



2020-2022 GEO Work Programme
Track 1 – Implementation Plan for *GEO Initiatives* and GEO Flagships

AtlanticGEOSS Implementation Plan

1. Executive Summary

Full title of the Regional GEO

GEOSS for the Atlantic Region

Short title or acronym

AtlanticGEOSS

Proposed or existing category

GEO Initiative

Overview

In 2015 the UN members agreed on the 2030 Agenda for Sustainable Development, defining 17 [Sustainable Development Goals](#) (SDGs) to be achieved over the next 15 years. Implementing and monitoring progress toward many of these goals depend on comprehensive information on, and knowledge of, the oceans. Earth Observation (EO) data and monitoring systems have proven to be an effective solution for a deepened understanding of the marine environment and, as a result, can support the development of better responses to emerging challenges. The AtlanticGEOSS is an initiative proposed in the context of the Atlantic International Research Centre (AIR-Centre), focusing on an integrated approach for Earth Observation based services.

The goals of the AtlanticGEOSS are to develop an integrated EO framework that promotes collaboration and sustainable growth within the Atlantic countries, and to engage with communities to identify and develop opportunities for EO information and services, serving the region's societal needs.

The AtlanticGEOSS is focused on Marine, Maritime and Coastal application areas, such as monitoring marine biodiversity and protected areas, fishing and aquaculture, and marine spatial planning. Geographically, the initiative is based on the extension to the South Atlantic of the Galway Statement - the [Belém Statement](#), signed between the European Commission, South Africa and Brazil. The initiative comprises institutions from many Atlantic States from Europe, Africa and America, in order to facilitate the creation of value-added services for federated users in support to decision-making processes.

The four pillars of the AtlanticGEOSS are 1) federating user needs for the Atlantic leveraged mostly on the AIR-Centre extensive network; 2) matching the user needs with proven Earth



observation technology and scientific players in Atlantic bordering countries; 3) engaging International and National Funding Institutions to support the initiatives with highest impact; 4) promote dedicated capacity building to ensure the local and widespread sustainability of the activities.

Planned activities

For 2019 the focus will be on the consolidation of the support for the AtlanticGEOSS initiative and engagement of stakeholders, particularly through the AIR Centre network and meetings, and for the consolidation of this Implementation Plan, in coordination with the GEO-Sec. A task will be setup to identify relevant initiatives, programmes and projects in the Atlantic area in order to develop synergies and avoid overlapping will already active activities. The resources for the AtlanticGEOSS initial setup in 2019 will be provided as in kind contributions from the participants in the initiative, and funding for an initial batch of activities for 2020-2022 will also be pursued during this period through identified opportunities by and coordination of the participants in AtlanticGEOSS.

Starting in 2020, the governance structure will be defined and setup, and the cycles of *Users Federation and Challenge Identification* → *Preliminary Technical Assessment* → *Funding Rounds and Selection of Activities* → *Implementation in Co-design* → *Capacity Building* → *Operations* will be promoted for the activity areas identified by the federated users.

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2. Purpose

The AtlanticGEOSS aims to support international collaborative initiatives promoting the use of Earth observations (including full range of space, air, near and in-situ observations) based systems and services for an increased sustainability of the Atlantic region, and in support of the implementation of the 2030 Agenda for Sustainable Development in the Atlantic countries. The AtlanticGEOSS will mobilise the main actors of the Atlantic regions of Europe, Africa and the Americas, towards an increased knowledge of the biophysical properties of the Atlantic Ocean, as well as of the human activity and its impact in the Ocean and populations. It will develop an integrated EO framework that promotes collaboration and growth within the Atlantic countries, engaging with communities to identify and develop opportunities for EO information and services, serving the region's societal needs.



The main challenge will be to share the information and knowledge for the most relevant issues for the Atlantic region through geographic and thematic collaborative scaling of existing initiatives. The AtlanticGEOSS shall continuously identify and make use of many past and existing R&D activities in the Atlantic region, **promoting** the scaling of activities and interoperability of systems and services across all regions, actively involving the public and private sector in this endeavour.

The AtlanticGEOSS is focused on Marine, Maritime and Coastal application areas, such as monitoring marine biodiversity and protected areas, fishing and aquaculture, and marine spatial planning. Geographically, the initiative is based on the extension to the South Atlantic of the Galway Statement - the Belém Statement, signed between the European Commission, South Africa and Brazil. The initiative comprises institutions from many Atlantic States from Europe, Africa and America, in order to facilitate the creation of value-added services for federated users in support to decision-making processes.

The main thematic focus areas for AtlanticGEOSS is the Marine, Maritime and Coastal environments, in particular:

1. Marine Environment & Ecosystem

Essential Ocean Variables, coastal areas, ecosystems and protected areas, Ocean plastics, ...

2. Fishing and Aquaculture

Ensuring sustainable fishing through fish population characterisation, illegal fishing detection and support to sustainable aquaculture and impact assessment.

3. Maritime Safety and Security

Supervise and secure navigation of people and goods.

4. Marine Spatial Planning

Monitoring of coastal and offshore infrastructures, resilience to geo-hazards.

The AtlanticGEOSS will develop its initiatives based on the following *five pillars* of action:

1. Federate user needs for the Atlantic leveraged mostly on the AIR-Centre extensive network.

Continuously identify the main *Challenges* faced by the Atlantic Region, through the regular consultation of the main stakeholders, including national and international authorities and curating agencies for the SGDs. The AtlanticGEOSS aims to engage with relevant societal organizations and institutions, and collect the main challenges to be addressed, identifying and standardising requirements, promoting coordinated international joint calls for ideas and challenges.

2. Match the user needs with proven Earth observation technology and scientific players in Atlantic bordering countries.

Identify, develop and reuse interoperable *Technological Solutions*, working with the providers of knowledge, technology and service from Atlantic countries. The main focus of this pillar will be the co-design of operational collaborative solutions for the challenges



identified, supporting the technological and spatial scaling of applications for new services and geographic regions. The technological solutions shall include virtual research and development environments, allowing for new applications to be developed, tested and setup, as well as a strong focus on the operationalisation and evolution of services.

3. Engage International and National Funding Institutions to support the initiatives with highest impact.

Ensure continued, sustainable activities, by attracting and working with the international funding institutions. The AtlanticGEOSS shall promote with these institutions funding rounds for challenges federated across several geographic Atlantic regions. It shall also work with national and trans-national funding mechanisms to ensure coordinated, sustainable funding for addressing the identified challenges.

4. Promote dedicated capacity building to ensure the local and widespread sustainability of the activities.

The *Capacitation* of the community, with a strong focus on knowledge sharing activities, and capacity building towards the creation of an AtlanticGEOSS ecosystem. The AtlanticGEOSS shall organise international training events, webinars and workshops, and its collaborators shall participate in the most relevant international events and promote the collaboration with AtlanticGEOSS. Moreover it will support a shadowing and mentorship scheme, thereby providing ongoing support to complement the one off training activities.

5. Promote collaboration, Interoperability and standardisation

The AtlanticGEOSS shall engage with the most relevant stakeholders in the Atlantic area and perform dissemination and communication activities. The AtlanticGEOSS shall also work on the promotion of standardisation, interoperability and GEO Data Management Principles. In addition, it will also promote a strong engagement of the Atlantic region citizens in its initiatives, including citizen science, dissemination initiatives and best practices and standards on observations, data processing and data governance.

3. Background and Previous Achievements

Being a newly proposed initiative for the GEO 2020-22 Work Programme, the AtlanticGEOSS has been in its setup phase, where the concept and support have been addressed. The main activities have been on the international networking activities, and participation in international events, where the international Atlantic community has been engaged.

The following actions are of particular relevance:

1. Engagement and support of the GEO Blue Planet Initiative;
2. Presentation and discussion of the AtlanticGEOSS concept at the Atlantic International Research Centre (AIR Centre) meetings in Mindelo (Cape Verde),



Florianópolis (Brazil) and the Canary Islands (Spain). The AtlanticGEOSS is currently one of the main priorities for the AIR Centre;

3. Networking and engagement of collaborators and supporters, in particular through atlanticgeoss.org.

In addition, several past and ongoing initiatives have been identified as contributions for AtlantiGEOSS, which can be readily explored and scaled to new challenges and regions:

- The **AIR Centre** is a new long-term platform for scientific and economic cooperation across and along the Atlantic, based on existing research capacities and infrastructures. It has generated a large momentum and a large international network within Atlantic bordering countries, namely through its many international meetings in Europe, Africa and the Americas;
- **MELOA** (ec-meloa.eu) is developing low cost, lightweight ocean drifter buoys for coastal and ocean applications, with satellite communication capabilities for open ocean use;
- **NextGEOSS** (nextgeoss.eu) is the European GEO Data Hub and Cloud Platform, developing and integrating applications in the scope of the Group on Earth Observations. The NextGEOSS services are being co-developed with more than ten (and growing) Pilot Applications, which are made operational and scalable through the integration with NextGEOSS data hub and services;
- **Marine-EO** is an European Pre-Commercial Procurement, where several federated European national authorities are supporting the co-design of services for Ocean Environmental Monitoring (Marine Protected Areas, fish farm threats, vessel and iceberg detection) and Maritime Security;
- **EuroGEOSS** Water Resources Showcases, with services on sustainable fishing, flood monitoring, inland water quality and quantity, coastal water quality and sargassum detection. Furthermore, an EuroGEOSS action group is also formed, which will lead the development of a marine application showcase;
- **SIMOcean** (simocean.pt) is pre-operational system for the use of Earth Observation assets supporting sustainable fishing and port operations. It is currently (Feb 2019) in a co-design stage with national authorities for ports in the Portuguese Atlantic coast;
- **Earth Observation Exploitation Platforms Domain Working Group** (EOXP-DWG) at the Open Geospatial Consortium (OGC). The OGC is the most active international institution working on standards for the geospatial domain. At the end of 2018 a DWG was created at OGC, with co-chairs in Europe, America and Australia, to address architecture and interoperability issues for the domain of Earth Observation platforms. The work of this DWG will be of importance to ensure the technically collaborative AtlanticGEOSS ecosystem.

The following initiatives, and other to be identified, are and will also be engaged by AtlanticGEOSS: [AORA](#), [AANCHor](#), [GOOS](#), [EOOS](#), [EMODnet](#), [ATLANTOS](#), [Marine-EO](#), other [BG-8](#) funded initiatives as well as any bilateral and multilateral ongoing activities, including [ESA plans for the Atlantic](#).



4. Relationship to GEO Engagement Priorities and to other Work Programme Activities

The roadmap for the initial implementation of the AtlanticGEOSS during 2019 is:

- Gather initial list of supporting countries and entities and potential members within AIR Centre stakeholders and the GEO community;
- Define initial contributing members;
- Engage user authorities in participating countries;
- Discuss collaborative governance and structure;
- Discuss and agree on a AtlanticGEOSS programme for submission to GEO;
- Obtain and consolidate concrete requirements for services from users;
- Assess capacity of Atlantic GEOSS members;
- Apply to initial projects for funding from International¹, Regional² or National³ entities ;
- Engage with international funding agencies to attract interests for funding.

Within the period 2020-22, AtlanticGEOSS should focus on implementing the governance structure (see section 6 below), and optimise the successive cycles of *Users Federation and Challenge Identification* → *Preliminary Technical Assessment* → *Funding Rounds and Selection of Activities* → *Implementation in Co-design* → *Capacity Building* → *Operations*.

The activities of AtlanticGEOSS will contribute mainly to SDG14 (life below water) and SDG12 (responsible consumption and production) and SDG2 (zero hunger), in what concerns sustainable fishing and aquaculture, but also to SDG9 (industry, innovation and infrastructure), SDG8 (decent work and economic growth) and SDG13 (climate action), as well as to SDG4 (quality education) through the capacity building initiatives for the Atlantic region.

The following GEO Flagships, Initiatives and Community Activities are particularly relevant for AtlanticGEOSS:

GEO Blue Planet is a GEO Initiative aiming to ensure the sustained development and use of ocean and coastal observations for the benefit of society. Its missions are to 1) advance and exploit synergies among the many observational programmes devoted to ocean and coastal waters; 2) improve engagement with a variety of users for enhancing the timeliness, quality and range of services delivered; and 3) raise awareness of the societal benefits of ocean observations at the public and policy levels.

¹ E.g. [International Funding Institutions](#).

² E.g. [Horizon Europe](#), [European Space Agency](#).

³ E.g. [Development Aid Agencies](#), National Space Agencies.



There will be significant synergies between AtlanticGEOSS and GEO Blue Planet in many areas of activity for the Atlantic region. The two initiatives have in fact already started engagement, and will continue to be closely interlinked.

EuroGEOSS is Europe's part of the Global Earth Observation System of Systems (GEOSS). It will allow Europe to position itself as a global force in Earth observation thanks to the vast knowledge gained through running the Copernicus programme and others.

In the EuroGEOSS Showcase activity, the Water Resources Showcase is particularly relevant for AtlanticGEOSS. In addition, the Maritime Action Group within EuroGEOSS is also expected to be relevant in general.

AmeriGEOSS initiative is a framework that seeks to promote collaboration and coordination among the GEO members in the American continent, "to realize a future wherein decisions and actions, for the benefit of the region, are informed by coordinated, comprehensive and sustained Earth observations and information". The proposed initiative focuses its efforts in the four Societal Benefit Areas (SBA's) selected and prioritized by the Americas (agriculture, disaster risk reduction, water resources, and biodiversity and ecosystem monitoring).

AfriGEOSS is an Initiative of the African community in GEO aimed at providing a coordination framework and platform for Africa's participation in GEO. The AfriGEOSS objectives are to provide the necessary framework to initiate Africa focused mutual activities within the scope of GEO; coordinate and bring together stakeholders across Africa to reduce duplication of efforts; foster the participation of Africans in GEO by linking GEO activities initiatives in Africa; enhance Africa's capability to access, use and manage EO for informed decision making; develop a strategy for accessing and disseminating Earth observation data in Africa; contribute to the implementation of the African Space Policy and Strategy; and advocate for the uptake of EO in decision making to realize the African aspirations.

The cooperation with Atlantic-relevant initiatives within EuroGEOSS, AmeriGEOSS and AfriGEOSS is of paramount relevance for AtlanticGEOSS, given that these include the bordering regions of the Atlantic. AtlanticGEOSS should assume a privileged role of enabling a narrower cooperation between these three initiatives in the Atlantic area.

The GEO Global Water Sustainability (**GEOGLOWS**) Initiative aims to facilitate the use of Earth observation assets to contribute to mitigating water shortages, excesses and degraded quality arising from population growth, climate change and industrial development. The Initiative is developing knowledge based on an analysis of Essential Water Variables (EWVs) and use the knowledge to inform applications related to minimizing Basin and Regional Risk, policies related to enhancing global water sustainability and capacity building.

AquaWatch is a GEO Initiative that aims to develop and build the global capacity and utility of Earth Observation-derived water quality data, products and information to support water resources management and decision making. The goal of the AquaWatch Initiative is to



develop and build the global capacity and utility of Earth Observation-derived water quality data, products and information to support effective monitoring, management and decision making.

AtlanticGEOSS will explore synergies with both GEOGLOWS and AquaWatch, in particular with respect to quality of coastal waters, monitoring of Essential Water Variables, and support to risk policies for Atlantic coastal regions.

The main objective of the Climate Change Impact Observation On Africa's Coastal Zones (**GEO-CCIOoACZ**) GEO Initiative is to strengthen the continent's existing capacity to collect, analyze, manage, and share up-to-date and high resolution information on climate change impacts in Africa's coastal zones in order to develop mitigation and adaptation measures as well as resilience.

The Data Access for Risk Management (**GEO-DARMA**) GEO Initiative aims to support operational risk reduction activities through the implementation of end user priorities in line with the "Sendai Framework", on a trial basis in several regions of the developing world (such as Latin America, South Asia and Southern Africa). One of the main objectives of GEO-DARMA is to address critical issues related to DRR affecting most of the countries in a given region through a series of end-to-end projects (initially demonstrators) that rely on the use of multiple sources of observation data (space, in-situ, socio-economic, models outputs) in response to the needs of the end user communities.

The GEO Geohazard Supersites and Natural Laboratory (**GSNL**) Initiative is a voluntary international partnership aiming to improve, through an Open Science approach, geophysical scientific research and geohazard assessment in support of Disaster Risk Reduction. The GSNL goal is pursued promoting broad international scientific collaboration and open access to a variety of space- and ground-based data, focusing on areas with scientific knowledge gaps and high risk levels: the Supersites and Natural Laboratories. For these areas a joint effort is carried out: the space agencies provide satellite imagery at no cost for scientific use, the monitoring agencies provide access to ground-based data, the global scientific community exploits these data to generate state of the art scientific results.

AtlanticGEOSS should establish significant links with GEO-CCIOoACZ, GEO-DARMA and GSNL in particular concerning resilience and support to risk policies for Atlantic coastal regions.

The **GEO ECO** Initiative builds upon available Earth Observation data, results and information and use them on a global scale, identifying Protected Areas of international relevance, extending the analysis to unprotected areas and adopting the view of ecosystems as "one physical system" with their environment, characterized by strong geosphere-biosphere-anthroposphere interactions across multiple space and time scales. Both terrestrial and marine ecosystems are considered, with a special focus on interactions and



processes taking place in the thin layer at the surface of our planet (the Earth Living Skin), such as the Earth Critical Zone from the rocky matrix to the top of tree canopy for terrestrial ecosystems, and the dynamics in the euphotic layer and in coastal areas for marine ecosystems. The knowledge on ecosystems acquired through the activities of GEO ECO will be built together with the people in charge of the management of Protected Areas, and an Ecosystem Community of Practice will be created.

The **Earth Observations in Service of the 2030 Agenda for Sustainable Development** Initiative enables contributions to the 2030 Agenda by GEO and the Earth observation community. The primary purpose of this Initiative is to organize and realize the potential of Earth observations and geospatial information to advance the 2030 Agenda and enable societal benefits through achievement of the SDGs. This Initiative supports efforts to integrate Earth observations and geospatial information into national development and monitoring frameworks for the SDGs.

5. Stakeholder Engagement and Capacity Building

As a collaboration framework, AtlanticGEOSS will have dedicated effort to engagement with international and national funding institutions to support the initiatives with the highest impact. The main goal is to engage with the community that is already supporting the AIR Center in Azores, taking advantage of the cooperative environment that is being promoted. Such initiative represents an opportunity to spark the dialogue among the stakeholders, identify main challenges, and provide them a set of solutions to tackle these issues. This includes the following countries: Portugal, Spain, UK, USA, Canada, Brazil, Argentina, Uruguay, South Africa, Nigeria, Angola, Cabo Verde, India, Morocco. Building upon AIR Center's community, including more than 15 countries within 4 continents, the engagement with potential end-users aims to promote a demand-oriented market, by allowing end users to request EO-services, connect to users across other domains beyond the EO users hub and involve users in service development (i.e. codesign). As a result, this will allow to get relevant feedback from the Atlantic Community, namely challenges and services needed to boost the market, generate meaningful worth of mouth and build a consolidated users' base. The engagement activities are nevertheless not limited to the AIR Center Community. The focus will be on countries that contribute to space programmes; depending on the impact of the EO industry in their national economy and the level of investment in the Ocean Monitoring and Maritime activities.

AtlanticGEOSS aims to promote with these institutions funding rounds for challenges across the Atlantic region as well as work with national and trans-antional funding mechanisms to ensure sustainable funding for addressing the identified challenges.

Moreover, the engagement will also have a capacity building purpose. AtlanticGEOSS will enhance AIR Center community capacity not only to take advantage of already existing technologies and EO based services, but also to deploy new applications that will bring



added-value to our society. AtlanticGEOSS will provide the following features to the community: AtlanticGEOSS Services, and AtlanticGEOSS Service Development Center.

Aiming at ensuring the local and widespread sustainability of the activities, AtlanticGEOSS will contribute to the capacitation of the community, with a strong focus on knowledge sharing activities, and capacity building towards the creation of an AtlanticGEOSS ecosystem. The AtlanticGEOSS shall organise international training events, webinars and workshops, and its collaborators shall participate in the most relevant international events and promote the collaboration with AtlanticGEOSS. Moreover it will support a shadowing and mentorship scheme, thereby providing ongoing support to complement the one off training activities.

Moreover, AtlanticGEOSS will promote and organize international workshops with the communities of practice and the funding agencies, to facilitate networking as well as to mediate and create new opportunities to solve Atlantic challenges.

6. Governance

The AtlanticGEOSS is a collaboration framework composed of organisations and members collaborating towards a set of common goals. The initiative will support the collaborating institutions in the search of sustainability for the activities, but also rely on the contribution of its members for the setup of baseline activities and governance structure.

The proposed AtlanticGEOSS Governance Structure for the period 2020-22 is the following:

The **Advisory Board** will be composed of high level individuals representing foundational ocean observing organisations and users. The Advisory Board will be responsible for providing strategic advice for AtlanticGEOSS.

The **General Assembly (GA)** will be composed of a member of each of the major contributing institutions, initially designated by the AIR Centre upon recommendation of the Advisory Board. The GA is the highest authority of AtlanticGEOSS, and has the ultimate responsibility to ensure that AtlanticGEOSS is achieving its purposes.

The **Steering Committee (SC)** will consist of the chairs and co-chairs of Working Groups and other contributing shareholders to be designated by the GA. The Steering Committee is responsible for preparing the AtlanticGEOSS Action Plan for approval by the GA, for ensuring that GA decisions are implemented, for creating working groups and electing members of the Management Board.

The **Management Board** will be composed of the Scientific and Technical Coordinators, three chairs or co-chairs of the Steering Committee to be nominated by the GA, and two



representatives at large. The daily operations and activities of the AtlanticGEOSS are managed by the Management Board.

The AtlanticGEOSS **Secretariat** will provide scientific and technical coordination for AtlanticGEOSS components, as well as logistical support for AtlanticGEOSS activities. The AtlanticGEOSS Secretariat will have a Scientific Coordinator and a Technical Coordinator. Other roles may be created as the need arises and depending on the availability of funds/contributions from the stakeholders.

There will be five main **Working Groups** in AtlanticGEOSS:

1. *User Challenges*, in charge of connecting with users, federating and consolidating the users inputs into overarching sets of requirements, and promoting the involvement of users in co-design of services;
2. *Technical Solutions*, responsible for the identification and cataloguing of technical interoperable solutions, preliminary challenge execution assessments, and promoting implementation of selected solutions. The Technical Solutions Working Group will include a number to be defined of thematic and technological subgroups, the chair of each subgroup being a co-chair of the Technical Solutions Working Group. The thematic technical groups should cover the thematic areas and potential services in the scope of AtlanticGEOSS (see sec. 8 below), but should be managed dynamically, depending on the ongoing interest and resources availability;
3. *Sustainability*, in charge of interaction with the funding institutions, identification and promotion of coordination of funding opportunities;
4. *Engagement and Capacity Building*, in charge of promoting the production of material for and activities of engagement and capacity building of the AtlanticGEOSS ecosystem, and coordination of general dissemination and communication activities. The ECB Working Group will be responsible for ensuring that the Atlantic GEOSS strives to implement the 6 pillars of Responsible Research and Innovation (RRI) namely, stakeholder engagement, science education, gender equality, ethics, open science and governance.

Each Working group should have co-chairs selected from a balanced selection of Atlantic region continents and participating countries.

The main challenges identified for getting AtlanticGEOSS going are the following:

- Get a critical mass interested and coordinated;
- Find appropriate funding for near future activities (2020-2022);
- Collaborate across continents and cultures;
- Ensure that real user needs are addressed;
- Avoid that all the work comes to the Global North, ensuring equity;
- Ensure sustainability for the mid to long term (post 2022);
- Achieve implementation and continuity in developing countries.

7. Resources

The following is an estimated budget for the AtlanticGEOSS activities during the period 2020-22:

Stream	Description	Budget Estimation
User needs	Identification of main users needs through direct and remote interaction, including the setup of thematic users meetings. This will be followed by a detailed feasibility assessment.	3M€
Services definition	Identification of the EO services for users, including the identification of technical developers, existence and access to required datasets in all applicable regions for each potential service and other potential blocking points.	1.5M€
Funding rounds	Multilateral initiatives with international, regional and national funding organizations to select activities and services to go forward to implementation stage.	2.5M€
Services implementation	Implementation of an AtlanticGEOSS catalogue of data and services. Implementation of EO services through collaborative engagement of technological solutions from AtlanticGEOSS countries.	6M€
Capacity building	Preparation of dedicated actions for capacity building for users, system operators and downstream developers. Collocation of key users and stakeholders with development teams for specialized training.	3M€
Dissemination	Website, social media, participation in international events, etc.	1M€

The target funding institutions for AtlanticGEOSS projects and activities currently identified are the following:

- AIR Centre, e.g. in kind support of human resources for promoting international cooperation
- African Development Bank (AfDB)
- World Development Bank (WDB)
- European Investment Bank (EIB)
- European Bank for Development and Reconstruction (EBRD)
- West African Development Bank (BOAD)
- Food and Agriculture Organization of the United Nations (FAO)



- United Nations Office for Outer Space Affairs (UNOOSA)
- European Space Agency (ESA), including Atlantic Initiative (5-6 M€)
- European funding through H2020 actions, e.g.:
 - Coordination and Support Actions (CSA), e.g. SC5-16-2019 CSA (1M€)
 - Research and Innovation Actions (RIA) , e.g. DT-SPACE-06-EO-2019 (2M€)
 - Innovation Actions (IA), e.g. SC5-16-2019 CSA (3M€)
- National/Regional Budgets
- Private investment (>3M€)

During 2019 these institutions will be actively engaged, the main funding opportunities will be pursued and identified, and the high level funding priorities in the scope of the AtlanticGEOSS will be consolidated with the funding institutions.

8. Technical Synopsis

The thematic EO services in the scope of AtlanticGEOSS include the following initial selection:

1. Marine Environment & Ecosystem
 - a. Coastal Monitoring
 - i. Coastal Altimetry
 - ii. Coastal Bathymetry
 - iii. Benthic Classification
 - iv. Coastal litter
 - b. Ecosystems and protected areas
 - i. Water Quality
 - ii. Oil spills detection
 - iii. Detection of marine litter and ocean plastics
 - iv. Biophysical Indicators
 - c. Detection of Ocean Fronts
2. Fishing and Aquaculture
 - a. Fishing correlation and fishing effort estimation
 - b. Illegal fishing detection
 - c. Fishing and aquaculture threats (e.g. Algal Bloom Detection)
 - d. Support to sustainable aquaculture
 - e. Aquaculture impact assessment
3. Maritime Safety and Security
 - a. Ships and icebergs detection
 - b. Ship route optimisation
 - c. Identification of non-cooperative vessels
4. Marine Spatial Planning
 - a. Monitoring of coastal and offshore infrastructures
 - b. Monitoring of hot spots (e.g. Marine Protected Areas and nurseries)
 - c. Resilience to geo-hazards

d. Identification of non-cooperative vessels.

The table below identifies a list of available datasets, which will feed the AtlanticGEOSS services. The NextGEOSS catalogue, the GEOSS Platform, Copernicus Marine Service and other solutions to be defined will be available for accessing the required data.

Table: Main data sets used by AtlanticGEOSS

Parameter	Dataset	Origin	Spatial Resolution	Temporal Resolution	Start / End	Accuracy Bias/r2
Sentinel-1	Level 1 and 2 products (all instruments and modes)	NextGEOSS catalogue	-	-	2014 onwards	-
Sentinel 2	Level 1 and 2 products (all instruments and modes)	NextGEOSS catalogue	-	-	2015 onwards	-
Sentinel-3	Level 1, 2 and 3 products (all instruments and modes)	NextGEOSS catalogue	-	-	2016 onwards	-
Sea surface temperature	SL_2_WST (Sea and Land Surface Temperature Radiometer_ Water Surface Temperature)	ESA-Sentinel 3	500 m resolution / 1 km resolution	1.8 days		
	SST_GLO_SST_L4_REP_OBSERVATIONS_010_011	CMEMS	0.05°	Daily	1985-2007 2007-present	0.06/0.40 °C
	SST-GLO-SST-L4-NRT-OBSERVATIONS-010-001					
	SST_MED_SST_L4_REP_OBSERVATIONS_010_021	CMEMS	0.04	Daily	1981-2016	
	SST_BAL_SST_L4_REP_OBSERVATIONS_010_016	CMEMS	0.03	daily	1982-2011	
	SST_MED_SST_L4_NRT_OBSERVATIONS_010_004		0.01	daily	2008-present	
	MUR SST	PODAAC	0.01°	daily	2002-present	0.00/0.49 °C
Salinity	OISSS_IPRC	PODAAC	0.5	7-day	2011-2017	-/0.2psv
Chlorophyll-a	OL_2_WFR / OL_2_WRR (Ocean and Land Colour Instrument_ Water Full Resolution / Reduced Resolution)	ESA-Sentinel 3	300 m FR / RR at 1.2 km	3.8 days		n.a.
	OCEANCOLOUR_ATL_CHL_L4_REP_OBSERVATIONS_009_098	CMEMS	0.01	daily	1997-2016	0.06/0.81
	OCEANCOLOUR_ATL_CHL_L4_NRT_OBSERVATIONS_009_037	CMEMS	0.01	daily	2017-present	
	OCEANCOLOUR_MED_CHL_L4_REP_OBSERVATIONS_009_078	CMEMS	0.01	week	1997-2016	
	OCEANCOLOUR_MED_CHL_L3_REP_OBSERVATIONS_009_073	CMEMS	0.01	daily	1997-2016	
	OCEANCOLOUR_MED_CHL_L4_NRT_OBSERVATIONS_009_041	CMEMS	0.01	daily	2015-present	
Suspended matter	GLO_OPTICS_L3_REP	CMEMS	0.04	daily		-0.18/0.59 g/m3

concentration						
Transparency	GLO_OPTICS_L3_REP	CMEMS	0.04	daily		-1.72/5.90 m
Currents	IBI_ANALYSIS_FORECAST_PHYS	CMEMS	0.028	daily/h4sfc		0.031/0.086 C.Peñas sfc only
model surface Wind	AROME surface wind direction and speed	AROME	0.025	hourly		
surface Wind	Ocean Wind Field	SENTINEL-1	0.01			
Wave direction	IBI_ANALYSIS_FORECAST_WAV	CMEMS	0.1	hourly		only for SWH and MWP
Water-leaving radiances	GLO_OPTICS_L3_REP	CMEMS	0.04	daily		wavelength dependent
Primary production	CbPM NPP	Oregonstate	0.08	8-day	2012-2017	
	Standard VGPM	Oregonstate	0.08	8-day	2013-2017	
	Eppley VGPM	Oregonstate	0.08	8-day	2013-2017	
In-Situ Observations (T,S,SSH,UV, SWH,MWP,V MDR,CHL,O2)	INSITU_NWS_NRT_OBSERVATIONS_013_036	CMEMS	--	--	2009-present	-
	INSITU_NWS_TS_REP_OBSERVATIONS_013_043	CMEMS			1990-2015	-
	INSITU_IBI_NRT_OBSERVATIONS_013_033	CMEMS	--	--	2010-present	-
	INSITU_IBI_TS_REP_OBSERVATIONS_013_040	CMEMS	--	--	1990-2015	-
	INSITU_MED_TS_REP_OBSERVATIONS_013_041	CMEMS	--	--	1990-2015	-
	Mediterranean Sea- In-Situ Near Real Time Observations	CMEMS	--	--	2010-present	-
Other In-situ and Citizen Science Data	EMODNET data catalogue available in (http://www.emodnet.eu/data)	EMODNET	-	-	-	-
AIS Data	Online free AIS data from Marine Traffic or other AIS data providers	Marine Traffic	-	-	-	-
Fish Stock Data	International Council for the Exploration of the Sea (ICES) datasets available in (https://www.ices.dk/marine-data/dataset-collections/Pages/default.aspx)	ICES	-	-	-	-

9. Data Policy

The AtlanticGEOSS will mainly be a collaboration framework, where new data is produced as part of the each contributor entity's activities. The data governance will be the responsibility of each curating agency. The AtlanticGEOSS will nevertheless adopt and



promote the [GEOSS Data Sharing Principles](#) and [GEOSS Data Management Principles](#), as well as the. Particular stress will be put on promoting the adoption of the [FAIR data principles](#).

AtlanticGEOSS will engage with ongoing activities, GEO Initiatives and other regional and global initiatives, in order to leverage on existing tools and products.

Appendix:

The AtlanticGEOSS