometres from the sea. It is estimated that 250 million people will be displaced for reasons relating to the climate by 2050. 

"Each expedition is unique, usually complicated to set up, and every time each one is, as far as I’m concerned, a beautiful adventure." 

Étienne Bourgois

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2015-2016

www.taraexpeditions.org
Of course many of the issues that the Tara highlights have political repercussions, it’s inevitable. So how do you deal with that aspect of your work?

The question came up when we put forward the proposition, with others, for establishing a legal status for the "High Seas", a zone which currently has none. We worked on the political aspect of this with Romain Troublé and André Abreu. Subsequent to this initiative Tara Expeditions was granted observer status to the UN, which was an important step for us. We must promote ever closer collaboration between developed and developing countries. We have renewed our partnership with UNESCO because education is at the heart of what we do. Soon I hope the endowment fund for the Tara will become a real foundation, led by an executive committee.

Which of your priorities, in the short and medium term, are you focusing on most?

I would like to develop Tara Expedition’s educational scope so the project outgrows its French origins and gets reported more on the international stage. We need to continue raising awareness among the French public, but that cannot suffice. The Tara will be going to Asia next year and it seems to me that we really have to concentrate on social media to promote the boat, her message and news, in particular in China and Japan.

So what about the rumour that there’s going to be a Tara II, is there a project underway?

It’s true that, several months ago, I put up for discussion the idea for a new vessel. The Tara has spent twenty-five years at sea. She’s been put under a lot of strain and requires increasing maintenance. It makes us think that we should perhaps look at building a Tara II, a bigger oceanographic vessel, but still a sailing boat. She would be built with new materials and use new sources of energy—and these latter points are already gaining us potential partners. So, yes, we’re looking into it but a project like this needs long-term funding. The Tara would remain our ambassador for raising awareness while the focus of the Tara II would be more on research.

For now the Tara is being prepared for an expedition to study coral and associated ecosystems in Asia and the Pacific Ocean. She’ll be setting out from Lorient (France) in the spring of 2016 for two years. Is this a major new step?

Well the Tara wasn’t designed for tropical waters but she will adapt to the conditions. Asia is certainly a new step for us. We will be presenting what the Tara does, the results of the Tara Oceans expedition, as well as talking to institutions and the public about the impact climate change is having on the oceans. There will be forums, exhibitions and lots of opportunities for discussion. In Asia the Tara will be carrying out new research into plastic pollution and the gradients of biodiversity. She will also be sampling coral reefs for research on, in particular, genomes. It’s the continuation of previous projects.

Much work has already been done on coral in the Pacific but what is important is to be able to compare how the reefs respond to anthropic, that is man-made, stresses, and then analyse what we do or don’t find. It will be a major research programme and also, I’m quite sure, a wonderful voyage! I hope we’ll be welcoming aboard Tara researchers from New Zealand, Australia, Japan, China, Korea and Taiwan. Tara Expeditions is also the science of sharing!

INTERVIEW BY MICHEL TEMMAN

"It makes us think that we should perhaps look at building a Tara II, a bigger oceanographic vessel, but still a sailing boat. She would be built with new materials and use new sources of energy..."

Étienne Bourgois
Biodiversity

TARA IN THE ASIA-PACIFIC: CORAL AT HEART

WHEN YOU SET OUT TO STUDY CORAL IN THE IMMENSE PACIFIC OCEAN AND THE REGION OF ASIA, YOU’RE ATTEMPTING TO UNDERSTAND HOW AND WHY CERTAIN TYPES OF CORAL ARE UNDER THREAT AND OTHER CORALLINE FAMILIES FLOURISH. WHATEVER THE CONSEQUENCES FOR THESE LIVING ORGANISMS, INTERACTIONS WITH THE CLIMATE AND HUMANS ARE TO BLAME.

It is the tree-like, branching fruit—almost artistic in its presentation and certainly very aesthetic—of symbiosis. It lives and grows at sea, at the surface and at depth, and is home to one of the most biodiverse marine environments: we’re talking about coral. “We should actually say “corals”,” explains Serge Planes, French coral specialist, CNRS research director at Perpignan University and director of the research centre and environment watchdog CRIOBE in French Polynesia. “Because when you take a closer look you find that three main families build coral reefs: the corals themselves, the best known; coralline algae which also produce calcareous structures; and hydrozoans, a class to which we owe fire coral and which are not real coral but instead a kind of modified jellyfish. Corals and hydrozoans are the result of similar symbioses between an animal—a type of anemone—and a single-celled algae that is capable of generating energy for the animal to harness in order to develop. In sum, the key to the entire coralline process resides in this association between a pseudo-anemone and an alga, even in waters that contain very little in the way of food.”

LIVING RIDGES

These three main coralline families populating the world’s reefs—and covering barely 0.02% of the ocean’s surface—are home to a large and mixed number of sub-groups. “There are nearly one thousand species of coral, some of which formed millions of years ago. Similar to rainforests, these corals create a habitat which is then populated by a reservoir of biodiversity amounting to a quarter of the total biodiversity of the ocean,” adds Serge Planes.

Gone is the time when we considered the reefs to be merely interesting features. Coralline systems form immense living ridges and, whatever their type, are well adapted to their environments: we’re talking about coral. “We should actually say “corals”,” explains Serge Planes, French coral specialist, CNRS research director at Villefranche-sur-Mer’s Oceanological Observatory.

CORAL STRESSORS

During the Tara Oceans expedition scientists aboard the Tara took the pulse of the world’s coralline ecosystems. In all, they studied 102 sites between 2009 and 2012, from Djibouti and Mayotte to the Gambier Islands, and found them to be in a good state of health. In 2016 the Tara will be picking up where she left off to continue the study in Asia and the Pacific until 2018. The purpose of this coral expedition will, according to Serge Planes, be to “cast a light on the hidden biodiversity of a reef—that is its genome, genetics, viral and bacterial characteristics—in order to build a database that we can draw comparisons with the surrounding waters. We hope to get a real idea of the overall diversity of a coralline colony, in other words, to comprehend this diversity. “During the expedition we will be sampling coral reefs at the surface and at depth” says Romain Troublé, the project’s leader. “We will also be comparing the reactions of reefs to various stressors, whether climatic or human in origin. The point being that, while numerous reefs are resisting well or quite well to external stressors, others, particularly in Asia and the Pacific, such as Australia’s Great Barrier Reef, are suffering from the effects of coastal development, shipping and industry. Stressors include pollution, bridge building, breakwater building, land reclamations, fishing and overfishing and population growth. Moreover, Southeast Asia is home to more than half the coral found on the surface of the globe. In particular the zones between Taiwan and the Okinawa Islands, between the Philippines and Malaysia, and between Indonesia or Papua New Guinea and the South Pacific. Another threat comes from the excessive enrichment of coastal waters. Too much nitrogen, too many phosphates and other fertilizing agents promote the growth of seaweed but harm coral” observes Serge Planes.

As for the rise in temperature which is provoking climate change, that’s the other major threat. “Coral reefs are the most sensitive of all marine bioindicators. An increase of just half a degree in the temperature of seawater at the surface is enough to provoke a cataclysmic event across dozens of square kilometres which is patently obvious to the eye: coral bleaching,” warns Denis Allemand, scientific director of the Scientific Centre of Monaco. An expert with the well-being of coral at heart, Denis reminds us that “already several coral islands have sunk beneath the waves, such as Tèhau Taravua and Abahuna in the island nation of Kiribati and that others are under threat in the short term such as Tuvalu, the islets of Micronesia, the Marshall Islands and the Maldives. Islands and reefs we need to watch closely.”
TAKESHI KITANO: "IN 2019 I WOULD LOVE TO GO TO THE NORTH POLE WITH THE TARA!"

FAMOUS SHOWMAN AND STAR OF THE SMALL SCREEN IN HIS NATIVE JAPAN WHERE HE HOSTS NO FEWER THAN EIGHT SHOWS A WEEK, TAKESHI KITANO IS "DELIGHTED" TO BE THE TARA’S AMBASSADOR IN THE NIPPON ARCHIPELAGO. HERE’S WHAT ONE OF JAPAN’S MOST PROMINENT FILM DIRECTORS HAS TO SAY.

The Tara will soon be undertaking a long expedition, lasting two years, to Asia and she’ll be stopping off in Japan before setting out on a second Arctic drift in 2019…

In the meantime, if I can find a gap in my work agenda—and it is very full—I would really love to embark on the Tara. In 2019 I would love to go to the North Pole with the Tara and her team so I could do some reporting and explain to viewers back home in Japan why the polar ice-cap is melting and that polar bears are having to swim miles and miles to reach stable ice. And even if I can’t go aboard the Tara, I will still be able to relay the information on Japanese TV channels. I could talk about the Tara, as I have been doing recently, and encourage television producers to talk about the expedition in their programmes. That way Tara Expeditions will get more and more enthusiastic supporters in my home country!

In my programmes I often remind viewers, as well as the big companies in Japan—a country which is often considered to be the fifth biggest polluter in the world and home to big businesses such as Toyota—that we need to make greater efforts to reduce CO2 emissions into the atmosphere. I have also asked business leaders and major Japanese industrials to actively support Tara Expeditions. One of them said to me: "Sponsor the Tara yourself!"

Could the Tara help raise awareness of climate change among the Japanese?

Yes, probably, because the strength of Tara Expeditions is, as I see it, that you know how to use the big media outlets to get the results of your research into the public arena, in particular television. TV is the media of the people. It’s only with the small screen that we can talk to the majority about environmental problems. The questions that Tara Expeditions raises are not always easy to understand for the ordinary man in the street.

Problems involving the climate and the ocean seem very distant. But we need to act and, in a similar fashion to Tara Expeditions, we need to keep the public informed of these actions.

"It seems to me, like it does to so many others, that the Earth is in a terrible state! I am very happy to make my modest contribution…"

Takeshi Kitano

You are interested in the sea. When you were a child, your father took you by the hand one fine morning to see the sea for the first time, in the south of Tokyo. One of your films is called A Scene at the Sea(1). You have also talked in the past about Jacques Mayol, a Frenchman who often came to Japan to swim with dolphins…

Mayol, yes… The diver made famous in the film by Besson, The Big Blue. Mayol was able, I believe, to hold his breath for seven or eight minutes during deep-sea dives. Mayol practised yoga during his visits to Japan, a particular type of yoga that helped him develop his breathing technique. But I must come back to Cousteau, he really impressed me. In the end I didn’t become a marine biologist. Life decided otherwise and I took to the stage, theatre… But this interest for the planet, for the sea and the natural world has remained with me. And it seems to me, like it does to so many others, that the Earth is in a terrible state! I am very happy to make my modest contribution to the actions of the Tara. ~

INTERVIEW BY MICHEL TEMMAN

"Cousteau was such a huge influence that I wanted to follow in his footsteps and become a marine biologist."

Takeshi Kitano

When I was a teenager I was a big fan of Jacques Cousteau and his voyages around the world. His films were shown on Japanese television and they were very popular at the time. Cousteau was such a huge influence that I wanted to follow in his footsteps and become a marine biologist. So I went to study at the scientific faculty of Meiji University, but it wasn’t for me… It seems to me that the Tara is involved in a similar adventure, albeit one with a different mind-set. What’s changed since Cousteau’s days is that the state of the planet has got worse. The natural balance has never been in such great danger because of climate change and global warming. The climate is changing and humans are paying the price. Upheavals that perhaps only now are we realizing their gravity.

"It’s a pleasure! I’m very interested in the Tara. She belongs to agnès b. Allow me to ask you the first question: Where is the Tara at the moment?"

This summer (2015) she’ll be heading to Greenland and then on to Sweden and Great Britain before returning to France. Allow me to ask you the second question: What is it about the Tara that interests you?

"The Tara Expeditions News n°10: Thank you, Takeshi Kitano, for accepting to take part in this interview…"

"Could the Tara help raise awareness of climate change among the Japanese?"

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"The Tara’s work of discovering, analyzing, summarizing and campaigning is vital. All human actions should be of this order. The Tara does her work with such discreet elegance, it is unique to her and that’s her strength. ",
Philippe Starck  © F Aurat / Tara Expeditions
PHILIPPE STARCK: "COMBINING PASSION AND NECESSITY"

CELEBRATED FRENCH ARCHITECT AND DESIGNER, A PIONEER AND AUTHOR OF MANY CREATIONS, PHILIPPE STARCK UNVEILS HIS LOVE FOR THE SEA AND HIS GRATITUDE TO THE TARA.

TARA EXPÉDITIONS NEWS: What does the Tara represent for you?

PHILIPPE STARCK: Every human endeavour has its negative and positive sides, it’s natural. We are used to that fact and accept it, as if there is always a price to pay. I am always on a quest for and inspired by the few human endeavours that escape this baleful equilibrium. The Tara is one of those rare examples whose every aspect benefits mankind without claiming any negative compensation. For the Tara to exist at all is a rare thing. Her work of discovering, pioneering, analysing, synthesizing and campaigning is absolutely vital. All human actions should be of this order. The Tara does it magnificently with an unassuming elegance which is unique to her and attests to her strength. If all human endeavours were of the Tara’s calibre and structure, we would not be in this state of emergency.

You say that the Tara is “working to save us”. You receive hundreds of requests every day. Why did you decide to support Tara Expeditions?

It is true that, from my viewpoint, I get to see a wide range of projects and actions. If, in most cases, I turn them down, it is because they are mainly driven by money and foolhardiness. This sad state of affairs can only prompt us to support initiatives such as Tara Expeditions. Besides, it is always pleasant when projects are not punitive but combine necessity with passion. Being an amphibian by nature, living permanently on water; being a man or indeed a couple of sprays of the sea, we—with my wife Jasmine—can only but feel emotionally close to the sole tangible element of the Tara, namely her magnificent and intelligent vessels. We live in an era where, except for professional seafaring, ninety per cent of what we produce exists merely to indicate a social status, so it is great to see the Tara combine elegance with integrity.

Do you see a link between the desire to be who you are, an architect and a designer, with the need to save the oceans and the biodiversity they sustain?

It matters little whether you’re a designer or an architect or anything else once you’ve understood that saving the oceans and everything they contain is a matter of the utmost urgency. Indeed, the main catalyst for me to fully comprehend the challenges we are facing came from something Étienne Bourgois once said: “Every second breath you take comes from the oceans.” Being a little claustrophobic, I can strongly relate to that.

Tara Expeditions will be going to Asia and the Pacific in 2016. You are familiar with this part of the world. Can the Tara help convey crucial messages?

Asia is a vast and diverse region. While some countries are currently in a post-development stage, and are already aware and have taken steps towards protecting the oceans, others are still caught in the dazzle and inconsistency of development. Of course, these countries will one day take action but the current state of the planet is such that every minute counts. The Tara’s message is sufficiently clear to enable certain countries to speed up their awareness-raising and thus save what remains to be saved.

"The current state of the planet is such that every minute counts"

Philippe Starck

As a designer, what inspiration do you draw from the planktonic forms and species newly discovered by the Tara’s scientists?

The infinite and fabulous riches of the plankton aesthetic is a permanent lesson for a producer, like me, of shapes and colours. Plankton is a true master of creation. But beyond that, the Tara made me aware of my responsibility as a producer of objects that are mostly made from plastic, and that such substances are harmful to plankton. I wish I were in a position to legislate so that all plastics were compatible and organic so that they would become—we can dream—a source of food for plankton. To the best of my knowledge there’s nothing unrealistic about my proposal. The most interesting bioplastics are made from stuff such as algae. The connection appears obvious and simple, but only state legislation could make it feasible. This could be part of the solution. The one and only genuine solution is the increasingly vital question: “Is economic decline inevitable and would it be positive or negative?”

INTERVIEW BY MICHEL TEMMAN

AN ENTHUSIASTIC EARTHLING

Perhaps it was his father, aircraft designer and engineer, who gave Philippe Starck his desire to explore new horizons, both physical and metaphysical. As a winner of numerous awards and accolades (over 150 so far), this expert and master of contemporary permutations, this designer of transcendence and desire, this author of a thousand projects and objects that have gained iconic status is never one to shy away from shaking up the mind to better awaken it.

He claims to “love opening the doors of the human mind” in order to make life more beautiful for the greatest number. “Subversive, ethical, environmental, political, fun: this is how I see my duty as a designer.” This clear-headed and enthusiastic Earthling, this lover of the seas, believes more than ever in “democratic environmentalism.” Enough said.

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THOUGHTS ON THE TARA

"I believe the Tara is a model for us all. It’s a beautiful adventure, obviously environmental, clearly maritime, but above all it is a human one."

HIS HIGHNESS PRINCE ALBERT II OF MONACO
Aboard the Tara in the Cyclades (Greece) during Tara Mediterranean

"Once there was the Cousteau generation, now there’s the Tara generation. And I’m one of them. It’s incredible."

MARIE BARBIEX
Scientist, aged 23, who joined the vessel during Tara Mediterranean

"Thanks to the Tara, I have never been happier on earth than at sea."

MALIK NEJMI
Artist aboard during Tara Mediterranean

"We feel orphaned long after leaving the Tara… Let’s hope we forget nothing."

CLÉMENCE LESACQ,
Winner of the L’Ibo-Apaj writing competition, after leaving the Tara in Naples

"Boats are a hymn to slowness. You move slowly but you never stop. You can sail a long way with the same boat... Much more than just a means of transport, it’s a way of life."

MARTIN HERTAI
Captain of the Tara

"The Tara is a service of general interest!"

SÉGOLÈNE ROYAL
Minister of Ecology, Energy and Sustainable Development in Lorient at the end of Tara Mediterranean

* Once you get used to sea-sickness and it passes, it’s great. Even with sea-sickness, I would still like to sail on the Tara again. What I like about being on the boat is you get to experience something that others don’t. *

 CYANNE BOUGARDE
Eleven year-old aboard during Tara Mediterranean in 2014

"The Tara is important because a worthy cause needs a symbol. For me, the Tara is the new Calypso. And the Tara symbolizes something I love and that is teamwork. Whilst it may be tempting to sail solo, understanding and protecting our oceans can only be achieved if we work together."

PATRICIA RICARD
Chairperson of the Paul Ricard Oceanographic Institute and advisor to the Economic, Social and Environmental Council (CESE)

"The questions that Tara Expeditions raises are not always easy to understand for the ordinary man in the street. Problems involving the climate and the ocean seem very distant. But we need to act and, in a similar fashion to Tara Expeditions, we need to keep the public informed of these actions."

TAKESHI KITANO
Film director

"The Tara is not only a boat that does science, she’s a beacon of hope for research, for mankind, and for the future."

CÉCILE TIAN
Chinese publisher

"I am thrilled to have sailed on the scientific research vessel Tara during her visit to New York. I encouraged the Tara Oceans team to get actively involved with the United Nations, and I am delighted they did so."

BAN KI-MOON
UN Secretary-General

"With the data provided by the Tara Oceans expedition, we are going to know a lot more about how the oceans will be in 50 or 100 years’ time."

CHRIS BOWLER
CNRS research director and co-director of the Tara Oceans expedition

"The Tara is the only vessel able to study changes in the Arctic for extended periods of time."

JEAN-CLAUDE GASCARD
CNRS oceanographer emeritus

"When I first visited the Tara in Paris, I instantly felt that this mix of scientific rigour and humanitarian values was the bedrock of a fine project."

BERTRAND DELANOË
Former mayor of Paris

"It seems as though every time someone leaves the Tara, a piece of their heart is left behind... And that’s probably the reason why you feel so good aboard."

MARIA-LUIZA PEDROTTI
Scientist aboard during Tara Mediterranean

"This boat is a bit like Captain Harlock’s Albatar. There’s something strange about her, something reminiscent of science fiction…"

KATIA KAMELI
Artist aboard during Tara Mediterranean

"The Tara is one of life’s gifts."

MARYVONNE HENRY
Scientist aboard during Tara Mediterranean

"The Tara is both an incentive to travel and a call to conscience."

IRINA BOKOVA
Director-General of UNESCO

"The recipe for success is simple. Mix together some scientists, including students and technicians, some artists, a crew of enthusiastic sailors, some high-quality cooking and a management team (the shore crew) that is trusting and provides support when needed."

GABY GORSKY
Director of Villefranche-sur-mer’s Oceanological Observatory (CNRS/UPMC) and scientific director of Tara Mediterranean

"The Tara is a school of thought with a taste for the sea, and one which enables scientists to express themselves in every circumstance."

FRANÇOISE GAILL
CNRS research director and director of the Environment and Sustainable Development (EDD) department

"What the Tara does is of far greater service to us than we might think. Ours is a maritime city, with specific issues relating to water quality, coastal erosion, flooding and so on. We need scientific knowledge of what is occurring in the seas, so that we may understand the phenomena and perhaps take evasive action at our own level, especially in this period of climate change affecting our lives."

NORBERT METAIRE
Mayor of Greater Lorient

"I was delighted to work with the Tara’s team and, thanks to them, I learned a great deal about plankton. Thank you Tara."

YANN ARTHUS-BERTRAND
Photographer

"BillerudKorsnäs has much to learn from the Tara. She generates information that we can integrate into the development of our eco-friendly packaging. Tara Expeditions and BillerudKorsnäs are rising to the challenge of establishing sustainable development. We share a vision of the future where plastic discharged into the sea is a problem of the past."

HENRIK ESSEN
Director of communication and sustainable development at BillerudKorsnäs
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INSTITUTIONAL PARTNERS

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OFFICIAL PARTNERS

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CHARITIES

Start and arrival town for the Tara Arctic 2006-2008, Tara Oceans 2009-2012, Tara Oceans Polar Circle 2013 and Tara Méditerranée 2014 missions. 3rd largest urban area in Brittany, the capital of the “SAILING VALLEY” with 3,000 berths for leisure boats, 1,300 jobs in nautical services and industry, 10 major offshore racing teams and 80 professional skippers. Cité de la Voile Éric Tabarly, a scientific and technical centre devoted to modern sailing.

*SAILING VALLEY – A CLUSTER FOR SAILING EXCELLENCE

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The ocean in the 21st century — vital element, ocean of possibility, sailors, researchers, artists, and us — citizens of the world, citizens of the sea.

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