APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH IN WATERS UNDER THE JURISDICTION OF UNITED KINGDOM

Date: 07 February 2019

1 - GENERAL INFORMATION

1.1. Expedition's name **TARA EUROPE**

1.2. Sponsoring institution

Name	**Tara Foundation**
Representative	**Romain Troublé** CEO
Address	11 Boulevard Bourdon 75004 Paris, France
Phone	+33 (0)6 60 68 97 12
Email	romain@taraexpeditions.org

1.3. Scientist in charge of the project:

Name	**Dr. Jean-François GHIGLIONE**
Address	**CNRS/Sorbonne University**, Laboratoire d'Océanographie Microbienne 1, Avenue Fabre ; 66 650 Banyuls sur mer, France
Phone	+33 (0)4 68 88 73 16
Email	ghiglione@obs-banyuls.fr

1.4. Local scientist involved in the planning of the project

Name	**Pr. Robert Britton**
Address	**Bournemouth University,** Christchurch House C238b, Talbot Campus, Fern Barrow, Poole, BH12 5BB
Phone	01202 965384
Email	rbritton@bournemouth.ac.uk

1.5. Submitting officer:

Name	**Romain Troublé**
Address	11 Boulevard Bourdon 75004 Paris, France
Phone	+ 33 (0)6 60 68 97 12 – Cellular R. Troublé +33 (0)1 42 01 38 57 – Office
Email	romain@taraexpeditions.org

2 - DESCRIPTION OF THE PROJECT

2.1. Nature and objectives of the project:

Project Summary. We are generating more than 275 million tons of plastic waste, with 5% ending in the oceans (Jambeck et al., 2015). We estimate that 80% of this waste in coming from the continent, mainly from rivers that can carry up to 1.5 million tonnes of waste per year (Yangtze, China) (Carson et al., 2013). Most studies in rivers consider only macro-wastes, whose concentrations are closely related to the waste treatment capacities of the countries considered. The few studies conducted in industrialized countries suggest that a large proportion of plastics arriving at sea are already in the form of microplastics. The Thames river (UK) carries 18 tons of plastic annually to the sea and the debris collected are 65% made of microplastic (Browne et al., 2010). Better assess the sources of microplastics and their fate at sea is a new scientific challenge that will help solving this pollution more effectively.

The objective of TARA Plastic Europe expedition is to identify the source and to predict the fate and the ecosystem impacts of microplastics in the land-sea continuum, within rivers, estuaries and at sea.

This will be the first large-scale and cross-disciplinary expedition taking into account **eleven of the largest rivers in Europe: Thames, Elbe, Rhine, Seine, Loire, Garonne, Tagus, Ebro, Rhone, Var and Tiber.**

The main goals of TARA Europe Expedition.

This project aims to meet several complementary goals:

(i) evaluate the composition of microplastics to better understand their origin. Today, studies are generally limited to quantifying plastic waste accumulated on beaches, rivers or oceans by sorting plastics by size or shape (granules, films, fibers, ...), which only gives a fragmentary information on their origin. Here, we will identify the polymer composition including the various additives (plasticizers, stabilizers, flame retardants, pigments, ...) that make up microplastics. These analyzes will enrich the environmental data banks today mainly made up of marine samples (in particular from the data of the Mediterranean Tara Expedition 2014) with the aim of evaluating their origin in order to identify the sources of pollution.

(ii) explore the fragmentation of plastics to nano-plastics. Recent studies indicated that plastic fragmentation is already occurring in rivers, prior to their arrival at sea, but the mechanisms involved are unknown. The tools developed by the partners of this project and their complementarity will make it possible to understand the diversity of phenomena that lead to the fragmentation of plastics in rivers (description of photochemical oxidation states, mechanical stress, biodegradation by microorganisms). We will compare the reactivity of large microplastics (from 1 to 5 mm), small microplastics (from 1 to 1 mm) and their transformation into nano-plastics (<1 µm) in the salinity gradient of rivers. This knowledge will have important impacts on understanding the fate of plastics in the aquatic environment.

(iii) evaluate the effect of plastics on biodiversity. The "plastisphere" has been described as a new habitat for the many species that colonize plastics. Our teams have shown that there is a very special biodiversity on plastics, with the presence of species having a key role in global biogeochemical cycles. Moreover, plastics participate in the dispersal of species over long distances and constitute a vector of invasive species that can permanently disrupt ecosystems. This project aims to assess the biodiversity of the plastisphere in the land-sea continuum, which has so far been totally unexplored.

(iv) ***predict the fate of plastics at sea from riverine inputs.*** The modeling allows to predict the fate of plastic waste in the statistical vision of the trips, strandings on the beaches or sedimentation. This project provides statistical scenarios of the geographical paths of floating plastic wastes of different sizes at sea, from which were characterized by parts (i) and (ii) and taking into account biofouling on the buoyancy of plastics studied in part (iii). The resolution scales of the hydrodynamic model will be both local (400m resolution) and more global (2-4 km).

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Tara Expeditions
Tara Europe is the new expedition managed by Tara Expeditions. This initiative involves as a main character, the unique expedition vessel Tara. Tara's voyages are dedicated to the understanding of our planet for a better protection. Tara expeditions have therefore common multi-orientated goals which are:

- to constitute a unique platform for scientific research ,
- to bring through its adventurous voyages, the community and the children towards more scientific and environmental awareness.

Tara has entered the history of exploration through its past expeditions. She has carried out 6 major expeditions in Arctic, in Antarctic, in Patagonia, in Greenland, and all over the world. Famous characters as the Dr Jean-Louis Etienne, Sir Peter Blake, and nowadays Etienne Bourgois have contributed to the legend of Tara.

2.2. Relevant previous or future research cruises of the Chief Scientist:

Chief scientist: total of 421 days at sea as scientist.

2018-Campaign TARA PACIFIC 24 Jan-5 March 2018 (40 days) onboard the R/V TARA from Tay-Tay (Philippine) to Sanya (China), on the study of examine the biodiversity of coral reefs and their evolution in response to climate change and human activities (including plastics).

2017-Campaign SGD 29 May-2 June 2017 (4 days) onboard the R/V Antédon, on the study of the submarine groundwater discharge as a source of plastics and chemical compounds at the land-ocean interface.

2016-Campaign TARA PACIFIC 2 Nov-15 Dec 2016 (34 days) onboard the R/V TARA from Tahiti – Wallis et Futuna, on the study of examine the biodiversity of coral reefs and their evolution in response to climate change and human activities (including plastics).

2016-Campaign INDOS 17-26 May (10 days) onboard the R/V Pilos, on the study of climate and human-induced alterations in carbon cycling in Jakarta bay (Indonesia).

2014-Campaign TARA MEDITERRANEA April, 1-11 June and 1-19 November 2014 (30 days) onboard the R/V TARA, on the study of the impact of plastic on the ecosystems in the Mediterranean Sea.

2014-Campaign MORFUN 6-18 March 2014 (12 days) on the effect of copper-contaminated sediments on marine microorganisms in Palito canal and Flamenco bay (Chili).

2012-Campaign VERMEILLECOTOX (20 days) onboard R/V Nereis II on the source and impact of contaminants on biological diversity and activities in the Catalan course (NW Mediterranean Sea).

2011-Campaign CASCADE 2-28 March 2011 (26 days) onboard R/V Atalante on the effect of cascading, surge, convection, advection and downwelling events on microbial carbon pump and biodiversity (NW Mediterranean Sea).

2010-Campaign IBISCUS II 25 Jan-5 Feb 2010 (10 days) onboard the R/V Antédon on the study of the impact of HAP on marine bacterial communities (NW Mediterranean Sea).

2010-Campaign BERTOX 07-10 Jan 2010 and 23-28 Nov 2010 (10 days) on the study of the impact of HAP on marine biological communities in Berre Lagoon (France).

2009-Campaign IBISCUS 22 June-02 July 2009 (10 days) onboard the R/V Antédon on the study of the impact of HAP on marine bacterial communities (NW Mediterranean Sea).

2008-Campaign JEST 15 Nov-06 Déc 2008 (21 days) onboard the R/V Plancha on the study of climate and human-induced alterations in carbon cycling at the Terminos lagoon (Mexico).

2008-Campaign International Polar Year - POLMICROBS 11 July-10 Sept 2008 (62 days) onboard the R/V Laurence M. Gould on the study of Polar Microbial Observatories in Antarctic and Sub-Antarctic coastal zones.

2008-Campaign CHACCRA 9-25 May 2008 (17 days) onboard the R/V Tethys II on the study of climate and human-induced alterations in carbon cycling at the river-sea connection.

2006-Campaign BIOPRHOPHI in Mai 2006 (20 days) onboard the R/V Tethys II on the study of biogeochemical processes in Rhone diluted mesoscale structure.

2005-Campaign MOLA in July 2005 (7 days) onboard Nereis II on the study of microbial biological processes on organic carbon pump in NW Mediterranean Sea.

2004-Campaign DYNAPROC in September-October 2004 (30 days) onboard the R/V Thalassa on the study of physic, chemical and biological processes, controlling the vertical flux of organics in the NW Mediterranean Sea.

2003-Campaign PROPECHE in 25-31 March and 19 June-4 July 2003 (25 days) onboard R/V Téthys II on the study of physic, chemical and biological processes, controlling the vertical flux of organics in NW Mediterranean Sea.

2002-Campaign BASICS in 1st Sept-3 Oct 2002 (33 days) onboard R/V PELAGIA on the study of physic, chemical and biological processes, controlling the flux of organics in the Atlantic.

2.3. Previously published research data relating to the project:

Publication in the last 5 years of the Chief Scientist (2015-2019):

(see complete list at http://lomic.obs-banyuls.fr/fr/personnel/personnel_lomic/pages_personnelles/ghiglione.html):

1. Jacquin J, Cheng J, Odobel C, Conan P, Pujo-Pay M, Meistertzheim AL, **Ghiglione JF.** Microbial ecotoxicology of marine plastic debris: a review on colonization and biodegradation by the 'plastisphere' ***Frontiers in microbiology (IF 4.52)*** (in press)
2. Meistertzheim AL, Pochon X, Wood SA, **Ghiglione JF,** Hédouin L (2019) Development of a quantitative PCR-high resolution melting assay for absolute measurement of coral-Symbiodiniaceae associations and its application to investigating variability at two geographic scales. ***Marine Biology (IF 2.61)*** 166:13.
3. Fichez R, Linares C, Chifflet S, Conan P, Contreras Ruiz Esparza A, Denis L, Douillet P, Grenz C, **Ghiglione JF**, Gutiérrez Mendieta F, Origel-Moreno M, Muñoz Caravaca A, Pujo-Pay M, Zavala-Hidalgo J. Multiparametric typology of transitional waters in a tropical lagoon (Terminos Lagoon, Mexico), spatiotemporal variability and impact of the 2009-2010 El Niño related drought. ***Regional Environmental Change (IF 2.34)*** (under correction).
4. Catao E, Pollet T, Misson B, Garnier C, Ghiglione JF, Barry-Martinet R, Maintenay M, Bressy C, Briand JF. Shear stress as a major driver of marine biofilm communities in the NW Mediterranean Sea. ***ISME Journal*** (in correction).
5. Dussud C, Meistertzheim AL, Conan P, Pujo-Pay M, George M, Fabre P, Coudane J, Higgs P, Elineau A, Pedrotti ML, Gorsky G, **Ghiglione JF** (2018) Evidence of niche partitioning among bacteria living on plastics, organic particles and surrounding seawaters. ***Environmental Pollution (IF 5.09)*** 236: 807-816.
6. Dussud C, Hudec C, George M, Fabre P, Higgs P, Bruzaud S, Delort AM, Eyheraguibel B, Meistertzheim AL, Jacquin J, Cheng J, Callac N, Odobel C, Rabouille S, **Ghiglione JF** (2018). Colonization of non-biodegradable and biodegradable plastics by marine microorganisms. ***Frontiers in microbiology (IF 4.52)*** 9:1571.
7. Ziegler M, Quéré G, **Ghiglione JF**, Iwankow G, Barbe V, Wincker P, Planes S, Voolstra CR (2018) Status of coral reefs of Upolu (Independent State of Samoa) in the South West Pacific and recommendations to promote resilience and recovery of coastal ecosystems. ***Marine Pollution Bulletin (IF 3.15)*** 129:392-398.
8. Lambert S, Tragin M, Lozano JC, **Ghiglione JF**, Vaulot D, Bouget FY, Galand P. Rhythmicity of coastal marine picoeukaryotes, bacteria and archaea despite irregular environmental perturbations. ***ISME Journal (IF 9.52)*** doi.org/10.1038/s41396-018-0281-z.
9. Celussi M, Quero Grazia M, Zoccarato L, Franzo A, Corinaldesi C, Rastelli E, Lo Martire M, Galand PE, **Ghiglione JF**, Chiggiato J, Coluccelli A, Russo A, Pallavicini A, Fonda Umani S, Del Negro P, Luna GM (2018) Planktonic prokaryote and protist communities in a submarine canyon system in the Ligurian Sea (NW Mediterranean) ***Progress in Oceanography (IF 3.85)*** DOI: 10.1016/j.pocean.2018.10.002
10. Chapron L, Peru E, Engler A, **Ghiglione JF**, Meistertzheim AL, Pruski AM, Purser A, Vétion G, Galand PE, Lartaud F (2018) Microplastics are a serious threat for deep-water coral reefs. ***Scientific reports (IF 4.61)*** 8:15299.
11. Conan P, Pujo-Pay M, Agab M, Calva-Benitez L, Chifflet S, Douillet P, Dussud C, Fichez R, Grenz C, Gutierrez Mendieta F, Origel-Moreno M, Rodríguez-Blanco A, Sauret C, Séverin T, Tedetti M, Torres Alvarado R, **Ghiglione JF** (2017). Biogeochemical cycling and phyto- and bacterioplankton communities in a large and shallow tropical lagoon (Términos Lagoon, Mexico) under 2009–2010 El Niño Modoki drought conditions ***Biogeosciences (IF 3.86)***, 14: 959–975.
12. Blanchet M, Pringault O, Panagiotopoulos C, Lefèvre D, Charrière B, **Ghiglione JF**, Fernandez C, Aparicio F, Marrase C, Catala C, Oriol L, Caparros J, Joux F (2017) When riverine dissolved organic matter (DOM) meets labile DOM in coastal waters: changes in bacterial community activity and composition ***Aquatic Science (IF 2.71)***, 79:27–43.
13. Durrieu de Madron X, Ramondenc S, Berline L, Houpert L, Bosse A, Martini S, Guidi L, Conan P, Curtil C, Delsaut N, Kunesch S, **Ghiglione JF**, Pujo-Pay M, Séverin T, Testor P, Tamburini C, and the ANTARES collaboration (2017) Deep sediment resuspension and thick nepheloid layer generation by open-ocean convection. ***Journal of Geophysical Research - Oceans (IF 2.93)***, 122: 2291–2318.
14. Severin T, Kessouri F, Rembauville M, Sanchez D, Oriol L, Caparros J, Pujo-Pay M, **Ghiglione JF**, D'Ortenzio F, Ulses C, Estournel C, Conan P (2017) Open-ocean convection process: A driver of the winter

nutrient supply and the spring phytoplankton distribution in the Northwestern Mediterranean Sea. ***Journal of Geophysical Research: Oceans (IF 2.93)***, 122: 4587–4601.

15. Grenz C, Fichez R, Álvarez Silva C, Calva Benítez L, Conan P, Contreras Ruiz Esparza A, Denis L, Díaz Ruiz S, Douillet P, Gallegos Martinez ME, **Ghiglione JF**, José Gutiérrez Mendieta F, Origel-Moreno M, Zoilo A, Garcia M, Muñoz Caravaca A, Pujo-Pay M, Torres Alvarado R, Zavala-Hidalgo J (2018) Benthic ecology of tropical coastal lagoons: environmental changes over the last decades in Terminos Lagoon, Mexico. ***Comptes Rendus Geoscience (IF 1.54)*** 349:319-329.

16. Severin T, Sauret C, Boutrif M, Oriol L, Caparros J, Pujo-Pay M, Durrieu de Madron X, Garel M, Tamburini C, Conan P, and **Ghiglione JF** (2016) Impact of an intense water column mixing (0-1500m) on prokaryotic diversity and activities during an open-ocean convection event in the NW Mediterranean Sea. ***Environmental Microbiology (IF 4.91)***, 18(12):4378-4390.

17. **Ghiglione JF**, Martin-Laurent F, Pesce S (2016) Microbial ecotoxicology: an emerging discipline facing contemporary environmental threats. ***Environmental Science and Pollution Research (IF 2.83)*** 23: 3981-3983

18. Misson B, Garnier C, Lauga B, Huy Dang D, **Ghiglione JF**, Mullot JU, Duran R and Pringault O (2016) Chemical multi-contamination drives benthic prokaryotic diversity in the anthropized Toulon Bay. ***Science of the total environment (IF 4.09)***, 556: 319–329.

19. Jeanbille M, Gury J, Duran R, Tronczynski J, **Ghiglione JF**, Agogué H, ben Saïd O, Taïb N, Debroas D, Garnier C, Auguet JC (2016) Chronic PAH contamination is a marginal driver of prokaryotic diversity and function in coastal sediments. ***Frontiers in Microbiology (IF 4.16)***, 19:1303.

20. Jeanbille M, Gury J, Duran R, Tronczynski J, Agogué H, ben Saïd O, **Ghiglione JF,** Auguet JC (2017) Response of core microbial consortia to hydrocarbon contaminations in coastal sediment habitats. ***Frontiers in Microbiology (IF 4.16)***, 7:1637.

21. Sauret C, Tedetti M, Guigue C, Dumas C, Lami R, Pujo-Pay M, Conan P, Goutx M, **Ghiglione JF** (2016) Influence of PAHs among other coastal environmental variables on total and PAH-degrading bacterial communities. ***Environmental Science and Pollution Research (IF 2.83)*** 23: 4242-4256

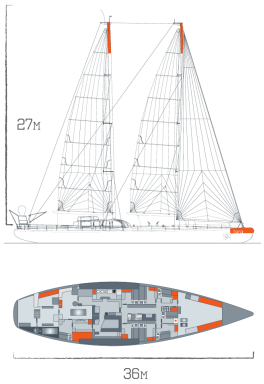
22. Céa B, Lefèvre D, Chirurgien L, Raimbault P, Garcia N, Charrière B, Grégori G, **Ghiglione JF**, Barani A, Lafont M, Van Wambeke (2016). An annual survey of bacterial production, respiration and ectoenzyme activity in coastal NW Mediterranean waters: temperature and resource controls. ***Environmental Science and Pollution Research (IF 2.83)*** 22:13654-13668.

23. Faure D, Bonin P, Duran R, Amato P, Arsène-Ploetze F, Auguet JC, Bernard L, Bertin PN, Bettarel Y, Bigot-Clivot A, Blot N, Blouin M, Bormans M, Bouvy M, Bruneel O, Cébron A, Christaki U, Couée I, Cravo-Laureau C, Danger M, de Lorgeril J, Desdevises Y, Dessaux Y, Destoumieux-Garzón D, Duprat E, Erauso G, Haichar Fel Z, Fouilland E, Francez AJ, Fromin N, Geffard A, **Ghiglione JF**, et al. (2015) Environmental microbiology as a mosaic of explored ecosystems and issues. ***Environmental Science and Pollution Research (IF 2.83)*** DOI: 10.1007/s11356-015-5164-5.

24. Sauret C, Böttjer D, Talarmin A, Guigue C, Conan P, Pujo-Pay M, **Ghiglione JF** (2015) Top-down control of diesel-degrading bacterial communities. ***Microbial Ecology (IF 3.12)***, 70:445-458.

3 - METHODS AND MEANS TO BE USED

3.1. Particular of vessel



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Name	TARA
Nationality	French
Owner	Tara Foundation
Operator	Tara Foundation
Overall length	35,98 meters
Maximum draught	160 UMS
Net tonnage	120 Tonnes
Gross tonnage	145 tons
Propulsion	Conventional fuel/sail; 2X 350kw diesel engines
Cruising speed	7,5 knots
Maximum speed	10,5 knots
Call sign	FVNM

N°immatriculation	RI 748443 A
N° MMSI	226070000

Method and capability of communication (including telex, frequencies)

Iridium	+8816 777 01732
E-mail	captain@tara5.oceanbox.net
Mobile (GSM):	+ 33 (0) 68 91 81 87

Name of master	Martin Hertau
Number of crew	11 persons
Number of scientists on board	5 persons

3.2. Aircraft or other craft to be used in the project: None.

3.3. Particulars of methods and scientific instruments:

Work at sea and in rivers.
Sampling will be done from the R/V Tara at sea or using a semi-rigid boat along the Thames river.
Station duration is approximatively 3 hours.
Each sample will consist of at least 2 Manta tows, 30 min each, performed in the Thames rivers and at sea. Plastic samples will be stored at -20°C.

At each sampling station, 10L water will be taken using a Nisking bottle, filtered and the filters will be frozen at 20°C for the suty of water column microbial communities.
Sediment samples will be also taken in each sampling point using a van Veen sediment grab. Plastic will be sorted and frozen in -20°C.

The physico-chemical sampling will be done underway using a SBE thermosalinograph and a hyperspectral ACs from the University of Maine. A SBE CTD will be deployed vertically to determine the depth of the mixed layer. Ocean Colour satellite images supplied by ACRI-ST and the Mercator circulation model will be used to determine the zones of interest for the field sampling.

Figure 1: Pictures of the manta net (left), SBE CTD (middle-left), van Veen sediment grab (middle-right) and Niskin bottle(right).

3.4. Indicates whether harmful substances will be used:

- Lugol
- Ethanol

3.5. Indicate whether drilling will be carried out: None.

3.6. Indicate whether explosives will be used: None.

4 - INSTALLATIONS AND EQUIPMENTS

Details of installations and equipments: None.

5 - GEOGRAPHICAL AREAS

5.1. Indicate geographical areas in which the project is to be conducted :

The sampling collection will take place within waters under your jurisdiction. It will consist in 4 sampling stations of 3 hours each. Some stations will take place at sea and others will take place in the Thames river.

Sampling will take place between the 9th and the 13th June 2019, with a possible delay of 20 days at maximum.

Station 1: Sea sample (in front of the mouth of the Thames river)

Sampling zone: 51°29'41.11"N
1°03'44.37"E
To be specified according to navigation conditions.

Station 2: River sample in Southern-on-Sea (river mouth of the Thames river)

Sampling zone: 51°30'12.98"N
0°42'36.34"E
To be specified according to navigation conditions.

<u>Station 3</u>: River sample in Greenhithe (brackish water in the Thames river)

Sampling zone: 51°27'47.24"N
0°15'36.63"E
To be specified according to navigation conditions.

<u>Station 4</u>: River sample in Richmond (freshwater in the Thames river)

Sampling zone: 51°27'38.25"N
0°42'36.34"O
To be specified according to navigation conditions.

5.2. Attach chart(s) at an appropriate scale showing the geographical areas of the intended work and, as far as practicable, the positions of intended stations, the tracks of survey lines:

6 - DATES

6.1 Expected dates of first entry into and final departure from the research area of the research vessel:

Entry **date:** at the earliest on 6th June 2019
Departure **date:** at the earliest on 15th June 2019

These dates might be subject to a delay of 20 days at maximum.

6.2 Indicate if multiple entry is expected:
no

7 - PORTS CALLS

7.1. Dates and names of intended ports of call.

The expedition Tara Europe offering an important pedagogic and public information dimension, it would be most appreciable if the S/V Tara could be easily visible for the public and scholars and accessible to welcome the country representatives and journalists on board.

London St Katherine's Dock – to 15th June 2019

7.2. Any special logistical requirements at ports of call All managed wityh the related authorities.

7.3. Name/Address/Telephone of shipping agent (if available) To be confirmed.

8 - PARTICIPATION

8.1. Extent of which the local scientists will be enabled to participate in the research project:

The local scientists and institutes will participate to the project with the statute of "Associated Institutes and Scientists". They will have primary access to all information regarding the cruise, as well as to all scientific results. Due to technical and logistic constraints regarding the size of the S/V Tara and its route, it will be difficult to allow the embarkation of more than one local scientist.

8.2. Proposed dates and ports for embarkation/disembarkation

Start **date:** St Malo harbour, France, June 8th.
End **date:** tSt Katherine's Dock, London, June 10th

9 - ACCESS TO DATA, SAMPLES AND RESEARCH RESULTS

9.1. Expected dates of submission of preliminary reports which should include the expected dates of submission of the final results:

A preliminary report precising all the scientific stations done will be available for any local scientist or institutions wishing to be associated to the project. It will be available at least 3 months after the ship departure from local waters.

9.2. Proposed means for access to data and samples:

Local scientists and institutes could participate to the project as "Associated scientists and institutes".

In order to preserve the collections, observations and analyses, the Tara Europe expedition will publish all data measured on public data-bases once cleaned and calibrated. The samples of plastic will be brought to the concerned laboratories for analysis. All the research results will be published on scientific journals. This sampling effort will allow the scientific community to refine its knowledge about the life interaction with plastic particles at sea.

9.3. Proposed means of making research internationally available:

Idem, the international diffusion of scientific results will be freely accessible through data bases and through scientific publications. The general information of the public and of children will be made through the usual media, the production of films and a specific pedagogic program across France and at port calls.

ANNEXE

The Tara Europe fields coordinators

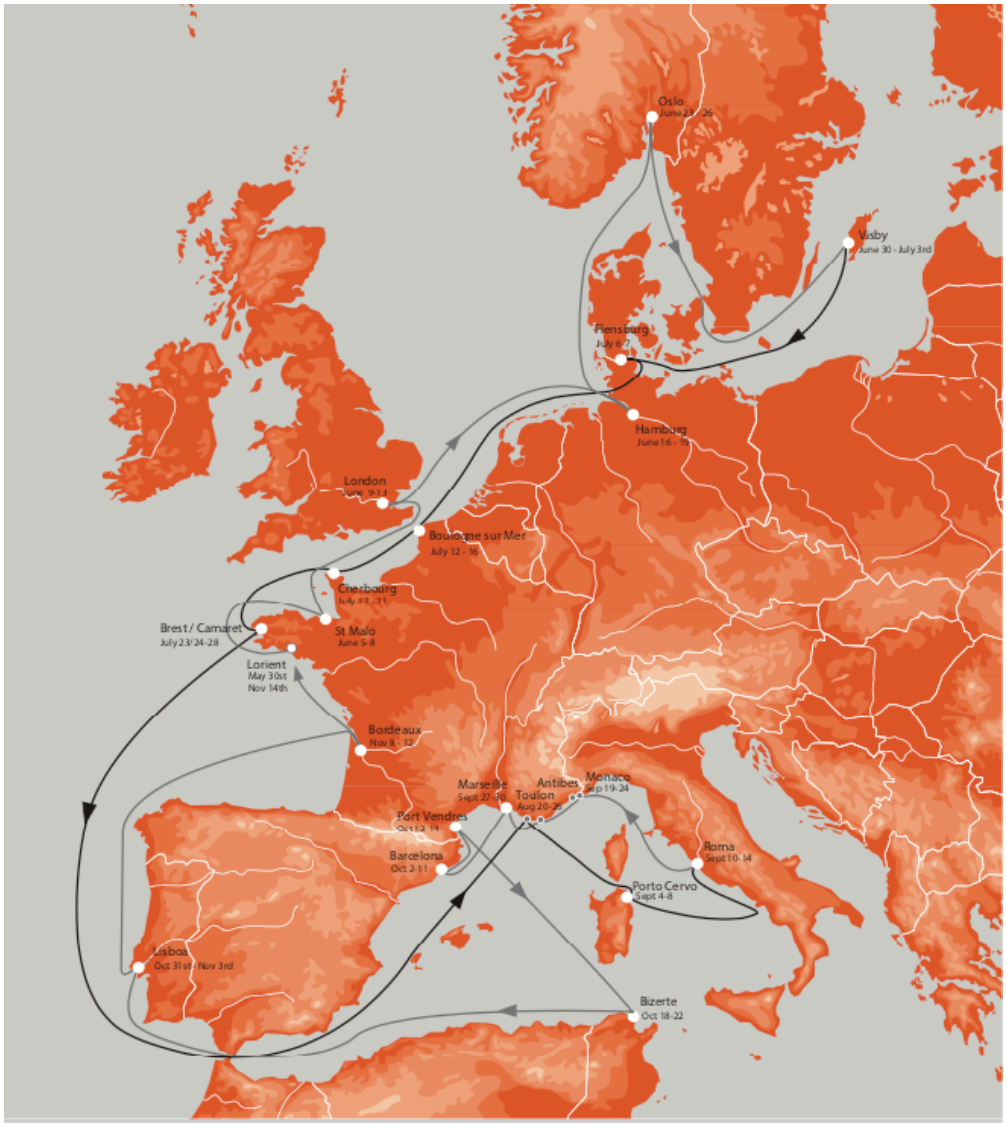
Tara Europe directors
Jean-François Ghiglione (CNRS, FR)
Romain Troublé (TARA, FR)

Scientific Coordinators

Stephane Bruzaud, UBS, Lorient, FR	Plastic composition
Alexandra ter Halle, CNRS, Toulouse, FR	Plastic fragmentation
Pascale Fabre, CNRS, Montpellier, FR	Plastic surface properties
Leila Meistertzheim, Plastic@Sea, Banyuls, FR	Plastic biodegradation
Matthieu George, University of Montpellier, FR	Atomic force microscopy
Valérie Barbe, CEA Genoscope, Evry, FR	Genomic analysis
Gaetan Burgaud, University of Bretagne, Brest, FR	Fungal biodegradation
Justine Jacquin, CNRS, Banyuls, FR	Bacterial biodegradation
Charlene Odobel, CNRS, Banyuls, FR	Microbial communities
Caroline Pandin, CNRS, Banyuls, FR	Metagenomes
Colomban de Vargas, CNRS, Roscoff, FR	Eukaryotes communities
Maria-Luiza Pedrotti, CNRS, Villefranche, FR	Macrobial communities
Ika Paul-Pont, CNRS, Plouzané, FR	Ecotoxicology
Arnaud Huvet, IFREMER, Plouzané, FR	Toxicology
Pascal Conan, Sorbonne University, Banyuls, FR	Primary production
Mireille Pujo-Pay, CNRS, Banyuls, FR	Organic and inorganic matter
Emmanuel Boss, University of Maine, USA	Hydrology and satellite imagery
Francois Galgani, IFREMER, Bastia, FR	Database of marine plastic
Wolfgang Ludwig, University of Perpignan, FR	Database of land-sea plastic
Johnny Gasperi, CNRS, Paris, FR	Database of river plastic
Yann Ourmières, University of Toulon, FR	Hydrology modelisation
Claude Estournel, CNRS, Toulouse, FR	Hydrology and biology modelisation

Other coordinators

Romain Troublé, TARA, FR	Tara Foundation Manager
Elodie Bernollin,TARA, FR	Communication
Myriam Thomas, TARA, FR	Events



Map of the Tara Europe cruise from May to November 2019