



# PRESS KIT

JOIN THE OCEAN DECADE



2021-2030 United Nations Decade  
of Ocean Science  
for Sustainable Development

# OCEAN HACKATHON® 2020

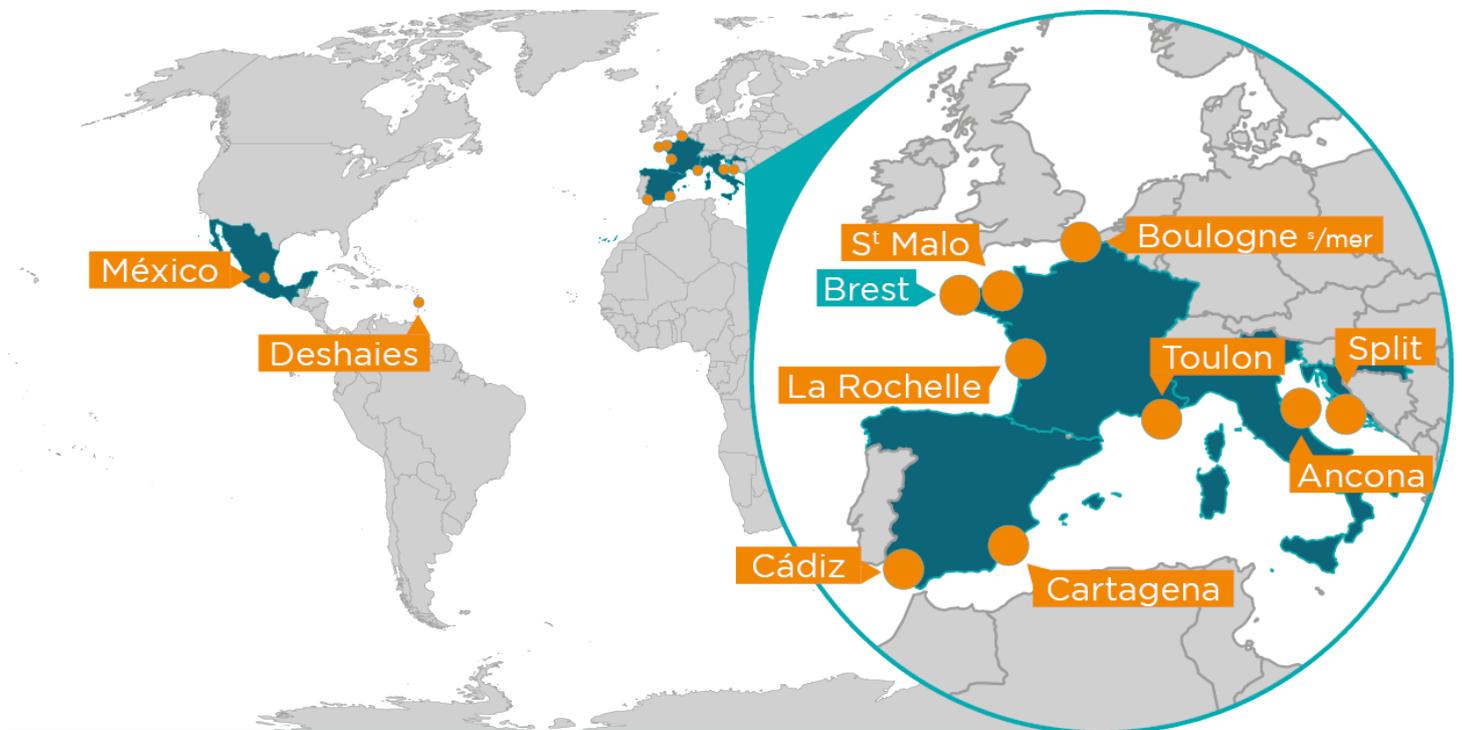
ANCONA · BOULOGNE S/MER  
BREST · CÁDIZ · CARTAGENA  
DESHAIES · LA ROCHELLE  
MEXICO · SPLIT  
ST MALO · TOULON

CAMPUS  
MONDIAL  
DE LA MER

[WWW.OCEAN-HACKATHON.FR](http://WWW.OCEAN-HACKATHON.FR)

# TABLE OF CONTENTS

Ocean Hackathon®, the concept	3
Ocean Hackathon® 5 in figures	4
The reactor core: the data	5
<b>A look back at the challenges by city</b>	
Ancona	6
Boulogne-sur-Mer	8
Brest	10
Cádiz	13
Cartagena	15
Deshaies	16
La Rochelle	17
México	18
Split	20
Saint-Malo	22
Toulon	23
<b>The Grand Finale</b>	<b>26</b>



	City	Participants	Coaches	Teams
	Ancona	97	20	12
	Boulogne-sur-Mer	57	14	10
	Brest	110	22	18
	Cádiz	58	11	6
	Cartagena	14	3	3
	Deshaies	4	1	1
	La Rochelle	33	5	4
	México	72	14	5
	Split	30	7	4
	Saint-Malo	68	16	11
	Toulon	42	23	9
	<b>11</b>	<b>585</b>	<b>136</b>	<b>83</b>



## THE CONCEPT

Ocean Hackathon® is a 48-hour non-stop event during which teams develop a prototype to tackle a challenge. A call for challenges is launched in each cities few months prior to the event. The focus point of Ocean Hackathon® is the use of a range of marine data made available by local, national and international data providers.

If the organisation of a face-to-face event is preferred, a 100% or partly remote edition was organised in 2020.

### BACKGROUND

After 3 editions in Brest (France), the organiser (Campus mondial de la mer) decided to deploy the concept by inviting national and international legal entities to host the event in their city.

Campus mondial de la mer provides the methodology and toolboxes related to communication and data, and accompagnies the local organisers (advisers) throughout the project.

### COMMUNITY

In 2020, Ocean Hackathon® has federated a large community at the crossroads of the sea and digital technology in France and abroad.

The event owes its suces to all the people involved, all with expertise, creativity and team spirit. In five editions, more than 1000 people participated to the Ocean Hackathon® adventure.

In each city, Ocean Hackathon® relies on the expertise of local ecosystems to support the project both during and after the event.



Ocean Hackathon® is coordinated by the Campus mondial de la mer, which brings together the first French community dedicated to the knowledge and development of marine resources. At the tip of Brittany, the Campus is based on the dynamics of Brest, Roscoff, Morlaix, Quimper and Concarneau.

## OCEAN HACKATHON® 5, A 5-STEP ORGANISATION

1

### Call for hosting the event

to organise Ocean Hackathon® in your city

2

### Call for challenges

to identify the topics that will be the subject of a team, as well as their owner (natural or legal person)

3

### Opening of registrations

to set up teams of participants

4

### Ocean Hackathon®

from 9 to 11 October 2020

5

### The Grand Finale

itches contest on December 4<sup>th</sup> 2020 online



# 5<sup>TH</sup> EDITION



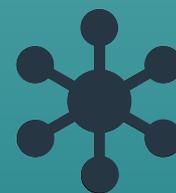
**48 HOURS**  
NON STOP



**11 CITIES**  
SIMULTANEOUSLY



**585**  
PARTICIPANTS



**1 DEDICATED**  
METADATA PORTAL:  
INDIGEO



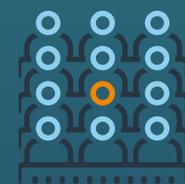
**+ THAN 3250 IDENTIFIED**  
METADATA SHEETS  
IN THE CATALOGUE



**+ THAN 10 DATA**  
PROVIDERS



**83 TEAMS AND AS MANY**  
CHALLENGES



**180+ SPECTATORS**  
DURING THE FINAL

**3 GRAND PRIZES**  
**+1 SPECIAL PRIZE FROM**  
THE FRENCH MINISTRY OF THE SEA



In 2020, Ocean Hackathon® relied on its seven Ambassadors, who contributed to the success of the national and international scale-up of the event.



## THE REACTOR CORE: THE DATA

### Without data access, no Ocean Hackathon®!

Research organisations and administrations collect large volumes of data to improve knowledge and support public policies. Ocean Hackathon® is an opportunity to explore the great potential of this data to address social, economic and environmental challenges.

In order to enrich the demonstrators and allow the teams to develop their challenges, the identification and provision of data for the challenges is carried out by the local organisation teams and by many partners.

### FRENCH DATA PROVIDERS

They provide data for all the French teams: Ifremer, Shom, French Biodiversity Agency, Météo France, Cerema

### EUROPEAN AND INTERNATIONAL PORTALS

In order to make data available to all the teams, the emphasis is put on large scale data, whether satellite data or data from oceanographic campaigns and numerical modelling:

EMODnet, CMEMS (Copernicus Marine Service, PEPS (CNES), DIAS Sobloo, AIS Hub (thanks to the University of Le Havre)

### The typology of data:

- Nautical and coastal charts; chart backgrounds; maritime and surveillance boundaries; aerial photos; coastline; toponymy; electronic navigational charts
- Seabed (lidar and bathymetric surveys); sedimentological nature of the seabed; location of cables, pipes, wrecks, obstructions, buoys and floating markers
- Tide prediction; water height; ocean forecasts; circulation; waves
- Physico-chemical parameters (temperature, salinity, O<sub>2</sub>, chlorophyll, etc.)
- Biology and ecology; habitats (birds, marine mammals, fish, algae, etc.); ecological and biological state of environments
- Microbiology; contaminants; water quality; macro-waste
- Maritime activities; restricted areas

### A whole range of expertise:

- Geomatics, GIS
- Image processing, remote sensing
- Underwater acoustics
- Deep learning
- Mathematics
- Hydrography, oceanography
- Marine chemistry
- Biology, ecology
- Mechanical engineering, shipbuilding
- Electronics
- Robotics
- Signal processing
- Coding, development, IT
- Statistics, data management
- Design, graphics
- Marketing, communication
- Scientific Mediation
- Business model
- Law



The metadata are mainly gathered in an instance dedicated to Ocean Hackathon® in the Indigéo portal.

Part of the data is stored on Datarmor.



© O. Duornay - Ifremer

# WHY DID YOU ORGANISE OCEAN HACKATHON® IN ANCONA?



"The Institute for Biological Resources and Marine Biotechnologies and Università Politecnica delle Marche organized to the fifth edition of the Ocean Hackathon®, hosting a 48 hour non-stop event in the city of Ancona. The collaboration among the institutions was a key aspect of the organization, gathering the interest for 12 challenges

with participants willing to develop novel and innovative solutions. The challenges proposed several topics that could strengthen the collaboration within the our institutions and the regional territory. Hundred participants in remote contributed to the success of the event that was introduced by the conference with regional and national authorities."

Marco Berzano, Università Politecnica delle Marche

## CHALLENGES IN ANCONA

### Where is the observer and what is looking at?

Development of user-friendly and versatile systems that integrate robotic and IC technologies for gathering, filtering and fusing 3D geolocalized marine environmental data which can be conveniently and fast transmitted to monitoring and research centers for processing, comparison and interpretation.

**Challenge owner:** Giuseppe Conte

### Benefits and opportunities from the establishment of the Monte Conero Marine Protected Area

Overview of the benefits for the establishment of the Conero MPA not only for conservation purposes, but benefits for the green/blue economy, including the blue tourism.

**Challenge owner:** Roberto Danovaro

### Fishers and sailors monitoring the anoxic waters of the Amvrakikos Gulf "dead zone"

Development of a mobile phone Application for field data, easy to use, to estimate the depth of the anoxic zone. The approach could be easily used in the numerous areas suffering from similar problems all over the world.

**Challenge owner:** Konstantinos Koutsikopoulos

### Novel interactive tools for planners and stakeholder engagement in Maritime Spatial Planning

Developing novel interactive tools for planners to support in particular the scenario development and analysis phase and the engagement of stakeholders.

**Challenge owner:** Stefano Menegon

### Tipicità in blu

Promotion of comparisons and exchange of experiences between local communities of the sealand, at european level, especially focused on Mediterranean framework, with the aim to boost up the capacity of development a «blue way», more sustainable, inclusive and based on circular economy.

**Challenge owner:** Alberto Monachesi



### **Underwater marine object detection by deep neural networks**

Processing of underwater images and videos using the recent version of a real-time object detection system YOLO, on a dataset acquired and labelled by choosing the meaningful species and objects.

**Challenge owner:** Marina Paolanti

### **Exploring the fate of textile nanofibers: from the washing machine to the sea**

Simulation of the natural exposure of non-synthetic and synthetic MFs to ultraviolet light in marine water and to investigate the structural properties of the NFs produced by degradation processes.

**Challenge owner:** Astra Piccinini

### **Self-Reporting Data and SAR Ship Detection Fusion to track the impact of the COVID-19 pandemic**

Developing a tool for maritime surveillance to the benefit of maritime safety, security and sustainability, including spatial planning and understanding of Illegal, unreported and unregulated (IUU) activity.

**Challenge owner:** Roberto Pierdicca

### **Interactions between prokaryotes and protists in the global Ocean**

Understanding the presence and type of interactions occurring (e.g., predation, co-occurrence, symbiosis, etc.) in the surface global Ocean among microbes, and, in more detail, between prokaryotes and protists.

**Challenge owner:** Roberta Piredda

### **Conte Rosso sets the sails again**

Finding out a way to let “laymen” get acknowledged with and appreciate even those aspects of modern navigation that are little popular only because they are more technical or less impressive.

**Challenge owner:** Paola Salmona

### **N2K4 Adriatic - Natura 2000 for Adriatic sea**

Researching the best location for new Natura 2000 sites to create a network of recovery areas for habitats along the coast or in the open sea.

**Challenge owner:** Fabio Vallarola

## **THE WINNING TEAM FROM ANCONA**

### **HOW DO INVASIVE SPECIES SPREAD? ANIMATING ROW DATA TO COMMUNICATE INVASION HISTORIES**

A challenge to analyze and communicate one of the greatest changes of our time: that of the spread of invasive species in our seas. In just 48 hours, a team of four Italian researchers led by CNR-IRBIM Ancona, reconstructed over a century of invasion, animating historical observations collected by scientists all over the Mediterranean Sea. Reports from other sources, such as social networks and citizen science were used as well.

The work of these hackathoners allows us to visualize the extent of these changes and their impact on coastal ecosystems, with interesting predictive applications

**Challenge owner:** Ernesto Azzurro, [eazzurr@gmail.com](mailto:eazzurr@gmail.com)



## WHY DID YOU ORGANISE OCEAN HACKATHON® IN BOULOGNE-SUR-MER?



"Boulogne-sur-Mer Développement Côte d'Opale has organised Ocean Hackathon® with its local partners to add value to the territory's capacity of innovation and its maritime identity. We decided to collaborate with other coastlines to identify with a broader vision the stakes of the sea. We have all the same target with different point of view and it's important to share and cross experience and ideas from scientists, citizens et students to find better solutions."

Florence Sergent, Boulogne-sur-Mer Développement Côte d'Opale

## CHALLENGES IN BOULOGNE-SUR-MER

### Enhancement of the direct sales offer in Capécure from the angle of industrial tourism

Create an online directory via a mobile application to present the companies (activity, products, location, etc.) at the Boulogne-sur-Mer port site that offer visits and/or carry out direct sales on their production site.

**Challenge owner:** Matthieu Audollent

### Improvement of exchanges between the port authority and users (Boulogne and Calais sites)

To develop a methodology and a tool (mobile application) to ensure on the one hand the dissemination to the users and on the other hand the localisation in real time of the acts in progress within the port limits.

**Challenge owner:** Matthieu Audollent

### Ecotourism stay in the Opal Coast

To create a questionnaire which, by integrating an interactive map, makes it possible to identify or even reserve the ecotourism leisure activities that users of our cooperative could do.

**Challenge owner:** Jean Denis Hue

### Permaquaculture: open sea farms regenerating marine ecosystems

To develop the engineering of a marine reef to serve local permaquaculture by selecting species capable of forming a productive ecosystem and by using existing models. Create a roadmap for the implementation of the first prototype and a pre-evaluation of its potential impact.

**Challenge owner:** Adrien Landa

### A Battle Plan to Save the Ocean: Mapping Conservation Fronts & Actors

Develop the database architecture that will allow for the progressive addition of information as the project is built. A first version of the graphical interface that will allow the data to be visualised on the planetary map.

**Challenge owner:** Adrien Landa



### Creating a tool for pooling skills for innovation for the benefit of the Ocean

This type of tool is scalable and aims to connect people, ideas, knowledge; communicate on shared values; develop learning paths; share innovative practices... to make it easier to do it together!

**Challenge owner:** Agnès Lavergne

### Development of an application to link local fishermen and consumers

Developing a simple interface enabling him to enter this information via a smartphone and to be able to easily and quickly update it each time he returns from sea.

**Challenge owner:** Antoine Mionnet

### Routing aid application for sailing navigation

The main objective of the challenge lies in the design of a good compromise between ergonomics for beginner and intermediate sailors and routing accuracy. The challenge will be to create an application for mobile terminals.

**Challenge owner:** Guillaume Morlet

### Exploring the marine environment from a smartphone

Develop a consumer application, geolocalised with numerous data layers to be used simultaneously. The sources remain to be identified in several cases. Various visual processes will have to be envisaged (modified reality, 3D, videos, inlaying paintings in the landscape, etc.).

**Challenge owner:** Line Viera

## THE WINNING TEAM FROM BOULOGNE-SUR-MER

### MOPODES

Pollution of the environment by litter has become one of the major challenges of the current ecological crisis. Its consequences on ecosystems, biodiversity and also on human health are no longer in doubt. The astronomical figures that characterise it push us to take concrete and effective action. To do so, it is essential to grasp its complexity through its global, systemic, cultural and multi-sectoral nature. In addition to this, there are the factors of production, management and dissemination at different territorial scales including the coast, upstream and catchment areas. It is in this context and to meet our objectives that Nature Libre has developed 4 study projects. The objective of the challenge is thus to be able to set up an efficient tool allowing to model on a territorial scale the data collected through these 4 projects. It will be a question of cross-referencing the data, mapping them and making them coherent. This study and analysis modelling will be aimed at improving knowledge and understanding of pollution by wild waste in order to subsequently define effective and differentiated management plans and action strategies.

The challenge was to develop a digital tool in the form of a platform, website or application that will serve to inform, centralise and model the various data collected through our study projects. Concretely, this tool should enable us to study and analyse more efficiently, to map the data and to bring out statistics.

**Challenge owner:** Thomas Hemberger, [technique@assonaturelibre.fr](mailto:technique@assonaturelibre.fr)



# A LOOK BACK AT OCEAN HACKATHON® IN BREST



"Ocean Hackathon® is organised in Brest since 2016. The 5th edition was hosted at the Engineer School ENIB coupled with the possibility to participate in remote. During the weekend, 110 participants divided into 18 teams have developed their project helped by 22 coaches with expertise in design, business, innovation, intellectual property and of course data. All the teams have received prizes from Brest métropole, Laboratoires Gilbert, Ifremer, Météo France, Musée de la Marine, Océanopolis, Le Quartz Congrès, Institut Français de la Mer, Brest Bretagne Nautisme, Crédit Agricole Filière Mer, Village by CA Finistère, Shom, CLS and Campus mondial de la mer." Juliette Rimetz-Planchon, Campus mondial de la mer, Technopôle Brest-Iroise

## CHALLENGES IN BREST

### Application of scientific mediation - another look at the coastline

Creating a scientific mediation application designed to accompany the general public in an activity to discover the coastline in a fun and original way.

**Challenge owner:** Martin Amice

### Intelligent anti-shark nets

Creating meshes with visual sensors using pattern recognition and/or force sensors that would prevent or release the animal caught in the net.

**Challenge owner:** Mathilde Clairambault

### Deep sea twins

Environmental monitoring of diving sites and marine parks over time; making scuba diving accessible to as many people as possible.

**Challenge owner:** Alain Dinis and Jean-Baptiste Dodeur

### A multicoloured ocean to decipher

Study and possibly propose learning methods based on satellite observation data, potentially coupled with other in-situ data (instrumentation and bathymetry), in order to provide information or indicators relating to water quality (vs. bio-chemical parameters, plastic pollution, etc.).

**Challenge owner:** Gaetan Fabritius

### Blue diplomasea, a serious game on the governance of the high seas

Imagining the digital version of a serious game, currently being developed on the sidelines of the UN negotiations on the conservation of biodiversity on the high seas.

**Challenge owner:** Charline Guillou

### Participatory field data collection for satellite applications

Development of a field truth collection service open to all and available online.

**Challenge owner:** Marie Jagaille

### Digital GameTwin, from data to decision game!

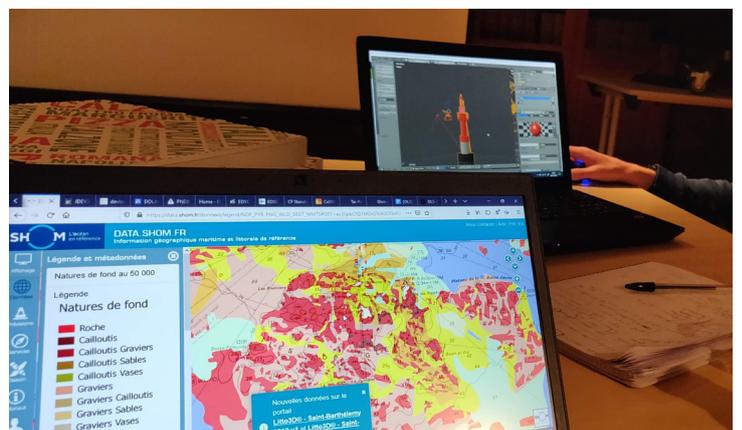
Investigate the use of programming languages used in scientific fields to represent biodiversity data in dynamic 3D and to visualise the results of different climate scenarios in relation to your decisions.

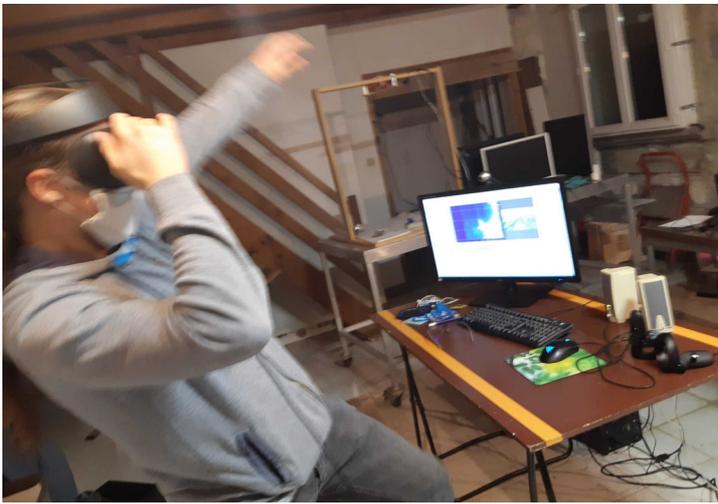
**Challenge owner:** Yvan Le Bras

### IODYSSEHUX

Check correlations between planktonic bloom intensity data and environmental parameters.

**Challenge owner:** Eloïse Le Bras





### **How can satellite images be used to enhance the value of coastal territories?**

Develop a processing chain from the collection of «satellite image» data to the analysed product (cartography, indicators) and made available via an online visualization interface.

**Challenge owner:** Marc Lennon

### **Who is hidden in the genomes of algae?**

A tool to assist in the management of protein sequences, facilitating the sharing of comments, annotations and modification proposals on the structure and function of sequences.

**Challenge owner:** Gabriel Markov

### **Marine energies to feed an oil development in very deep sea waters**

Identify and classify known types of energy and associated technologies, propose new sources of energy and marine technologies and promote a combination of energy and marine technologies making it possible to reach 150 MW corresponding to the energy required for an FPSO.

**Challenge owner:** Remy Marmier

### **CETARISK: mapping of collision risks between ships and cetaceans**

Application generating cetacean distribution maps, possibly integrating other spatial parameters (e.g. speed of ships) or not (e.g. animal behaviour).

**Challenge owner:** Sylvain Michel

### **MACDONALGUE**

Application allowing the general public to know where to harvest algae and to learn how to eat them.

**Challenge owner:** Solène Niqueux

### **Bio-sourced surf fins, thanks to 3d printing and composites**

Creation of a company which designs and manufactures bio-sourced surf fins, EcoSharp.

**Challenge owner:** Damien Rolland

### **Development of a «show me your fish» application for the monitoring of recreational fisheries**

Conceptual application model allowing the collection of data useful for the characterisation of the practice of recreational fishing.

**Challenge owner:** Loïc Van Audenhaege

### **MARITIME CHATBOT**

On the basis of an existing maritime information system, development of a vocal assistant to respond to requests such as «maritime safety and security».

**Challenge owner:** Vincent Verbeque

### **Creating an application of gamification to protect the oceans**

Produce a gamification application that demonstrates the link between consumption and everyday gestures with the oceans.

**Challenge owner:** Claire Lissajoux



## THE WINNING TEAM FROM BREST

### MARINE ANALYST, THE CONQUEST OF MARITIME SPATIAL PLANNING IN EUROPEAN WATERS

The winning team of the Brest edition worked on the challenge Marine Analyst: Integrated Spatial Planning of the European Seas led by Pascal Derycke, business analyst & data scientist at the Virtual Village:

"We participated in Ocean Hackathon because some of us who have already participated in hackathons find it a unique and exciting time. Over a weekend, we get out of our professional sphere to create and innovate. We share our skills. We enrich each other. At Ocean Hackathon, there are only winners. We loved following the challenge presentations. We experienced this hackathon as a game; a game that produces innovation.

The «Marine Analyst» team is composed of 5 people who participated in Ocean Hackathon® from Normandy: three members of the laboratory Ressources Halieutiques de Port-en-Bessin (Jehanne Rivet, Thibault Cariou and Laurent Dubroca), as well as Pascal Derycke and Claudia SchlagenHauf from the association le Village Virtuel.

- Thibault Cariou, Ifremer, PhD student in ecology & 2nd line,
- Pascal Derycke (carrier), the Virtual Village, business analyst & data scientist, djembefola,
- Laurent Dubroca, Ifremer, ecologist & clown animator,
- Jehanne Rivet, Ifremer, bi-commissioned environmental & sea engineer,
- Claudia Schlagenhauf, the Virtual Village, linguist & knitter.



This project aimed to implement a maritime activity planning module for the European seas. The integration of maritime planning is the continuation of the work started by Jehanne during her Master 2 internship that she did this year at Ifremer supervised by Thibault and Laurent. This collaboration follows a previous hackathon (Copernicus 2019 hackathon in Estonia), during which the team worked on the theme of climate change and designed the «Marine Analyst» (first runner-up).

The Marine Analyst simplifies and aggregates access to marine data made available by the various European portals (EMODnet, Copernicus, IUCN, ICES, etc.). To this access, the Marine Analyst



integrates a complete and open analytical system. The objective is to create added value to individual information in order to respond to societal and environmental issues related to the marine domain.

In addition to the recognition brought by this victory, this hackathon made it possible to consolidate the tool and identify the material needs to perpetuate the Marine Analyst while keeping its societal and associative dimension: free and open access, responding to societal demands through rigorous and transparent analytical and scientific approaches.

For more information on the Marine Analyst, you can test the platform (<http://www.marine-analyst.eu>) and contact them on [my-beach@knowcean.eu](mailto:my-beach@knowcean.eu).

**Challenge owner:** Pascal Derycke



# WHY DID YOU ORGANISE OCEAN HACKATHON® IN CADIZ?



"For the Free Zone of Cádiz, Ocean Hackathon® 2020 was an opportunity for Entrepreneurs, Researchers, Students and Citizens from the province of Cadiz, offered by "IncubAzul", to promote the development of businesses in the Blue Economy Sector.

It has proven to be a good platform to provide visibility to the projects that are being developed in the province of Cadiz and also a motivation for their promoters to try and take these projects to the market.

"IncubAzul" is a project 80% co-financed by ERDF Plurirregional Operational Programme 2014-2020, through Fundación Incyde "A way to make Europe"."

Ana Suárez Lena, CEEI Bahía de Cádiz



## Bio-technological solutions from sea

A graphical information about our experience during the national project A4HW (Algae for healthy world) that ended with several publications and one patent, developed through "Applied proteomics" concept.

**Challenge owner:** Rafael Carrasco Reinado

## Plastic detection by drones

The spectral signature of plastic to study its presence and distribution on beaches.

**Challenge owner:** Andrea Celeste Curcio

## Route optimization for vessels in the ocean

An algorithm to calculate time, emissions and fuel consumption for a given route, taking into account a fixed current map (i.e. stationary hypothesis) and a fuel-speed curve for a given vessel.

**Challenge owner:** David Gómez-Ullate

## Mobile APP to promote a new Blue Tourism Model, safer, smarter, more inclusive and sustainable

Pilot proposal for a mobile application that offers official and updated information to the population on coastal risks, environmental sustainability, safety, accessibility and activities of interest (including sport ones) on the beaches of the Cádiz coastline.

**Challenge owner:** Esther Puertas Cristobal

## Integral water cycle and circular economy through oily and bilge water management from vessels

Description of the practices carried out in Navantia for the treatment of oily waste from ships, obtaining regenerated water that is reused in our facilities and a valuable combustible waste

**Challenge owner:** Jorge Sánchez de las Cuevas

## THE WINNING TEAM FROM CADIZ

### QUANTIFICATION OF OCEAN LITTER USING IMAGES (I-LITTER)

The accumulation of litter in the biosphere has become one of the foremost environmental concerns of the 21<sup>st</sup> century due to its highly persistent nature and adverse environmental effects, which are driven by the growth of a globalized consumer society coupled with inadequate preventive and waste management actions. In 2010, total plastic waste generated was estimated to equal the global production of plastic materials, with around eight million metric tons of plastic waste entering the ocean from land based sources alone. The growing scale of these impacts has led to develop different apps to characterize litter. However, no one of them quantifies marine litter in a comparable way. Current apps are focused on the counts of items per category (e.g. bottles, threads, lollipops, nets). Moreover, the category lists used to classify litter items often differ between apps (e.g. OSPAR codes, UNEP codes). Thus, counts across categories cannot add up, and even the size of the items within a particular category (e.g. fragments, wrappings, nets, ropes) may be highly different. Up to date, the huge amount of information provided by citizen science through this kind of apps, has had a very limited use. Nowadays, we can obtain images from cell phones to multiple locations and ecosystems around the globe.



Images have a great potential and can play a unique role in ocean litter research, but to use them at their highest potential we need to develop image processing tools that will allow.

During the Ocean Hackathon@ I-LITTER has developed a prototype of an app able to recognize and quantify litter items in an image taken by a mobile phone. The app uses artificial intelligence to categorize each of the litter items present in the photo and is able to calculate the approximate area and weight of every single object.

**Challenge owner:** Carmen Morales Caselles, [carmen.morales@uca.es](mailto:carmen.morales@uca.es)



# WHY DID YOU ORGANISE OCEAN HACKATHON® IN CARTAGENA?



"Ocean Hackathon was a great opportunity to join people of different disciplines and interested with a common goal, to protect the ocean in a city as Cartagena where is located companies, research and technological institutes and an heritage of more than 3000 years linked to the sea. Ocean Hackthon fulfilled completely this goal and for 48 hours a lot of people were thinking to find solutions for a more sustainable ocean."

Francisco López Castejón, Cartagena Oceanographic Research Institute

## CHALLENGES IN CARTAGENA

### HAB's forecasting system

An app to get the photos taken and obtain the data of Temperature, Salinity, Currents and Chlorophyll

**Challenge owner:** Nuria Alcaraz Oliver

### ARGO buoy recovery strategy

Develop a buoy rescue system or platform (interactive online map) that crosses data from nearby ships available and the exact GPS location of the buoys, to predict and plan a successful rescue.

**Challenge owner:** María José Candel Romero



## THE WINNING TEAM FROM CARTAGENA

### SEAHORSES GEOREFERENCED SYSTEM

The challenge was proposed by a NGO focused on the seahorse protection on the Mar Menor Coastal lagoon. They need some system to improve the manual system used to record the information collected regarding the seahorses observed. An app was developed connected to a map server. The app allows the diver to record the coordinates, size, sex, and sea bottom type of each seahorse detected.

**Challenge owner:** Elen García, Elena Torro and José Antonio Oliver



# WHY DID YOU ORGANISE OCEAN HACKATHON® IN DESHAIES?



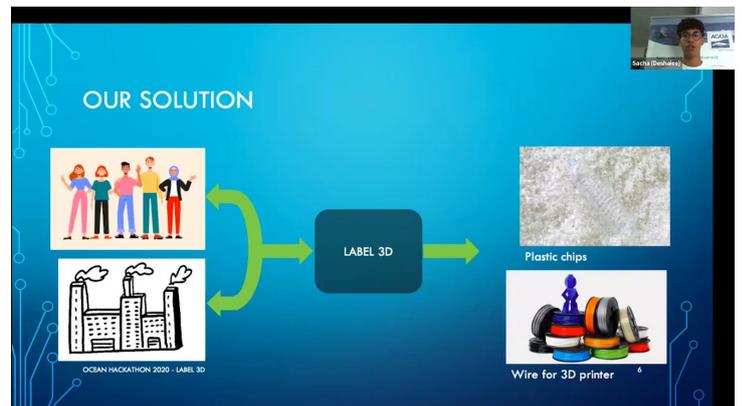
"The reason why I organized Ocean Hackathon® in Deshaies, Guadeloupe (West Indies), is that there is so much to do to promote the preservation of this "hot-spot" of biodiversity which is unknown even locally for the wealthiness of the fauna. Educational actions are really my main motivation: the dissemination of knowledge to all the population locally and all over the world, in order to cooperate in the Caribbean Region and around the Atlantic Ocean on this topic to protect Nature and create new jobs for young people and future generation, around the subject of « blue growth economy » from a sustainability point of view"  
Sabine Garnier, KEM'S.



## THE WINNING TEAM FROM DESHAIES

### 3D LABEL

As part of the HITECH-CLEAN TECH-GREEN TECH project, while defining a recycling channel for plastic waste, a source of marine pollution that endangers the environment and the nostril biocenosis in particular, the «3D label» project The first part of the project, which is based on the rating of companies with good environmental practices, consists of developing resources and preserving marine biodiversity in the Atlantic Ocean/Caribbean Sea and creating a mobile application based on the rating of companies with good environmental practices.



**Challenge owner:** Sacha Jean-François, [jf.sacha.kt@gmail.com](mailto:jf.sacha.kt@gmail.com)



## WHY DID YOU ORGANISE OCEAN HACKATHON® IN LA ROCHELLE?



"As an ambassador, the Village by CA is actively involved in the organisation of the Ocean Hackathon®. Each Village by CA in a French coastal region has logically been invited to organise the Ocean Hackathon® in its own town. Our Village by CA is currently based in Niort, 60 km from the coast, but we are planning a new Village in La Rochelle at the end of 2021. We actually saw the Ocean Hackathon® as a real opportunity to create a positive emulation around the themes of the sea in this city, an opportunity to show how the Village by CA could promote innovation."

Fabien Elie, Le Village by CA Charente-Maritime Deux-Sèvres

## CHALLENGES IN LA ROCHELLE

### Virtuous ostericulture

Create a working group made up of professionals but also biologists, schools and local industrialists capable of analysing the situation and providing concrete solutions.

**Challenge owner:** David Hervé

### Modeling ocean movements in harbors

Modelling of the port and the tidal context at the time of the occurrence of seiche.

**Challenge owner:** Frédéric Surville

### SOS beach mobile app for desperate parents

An application, accessible to all and in particular to parents of children, which would deal with various themes with always a strong notion of ecology: fun activities, maritime knowledge, prevention, local services, social network, useful information.

**Challenge owner:** Chloé Violleau



## THE WINNING TEAM FROM LA ROCHELLE

### MOBILE APP FOR MARITIME NAVIGATION WITH GPS COORDINATES

Knowing the depth at all times under your boat is a precious piece of information for pleasure boating, whether for leisure (fishing, ...) or to compare the depth with your draught. However, for economic reasons, many boats do not have a depth sounder (day cruising or light sailing for example). The objective of this mobile application is to offer an alternative to the use of the depth sounder, free and easy to use. The aim is to provide navigators with information on the depth and tidal current where they are in the Pertuis. A water height prediction is made thanks to the GPS position of the smartphone, in real time. This prediction is based on the use of a regional tidal atlas, itself elaborated thanks to a hydrodynamic model developed within the framework of a thesis carried out at the Laboratoire LIENSs (University of La Rochelle).

**Challenge owner:** Yann-Treden Tranchant,  
[yanntreden.tranchant1@univ-lr.fr](mailto:yanntreden.tranchant1@univ-lr.fr)



# WHY DID YOU ORGANISE OCEAN HACKATHON® IN MÉXICO?



Liberté • Égalité • Fraternité  
AMBASSADE DE FRANCE AU MEXIQUE  
INSTITUT FRANÇAIS D'AMÉRIQUE LATINE / IFAL

Francia  
México

"After a very successful 1st edition in 2019, and despite the complex sanitary situation, the French Embassy in Mexico, in collaboration with major research local institutions, decided to launch a virtual Ocean Hackathon® in 2020. This event has our full support, as it empowers and brings together people of all ages and backgrounds in order to develop useful and innovative technology-based prototypes that address real-life problems. In addition, it constitutes an amazing tool to highlight the importance of ocean preservation. As an international event, it also contributes to make visible the issues and solutions that are developed in other countries."

Valérie Barbossa, French Embassy in Mexico

## CHALLENGES IN MÉXICO

### Proyecto de cuidado del Gran Arrecife Maya

Interactive web platform, coral reef preservation plan and a short and medium term plan to be carried out in determined times.

**Challenge owner:** Emilio Ramírez Franco

### Drones inteligentes para rescatar a las vaquitas marinas

A strategy for autonomous drones that detects suspicious human activity, for example, the presence of turtle egg poachers.

**Challenge owner:** Arturo Rodríguez García

### México, a través de sus costas

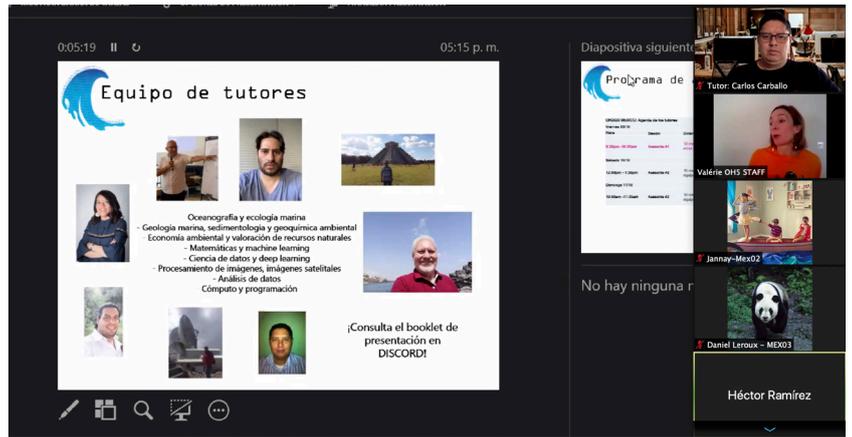
A geographic information system (GIS) that, through the ZOFEMAT concessions, tells us about the evolution and growth of sun and beach tourism in Mexico.

**Challenge owner:** Yazmin Rubio

### En un planeta de Agua: Luchar por los Océanos es una lucha ante el Cambio Climático

The design of a web page that contemplates these changes and is an accessible tool for the Mexican coastal populations.

**Challenge owner:** Lesly Solis Solis



## THE WINNING TEAM FROM MÉXICO

### CARBÓN ¡OH NO!

Although carbon dioxide (CO<sub>2</sub>) is widely acknowledged as the principal greenhouse gas contributing to global warming, its concentration in the atmosphere keep increasing, reaching unprecedented levels since the Pliocene. This worrisome situation has led the UN to target a 45% reduction of greenhouse gas emissions by 45% in its 20-30 agenda.

Seagrasses play a crucial role in carbon fixation and sequestration, but they remain to be included in Certified Emission Reduction projects. Notwithstanding the ecological importance and the multiple services provided by this complex and fragile ecosystem, insufficient attention and protection against degradation has been given to it.



The «Carbon ¡Oh no!» team generated an AI-based automated code process capable of detecting changes in the seagrass coverage in Los Petenes Biosphere Reserve (Campeche, Mexico) - and estimating the economic value associated to its reduction. The model uses remote sensing data (Landsat satellite images) and previously reported seagrass coverage points. The purpose of this tool is to estimate carbon sequestration in order to monetize it, using carbon offsets and the social cost of carbon (CEPAL). One carbon offset represents one ton of CO<sub>2</sub> that was not released into the atmosphere while the Social Cost of Carbon is an estimate of the economic damages derived from emitting one additional ton of carbon dioxide into the atmosphere.

The aim of the project is thus to highlight the economic and ecological relevance of seagrass ecosystems and the urgent need to preserve them due to their strong potential in climate change mitigation.

# WHY DID YOU ORGANISE OCEAN HACKATHON® IN SAINT-MALO?



"Ocean Hackathon® in Saint Malo was a unique opportunity to gather people from every maritime fields in the area: sailors, entrepreneurs, researchers, artists, designers, developpers, students and university teachers, innovation incubators, local data collectors, local institutions, etc. Gathering all these people and skills enables us to promote maritime innovation which is not yet structured locally. The aim of the Collective Les Vagues is to make connections between multiple disciplines in order to innovate together. Our purpose is to develop in Saint Malo area a very open and innovative environment connected to other places in the world."

Nicolas Bessec, Les Vagues

## CHALLENGES IN SAINT-MALO

### Rance - Coastal Emerald

A useful mobile application for all holidaymakers and users of the beaches along the Saint-Malo Agglomeration coastline, enabling them to find information related to the weather, tides, safety, regulations and associated services, in order to make the most of their beach experience.

**Challenge owner:** David Poncet

### Assessment of the impacts on biodiversity of a marine agroforestry farm on the reef principle

A tool for monitoring the environmental impacts of our marine farm in terms of biodiversity and the regeneration of the marine ecosystem.

**Challenge owner:** Xavier Dasque

### FISH BONES - A creative project to popularise science around fishes

A creative project of scientific popularisation around fish, crustaceans and shellfish living near the Breton coasts.

**Challenge owner:** Thierry Garance

### Morgazh: the environmental data extraction tool

Creation of a tool to centralise them in a database, based on GPS coordinates and the date and time of our data on the bottlenose dolphin population in the Normandy-Brittany gulf.

**Challenge owner:** Gaël Gautier

### Immersive journey in the Rance landscape

Responsive website presenting the project, immersive itineraries and geolocalised content.

**Challenge owner:** Séverine Walter

### Stanett Bio2B - The organic and bio-inspired cleaning station for boats

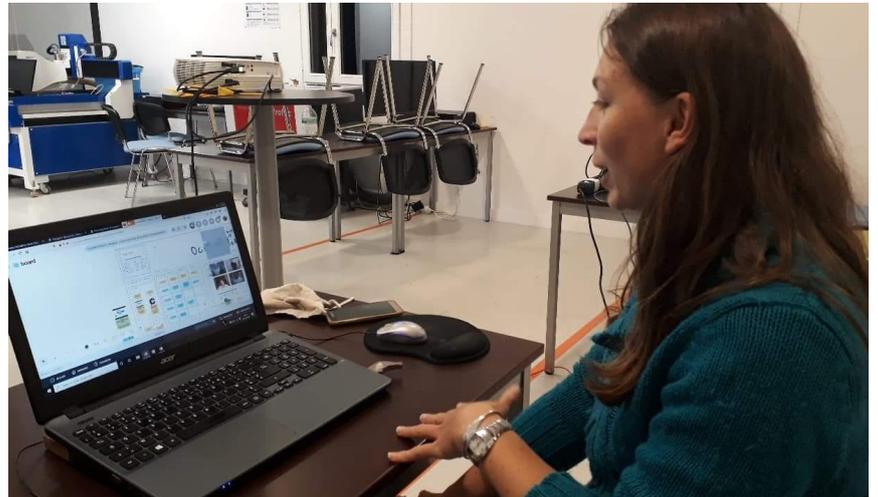
A cleaning station consisting of fish and other native cleaning organisms will be set up within the harbour to remove biofilm and the deposit of micro and macro algae adhering to the hull.

**Challenge owner:** Charlène Hubert

### How do I find a place for my boat in the Rance - Emerald navigation basin?

A global responsive website of the Rance-Emerald navigation basin (Bay of Saint Malo, Bay of Mont St Michel and the Rance Valley) which helps all boaters and makes it easier for them to navigate all year round.

**Challenge owner:** Dominique Bonnel



### ProCOstrea - Recovery of oyster waste for coastal protection

Experimenting with efficient, responsible, innovative and low-cost eco-engineering solutions based on oyster farming waste from the local sector in partnership with the oyster farming sector.

**Challenge owner:** Antoine Mury

### Optimisation of navigation in currents

A constrained optimization algorithm that runs on current data.

**Challenge owner:** Pierre Vennin

### Participatory monitoring of the evolution of the Malouin coastline

An application offering an educational trail on the dikes of Saint-Malo to raise awareness of coastal risks by guiding people to different predefined viewpoints.

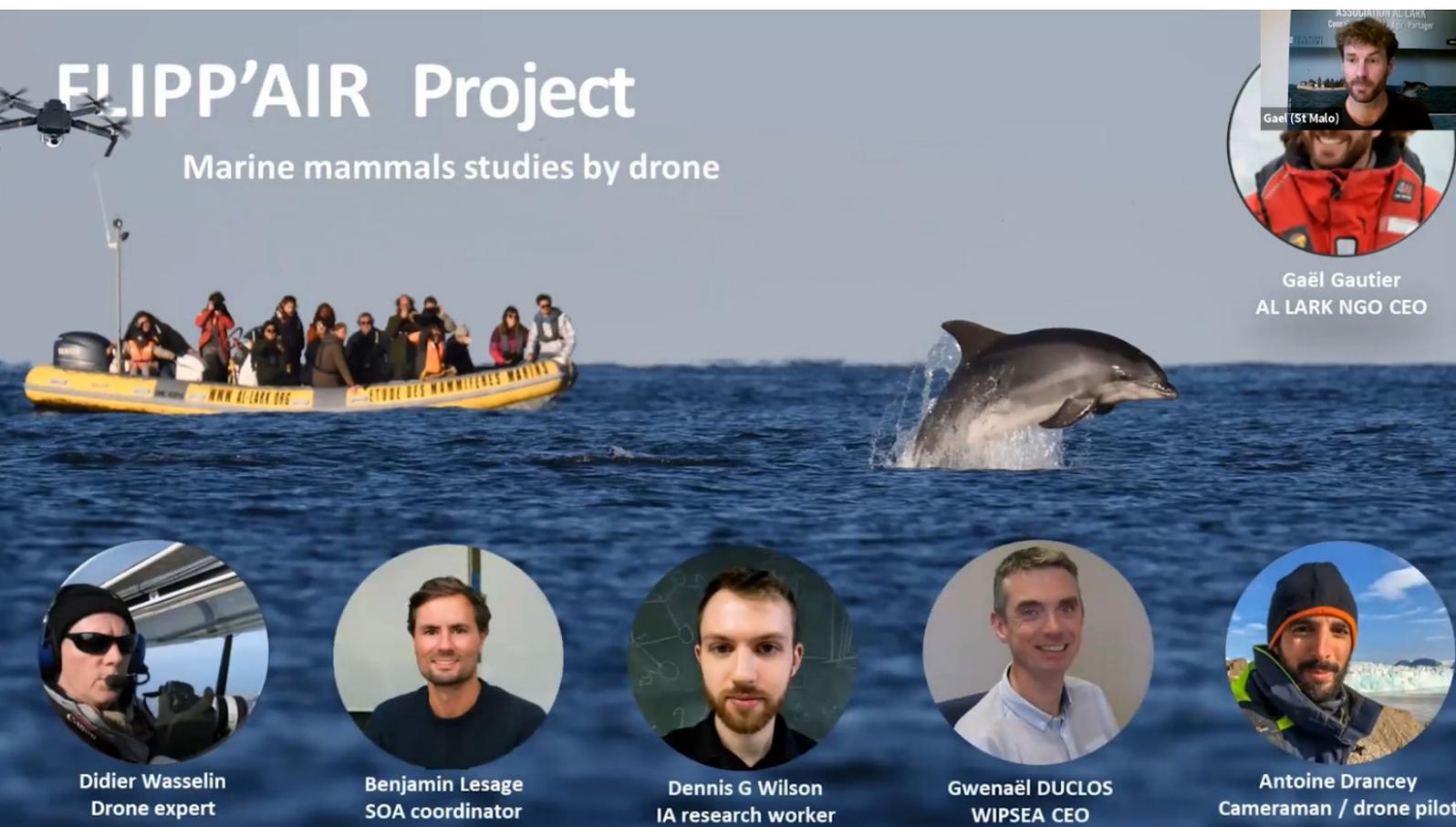
**Challenge owner:** Guillaume Villemagne

## THE WINNING TEAM FROM SAINT-MALO

### MAMMIF'AIR

The creation of a tool for analysing drone images to obtain new complementary scientific data on cetaceans such as their speeds, headings and biometrics.

**Challenge owner:** Gaël Gautier, [contact@al-lark.org](mailto:contact@al-lark.org)



**FLIPP'AIR Project**  
Marine mammals studies by drone

**Gaël (St Malo)**  
Gaël Gautier  
AL LARK NGO CEO

**Didier Wasselin**  
Drone expert

**Benjamin Lesage**  
SOA coordinator

**Dennis G Wilson**  
IA research worker

**Gwenaël DUCLOS**  
WIPSEA CEO

**Antoine Drancey**  
Cameraman / drone pilot

## WHY DID YOU ORGANISE OCEAN HACKATHON® IN SPLIT?



"The University of Split as one of the founding partners of the European University of the Sea (SEA-EU) is strategically investing its resources in supporting sustainable blue growth. We are all citizens of the sea, breathing the salty air and benefiting from the richness of the seas. From coastal tourism, marinas, food from the sea to shipping, renewable energy, and deep-sea activities. Ocean Hackathon® was an opportunity to reflect on this and search for fresh perspectives from the new generations. We have learned a lot from them and hope to continue learning from future generations."

Nikola Balić, University of Split

## CHALLENGES IN SPLIT

### Adria Clean

Development and production of floating sea purification devices powered by energy collected from solar panels to collect surface waste.

**Challenge owner:** Branimir Corluka

### The problem of wastewater that spills into the seas and oceans

Development of a system of advanced filters for wastewater treatment using a combination of different technological treatment processes without a negative impact on biodiversity and marine habitats.

**Challenge owner:** Zvonimir Juki



### IoT extension to underwater devices and systems

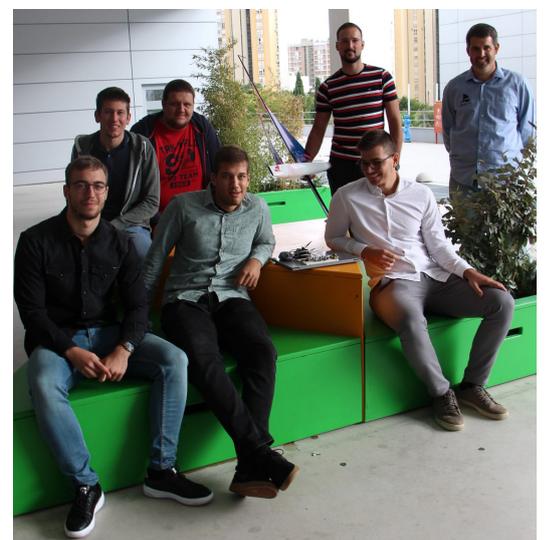
Comparison of the calculated and measured sea water attenuation coefficients from different sea locations for the development of the high efficiency VLC communication link for stand alone underwater sensor.

**Challenge owner:** Marko Vukši

## THE WINNING TEAM FROM SPLIT

### MOBILE APP FOR MARITIME NAVIGATION WITH GPS COORDINATES

The team developed a prototype of hardware and software solution and web application for advanced mooring in marinas that will enable every marina, harbor or port to achieve much better efficiency. The software to map every possible space for mooring of yachts, sailboats, powerboats, etc. and to put those places online so everybody can see available and reserved positions, make their own reservation and be totally worry-free while sailing to the final destination. Hardware add-on of the system is connected to the IT reservations system and enables reservation for each possible position in every harbor / marine so that every sailor which enters that marine will know exactly which spot is taken and what reserved space is his. Furthermore, the IT solution on the website has a map which leads the skipper directly to his reservation space.



**Challenge owner:** Josip Marasović, [info@sailboatrc.com](mailto:info@sailboatrc.com)



# WHY DID YOU ORGANISE OCEAN HACKATHON® IN TOULON?



"As part of its Open Innovation missions, TVT Innovation wanted to organise an Ocean Hackathon® in order to create a new creative dynamic around the sea and data. This project was part of a process of appropriating data and putting this data into perspective for the benefit of users and companies."

Marie-Aude Hémard, TVT Innovation



## CHALLENGES IN TOULON

### Bio Pump&Co

Scientific popularisation application of the biological carbon pump using a real-time map and user interaction

**Challenge owner:** Chloé Baumas

### Yachting with peace of mind

Mobile application based on Shom maps and marine regulation maps (whether general or specific such as that of protected areas) which would make it possible to know where one is located, particularly near the coast, in terms of regulatory zoning.

**Challenge owner:** Marc Duncombe

### Binoculars connected for optical monitoring

Development of a simple module used in combination with a pair of connected gyrostabilised binoculars and a means of restitution in the form of an on-board hardened PC for the restitution of the visual fields of the watchers thanks to a calculation algorithm.

**Challenge owner:** Francis Dussol

### NautloTic

Imagine new cases of using satellite data (observation, IoT/data collection...) to support nautical activities (yachting, sailing schools, boat rentals without a licence etc.).

**Challenge owner:** Gaëtan Fabritius

### Autonomous hunter of jellyfish, or other marine objects

Automate the hunt for jellyfish by coupling the submerged camera to proximity electronics that would process the images on board in real time thanks to artificial intelligence (AI).

**Challenge owner:** Frédéric Férésin

### Underwater 3D model from open data and Shom data

Development of a complete multi-resolution model in several pieces, 3D models in the form of tiles that can be assembled and streamed, and a 3D viewer to load them dynamically.

**Challenge owner:** Xavier Fischer

### On the Whale Trail by Passive Acoustics: 3D Observations and Analyses in the Abyss

Determine the biometric characteristics of sperm whales, in the manner of a human being who can be recognised by the way he walks, for example, and analyse and determine the behaviour of sperm whales during recording (ethoacoustics).

**Challenge owner:** Hervé Glotin

### Tracking MD - hazardous material

Design and implementation plan for a tracking® information system for the monitoring of maritime flows of MDs and the development of navigational safety.

**Challenge owner:** Pierre Robineau

## THE WINNING TEAM FROM TOULON

### NATURAL SOLUTIONS

The aim of the project is to create an IDO «internet of the oceans» using boats as relays. In particular, they will be used to retrieve and then transmit the messages sent by LORA beacons - low cost and low speed - which marine species are equipped to transmit to terrestrial servers. These messages will make it possible to provide information on the animal's behaviour, but also other types of information such as the state of the seabed, the level of biodiversity or even useful information for fishermen and sea users.

**Challenge owner:** Aurélie Jambon, [aurelie\\_jambon@natural-solutions.eu](mailto:aurelie_jambon@natural-solutions.eu)

THE GRAND FINALE  
DECEMBER 4, 3PM - 5PM CET  
ONLINE

2020 OCEAN HACKATHON

Rob @winner

WATER SOLUTIONS  
Agence d'Innovation, Développement Économique  
Métropole Toulonnaise

Odyssean

Welcome to the Oceans' web





# OCEAN HACKATHON® GRAND FINALE

On December 4<sup>th</sup> was organised the Grand Finale of Ocean Hackathon® 2020. 11 teams presented their projects. A Webinar of nearly half past two hours with a succession of presentation of the cities involved in the event, pitches of the teams and interludes for more interactivity with the audience. An intense moment for the jury, which had the heavy task of scoring the projects live. And the winners are...

## 3<sup>rd</sup> place on the podium: Split (Croatia)

The project «Advanced mooring in marinas» was presented live by Josip Marasović et Tomas Pinjušić, on behalf the whole team also composed of Zvonko Jelačić, Josip Baumgartner, Neno Židić, Ivan Samardžić and Petar Perković.

## 2<sup>nd</sup> place on the podium: México (Mexico)

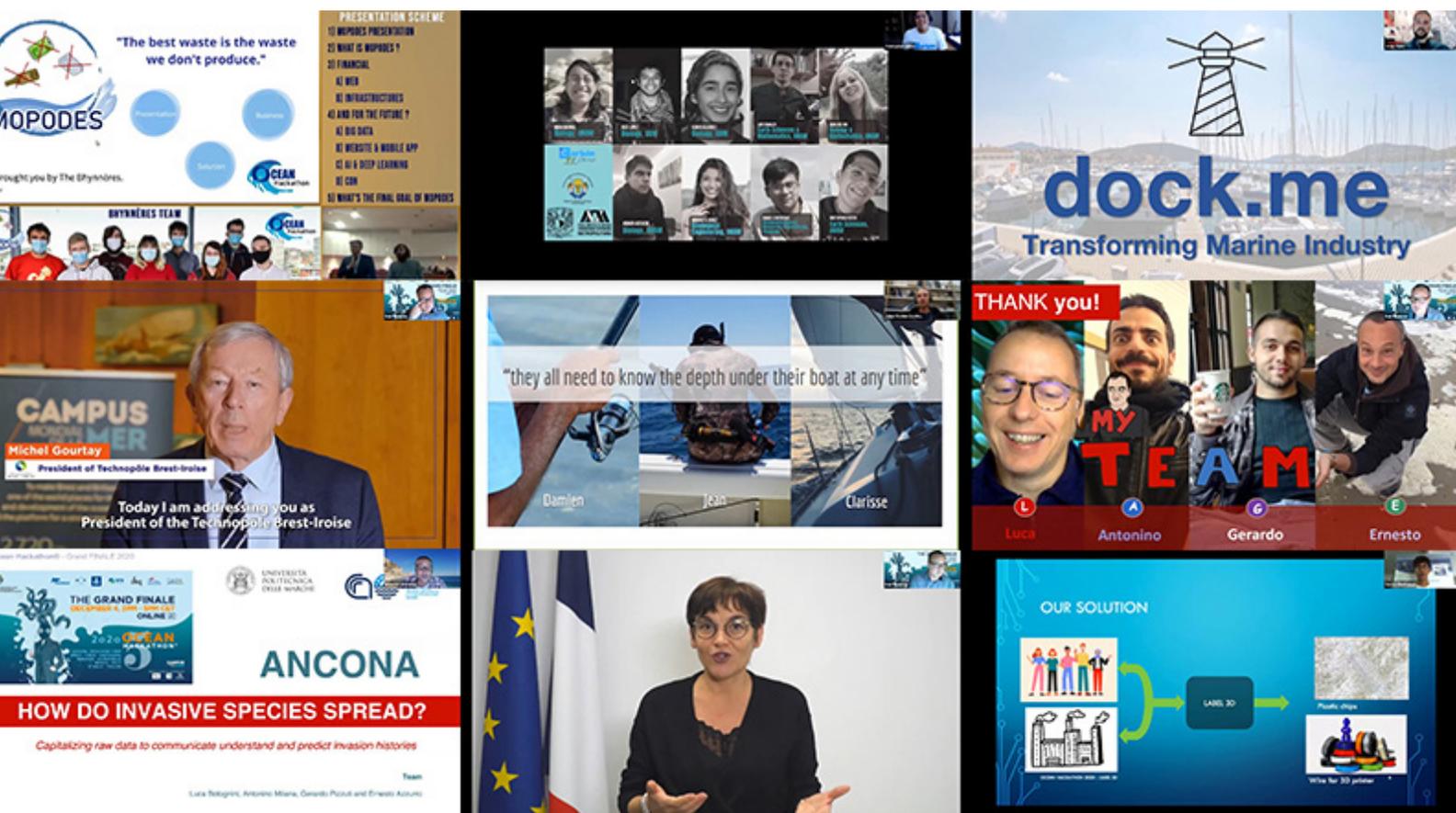
The project «Carbón ¡Oh no!» was presented live by Cristopher Foster Velázquez, on behalf the whole team also composed of Maru Bernal, José López, Karen Álvarez, Miriam Álvarez, Ismael Contreras, Luis Canales, Sara del Rió and Adrián Acevedo.

## 1<sup>st</sup> place on the podium: Ancona (Italy)

The project «How do invasive species spread? Animating raw data to communicate invasion histories» was presented live by Ernesto Azzurro, on behalf the whole team also composed of Antonino Milana, Luca Bolognini and Gerardo Pizzuti.

## Special Prize from the French Ministry of the Sea: La Rochelle (France)

The project «App for maritime navigation» was presented live by Yann-Treden Tranchant, on behalf the whole team also composed of Arthur Coquereau, Corentin Barataud and Clément Parpaillon.



Ocean Hackathon® is one of the actions coordinated by the Campus mondial de la mer, driven by Technopôle Brest-iroise and funded by Brest métropole and the Brittany Region. Ocean Hackathon® is also supported by its Ambassadors and rely on the local advisers, which organise the event in their city.



# THANKS TO THE MEMBERS OF THE JURY

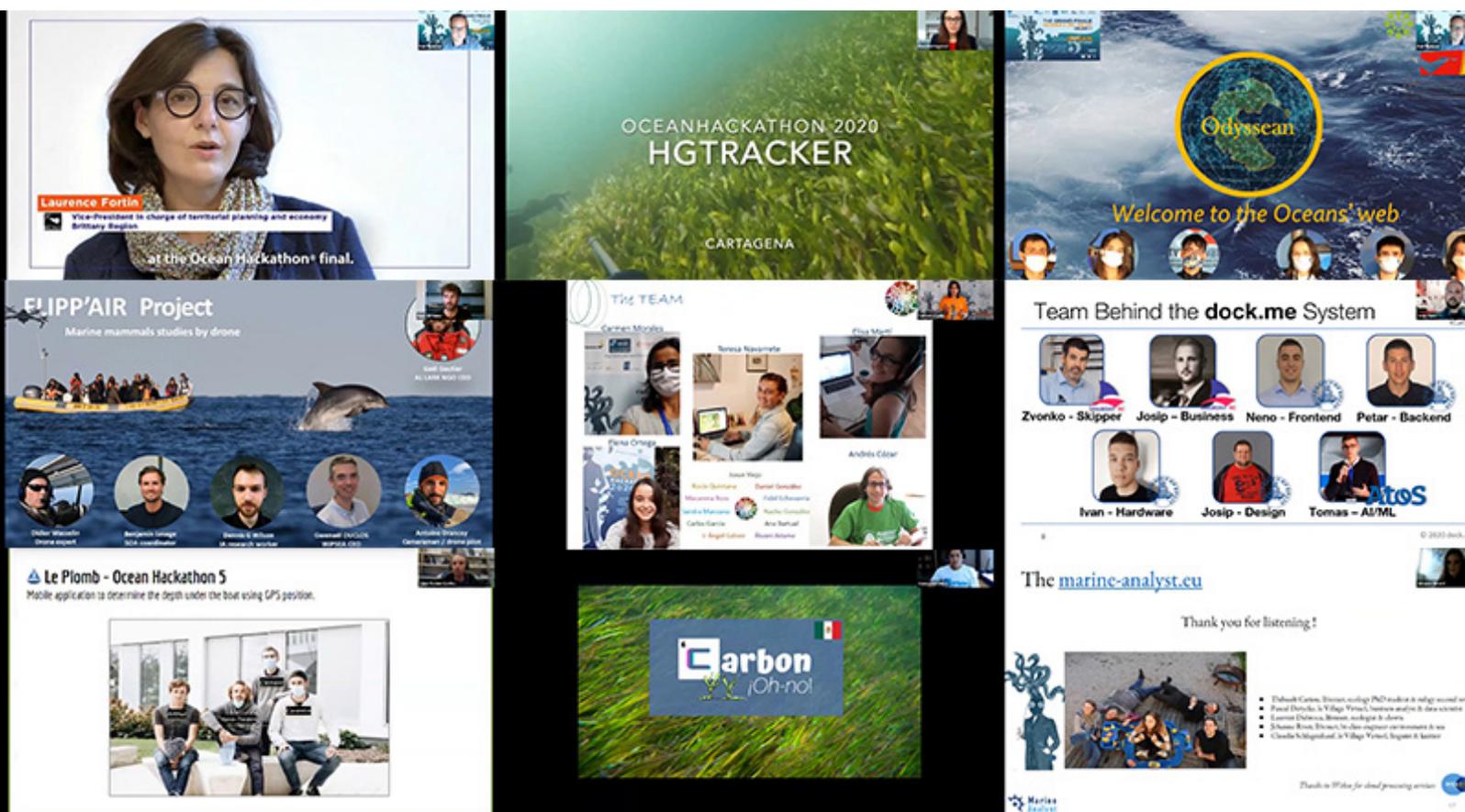
The organisers of Ocean Hackathon® thank the high-level jury which scored the projects, the Ambassadors and the French Ministry of the Sea for offering the prizes, the local advisers for their involvement and enthusiasm to organise the event in their cities, and of course all the teams participating to the 5<sup>th</sup> edition of Ocean Hackathon®.

## The Ambassadors and the French Ministry of the Sea

- Laurent Kerléguer, Director, Shom
- Romain Charraudeau, Director Technology Transfer and Innovation, Ifremer
- Matthieu Chevallier, in charge of the marine forecasting department, Météo France
- Florence Cayocca, French Office of Biodiversity
- Stéphane Doll, Director, Cedre
- Frédéric Moncany de Saint Aignan, President, Cluster Maritime Français
- Sigolène Brun, Director, Le Village by CA Finistère
- Laure Dassonville, Representative of the French Ministry of the Sea

## The representatives of the cities in the jury

- Antonello Sala, CNR IRBIM (Ancona, Italy)
- Francisco López Castejón, Cartagena Oceanographic Research Institute (Cartagena, Spain)
- Nikola Bali, University of Split (Split, Croatia)
- Marie Nghiem, Village by CA PACA (Toulon, France)
- Nicolas Bessec, Les Vagues (Saint-Malo, France)
- David Merieau, Excelia Group (La Rochelle, France)
- Gaëlle Jean, Blue Living Lab NAUSICAA (Boulogne-sur-Mer, France)
- Sabine Garnier, KEM'S consulting (Deshaies, Guadeloupe, France)
- Valérie Barbosa, French Embassy in Mexico (México, México)
- Françoise Duprat, Technopôle Brest-Iroise (Brest, France)
- Francisco González Pérez, State Delegate of the Cádiz Free Trade Zone Consortium (Cadiz, Spain)



OCEANHACKATHON® IS ORGANISED BY:

WITH THE SUPPORT OF:





Actors of the sea,  
digital and innovation,  
organise  
Ocean Hackathon®  
in your city

**OCEAN 6**  
HACKATHON®  
NOVEMBER 5-7, 2021

March 15, 2021  
**CALL FOR  
HOSTING**  
[WWW.OCEAN-HACKATHON.FR](http://WWW.OCEAN-HACKATHON.FR)

