All Atlantic Ocean Research Alliance Flagship

The actions shall aim at understanding and sustainably managing the Atlantic Ocean as a whole, through a large-scale basin effort involving both the northern and the southern parts of this ocean and its interlinks with the adjacent areas. In order to achieve this, it is necessary to bring together and systematically connect scientists, stakeholders, data, knowledge, expertise, capacities, and resources. This is only feasible through the synergistic cooperation among the bordering countries. With the development of a South Atlantic Ocean Science Plan[[South-South Framework for Scientific and Technical Cooperation in the South and Tropical Atlantic and Southern Ocean]] focusing on the challenges and research needs of the South Atlantic Ocean, which are also interconnected with the challenges and research needs of the North Atlantic Ocean, this cooperation can converge towards the implementation of a systemic approach by linking and jointly tackling the climate-food-ocean challenges. Overall, activities shall contribute to upscale cooperation along and across the Atlantic Ocean and the creation of long-term partnerships building on on-going initiatives such as the All Atlantic Ocean Research Alliance. In order to realise this, proposals shall address one of the following sub-topics:

[A] 2018 - Coordination of marine and maritime research and innovation activities in the Atlantic Ocean. Activities shall launch a multi-stakeholder platform to reinforce international cooperation between Europe and tropical and South Atlantic countries and to connect with the challenges and research needs of the North Atlantic Ocean, as outlined above. The platform shall address the key following points: enhance business opportunities and the up-take of innovations e.g. aquaculture production systems, marine and maritime technologies; develop common standards e.g. for deep ocean and shelf observing systems, seafloor mapping, ecosystem approaches in utilizing marine living resources; reinforce capacity building by aligning European training programmes, including through industrial apprenticeship opportunities and networking with Atlantic partners; promote citizen awareness and literacy on ocean issues; align and converge international research and innovation cooperation activities and other relevant initiatives and investments between the northern and southern Atlantic countries. It

will upscale cooperation with countries bordering the South Atlantic Ocean, in particular Brazil and South Africa, by reinforcing the mutual benefits of science diplomacy, addressing the grand challenges and opportunities of the Atlantic Ocean as a system, exploiting the benefits it holds for our citizens and entering a new era of Blue Enlightenment which spans from Antarctica to the Arctic.

This action should build on past and ongoing regional, national initiatives and programmes e.g. PIRATA[[Prediction and Research Moored Array in the Atlantic]], SAMOC[[South Atlantic Meridional Overturning Circulation.]], SA MAR-ECO[[South Atlantic Patterns and Processes of the Ecosystems of the southern Mid-Atlantic Ridge.]], GEOTRACES[[An international Study of the Marine Biogeochemical Cycles of Trace Element and their Isotopes.]], SOLAS[[Surface Ocean Lower Atmosphere Study.]], OTN[[Ocean Tracking Network.]], ICEMASA[[International Centre for Education, Marine and Atmospheric Sciences over Africa.]], BCLME[[Benguela Current Large Marine Ecosystem.]], and EU projects e.g. MAREFRAME, BIOMORE, ATLANTOS, AORAC-SA, EU POLAR Net, INMARE, PREFACE etc. as well as national initiatives across and alongside the Atlantic Ocean. It should also involve (or liaise with) relevant European research infrastructures such as Euro-Argo ERIC and EMSO ERIC. In agreement with the Commission services, projects should ensure appropriate flexibility so as to respond in real time to potentially fast-changing policy scenarios.

[B] 2018-2019- Assessing the status of Atlantic marine ecosystems. Activities shall enhance the knowledge on the status and dynamics of Atlantic marine ecosystems, quantifying main drivers of short and long-term change, examine the interactions between different stressors, including climate change, and the role of cumulative impacts on ecosystem functioning and associated ecosystem services. They shall also contribute to improve the sustainability of the exploitation of the marine resources, through extending climate based predictions as well as testing for so-called tipping points, regimes shifts or more advanced assessments of ecosystem stability. Activities may entail 3D–mapping of the water column and high resolution seafloor mapping of selected large areas (including relevant marine ecosystems), considering the feasibility/safety and sustainability of these maritime operations. Mapping shall include variables of a different nature, such as physical, biological, chemical, habitats, seafloor characteristics and integrity (including in relation to climate change) and may require the development of new technologies. Furthermore, demonstration of cost-effective approaches to management and processing of the large quantities of data, better coordinated data sharing and operability, as well as the development of improved forecasting capabilities of stressors, tipping points, recovery and changes in ecosystem state will be important. The participation of industrial and regional stakeholders is encouraged to help define ecosystem-requirements. All data collected by the projects (including in international waters) shall be made open access by the end of the project. The choices of the selected areas need to be justified. Actions shall include capacity building and training with/in

countries bordering the South and Tropical Atlantic Ocean. Links with ongoing initiatives such as EMODNet should be considered. The activities will be carried out in close co-operation with relevant Commission services (Directorate-General for Research and Innovation), ensuring coherence with related policy initiatives.

[C] 2018-2019- New value chains for aquaculture[[In this context, 'Aquaculture' comprises the farming of aquatic organisms (including fish, shellfish, algae and aquatic plants) in all types of controlled or natural water environments (fresh, brackish and seawater).]] **production.** Activities shall explore new species, products and/or processes for aquaculture production (including algae). They shall consider existing, emerging and potential markets, take into consideration sound cost-effective production methods, sustainability and profitability. Consideration shall be given to the design of Internet of Things (IoT) approaches in the development of innovative production technologies, including new/improved biosensors, the circularity of the processes with the objective of zero waste and consider consumers' concerns and demands. The development of monitoring programmes for risk assessment including emerging pollutants and climate change resilience and mitigation will be essential. Activities shall contribute to reduce risks to human health. They will also foster higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors. Finally, it will be important to reinforce capacity building by aligning training programmes, including through industrial apprenticeship opportunities and networking along and across the Atlantic Ocean, in particular, but not exclusively, with South Africa and Brazil and other Atlantic Ocean coastal states. Reinforcing links between industrial partners is also crucial to exchange best practices and to facilitate the creation of business opportunities, therefore the SME participation in this topic is encouraged.

The Commission considers that proposals requesting a contribution from the EU respectively in the range of EUR 4 million for sub-topic [A] (Coordination and Support Action), EUR 9 million for sub-topic [B] (Research and Innovation Action) and EUR 8 million for sub-topic [C] (Research and Innovation Action) would allow this specific challenge to be adequately addressed. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Consortia submitting proposals to this Flagship are encouraged to include participants from countries bordering the Atlantic Ocean (North and South) as their active participation is key to the success of the proposals.

Proposals shall include a task to cluster with other projects financed under this topic and – if possible – with other relevant projects in the field funded by Horizon 2020. Possible links with related research and innovation activities supported by the Belmont Forum[[https://www.belmontforum.org/]] on Ocean sustainability shall also be considered.

The Atlantic Ocean is an invaluable shared resource. The societal value of its blue economy is enormous for countries located on its shores. There are however, still considerable gaps in our knowledge and understanding of processes related to this ocean especially with regard to its chemistry, ecology, biodiversity, impacts of climate and the potential for the sustainable exploitation of its natural resources including aquaculture. The Atlantic Ocean is subject to a range of pressures, such as impacts related to climate change, pollution, fishing above sustainable levels, mining and coastal eutrophication. Both remote and local forces play a role in these changes and it is necessary to consider local, regional and basin-wide drivers and factors to understand, predict and adapt to change. Furthermore, the potential of seafood to reduce food and nutrition insecurity calls for collaboration at international level. Having already demonstrated how successful research cooperation can be in the North Atlantic Ocean[[EU-Canada-US Galway Statement on Atlantic Ocean Cooperation, May 2013]] in tackling some of these issues, the objective now is to take a systemic approach to tackle the scientific and socio-economic challenges and to move towards a basin-wide cooperation from Antarctica to the Arctic, through enhanced cooperation with countries bordering the South Atlantic, notably Brazil and South Africa[[EU-Brazil-South Africa Belém Statement on Atlantic Research and Innovation Cooperation, July 2017]].

In order to contribute to the implementation of the EU Integrated Maritime Policy and its related Atlantic Strategy and Action Plan, the EU Blue Growth Strategy, the EU Marine Strategy Framework Directive, the EU Maritime Spatial Planning Directive, the EU International Ocean Governance Communication, the EU Communication for a Sustainable European Future, the UN SDGs, the EU Food 2030[[European Research and Innovation for Food and Nutrition Security, SWD(2016)319. http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF]] process for food and nutrition security, as well as the Atlantic Ocean Research Alliance, activities shall:

In the short term:

- Contribute to the implementation of the EU-Brazil-South Africa Belém Statement on Atlantic Ocean Research and Innovation cooperation (sub-topics A, B & C)[[EU-Brazil-South Africa Belém Statement on Atlantic Research and Innovation Cooperation, July 2017]].
- Improve the coordination and alignment of programmes/initiatives and projects between South and North Atlantic regions and with the EU and its Member States (sub-topic A).
- Contribute to create the right conditions for the development of better and accurate monitoring, modelling, planning, management and prediction capacities in the whole Atlantic (sub-topics A & B).
- Develop ecosystem assessments and forecasts as well as a deeper understanding of vulnerabilities and risk including those relating to the global climate system and the impacts of climate change (sub-topic B).
- Increase the competitiveness of the EU’s blue economy by developing new technologies to service societal needs and new value chains (sub-topics A, B & C).

- Create a lasting partnership on sustainable aquaculture business opportunities for industrial partnerships between Europe and countries bordering the South Atlantic (sub-topic C).
- Contribute to creating sustainable food production systems and implementing resilient aquaculture practices that increase productivity and production, help maintain healthy and productive aquatic ecosystems and strengthen capacity for adaptation to climate change (UN SDG 2) (sub-topic C).
- Contribute to the sustainable management and protection of marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans (UN SDG 14) (sub-topics A & B).

In the medium term:

- Contribute to the development of ecosystem services to ensure the long-term sustainable management of marine resources (UN SDG 14) (sub-topic B).
- Ensure that nutritious and safe food is available, accessible and affordable for all while conserving natural resources and contributing to climate change mitigation (UN SDG 2 and SDG 13) (sub-topic C).
- Contribute to achieving a zero waste European aquaculture system by strengthening the sustainability, resilience and robustness of industry, by 2030 (sub-topic C).
- Increase EU leadership in ocean technology developments (sub-topics A, B & C).
- Increase consumers' trust and confidence in seafood products (sub-topic C).
- Create a well trained workforce able to tackle the multi-sectoral, multi-disciplinary challenges and opportunities of the Atlantic Ocean (sub-topics A & C).
- Consolidate education and training networks including more ocean-engaged citizens and communities (sub-topic A).
- Improve the professional skills and competences of those working and being trained to work within the blue economy.
- Contribute to policymaking in research, innovation and technology (sub-topics A, B & C).

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