

Project	AtlantOS – 633211
Deliverable number	10.1
Deliverable title	Engagement Strategy
Description	AtlantOS Engagement and Communication Strategy
Work Package number	10
Work Package title	Engagement, Dissemination and Communication
Lead beneficiary	KDM
Lead authors	Jan Stefan Fritz
Contributors	All Work package leaders and WP 10 and 11 partners
Submission data	29/01/2016



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n^o 633211.

AtlantOS Engagement & Communication Strategy

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INTRODUCTION

Background

AtlantOS is a research and innovation project that proposes the integration of ocean observing activities across all disciplines for the Atlantic, considering European as well as non-European partners. The vision of AtlantOS is to improve and innovate Atlantic observing by using the Framework of Ocean Observing to obtain an international, more sustainable, more efficient, more integrated, and fit-for-purpose system. Hence, the AtlantOS initiative will have a long-lasting and sustainable contribution to the societal, economic and scientific benefit arising from this integrated approach. This will be archived delivered by improving the value for money, extent, completeness, quality and ease of access to Atlantic Ocean data required by industries, product supplying agencies, scientist and citizens.

The overarching target of the AtlantOS initiative is to deliver an advanced framework for the development of an integrated Atlantic Ocean Observing System that goes beyond the state-of – the-art, and leaves a legacy of sustainability after the life of the project. This legacy will be defined in a Blueprint Strategy to be published in 2019. This strategy will be a regional contribution to the Global Ocean Observing System. At European level it will be the Atlantic contribution to the development of a European Ocean Observing System (EOOS)¹, itself comprised of regional sea basin strategies (e.g. Atlantic, Arctic, Northwestern Shelves, Baltic, Irish-Biscay-Iberian Seas and Mediterranean).

The AtlantOS initiative contributes to achieving the aims of the Galway Statement on Atlantic Ocean Cooperation that was signed in 2013 by the EU, Canada and the US, launching a Transatlantic Ocean Research Alliance to enhance collaboration to better understand the Atlantic Ocean and sustainably manage and use its resources.

The project has 62 partners including research institutes, universities, marine service providers, multi-institutional organisations, international and private sector partners from 18 countries (13 EU & 5 non-EU) as well as additional supporting institutions. It has a budget of 20.65 million Euros for 4 years (April 2015 – June 2019) and is coordinated by GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany (Prof. Dr. Martin Visbeck).

Objectives of this document

The AtlantOS Engagement and Communication Strategy offers a framework for engaging and communicating with stakeholders both during and after the project's lifetime in support of an integrated Atlantic Ocean Observing System.

¹ **European Ocean Observing System (EOOS)** - is a coordinating framework designed to align and integrate Europe's ocean observing capacity; to promote a systematic and collaborative approach to collecting information on the state and variability of our seas; and to underpin sustainable management of the marine environment and its resources. EOOS will contribute to the Global Ocean Observing System (GOOS), a contribution to sustained Earth observations and information (GEO).

This strategy outlines a variety of measures to be implemented both, during and after the project, including communicating the project results. These measures will address a broad range of potential users and uses in order to strengthen the involvement of stakeholders in both the development process as well as the use of outputs.

While focusing on concrete services and outputs, the strategy takes a value-chain approach, by which all services and outputs will be conceived in terms of their contribution to developing stronger interactions between the scientific community as the supplier of products and services, and the various demands of industry, government and broader society.

Who is this document for?

We recommend that the aim of the Strategy is to provide a macro-account of how we plan to interact with stakeholders.

For AtlantOS partners, this strategy seeks to create a clear and common understanding of how the relationship with stakeholders can be developed as well as to provide an informal overview of engagement/communication tools that might be used. This should empower partners to maximise effective engagement.

For external stakeholders, the aim is to inform about our priorities and concrete activities in order to promote an understanding of and encourage interest in AtlantOS.

This strategy is NOT an exercise in micro-managing the interrelations of AtlantOS partners and stakeholders.

Vision for engaging and communicating with stakeholders

1. The Vision of AtlantOS

The vision of AtlantOS is to improve and innovate Atlantic observing by using the Framework of Ocean Observing (doi:10.5270/OceanObs09-FOO) to obtain an international, more sustainable, more efficient, more integrated, and fit-for-purpose system. Hence, the AtlantOS initiative will have a long-lasting and sustainable contribution to the societal, economic and scientific benefits resulting from this integrated approach. This will be delivered by improving the value for money, extent, completeness, quality and ease of access to Atlantic Ocean data required by governments, the private sector, NGOs, scientists and citizens.

The overarching target of the AtlantOS is to deliver an advanced framework for the development of an integrated Atlantic Ocean Observing System (also to be referred to as AtlantOS) that goes beyond the state-of-the-art, and leaves a legacy of sustainability after the life of the project.

The legacy will derive from the AtlantOS objectives and expected benefits:

Operational objectives:

- To improve international collaboration in the design, implementation and benefit sharing of ocean observing,
- To promote engagement and innovation in all aspects of ocean observing,
- To fill existing in-situ observing systems gaps and to facilitate free and open access to ocean data and information,
- To enable and disseminate methods of archiving quality and authority of ocean information,
- To develop a result-oriented dialogue with key stakeholder communities to enable a meaningful exchange between the products and services that an integrated Atlantic Ocean observing system can deliver and the needs of the stakeholder communities.

Expected benefits:

- To strengthen the Global Ocean Observing System (GOOS) and the Global Earth Observation System of Systems (GEOSS) and to sustain observing systems that are critical for the Copernicus Marine Monitoring Service and the European Marine Observation and Data Network (EMODnet),
- To increase competitiveness of industries, particularly of the small and medium enterprises of the marine sector,
- To contribute to the aim of the Galway Statement on Atlantic Ocean Cooperation

2. Engaging stakeholders to achieve the vision

Identifying Target Stakeholders of the engagement and communication efforts

In general, a stakeholder is understood here as a person, a group, or an organization that may be affected, impacted or have any interest in the AtlantOS project and the project's outcomes either directly, or indirectly.

Broadly, there are two stakeholder groups, though these cannot be treated as being mutually exclusive:

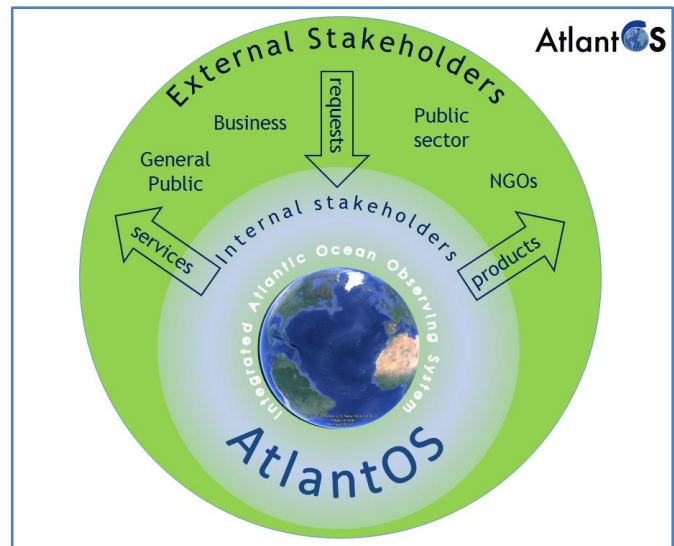
AtlantOS internal stakeholders

This category includes observatories and members of the operational and scientific communities that both produce and use data for scientific research, operational products and services and assessment (e.g. fish stock) purposes. To this end, AtlantOS has established an International Scientific and Technical Advisory Board (ISTAB).

External Stakeholders

External stakeholders uses a variety of product and services produced from observations directly (in-situ, Remote sensing) and/or model forecasts. These may not have heard of specific observatories initiatives or AtlantOS, but might profit from this knowledge and provide insights to the project's work. Some key groups in this category include:

- Industry
- Public-sector agencies that either produce or use data – shipping, environment, fisheries control and other agencies
- Public-sector funding bodies
- Organized civil society and NGO which often rely heavily on data/information from observations to support their work e.g. in environmental or ocean/climate change activities
- General public



Expected Achievements of AtlantOS with respect to stakeholders is:

- A working value chain between ocean data production and end-user services and products;
- Atlantic ocean observing system seen as Regional node “best-practice” that could be applied to other Regional nodes; and
- Sustainable funding mechanisms for Atlantic ocean observation to provide extended, complete, high-quality and easy to access Atlantic Ocean data

Means

AtlantOS will engage stakeholders by:

- Communicating in a dialogue with stakeholders about observatories and data, with a view to produce bespoke products and services
- Disseminating project results using web and social media, as well as Science-Policy Briefing Papers and Briefings
- Establishing an Engagement Board and wider pool of stakeholder representatives to advise and help co-design AtlantOS products and longer-term strategy so it is fit for purpose
- Promoting the concept and value of an integrated AtlantOS as a long-term initiative beyond

the end of H2020 project funding.

To these ends, specific tools for engagement will be employed including: website, social media, newsletter, workshops and conferences, reports and publications, specific ocean observation products, etc.

Impact monitoring (see dedicated section)

AtlantOS partners will utilize a range of methods to track and monitor uptake and impact of activities

- Stakeholder lists
- Dissemination records (i.e. numbers of publications and to whom)
- Media reporting and web tracking (using AtlantOS, twitter, google analytics etc.)
- Questionnaires to partners and stakeholders after events and interactions

Engaging Stakeholders in AtlantOS' Activities

The Challenge

AtlantOS seeks to establish a result-oriented dialogue with key industry and operational stakeholders in order to discuss both the products and services that an integrated Atlantic Ocean observing system might deliver in future as well as the demands and needs of these communities. In addition to the specific operational observatories established to meet particular demands (e.g. observations for weather, shipping, environmental quality) many observatories are established by the scientific community for research purposes.

AtlantOS is built on a vision that considers observatories as a flexible network of data collection technologies serving different demands, including scientific, operation and commercial. By articulating what such a system would look like, AtlantOS hopes to establish a network of diverse activities around integrated Atlantic Ocean observing systems, which both feed into and thereby strengthen the data collection and management (e.g. cheaper technologies) and take from the system data and other products which can be used for any purpose the users sees fit.

Specific Activities

There are several types of tasks being developed within AtlantOS that involve or specifically target external stakeholders

- Case studies – AtlantOS will pay particular attention to ensuring that portals, decision support tools, etc. are harmonized.
- Economic study
- Best practices study
- Stakeholder support facility
- Advisory board

1. Integration in models and impact (Copernicus Marine Service and seasonal prediction)

Task 7.4 partners will assess the impact of AtlantOS networks and their improvements for the Copernicus Marine Service. From these analyses, we will be able to quantify the contributions of AtlantOS in-situ observations for the Copernicus Marine Service and its applications. This will be a key aspect for observing system sustainability issues. The near real-time assessment for the Copernicus Marine Service will assess the value of all WP2 and WP3 AtlantOS in-situ observations (physical and biogeochemical) both for model validation and for data assimilation. Impact for data assimilation will use Observing System Evaluations and other alternative techniques (e.g. influence matrices). These impact studies will take into account synergy with satellite observations as they rely on data assimilation systems that merge in-situ observations together with satellite observations. MERCATOR will focus its activities on the impact of the AtlantOS in-situ observation array on its high resolution global ocean analysis and forecasting system at 1/12°. The Met O will use its coupled ocean-atmosphere data assimilation system (1/4° resolution). The assessment will be focused on upper layer measurements that are essential for short-term coupled prediction. Impact of the different AtlantOS observing systems providing temperature and salinity profiles will also be analysed with the ARMOR3D data analysis system [CLS]. We will also

carry out a specific study to assess the role of the Atlantic in-situ observing system for seasonal prediction [ECMWF]. Further, several low resolution (1°) ocean reanalyses will be conducted with/without the different in-situ observing systems and will be used to provide initial conditions for a series of coupled seasonal forecasts.

2. Case Studies: Societal benefits from observing/information systems (WP8)

Work package 8 will deliver a suite of products that are targeted at issues of societal concern in the Atlantic Ocean region. These products will enhance the safety of coastal communities and promote economic development in key emerging marine and maritime sectors through better decision support tools (flooding, maritime safety, algae blooms) and resource assessment (offshore aquaculture). Reanalysis products will, for example, assist EU Member States in reporting under the Marine Strategy Framework Directive (MSFD) and the Members of ICES in delivering required reporting on fisheries activities.

Harmful Algal Blooms (Task 8.1)

Providing near real-time and forecast information for the aquaculture industry along the Atlantic coast line is of vital importance in mitigating the effects of HABs. Satellite data will be amalgamated in a decision-support system, in-situ data include oceanographic data e.g. water column structure, current speeds, biological samples and hydrographic and biogeochemical information. The in-situ data will be used to inform and validate biophysical models and to produce circulation forecasts for the coming three to five days. These data will undergo expert interpretation to produce an early warning bulletin to the aquaculture industry in Spain, Norway and Ireland. The bulletin will be distributed over a specified production season in both countries to fish farmers and shellfish production facilities so that husbandry and harvesting techniques can reflect the prevailing HAB conditions at any point in time.

Coastal flooding/storm surges (Task 8.2)

Any increase in flood frequency or severity due to sea level rise or changes in storminess would adversely impact society. It is crucial to understand the physical drivers of extreme storm surges to have confidence in the datasets used for extreme sea level statistics. To refine and improve methods to the estimation of extreme sea levels around Europe and more widely a comprehensive world map of storm surge distribution (including extremes) for both tropical and extra-tropical cyclones will be developed. We will apply statistical methods to both tide gauge data and multi-decadal runs of hydrodynamic numerical models. This will contribute to the development of global storm surge climatology, building on the work of the IOC/WMO JCOMM Expert Team for Waves and Coastal Hazards.

Ship routing hazard mapping (Task 8.3)

This task will develop a system for ship routing risk mapping. Starting from knowledge of the environmental fields affecting vessel seakeeping, the system will estimate risk and cost associated to known routes in the Atlantic Ocean. The system will employ model analysis or reanalysis of sea state, hydrodynamics, and meteorological models. The system will produce an objective assessment of risk and vessel operational cost for an ensemble of historical routes obtained from the Automatic Information System database. In particular, the existing Euro-Mediterranean Centre on Climate Change ship routing code will be refined and evolved for evaluating routes compliant with IMO safety recommendations, for a class of large ocean-going vessels. The same approach will be extended to computation of vessel operational costs along the route. This information will build up a database, queried by the end-user through a graphical interface for visualizing

customized maps of route risk and cost for user provided parameters.

Oil spill hazard mapping and disaster risk reduction best practices (Task 8.4)

Around the Atlantic legislation requires robust tools for oil spill hazard mapping, from accidental to operational. In this task a methodology for oil spill hazard mapping from major commercial shipping lines across the Atlantic and produce hazard maps to be made available to public consultation will be developed. On request, this task can produce an Oil Spill Hazard Bulletin based upon the hazard mapping data for a Targeted Operational Period. Finally an assessment of fitness for purpose of the observing system for the Oil spill Hazard Bulletin will be produced.

Offshore aquaculture siting (Task 8.5)

Around the Atlantic policy goals are being defined to expand the space available to aquaculture. This presents challenges in terms of building structures e.g. fish cages that withstand the effects of offshore weather conditions along the Atlantic coast. In order to establish possible future sites for offshore aquaculture production this task intends to gather relevant wave, current velocity and water column structure measurements from the coasts of Ireland, Norway and Spain and use these data to validate site assessment models at ca. 200 m horizontal resolution of the potential new offshore aquaculture sites. This will result in a generic tool based on in-situ observations and model output over a hind cast period, coupled to existing site decision tools, so that potential license applicants can pinpoint sites for further exploration and site investigation. The task will also develop a weather window tool to give developers real-time access to observations and model forecasts of seas state to plan day to day operations.

Reanalyses for MSFD and ICES assessments (Task 8.6)

Environmental quality indicators for MSFD require the best possible estimates of the three-dimensional state of the shelf seas, now and in the recent past (reanalyses). This task will demonstrate the value of integrated Atlantic Ocean observations in improving physical and biogeochemical reanalyses of the North West European Shelf, using the North West European Shelf regional reanalysis system of the Copernicus Marine Service. As a by-product we will obtain insight into the influence of the open ocean on the shelf seas, leading to more confident attribution of the causes of observed changes on the shelf. We will work closely with representative national and international end-users to assess the value of these enhanced reanalysis products and attribution for managing MSFD compliance and fisheries.

Operational real-time and forecast modelling of North Atlantic albacore tuna populations (Task 8.7)

The model SEAPODYM simulates the spatial dynamics of tuna populations under the influence of both fishing and environmental effects. The main features of the model are:

- Forcing through off-line coupling to environmental variables, such as temperature, currents, primary production and dissolved oxygen concentration;
- Prediction of the distributions of functional groups of micronektonic prey, and age-structured predator (tuna) populations;
- Prediction of catch and size-frequency of catch by fleet; and
- Parameter optimization based on data assimilation techniques.

This model has now reached a degree of maturity allowing to use it for testing management scenarios and to implement operational monitoring (e.g. this includes ongoing work for the Indonesian Ministry of Fisheries). It is proposed to implement an operational forecast system for

the Atlantic albacore tuna based on the first configuration optimized for the North Atlantic stock at coarse resolution over the historical fishing period. The interest of this operational production of tuna stock distributions will be evaluated in collaboration with colleagues involved in the management of tuna fisheries at ICCAT and FAO.

3. Economic Study: Exploring the Economic Potential of Observatories (Task 10.5.)

AtlantOS will initiate a study-project to analyse the economic potential associated with observatories. This study is a forward-looking assessment of the ocean economy to 2030 and beyond, with particular emphasis on the development potential of emerging ocean-based industries. Ultimately, we will aim to make a concrete and substantial contribution to better understanding the role of data and information as part of the ocean economy's long-term outlook and future contribution to growth and jobs. A specific focus will be placed on locating scientific ocean observatories in the "marine big data" value chains. The study will be initiated by AtlantOS in cooperation with the OECD International Futures Programme's project on *The Future of the Ocean Economy: Exploring the prospects for emerging ocean industries to 2030* (<http://www.oecd.org/futures/oceanecconomy.htm>).

AtlantOS will use project funding to initiate this process, which is expected to be implemented over the long-term in the work of a planned OECD Ocean Forum as well as in various studies of national maritime economies. The findings of this study will be presented and discussed at the AtlantOS final conference and other high-level events across all relevant countries.

4. Best Practices Study: Stakeholder Engagement, Data Dissemination and Exploitation (Task 10.2.)

The main aim of this task is to gain a better understanding on how to efficiently engage with stakeholders, attract more users and identify ways to improve usage of data and information from observatories. This will entail identification of successful stakeholder engagement mechanisms and tools to disseminate and exploit data, information and products from observatories. To this end, the task will encompass a global mapping and assessment of:

1. Key user groups from policy, business and academic fields, their main interests and how these are currently being served by reference ocean observing communities around the world;
2. Current stakeholder engagement practices by observing communities;
3. Major marine data portals with special attention to observation visualization and marine data integration tools that attract visitors all over the world.

The assessment will include a comparative element looking at USA, Canada and Europe to see if there are notable differences in approaches and tools. Attention will be paid to engagement strategies to tailor and transfer marine observing outputs to private companies and intermediate-users to realize the full exploitation potential. The results of this task will be a report on best practices in stakeholder engagement, data dissemination and exploitation.

5. Engagement Board (WP11 and WP10)

According to the AtlantOS Grant Agreement, the Engagement Board shall have the following

mandate:

The Engagement Board (ENB) shall engage industry (i.e. shipping, energy, fisheries, technology manufacturers, ICT/data, etc.), government and other relevant stakeholders at a high, strategic level, advising on future actions to be implemented by the observatories community ... Its role shall be to support the project in gaining new ideas on how to efficiently engage with stakeholders, attract more users, identify ways to improve usage of data and information from society to science and vice versa, and advise on innovation management issues.

In short, Engagement Board should be comprised of stakeholders that are not part of the scientific observatories community (that is ISTAB), but have a deep relationship with ocean data and/or observations.

In late 2015 AtlantOS engaged in an extensive nomination process to identify a list of potential candidates for the Board. From this broader Engagement List a group of 7 individuals will be selected to form the core membership of the Engagement Board. This board should be comprised of stakeholders that are not part of the scientific observatories community (and thus complementary to the AtlantOS International Scientific and Technical Advisory Board), but have a deep relationship with ocean data and/or observations. The member should thus be able to discuss with and advise AtlantOS on all aspects of possible uses and added value on an integrated ocean observatory system for the Atlantic Ocean. The Board should have a close relationship with all WPs, especially those related to strategy (e.g. WP1) and societal benefits (e.g. WP8). Nominees should come from industry, regulatory bodies, public sector agencies or NGOs, but should be nominated for their personal expertise, rather than as representatives of their particular company or body.

This relatively small board will be complemented wider pool of experts to draw upon for specific stakeholder events.

Overall, and as stipulated in the DOA, targeted individuals being from:

- Industry (e.g. technology suppliers, data/output users and potential collaborators such as oil and gas);
- Government agencies with specific responsibilities for monitoring or related tasks (weather, fisheries, shipping, oil and gas, etc.);
- Others (this is a place holder for specific individuals we think might be important on a personal level, but who are not key stakeholders in AtlantOS, e.g. journalists, NGOs, etc.).

In line with the general AtlantOS policy on gender equality, every effort will be made to achieve gender parity in the membership of the Engagement Board.

6. Stakeholder Engagement ‘Support Facility’ (Task 10.3.)

AtlantOS will carry out a pilot trial working with a small selection of companies on a particular issue to deliver one or more concrete product(s) based on promising AtlantOS outputs. The deliverable will include both the results of this pilot, which in itself aims to be a concrete output, as well as a prototype for how an integrated Atlantic Ocean observing system might engage with (private) stakeholders in future. This prototype could entail the concept design and launch of an

online stakeholder forum and information exchange hub or ‘stakeholder support facility’, or other more appropriate mechanisms or tools as identified by the project and stakeholders. One option could be to look at the added value and cost-benefits of installing and operating an Integrated Atlantic Ocean Observing System “service desk” could be made available (permanently available/staffed) to assist users/stakeholders.

Engaging Agencies funding Research and Operational activities

First steps taken

The need for strong relations with funding agencies is mentioned in numerous places and in a variety of contexts in the DOA. AtlantOS is working toward ensuring that this relationship is based on a strategically-oriented dialogue. As support to this dialogue, AtlantOS is preparing materials on the costs and opportunities of ocean observatories. Specifically, WP1 and 9 are preparing an assessment of the costs of observatories, and WP10 is preparing a study, in cooperation with the OECD, on the economic potential of observatories (see previous section). This work will flow into a dialogue with funding agencies planned for later in the project cycle and to be coordinated through WP9.

The Challenge

There are a number of different groups of funding agencies which, taken together, encompass a very large group of different bodies. Specific groups include funders of the following infrastructures and activities:

1. operational observatories (e.g. transport and weather),
2. functional monitoring (e.g. environmental regulations, fisheries, offshore energy development)
3. research observatories (e.g. research project and infrastructure funding)

Each of these groups of funding bodies often have separate hierarchies (e.g. ministries of transport, environment, economics, research, etc.) and networks (operational and research observatories).

Specific Activities

AtlantOS will establish a structured dialogue with funding bodies, including the European Commission, USA, Canada and other countries to ensure sustainability and adequate growth of an integrated Atlantic Ocean observing system.

In particular, the following groups of funding bodies as well as other relevant bodies will be informed about AtlantOS' work and invited to engage in a dialogue with AtlantOS:

- ERA-NET GEO
- JPI Oceans
- European Marine Board also contains some marine research funding bodies
- Possibly DG MARE as funder of EMODnet, CISE, etc.
- Possibly DG GROW as funder of Copernicus EU programme and its marine (CMEMS) and climate (C3S) service (should include the delegated entities Mercator Ocean and ECMWF)

Sustainability issues and long-term national, EU and non EU Atlantic partner plans (Task 9.3)

AtlantOS relies on observing system networks that are primarily supported at national level as a contribution to an integrated Atlantic Ocean observing system. There are major gaps today in terms of space/time sampling, parameters to be monitored and financial sustainability. AtlantOS

will develop a framework to improve the performance of existing networks, develop or test new components and seek to optimise the whole integrated observing system (i.e. in-situ, satellite and models). A key issue will be to ensure that at the end of AtlantOS, networks and their improved new features can be sustained. Based on an initial design of an integrated Atlantic Ocean observing system and a costing exercise developed in WP1, national plans for funding of long-term observing systems will be prepared in close interactions with national funding entities. To this end, a dialogue with JPI Oceans will be initiated as the international body of national marine and maritime RTD funding ministries, agencies and academies.

The results will be shared, commitments will be documented and proposals to improve an integrated Atlantic Ocean observing system sustainability will be formulated. The findings will be presented at a dedicated “commitment meetings”, a gathering of key funding agencies around the Atlantic. This includes the US and Canada (contributing to implementation of the Galway Declaration) and those surrounding the South Atlantic.

At a European level the work will benefit from the overall umbrella of a sustained European Ocean Observing System (EOOS) that brings together national, regional and European infrastructures (EMSO, ESFRI, EUROGOOS/ROOS, EMODnet, Copernicus) following a system’s approach for all European and shared seas.

Communicating Project Results & involving the interested public

AtlantOS will make a broad effort to engage with the interested public, including parliamentarians, civil servants, the wider scientific community as well as other individuals interested in ocean observatories and their inputs.

To this end a number of activities have been committed to by AtlantOS and are described in the Description of the Action (DOA) such as web-based tools, briefings, participation in scientific conferences, scientific publications, etc. However, since this task needs to be addressed flexibly and creatively, there are additional activities that are either planned or being considered, involving among other the appointment of ambassadors and collaborations with other project working on public engagement. Both sets of activities are listed below.

Specific activities:

1. Web-based and social media communication (Task 10.7.)

A central component of the communication strategy entails a web presence and a social media campaign. Both will be tailored for a full range of potential users and uses. The requirements will be gathered during discussions with the project coordination unit, the Executive Board, and the Steering Committee. The webpage will be the main project tool for:

1. integrating the different levels of information and tailoring the dissemination to different categories of stakeholders (policy makers, business stakeholders, etc.) through fora for mobilizing the stakeholder community (online meeting point, knowledge and exchange hub),
2. for providing information on observing products and services (both current and future) with interactive map, products and services showcase and observatory profiles and links to existing relevant resources and portals,
3. featuring the suite of products targeted at issues of societal concerns developed by WP8 and demonstrating case studies targeted at the stakeholder community groups,
4. e-learning tools (training on-line, interactive material),
5. promoting project outputs, news and events as well as products and services. The *social media campaign* will target and engage with project partners, the wider observing communities and the stakeholder community user groups. For this purpose, low cost, potentially high impact means will be used, including social media programmes.

Web-based tools

Web-based portals, decision-support tools, maps and other products/services being develop in and in relation with AtlantOS should be coordinated to ensure that they are considered by users as part of a structured whole. This is particularly relevant for WP8, which proposes a variety of such products and services for storm surge probability climatology, oil spill hazard, ship routing hazard, harmful algal blooms as well as aquaculture operations. This task will work with the above WPs to ensure the development and implementation of a coordinated web strategy.

2. Science-Policy Briefing Papers and Briefings (Task 10.4.)

This task will communicate the results of work done in WPs 1-8 to relevant decision-making and implementation bodies, contributing to building greater awareness about ocean observatories to communities that are involved with decisions related to ocean development and management, but not necessarily directly working with observatories. Key project results will be translated and communicated to stakeholders. This communication will occur via at least 4 science-policy briefing papers presented during briefing events. Contributions to the papers and the presentations at the events will be made by AtlantOS partners, though occasionally external guests may be invited. The participants for the briefing events will be chosen from the stakeholder communities described in section 2.2. The events will be held in locations that offer the opportunity to engage an interested community such as relevant trade fairs as well as the cities of Brussels, Washington and Ottawa in order to enable a critical mass of relevant stakeholders to participate.

Other planned or possible activities not described in the DOA

3. Ambassadors

AtlantOS will engage a few, perhaps 3-5 'ambassadors' who will be invited to support AtlantOS awareness raising activities. Such individuals already nominated include:

- Jenifer Austin Foulkes, Manager, Google Oceans Program, USA
- Knut Frostad, Sailor and CEO, Volvo Ocean Race, Norway
- Ellen MacArthur, Sailor and founder, Ellen MacArthur Foundation, UK
- Ricardo Santos, Member, European Parliament, Portugal

The first ambassadors are expected to be invited in early 2016.

4. Popular and social media

Using popular media, including news sites, blogs and social media, including:

- www.oceanblogs.org
- www.earthzine.org
- Euronews

5. Public Engagement

Particular effort will be made to cooperate with the ResponSEAbLe and SEA CHANGE ocean literacy projects as well as with the AORA Support Action to develop a specific and highly-visible activity, such as, for example an appathon or other type of competition. AtlantOS will also explore the potential for cooperating with the private sector to run a sponsored competition.

Potential Legacy Contributions

Key Legacy Output

The AtlantOS project finishes in June 2019 and will deliver a Blueprint strategy for an integrated Atlantic Ocean Observing System (AtlantOS) which is to be presented at the Ocean Observatories 2019 event. The key elements of this Blueprint are:

1. Observing platform capabilities
2. New technologies and workforce training
3. Communication with user communities
4. Financial resources from nations and other sponsors
5. Ocean data and information products
6. National and other partnerships
7. Network design and impact studies
8. Visions for 2030

Visual and interactive legacy outputs (Task 10.8.)

The Blueprint will also be presented in up to 6 high impact visual/interactive outputs to be developed during the lifecycle of the project. These will be targeted at communicating with the stakeholder groups identified in the Engagement Strategy. The outputs will be a combination of digital and print outputs and contribution to workshops. Each output will be accompanied by a strategic dissemination plan designed to achieve maximum outreach and impact. The precise WPs and content will be identified as the project progresses.

An integrated Atlantic Ocean Observing System in the Context of a European Ocean Observing System (Task 10.6.)

The implementation of the Blueprint will also be considered in the further development of the EOOS. This task will deliver a strategic foresight paper on the contribution of AtlantOS towards an EOOS. The paper will build on work achieved in AtlantOS to inform the European research agenda and drive forward ocean observation as a priority area for the Transatlantic Ocean Research Alliance agreed by the EU, USA and Canada. The aim is to further develop the vision for an integrated and sustained ocean observing system as articulated in the publications of the European Marine Board, including the strategic foresight paper *Navigating the Future IV* (European Marine Board, 2013) and the joint Marine Board and EuroGOOS publication (2008) *EMODnet: A vision for an end-to-end, integrated, inter-operable and user-oriented network of European marine observation and data systems*.

Other results

All other project results will be published after exploration of possibilities for patenting specific products produced in AtlantOS. AtlantOS will close with a number of publications, which aim to contribute to the observatories landscape in the Atlantic region. All project results will be published on the AtlantOS website.

Dissemination measures in the closing phase of the project:

The final report of the project will include a plan for the use and dissemination of foreground, to

demonstrate the added value and positive impact of the project on the European Union. Publishable summaries of AtlantOS results will be made available regularly to the Commission for dissemination in the public domain. This will include information on expected results, and their wider societal implications. The text will be drafted in a way to be understandable for a lay audience. A final project booklet collecting all project publications will be produced at the end of the project. The booklet will be made available for download on the website.

Dissemination measures *after the closure of the project*:

After the official end of the project, the foreground of the project will be available as a web-based archive for all interested actors. The domain name of the project website will be assigned to GEOMAR. The website archives all documentation related to the project, including publications, and will be accessible for 5 years after the end of the project.

Measuring Impact of Stakeholder Engagement

All partners will be invited to implement and continuously update this strategy. This high level binding framework would maintain coherence while offering the necessary flexibility to take actions based on the actual needs as identified during the project; most importantly it would streamline interactions to avoid stakeholder fatigue. AtlantOS has a number of professional partners whose role it is specifically to promote the dissemination of the projects results. Additionally, the academic partners in the project have professional communication and public engagement officers in their organizations, and we will take advantage of their network.

A specific meeting will be held at each Annual General Meeting to discuss the effectiveness of efforts to engage with stakeholders. Specific impact measuring activities will be identified at the meeting to be held at the 2016 AtlantOS Annual General Meeting and will subsequently be listed here.

Some impact 'measuring' activities that have been proposed include:

- Stakeholder lists – this may include indicators of levels of engagement and the impact of that engagement.
- Dissemination records – this would involve collating numbers of publications and their impact.
- Media reporting and web tracking, e.g. twitter and google analytics, etc.
- Impact cover page for each task engaging with stakeholders – This would involve asking task leaders with relations to stakeholders to describe those relations and their impacts.
- Questionnaires to partners and stakeholders after events and interactions.

The implementation of these proposals is being explored. Since many of these are being proposed in addition to the DOA, the availability of appropriate resources will be a factor in their implementation.

Acronyms

AORA	Atlantic Ocean Research Alliance
C3S	Copernicus Climate Service
CISE	Common Information Sharing Environment
CMEMS	Copernicus Marine Environment Monitoring Service
DG MARE	Directorate-General for Maritime Affairs & Fisheries (European Commission)
DG GROW	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission)
DOA	Description of Activities (Horizon 2020)
ECMWF	European Centre for Medium-Term Weather Forecasting
EMODNET	European Marine Observation and Data
EMSO	European Multidisciplinary Marine Observatory Network
ENB	AtlantOS Engagement Board
EOOS	European Ocean Observing System
ESFRI	European Strategic Forum for Research Infrastructures
EuroGOOS	European Global Ocean Observing System
FAO	Food and Agricultural Organization of the United Nations
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GOOS	Global Ocean Observing System
H2020	Horizon 2020 EU Research Funding Programme
HABs	Harmful algae blooms
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Seas
ISTAB	AtlantOS International Scientific and Technical Advisory Board
IMO	International Maritime Organization
IOC	Intergovernmental Oceanography Commission of UNESCO
JCOMM	Joint Technical Commission for Oceanography and Marine Meteorology
MSFD	Marine Strategy Framework Directive
NGO	Non-governmental organization
OECD	Organization for Economic Cooperation and Development
ROOS	Regional Ocean Observation System
WMO	World Meteorological Organization
WP	Work Package (Horizon 2020)