

CNR
Department **ISTI**



Report on Management Procedures

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DEC	Websites, patents, filing, etc.	
DEM	Demonstrator	
O	Other	

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NAUTILOS - New Approach to Underwater Technologies for Innovative, Low-cost Ocean observation is an H2020 project funded under the Future of Seas and Oceans Flagship Initiative, coordinated by the National Research Council of Italy (CNR, Consiglio Nazionale delle Ricerche). It brings together a group of 21 entities from 11 European countries with multidisciplinary expertise ranging from ocean instrumentation development and integration, ocean sensing and sampling instrumentation, data processing, modelling and control, operational oceanography and biology and ecosystems and biogeochemistry such, water and climate change science, technological marine applications and research infrastructures.

NAUTILOS will fill-in marine observation and modelling gaps for chemical, biological and deep ocean physics variables through the development of a new generation of cost-effective sensors and samplers, the integration of the aforementioned technologies within observing platforms and their deployment in large-scale demonstrations in European seas. The fundamental aim of the project will be to complement and expand current European observation tools and services, to obtain a collection of data at a much higher spatial resolution, temporal regularity and length than currently available at the European scale, and to further enable and democratise the monitoring of the marine environment to both traditional and non-traditional data users.

NAUTILOS is one of two projects included in the EU's efforts to support the European Strategy for Plastics in a Circular Economy by supporting the demonstration of new and innovative technologies to measure the Essential Ocean Variables (EOV).

More information on the project can be found at: <http://www.nautilus-H2020.eu>.

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EXECUTIVE SUMMARY

The following report documents the management and quality control procedures to be used in the execution of the NAUTILOS project. The format of the document serves as a template for the project's deliverable reports. The report is considered a living document. It may be updated throughout the project's length, if necessary, to reflect changes in the project's rules and procedures.

The following deliverable has five main sections:

- **Chapter I: Project Management Structure**
The chapter on project management describes the consortium bodies, their structure, responsibilities, meetings, reporting requirements and conflict resolution procedures.
- **Chapter II: Project Management Tools**
The following section provides an overview of the project management toolkit, including the templates which have been created to ease the management and reporting processes within NAUTILOS as well as a short description of the internal partner ownCloud space.

- **Chapter III: Project Policies: Quality Assurance Plan for Deliverables** describes project planning, along with scheduling and due dates for deliverables. It outlines the structure for the tracking of the project. The Quality Assurance Plan describes process and resources for ensuring the quality of project reports and prototypes and determines internal measures to ensure that the above criteria will be satisfied, including the control and corrective mechanisms for project and deliverables execution.
- **Chapter IV: Project Policies: Communication** describes internal and external communication paths and rules.
- **Chapter V: Project Management Methodology, Planning and Scheduling**
The project planning and scheduling section provides an overview of the Gantt Chart, the PERT diagram as well as the digital management tools to be utilised throughout the project to manage the workflow.

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LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
CA	Consortium Agreement
GrAg	Grant Agreement
EC	European Commission
GA	General Assembly
TIB	Technical and Innovation Board
TIM	Technical and Innovation Manager
PM	Project Manager
EAB	External Advisory Board
EthAB	Ethical Advisory Board
EB	Engagement Board
WPL	Work Package Leader
WPcL	Work Package Co-Leader
TL	Task Leader
TcL	Task Co-Leader

I. PROJECT MANAGEMENT STRUCTURE

1. PROJECT MANAGEMENT STRUCTURE

NAUTILOS includes 21 partners from 11 European countries. CNR, which has extensive experience in large-scale project management and delivery will coordinate the NAUTILOS project. The consortium members have been involved in past and current EC-funded projects and are acquainted with EC reporting and project management procedures.

The project management structure of NAUTILOS has been designed as outlined in Figure 1. The management structure and procedures to be applied within NAUTILOS are established in the Grant Agreement (GrAg) and Consortium Agreement (CA).

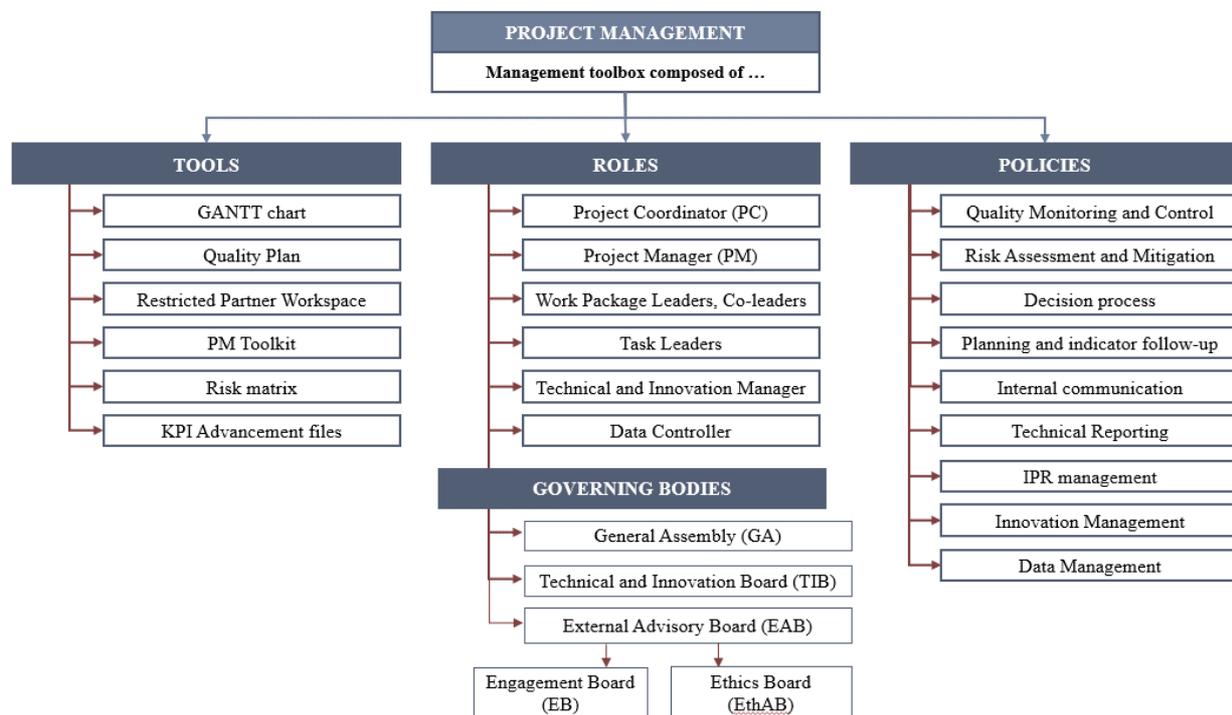


Figure 1. NAUTILOS Project Management Structure

The day-to-day management will be conducted at four levels:

- sub-task,
- task,
- work package, and
- overall project.

The **project's governing bodies** include (as further explained under section 2, Chapter 0):

- the ultimate decision body called the General Assembly (GA),
- the Technical and Innovation Board (TIB),
- the External Advisory Board (EAB).

The **project management roles** established within NAUTILOS include (as further explained under section 3, Chapter I):

- the Project Coordinator (PC),
- a Technical and Innovation Manager (TIM),
- a Data Controller (DC),

- a Project Manager (PM),
- Work Package Leaders and co-leaders (WPL, WPcL)
- Task and Sub-task Leaders (TL, STL).

The design of the management structure takes into consideration:

- Clear reporting and communication lines and the frequency of those,
- A central role of the Project Coordinator (PC) and the General Assembly (GA) aimed at successfully supporting the consortium in reaching its goals and delivering outputs,
- Simplicity, flexibility and transparency as the key factors to the project management.

It aims to involve all partners under the day-to-day coordination of the PC and ensure a strong follow-up leading to successful project implementation.

2. PROJECT GOVERNING BODIES

2.1. General Assembly

The General Assembly is the ultimate decision-making body of the consortium chaired by the PC. They are responsible for monitoring the project implementation, taking major strategic decisions and determining the long-term strategy and direction of the project.

The GA is chaired by the PC, and all other project partners are represented at the GA through one representative.

2.1.1. Process and Responsibilities

The GA will meet every six months during management meetings to review the overall project progress, track KPIs, Impact Indicators, milestones and deliverables, review any technical, innovation, managerial and administrative issues. The GA shall have the following decision powers:

- Approve major strategic decisions and the long-term detailed work plan, as implemented during the progress of NAUTILOS,
- Approve the deliverables and the technical report submitted to the EC,
- Approve any new contractors entering the CA,
- Endorsing project plans, including any WPL recommendations for modifications in project (content) direction, and monitor progress against these plans,
- Review and/or amend the terms in the CA i.e. additions or exclusion of partners,
- Agree upon proposals on defaulting parties,

2.1.2. Meetings

The chairperson shall convene *ordinary meetings* of the General Assembly at least once every six months and shall also convene *extraordinary meetings* at any time upon written request of any Member.

Meetings of the General Assembly may also be held by teleconference or other telecommunication means.

2.1.3. Members

The members of the GA have been nominated during the Kick-off meeting and the list is in the following Table

Table 1. NAUTILOS members of the GA.

Partner	Abbr.	Delegate
CNR (ISTI-CNR, CNR ISMAR, CNR IRBIM)	CNR	Gabriele Pieri
Hellenic Centre of Marine Research	HCMR	Eva Chatzinikolaou

Norwegian Institute for Water Research (Norsk Institutt for Vannforskning)	NIVA	Andrew King
Finnish Environment Institute	SYKE	Jukka Seppälä
Institut Francais de Recherche pour L'exploitation de La Mer	IFREMER	Julie Duchene
Centre national de la recherche scientifique (LEGOS, IJL)	CNRS	Carole Barus
ETT (representing EMODnet)	ETT	Antonio Novellino
University of Algarve	UALG	Flávio Martins
University of Applied Sciences Western Switzerland	HES-SO	Marco Mazza
EdgeLab	EdgeLab	Michele Cocco
NKE Instrumentation	NKE	Yves Degres
Centre of Engineering and Product Development	CEiiA	Rui Miguel Magalhães
Subsea Technology for the Marine Environment	SCT	Stefan Marx
Aquatec Group	Aquatec	Andy Smerdon
Centre Suisse d'Electronique et de Microtechnique	CSEM	Stefano Cattaneo
German Research Center for Artificial Intelligence	DFKI	Elmar Berghofer
University of Ljubljana, Laboratory of Microsensor Structures and Electronics, Faculty of Electrical Engineering	UL-FE	Danilo Vrtacnik
IMAR Institute (University of Açores)	IMAR	Pedro Afonso
Università della Calabria DIAM	DIAM	Salvatore Sinopoli
EurOcean	EurOcean	Sandra Sá
Europroject	EP	Natali Dimitrova

2.2. Technical Innovation Board

Technical Innovation Board is the supervisory Consortium Body for the technical implementation of NAUTILOS which shall report to and be accountable to the General Assembly.

The Technical and Innovation Board is led by the Technical and Innovation Manager and consists of the Coordinator, the Data Controller, the Project Manager and all WP Leaders (or a representative of the organisation leading the respective WP). The Technical and Innovation Manager in NAUTILOS is Armindo Torres from CEiiA.

2.2.1. Process and responsibilities

The Technical and Innovation Manager shall chair all meetings of the Technical and Innovation Board, unless decided otherwise by a majority of two-thirds of the Board Members. The chairperson shall prepare the meetings, propose decisions, and prepare the proposals for the General Assembly. It shall seek a consensus among the Technical and Innovation Board members.

The board shall be responsible for the proper execution and implementation of the decisions of the General Assembly. The Board shall monitor the effective and efficient implementation of the Action.

In addition, the Board shall collect information of the progress of the Action at least every 3 months, examine that information to assess the compliance of the Action with the Description of Action and, if necessary, propose modifications of the Action to the General Assembly.

The role of the board is to supervise and direct the technical and innovation aspects of the project, focus on the innovation uncertainties within NAUTILOS, ensure that the innovation objectives and potential are fulfilled, is responsible for the exploitation, dissemination and potential commercialisation of project results within and outside the member organisations. If needed, TIB will organise specific meetings to take strategic innovation decisions. If the decision is crucial for the project, the topic will be brought to the GA and EAB.

The Technical and Innovation Board shall:

- Ensure the effective day-to-day coordination and monitoring of the progress of the technical work affecting the Action as a whole.
- Decide upon the technical roadmaps regarding the Action.
- Propose to the General Assembly the plan for using and disseminating the Results.
- Prepare and implement the content and timing of press releases and joint publications by the Consortium or proposed by the Funding Authority.

In the case of abandoned or revised tasks because of a decision of the General Assembly, the Technical and Innovation Board shall advise the General Assembly on ways to rearrange tasks of the Parties concerned. Such rearrangement shall take into consideration the legitimate commitments taken prior to the decisions, and which cannot be cancelled.

2.2.2. Meetings

The chairperson of the Technical and Innovation Board shall convene ordinary meetings at least once every 3 months and shall also convene extraordinary meetings at any time upon written request by 25% of the Technical and Innovation Board members.

Meetings of the Technical and Innovation Board will be held by teleconferences or other telecommunication means.

2.2.3. Members

The members of the TIB have been nominated during the Kick-off meeting among the WPL, not considering those representing partners who already have a member within the TIB, and the list is in the following Table.

Table 2. NAUTILOS TIB members.

Role	Partner	Delegate
Technical Innovation Manager	CEiiA	Armando Torres
Coordinator	CNR	Gabriele Pieri
Project Manager	EP	Natali Dimitrova
Data Controller	ETT	Antonio Novellino
WP2 Leader	SCT	Konstantin Keller
WP3 Leader	AQUATEC	Andy Smerdon
WP4 Leader	NKE	Damien Malarde
WP5 Leader	EDGELAB	Michele Cocco

WP6 Leader	NIVA	Pierre Jaccard
WP7 Leader	HCMR	Manolis Ntoumas
WP9 Leader	UALG	Flávio Martins
WP10 Leader	EurOcean	Sandra Sá

2.3. External Advisory Board

2.3.1. Process and responsibilities

The EAB, chaired by the Coordinator, is composed of external experts, which will bring their expertise and ensure an external point of view concerning the implementation of the project. This organisational and decision-making structure will cover all necessary competences in regard of quality project implementation, supervision and correction actions, if necessary, based on the complexity of procedures. The EAB will receive updates and reports on the project's progress and related outputs and provide the GA with strategic and TIB – with technical actionable feedback.

The external advisory board will act as an independent external body which reviews the project's Progress, provides advice and guidance. EAB will aim to ensure that the project is in support of “the implementation of the G7 Future of the Seas and Oceans initiative, the Paris Climate Agreement, the UN Decade of Ocean Science for Sustainable Development, and the needs of the EC Integrated Maritime Policy and the Marine Strategy Framework Directive”.

The EAB will aim to:

- provide ongoing connection and compliance to EuroGOOS, CMEMS, EMODnet, European Marine Research Infrastructures (EMSO ERIC, EURO ARGO, JERICO RI, Lifewatch ERIC);
- provide expert advice, feedback and input into a better understanding of the barriers facing effective Transfer of Marine Technologies within NAUTILOS;
- build relationships with stakeholders in Europe; and internationally, where relevant,
- promote and enhance the external communication activities of the project.

2.3.2. Meetings

The EAB will meet once annually and be responsible for supervising the achievement of the project's objectives, oversee the project developments, results, constraints and obstacles and ways to overcome them.

2.3.3. Members

A preliminary list of External Advisory Board members has been outlined below.

The external advisory board will have two subsections within it:

1. The *Ethics Advisory Board (EthAB)*, to be part of EAB, will supervise and monitor the ethical aspects of the project proposal. EthAB, part of EAB, is an independent body which will advise the GA and all NAUTILOS members on ethical, regulatory and socio-environmental issues raised by the research and development to be undertaken under NAUTILOS. It will consist of Dr Nina J. Zugic, an independent research ethics expert and Prof. Dr Matthias Kaiser, science ethics expert from the Centre for the Study of the Sciences and Humanities, University of Bergen.
2. The *Engagement Board (EB)* will ensure that stakeholder's inputs have been taken into consideration in all aspects of the proposal implementation. The EB is part of EAB advising the GA and all NAUTILOS members regarding also the stakeholders' engagement. The representative from Surfrider Foundation is part of the EB.

The actual list of External Advisory Board Members in NAUTILOS:

1. Director General Juanjo Danobeitia. EMSO-ERIC.
2. Dr Alessandra Giorgetti. EMODnet Chemistry.
3. Dr Christos Arvanitidis. CEO LifeWatch ERIC.
4. Dr Stein Sandven. NERSC, Coordinator of INTAROS H2020 project.
5. Dr Mariana Mata Lara. Coordinator of AQUA-LIT project.
6. Dr Haizea Jimenez. Surfrider Foundation.
7. Prof. Jorge Miguel de Miranda. President of Portuguese Institute for the Ocean and Atmosphere.
8. Dr Mafalda Carapuço. Member of Portuguese Institute for the Ocean and Atmosphere.
9. Dr Nina J. Zugic, independent research ethics expert.
10. Prof Matthias Kaiser. Science ethics expert from the Centre for the Study of Sciences and Humanities, University of Bergen.

3. PROJECT MANAGEMENT ROLES

3.1. Project Coordinator

The Project Coordinator (PC) is responsible for the coordination and management of the overall project. CNR will coordinate the project, with the PC role being assigned to Gabriele Pieri, Researcher in the Signals & Images Laboratory within the Institute of Information Science and Technologies (ISTI) in the National Research Council of Italy. Researcher at ISTI–CNR since 2001, working in the field of image acquisition and analysis, tracking systems, neural networks. His main research activities are focused on data processing systems for the analysis of marine images and the fusion of multi-source data, with particular attention to geo-based decision support systems; analysis and development of integrated communication systems and for heterogeneous maritime data; analysis and development of Marine Information Systems for monitoring pollution at sea; definition of dynamic risk maps for the assessment of the danger due to oil spills at sea based on various heterogeneous factors. Member of organising committees of workshops in the field of advanced infrared technologies and applications; acted as the scientific and technical coordinator for CNR in FP7 Project ARGOMARINE (2009-12).

He takes the overall responsibility for the project, including:

- steering the relation with the European Commission and the EC Project Officer, including bearing responsibility to transmit the contractual documentation between the EC and consortium members,
- transmitting documents and information connected with the Project to any other Parties concerned,
- monitoring compliance by the other consortium members with their obligations as outlined in the GrAg and CA,
- collecting, reviewing to verify consistency, and submitting deliverables and specific documents (as requested) to the EC,
- acting as the chair of the GA as described above,
- handling interaction at the scientific and technical level with WPLs, WPcLs, TLs and STLs,
- taking specific measures in case project or partner-related issues arise within NAUTILOS,
- keeping the address list of Members and other contact persons updated and available.

3.2. Data Controller

The Data Controller (DC) is responsible for the data management and the data management plan within NAUTILOS. The DC within the project is Antonio Novellino from ETT. Being EMODnet Physics coordinator, EMODnet Data Ingestion “WP3- facilitate machine-to-machine interoperability” leader, CMEMS DU coordinator deputy, and actively participating to the SeaDataNet Technical Task Team, to the EMODnet Technical Working Group, to the EuroGOOS DATAMEQ and to some of the EuroGOOS Task Teams, as well as to some international Data Management Steering Committees (e.g.

OceanGliders, SOOS), he has a solid background, knowledge and connections for supporting the NAUTILOS project to design and implement data policy and data management plan in line with EU and international standards and aims.

Within the project the DC will be responsible for:

- the overall data management strategy,
- the ways in which data, including personal data, sensitive non-personal data, confidential data, personal and sensitive metadata, used within NAUTILOS is collected, processed, handled, distributed or safeguarded, stored and preserved,
- ensure that GDPR rules are strictly followed by all consortium members and everybody dealing with NAUTILOS related data and datasets.

3.3. Technical and Innovation Manager

The TIM supervises and directs the technical and innovation aspects of the project. The TIM in NAUTILOS will be Armindo Torres from CEiiA. He is a project manager at CEiiA, in the Development, Engineering and Production Department at the Product & Service Development Unit at CEiiA since July 2018. He has nearly 10 years' experience in project managing and coordinating complex EU funded projects having previously been seconded by CEiiA to support Leonardo Helicopter's (LH) activities.

The role focuses on:

- ensuring that the innovation objectives and potential are fulfilled,
- taking responsibility for the exploitation, dissemination, and potential commercialisation of project results within and outside the member organisations
- addressing the innovation uncertainties within NAUTILOS,
- leading the Technical and Innovation Board and organising meetings which convenes on a regular basis every three months,
- If needed, organising specific meetings to take strategic innovation decisions. If the decision is crucial for the project, the topic will be brought to the GA and EAB.

3.4. Project manager

The administrative and project manager is responsible for the administrative follow up of the project. The PM will be a role taken by Natali Dimitrova from EP. She has extensive experience as the project manager of Interreg, Erasmus+ and H2020 projects and industry project management as well. She will hold the responsibility for the project, administration, and communication management, as follows:

- providing partners with project management and communication templates,
- administrative follow-up of the project,
- implement and monitor adequate communication procedures between the PC, GA, WPL, WPcL, TL, TIM, DC, EAB to avoid delays, secure smooth implementation, and coordination of activities.
- regular communication with the CA and project partners.
- monitoring of the partners' technical progress regularly and informing the coordinator in case of problems, and reporting to the GA.

3.5. Work Package Leaders

Task Leaders (TL) and Sub-task leaders (sTL) are responsible for:

- ensuring the progress of their own Task/Subtask,
- coordinating the work of the partners collaborating on that task/subtask,
- aligning the work with other tasks/sub-tasks,
- ensuring that deliverables are produced with the appropriate quality, scope, on time and on budget.

At the operational level, the work of the project is divided into 13 work packages. Each Work Package will be led by a Work Package Leader (WPL). **Work package leaders** are responsible for:

- Formulating the implementation plan for the activities within the work package,
- Executing the planned activities,
- Coordinating the work of the partners collaborating on that work package,
- Monitoring the progress of the activities towards the specific deliverables and objectives of the work package,
- Identifying key issues that must be discussed with the other work package leaders,
- Reviewing draft deliverables from other work packages,
- Participating in the Technical Innovation Board meetings,
- Executing the tasks appointed by the Technical Innovation Board and the GA.

WPLs will be additionally supported by appointed work package co-leaders (**WPcLs**) who can:

- Support the lead,
- Ensure that timelines for deliverables and milestones are adhered to (together with the lead),
- Have the authority to take important decisions,
- Provide different perspective on issues at hand (inherently different experience and expertise between the WP leads and co-leads provides for a more diverse lead/decision tema),
- Fill in for the WP leader if they are not available.

All of the above will be based on mutual understanding on a per WP basis.

The **Task Leaders (TL)** and **Subtask Leaders (STL)** are assigned with the coordination of separate tasks/subtasks within the work packages. The TL/STL is responsible for the task implementation and its deliverable(s). This person will be directly involved in the task, responsible for the proper completion and the deliverable of its task and for reporting its progress or any issue encountered to the WPL.

Figure 2 outlines NAUILOS organisational structure while Table 3 contains the current Work Package leaders, Work Package co-leaders, task leaders and sub task leaders.

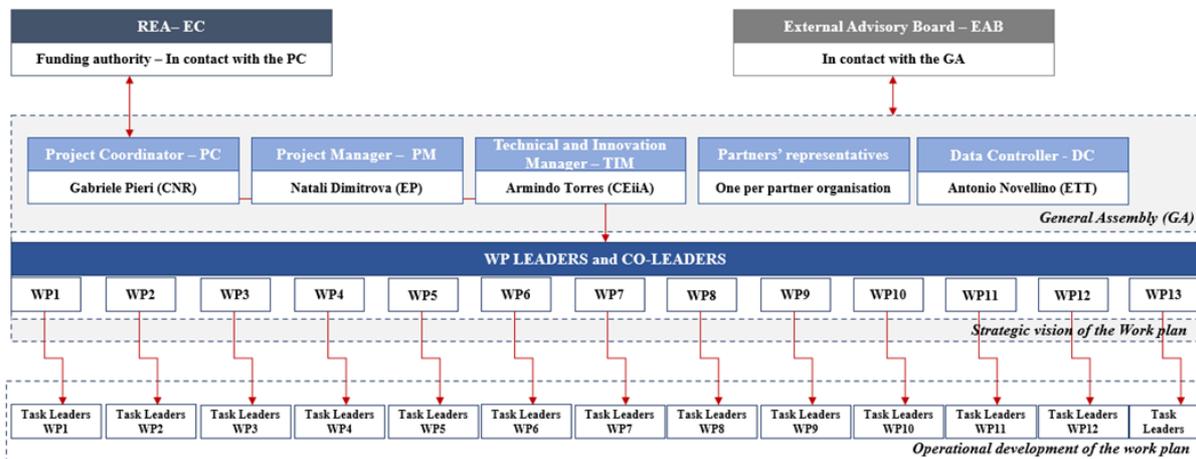


Figure 2. NAUILOS Organisational Structure

Table 3. NAUILOS WorkPackage leaders, co-leaders, Task and Sub-task leaders.

Work package/Task/Sub-task title	WP leader	WP co-leader	Task leader	Sub-task leader
Work package 1: Project Management	CNR			
Task 1.1: Scientific and Technical Project Management			CNR	
Task 1.2: Communication and Administrative Project Management			EP	

Sub-task 1.2.1: Internal Project Communication				EP
Sub-task 1.2.2: Creation of Project Management Tools				EP
Sub-task 1.2.3: Administrative Support to consortium members and Project Governing Bodies				EP
Task 1.3: External Advisory Board			CNR	
Task 1.4: Data Management Plan			CNR	
Task 1.5: Quality Assurance			EP	
Task 1.6: Ethics in the context of marine observation			CNR	
Work package 2: Technical Requirements	SCT	NIVA		
Task 2.1: Political and societal drivers and requirements			CNR	
Task 2.2: Technical requirements, standard sensor system and architecture			NIVA	
Task 2.3: Requirements for integration of sensors into selected platforms, incl. communication interfaces			SCT	
Work package 3: Biogeochemical and Biological Instrument Development	AQUATEC	HES-SO		
Task 3.1: Fluorometric Sensors			HES-SO	
Sub-task 3.1.1: Fluorometric Sensor				HES-SO
Sub-task 3.1.2: Dissolved Oxygen and Fluorescence Sensors				NKE
Task 3.2: Downward-looking sensors for ocean platforms and aerial drones			NIVA	
Task 3.3: Passive Acoustic Sensors			AQUATEC	
Sub-task 3.3.1: Passive broadband acoustic recording sensor for noise monitoring				AQUATEC
Sub-task 3.3.2: Passive acoustic event recorder (porpoise & dolphin clicks for abundance estimation)				AQUATEC
Task 3.4: Active Acoustic Profiling Sensor			AQUATEC	
Task 3.5: Sampler for phytoplankton and other suspended matter			NIVA	
Work package 4: Physical, Chemical and Microplastics Instrument Development	NKE	NIVA		
Task 4.1: Carbonate system/ocean acidification sensors			NIVA	
Task 4.2: Silicate Electrochemical Sensor			NKE	
Task 4.3: Submersible Nano- and Microplastics Sampler			SCT	
Task 4.4: Low-cost Microplastic sensors based on selective Nile Red staining and fluorescence detection			CSEM	
Task 4.5: Deep-ocean CTD			UL-FE	
Task 4.6: Deep-ocean low-level radioactivity sensor			HCMR	
Work package 5: Integration	EDGELAB	CEiiA		

Task 5.1: Novel multi-platform cooperative network integration			EDGELA B	
Sub-task 5.1.1: Adaptation of Acoustic and Optical Modems for platform intercommunication				AQUATE C
Sub-task 5.1.2: Integration between Lander platform and ASV				CEiiA
Sub-task 5.1.3: Network Integration between Lander platform, ASV and AUV/ROV				EDGELA B
Task 5.2: Sensor/payload integration on Unmanned Vehicles/Platforms			EDGELA B	
Sub-task 5.2.1: Integration of payloads and sensors on Unmanned Underwater Vehicle platform				EDGELA B
Sub-task 5.2.2: Integration of payloads and sensors on Autonomous Surface Vehicle platform				CEiiA
Task 5.3: Sensor integration into ships of opportunity			CNR	
Sub-task 5.3.1: Integration of DO and Chl-a sensor and Hub system on fishing vessels				CNR
Sub-task 5.3.2: Integration of sensors/samplers on FerryBox ships of opportunity				NIVA
Task 5.4: Sensor integration into floats, buoys and landers			NKE	
Sub-task 5.4.1: Integration of silicate sensor on a profiling float				NKE
Sub-task 5.4.2: Integration of sensors on mooring buoys				HCMR
Sub-task 5.4.3: Integration of payloads and sensors on Lander platform				CEiiA
Task 5.5: Sensor integration for animal tagging			CEiiA	
Work package 6: Calibration, Validation and Scenario Testing	NIVA	HCMR		
Task 6.1: Laboratory Validation and calibration for Biogeochemical and Biological Instruments			HCMR	
Sub-task 6.1.1: Dissolved Oxygen and Fluorescence Sensors for fishing vessels calibration				IFREMER
Sub-task 6.1.2: Downward-looking sensors for ocean platforms and aerial drones' calibration				NIVA
Sub-task 6.1.3: Passive Acoustic Sensor Calibration				AQUATE C
Sub-task 6.1.4: Active Acoustic Profiling Sensor Calibration				AQUATE C
Sub-task 6.1.5:				HCMR

Dissolved Oxygen Sensor for animal tagging calibration				
Sub-task 6.1.6: Sampler for phytoplankton and other suspended matter calibration				NIVA
Task 6.2: Laboratory Validation and calibration Physical, Chemical and Microplastics Instruments			NIVA	
Sub-task 6.2.1: Carbonate system/ocean acidification sensors calibration				NIVA
Sub-task 6.2.2: Silicate sensor calibration				CNRS-LEGOS
Sub-task 6.2.3: Deep ocean CTD				HCMR
Sub-task 6.2.4: Performance test Submersible Nano- and Microplastics Sampler				SCT
Sub-task 6.2.5: Low cost Microplastic sensors based on selective Nile Red staining and fluorescence detection				NIVA
Task 6.3: Controlled scenario testing of platforms and sensors			EDGELA B	
Sub-task 6.3.1: Controlled scenario testing of sensors, buoy, lander and ASV joint operations				HCMR
Sub-task 6.3.2: Controlled scenario testing of sensors, buoy and AUV joint operations				EDGELA B
Sub-task 6.3.3: Controlled scenario testing of sensors and UAV platform				CEiiA
Work package 7: Demonstrations	HCMR	CNR		
Task 7.1: Fisheries and Aquaculture Observing Systems			CNR	
Sub-task 7.1.1: Fisheries Observing Systems				CNR
Sub-task 7.1.2: Novel approach to Aquaculture Observing Systems				NIVA
Sub-task 7.1.3: Demonstration of Acoustic Marine Mammal Monitoring System				AQUATE C
Task 7.2: Demonstration on platforms of opportunity			SYKE	
Task 7.3: Demonstrations on Augmented Observing Systems			HCMR	
Task 7.4: Demonstration on ARGO platform			NKE	
Task 7.5: Animal-borne instruments			CEiiA	
Work package 8: Data Management	CNR	ETT		
Task 8.1: Data Quality Assessment, Assurance and Control			ETT	
Task 8.2: Data assembly and integration for interoperability			ETT	
Task 8.3: Data Processing and Model Setup			UALG	

Task 8.4: Graphic User Interface, incl. Citizen Science Tools and Interface			CNR	
Task 8.5: Automatic Image Analysis			CNR	
Work package 9: Data Modelling and Data Sharing	UALG	HCMR		
Task 9.1: Hydrodynamic simulation experiments			UALG	
Task 9.2: Biogeochemical and physical/circulation models			NIVA	
Task 9.3: Marine Litter and Microplastics Modelling			HCMR	
Task 9.4: Satellite remote sensing algorithm improvements			NIVA	
Task 9.5: Data Integration in European Platforms, Data Legacy			ETT	
Work package 10: Outreach, Communication and Dissemination	EUROCEAN	EP		
Task 10.1: Communication and Dissemination Strategy and Tools			EP	
Task 10.2: Communication and Dissemination Campaigns			EUROCEAN	
Sub-task 10.2.1: Dissemination Campaigns				EUROCEAN
Sub-task 10.2.2: Ocean Literacy and Public Engagement Campaign				EUROCEAN
Task 10.3: Policy Stakeholder Engagement			EUROCEAN	
Task 10.4: Citizen Science Campaigns			HCMR	
Task 10.5: Synergies building with relevant initiatives, projects and programmes			EP	
Work package 11: Exploitation and Impact	CEiIA	UALG		
Task 11.1 Exploitation Strategy and Campaign			CEiIA	
Task 11.2 Instrumentation Roadmap. Scalability, replicability, and transferability study			CEiIA	
Task 11.3: NAUTILOS Environmental Impact Assessment			UALG	
Task 11.4. Socio-Economic Impact Assessment			+Atlantic (CEiIA)	
Work Package 12: Synergies with ESPCE	HCMR	NIVA		
Task 12.1: Establishing collaborations in relation to the European Strategy for Plastics in a Circular Economy			HCMR	
Task 12.2: Citizen Science Plastics-Related Campaigns			HCMR	
Task 12.3: Capacity Building for ESPCE			EUROCEAN	
Work package 13: Ethics requirement	CNR			

II. PROJECT MANAGEMENT TOOLS

1. INTRODUCTION

The project management tools are important to facilitate the management of the project by the coordinator and all parties involved. All partners must be aware of their existence and use them appropriately to ensure the correct monitoring of actions and timely preparation of deliverables. Through the different tools prepared and shared by EP, the consortium has the means to correctly keep track of their administrative and technical information. All project templates are available under the project's ownCloud account.

2. PROJECT MANAGEMENT TOOLKIT

2.1. Deliverables template

www.nautilos-h2020.eu

Organisation [Name]
Department [Name]



Deliverable title
Deliverable subtitle

Date: <Date>
Doc. Version: <Version>



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Document Control Information

Settings	Value
Deliverable Title	
Work Package Title	
Deliverable number	
Description	
Lead Beneficiary	
Lead Authors	
Contributors	
Submitted by	
Doc. Version (Revision number)	[Status]
Sensitivity (Security):	Public, Basic, High
Date:	[Issue Date]

Document Approver(s) and Reviewer(s):
NOTE: All Approvers are required. Records of each approver must be maintained. All Reviewers in the list are considered required unless explicitly listed as Optional.

Name	Role	Action	Date
		<Approve / Review>	

Document history:
The Document Author is authorized to make the following types of changes to the document without requiring that the document be re-approved:

- Editorial, formatting, and spelling
- Clarification

To request a change to this document, contact the Document Author or Owner. Changes to this document are summarized in the following table in reverse chronological order (latest version first).

Revision	Date	Created by	Short Description of Changes

Configuration Management: Document Location
The latest version of this controlled document is stored in <location>.

Nature of the deliverable	
R	Report
DEC	Websites, patents, filing, etc.

2

NAUTILOS

DEM	Demonstrator
O	Other

Dissemination level	
PU	Public
CO	Confidential, only for members of the consortium (including the Commission Services)

<These notes should be deleted in the final version>

Notes for Templates:

- Text in <orange> has to be defined.
- Text in <blue> guidelines and how to use the Template, should be deleted in the final version.
- Text in green: can be customised, should be ~~removed~~ to black in the final version.

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NAUTILOS

ACKNOWLEDGEMENT

This report forms part of the deliverables from the NAUTILOS project which has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000825. The Community is not responsible for any use that might be made of the content of this publication.

NAUTILOS - New Approach to Underwater Technologies for Innovative, Low-cost Ocean observation is an H2020 project funded under the Future of Seas and Oceans Flagship Initiative, coordinated by the National Research Council of Italy (CNR, Consiglio Nazionale delle Ricerche). It brings together a group of 21 entities from 11 European countries with multidisciplinary expertise ranging from ocean instrumentation development and integration, ocean sensing and sampling instrumentation, data processing, modelling and control, operational oceanography and biology and ecosystems and biogeochemistry such, water and climate change science, technological marine applications and research infrastructures.

NAUTILOS will fill-in marine observation and modelling gaps for chemical, biological and deep ocean physics variables through the development of a new generation of cost-effective sensors and samplers, the integration of the aforementioned technologies within observing platforms and their deployment in large-scale demonstrations in European seas. The fundamental aim of the project will be to complement and expand current European observation tools and services, to obtain a collection of data at a much higher spatial resolution, temporal regularity and length than currently available at the European scale, and to further enable and democratise the monitoring of the marine environment to both traditional and non-traditional data users.

NAUTILOS is one of two projects included in the EU's efforts to support of the European Strategy for Plastics in a Circular Economy by supporting the demonstration of new and innovative technologies to measure the Essential Ocean Variables (EOV).

More information on the project can be found at: <http://www.nautilos-project.eu>.

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NAUTILOS

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5

NAUTILOS

EXECUTIVE SUMMARY

<Please customise as per your specific deliverable needs>

6

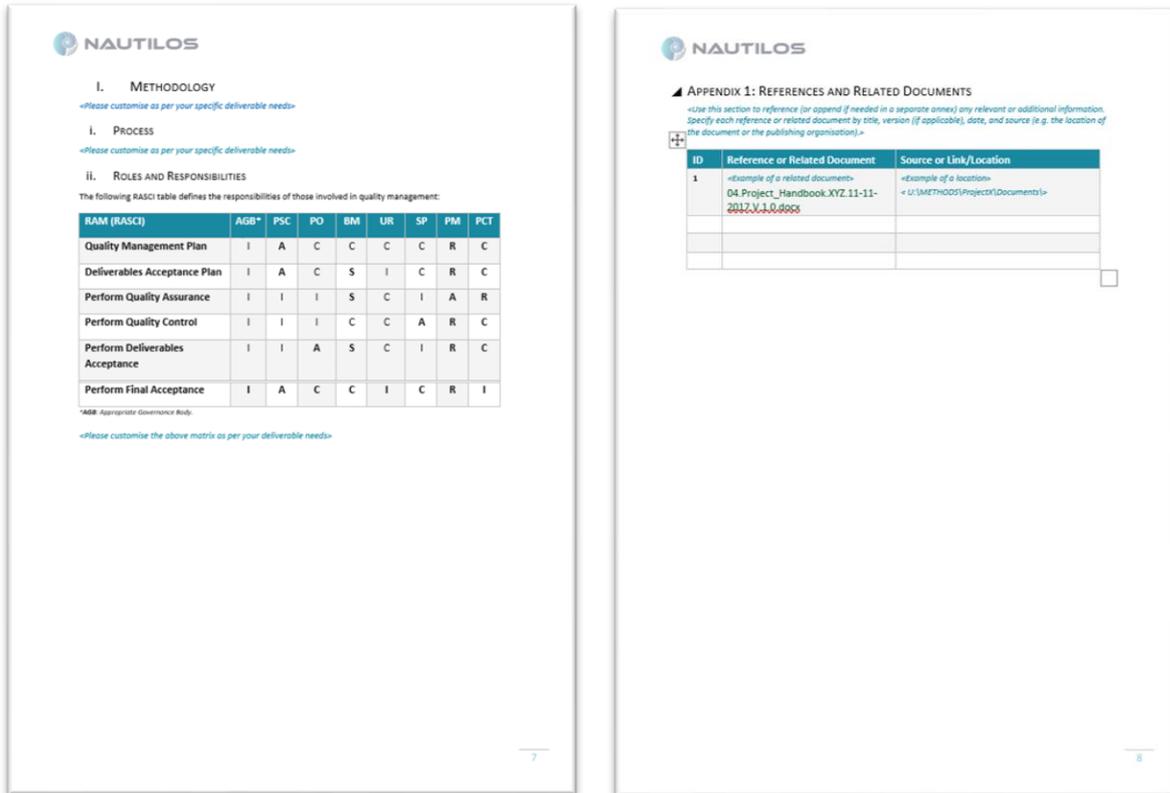


Figure 3. NAUTILOS templates for deliverables documents.

2.2. Internal Progress Report

An Internal Progress Report will be filled in every 6 months by each WP leader and sent to the project coordinator.

The objective of the internal report is to monitor the project’s technical progress. It will be a summary of the technical work completed, progress on the work which is ongoing as well as an explanation for any deviations from Annex 1. WPLs are responsible to gather all the information on the technical progress in their WP from their task leaders and compile a WP report before sending it to the coordinator. The Internal Progress Report will be integrated within the NAUTILOS reporting calendar part of the Quality Plan.

2.3. Template for meeting agenda

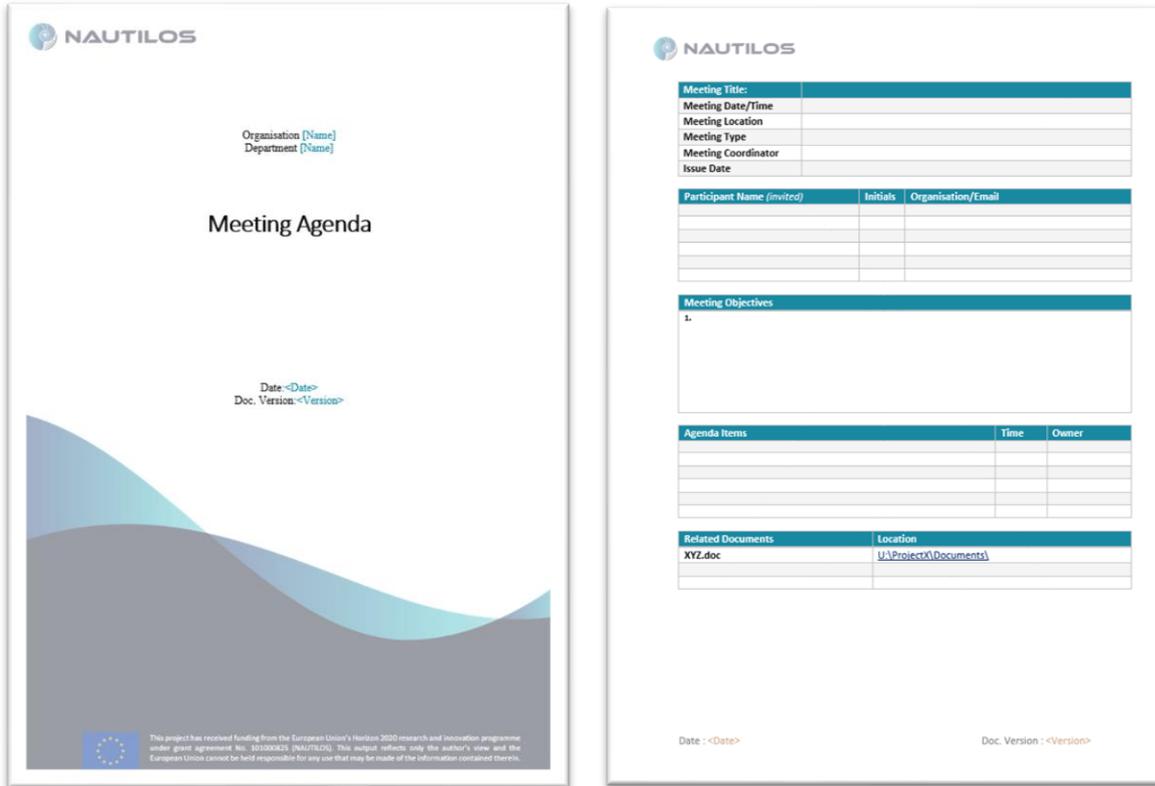


Figure 4. NAUTILOS templates for meetings' agenda.

2.5. Templates for presentations

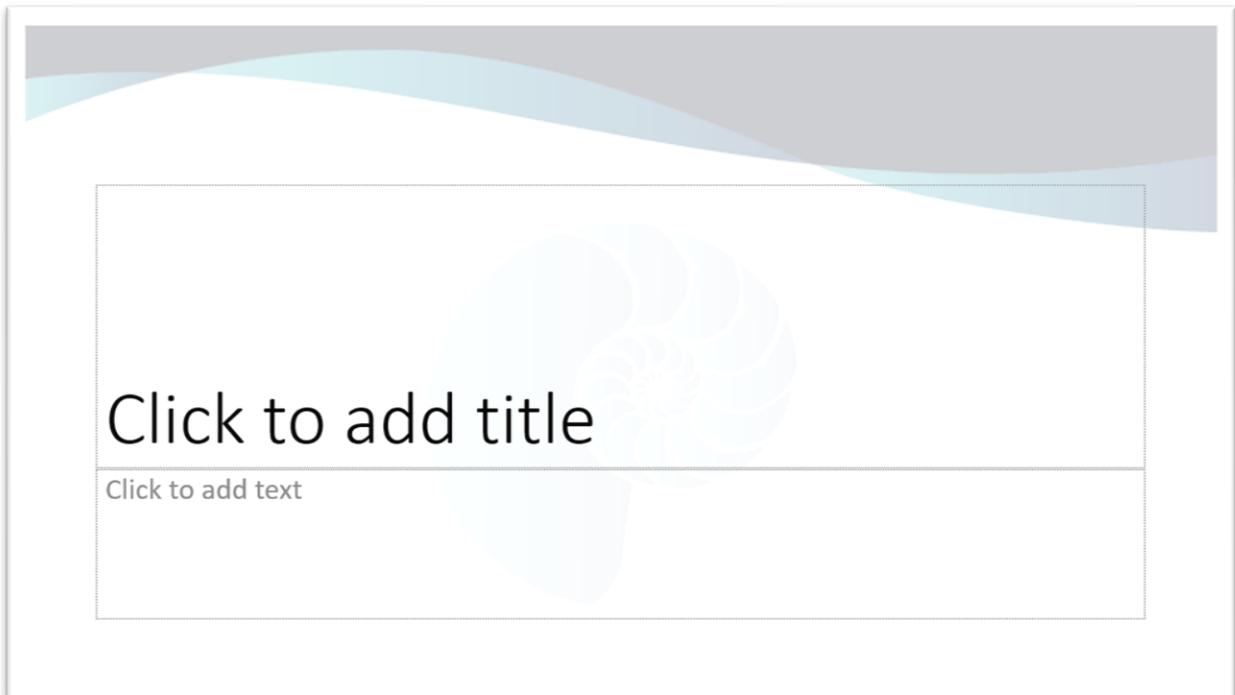
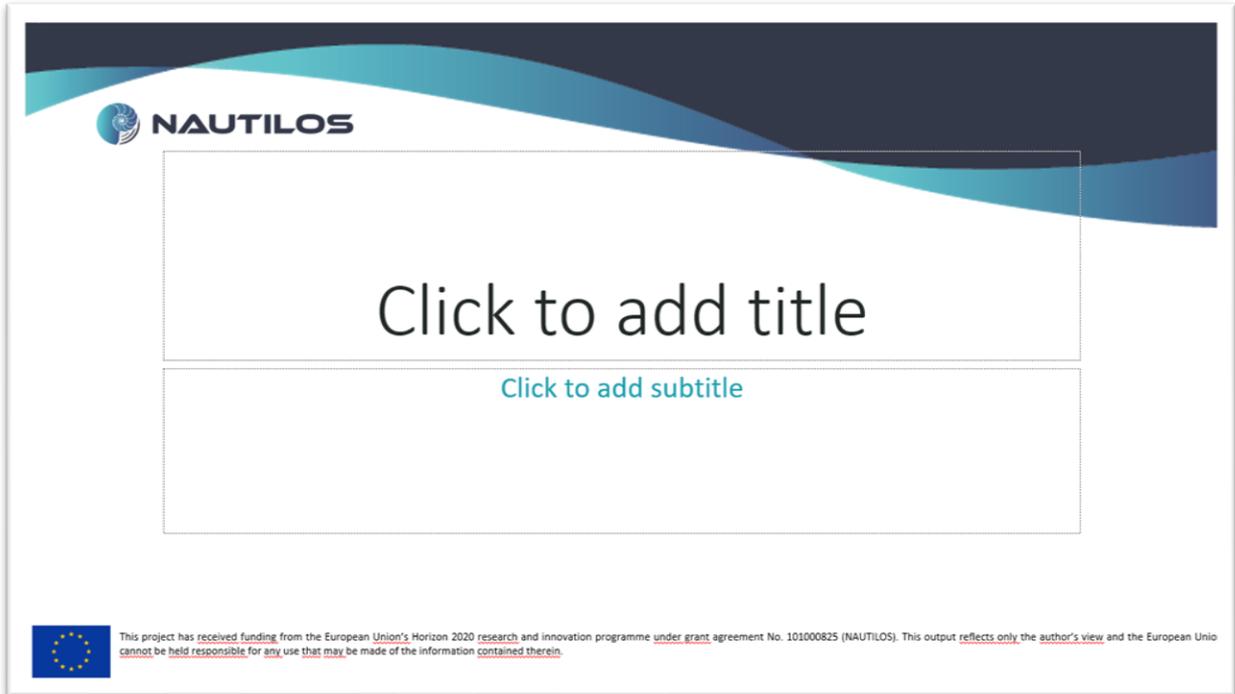


Figure 6. NAUTILOS PowerPoint templates for presentations.

2.6. Word Template

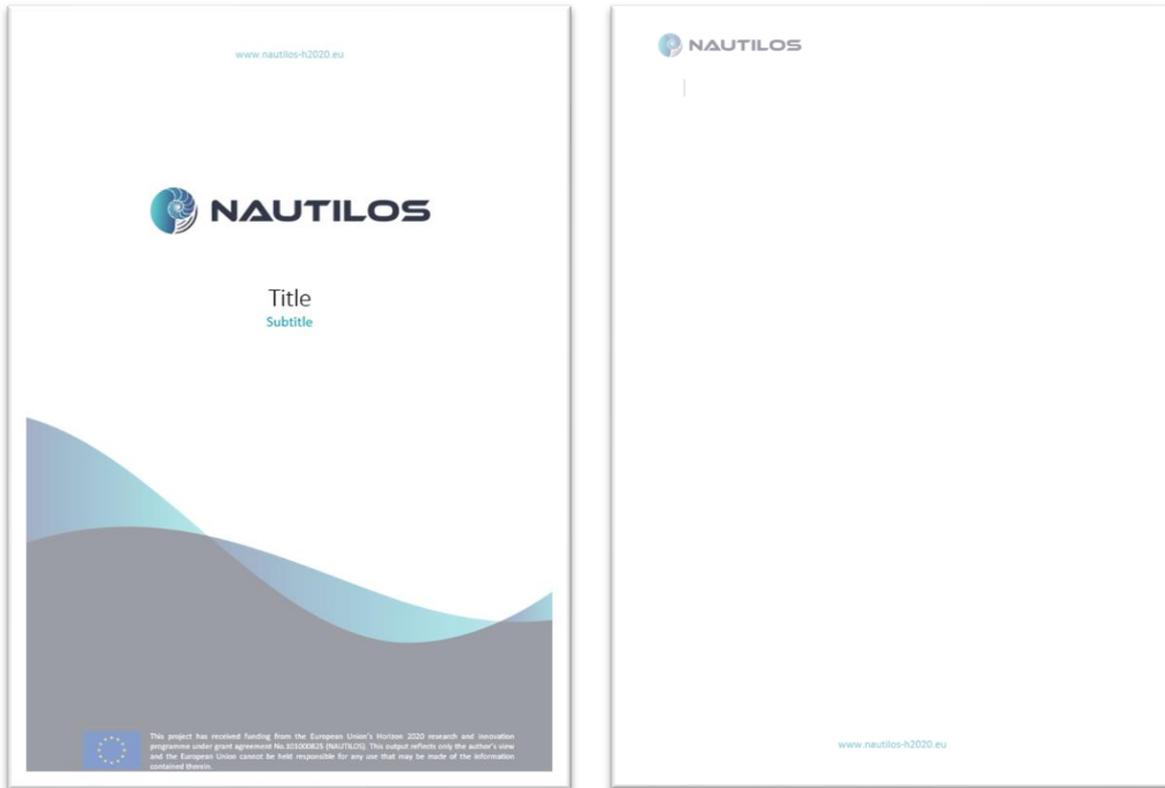


Figure 7. NAUTILOS Word document template.

3. RESTRICTED PARTNER WORKSPACE: OWNCLOUD

OwnCloud is an open source file sync and share software which provides a safe, secure, and compliant file synchronization and sharing solution on servers and is to be utilised by NAUTILOS partners throughout the four years of the project. Partners can share one or more files and folders on their computer and synchronize them with their ownCloud server. They can place files in their local shared directories, and those files are immediately synchronized to the server and to other devices using the ownCloud Desktop Sync Client, Android app, or iOS app. All partners representatives have an account which is password protected and has thus access to all information available within.

3.1. Presentation of the features

3.1.1. Drive (document storage)

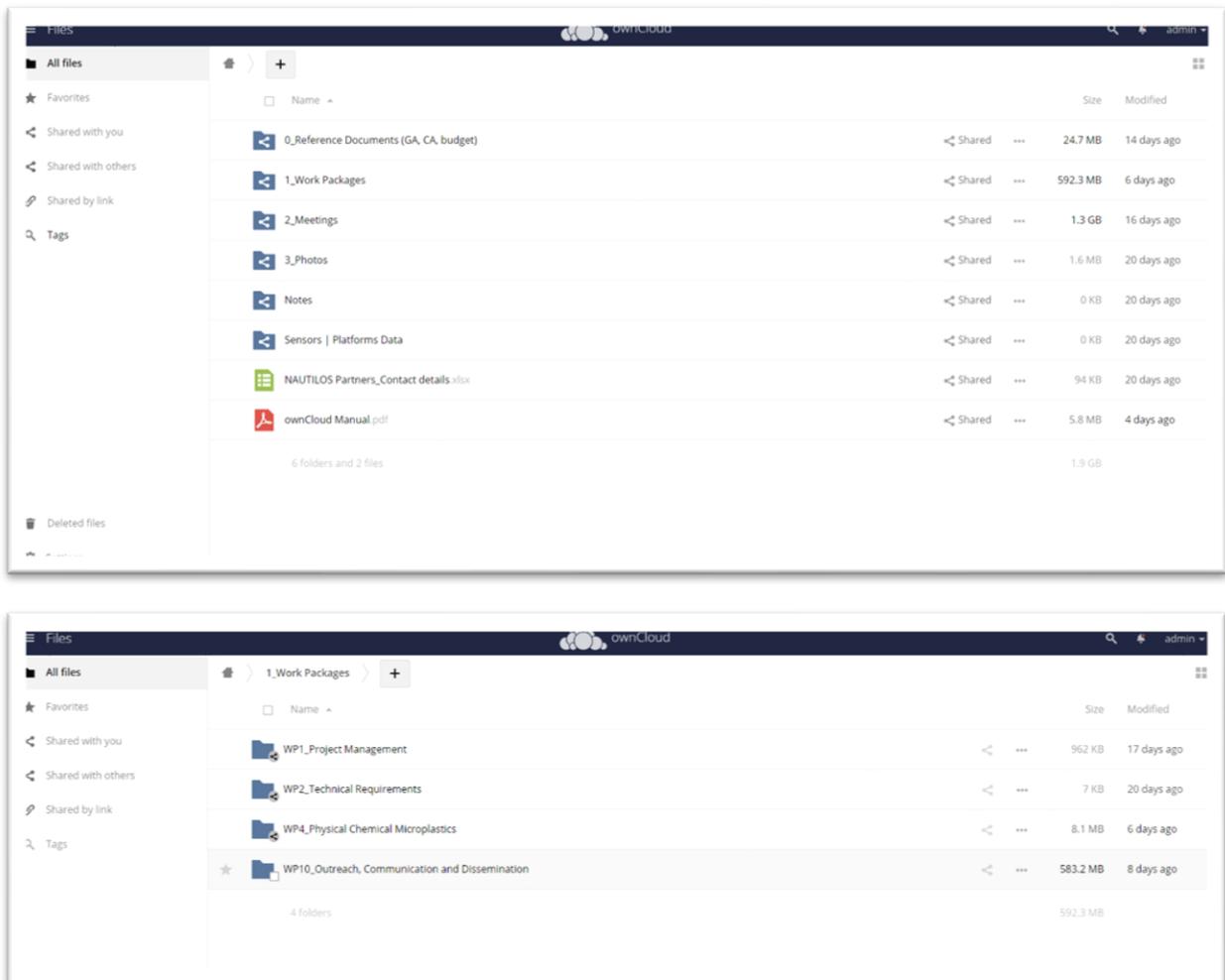


Figure 8. NAUTILOS OwnCloud storage.

- *Data Access*

NAUTILOS partners can store their files, folders, contacts, photo galleries and calendars within ownCloud. They can access their respective folders from their mobile device, desktop, or a web browser.

- *Data Synchronisation*

Files, contacts, photo galleries, calendars, etc. can be synchronized amongst devices.

- *Data Sharing*

Partners can share their data with others, and give them access to the latest reports, photo galleries, calendar, etc.

- *Versioning*

With the Versions Application enabled, ownCloud automatically saves old file versions thus preventing accidental deletions or unintended amendments.

- *Encryption*

With the Encryption Application enabled, all files stored on the ownCloud server are encrypted with the respective partner's password.

- *Drag and Drop Upload*

When ownCloud is accessed via a web browser this allows for a drag and drop of the respective files from the user's desktop into the desired target directory in the web browser. They will be automatically uploaded to the server.

- *File Notifications*

Other users of the ownCloud NAUTILOS space can be notified when a file is shared.

3.1.2. *Tasks*

The Tasks Application integrated within the ownCloud allows partners to easily sync their to-do lists within their ownCloud accounts.

3.1.3. *Calendar*

An internal calendar will be created within ownCloud outlining open internal meetings, the events partners are taking part of, as well as other thematically related events. Additionally, partner can enable the Calendar Application share, and choose the users or groups they want to share your calendar with.

3.1.4. *Galleries*

OwnCloud will also be utilised as a photo directory. Partners can specify the ownCloud photo directories, sort order, share your galleries with any email address you choose, and control whether they can share those photos with anyone else.

3.2. Managing files rules: editing and naming

The project document which will be added to the NAUTILOS OwnCloud will follow a specific editing and naming rule. In detail, each Deliverable will be named by its number, title, followed by the date and number of the actual version: e.g. "**DX.Y Title of Deliverable_dd-mm-yyyy_vn**".

While any other project document will follow a different naming rule, with the reference Work Package number as the initial indicator, followed by the eventual Task number, then the name/title of the document, followed by the version number: e.g. "**WPX_(TX.Y)_Name/Title_vn**".

More details on the editing and naming rules will be given in the deliverable report "D1.4 Quality Plan".

III. PROJECT POLICIES: QUALITY ASSURANCE PLAN FOR DELIVERABLES

A high level of quality in deliverables is essential to the success and impact of the project. Many deliverables will be available to the public and will thus be accessible long after the project's completion. This quality assurance plan for deliverables has been created to maximize project's impact and to ensure the above. The plan rests on activities of timely deliverable preparation by all partners involved.

1. DELIVERABLE TYPES

NAUTILOS creates deliverables that are either reports or demonstrators as described in Annex I of the Grant Agreement. For deliverables that do not take the form of a written report, a written record will

nevertheless be prepared to include supporting material for the accomplishment. For demonstrators, a technical report will be created, capturing the outcomes of the demonstration.

2. LIST OF DELIVERABLES

Table 4. List of NAUTILOS Deliverables

Del. No.	Deliverable Title	WP no.	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D1.1	Report on Management Procedures	WP1	1 - CNR	Report	Public	2
D1.2	External Advisory Board Report 1	WP1	1 - CNR	Report	Public	12
D1.3	Data Management Plan	WP1	1 - CNR	ORDP	Public	6
D1.4	Quality Plan	WP1	21 - EP	Report	Public	3
D1.5	EthAB Reports	WP1	1 - CNR	Report	Public	48
D1.6	External Advisory Board Report 2	WP1	1 - CNR	Report	Public	24
D1.7	External Advisory Board Report 3	WP1	1 - CNR	Report	Public	36
D1.8	External Advisory Board Report 4	WP1	1 - CNR	Report	Public	48
D1.9	Final Quality Plan	WP1	21 - EP	Report	Public	24
D1.10	Data Management Plan - 1st periodic report update	WP1	1 - CNR	ORDP	Public	18
D1.11	Data Management Plan - 2nd periodic report update	WP1	1 - CNR	ORDP	Public	36
D1.12	Final Data Management Plan	WP1	1 - CNR	ORDP	Public	48
D2.1	A review and prospectus of the mandate for marine environmental monitoring systems: technology challenges and opportunities	WP2	1 - CNR	Report	Public	6
D2.2	Document describing technical requirements required for sensors in WP3 and WP4	WP2	3 - NIVA	Report	Confidential	9
D2.3	Integrated ICD - Interface Control Document for partners' vehicles, platforms and infrastructure	WP2	12 - SCT	Report	Confidential	9
D3.1	Report and fabrication of a dissolved oxygen sensors based on fluorescence quenching	WP3	14 - HES-SO	Report	Public	18
D3.2	Report on the development of Dissolved Oxygen and Chlorophyll-a sensors for fishery vessels	WP3	10 - NKE	Report	Confidential	18
D3.3	Report on laboratory tests of downward looking sensors	WP3	3 - NIVA	Report	Confidential	18
D3.4	Report on initial laboratory and tank tests of Passive Broadband Acoustic Recording Sensor	WP3	11 - AQUATEC	Report	Confidential	18
D3.5	Report on initial tank tests of Passive Acoustic Event Recorder	WP3	11 - AQUATEC	Report	Confidential	18
D3.6	Report on initial laboratory tests of Active Acoustic Profiling Sensor	WP3	11 - AQUATEC	Report	Confidential	18
D3.7	Report on laboratory tests of suspended matter sampler hardware/software	WP3	3 - NIVA	Report	Confidential	18
D3.8	Report on development and initial testing of concept change detection system to trigger event-based sampling	WP3	18 - DFKI	Report	Confidential	18
D4.1	Report on the development of carbonate chemistry/ocean acidification sensors	WP4	3 - NIVA	Report	Confidential	24

D4.2	Report on the development and laboratory tests of Silicate electrochemical sensor	WP4	10 - NKE	Report	Confidential	24
D4.3	Report on the development of standard device for sampling nano- and microplastic particles in the ocean	WP4	12 - SCT	Report	Confidential	24
D4.4	Report on the development and characterization of low-cost of a new microplastic fluorescence sensor for microplastic detection	WP4	15 - CSEM	Report	Confidential	24
D4.5	Report on development and laboratory tests of Deep ocean CTD sensor	WP4	16 - UL-FE	Report	Confidential	24
D4.6	Report on development event-based sampling	WP4	18 - DFKI	Report	Confidential	18
D4.7	Report on the development of the radioactivity sensor	WP4	2 - HCMR	Report	Confidential	24
D5.1	Report on "Novel multi-platform cooperative network integration"	WP5	8 - EDGELAB	Report	Public	18
D5.2	Report on integration of sensors on Unmanned Vehicles/ Platforms	WP5	8 - EDGELAB	Report	Confidential	36
D5.3	Report on integration of payloads/sensors on ASV	WP5	13 - CEIIA	Report	Public	36
D5.4	Report on integration of payloads/sensors on UAV	WP5	13 - CEIIA	Report	Public	36
D5.5	Report on Silicate sensor integration on a profiling float	WP5	10 - NKE	Report	Public	36
D5.6	Validation and integration report on ships of opportunity	WP5	1 - CNR	Report	Public	34
D5.7	Report on integration of payloads/sensors on Lander platform	WP5	13 - CEIIA	Report	Public	36
D5.8	Data sheet of final animal towed tagging system with O2 sensor	WP5	13 - CEIIA	Report	Public	18
D6.1	Report on results and methodology of calibration/validation experiments performed in T6.1	WP6	2 - HCMR	Report	Confidential	36
D6.2	Report on results and methodology of calibration/validation experiments performed in T6.2	WP6	3 - NIVA	Report	Public	36
D6.3	Report on testing results of the joint operations of sensors, buoy, lander and ASV in ST6.3.1	WP6	2 - HCMR	Report	Public	36
D6.4	Report on the testing results of the joint operations of sensors, buoy and AUV in ST6.3.2	WP6	8 - EDGELAB	Report	Public	24
D6.5	Report on the testing results of the joint operations of sensors and UAV in ST6.3.3	WP6	13 - CEIIA	Report	Public	36
D7.1	Fisheries and Aquaculture Observing Systems demonstration mid-term	WP7	1 - CNR	Report	Public	40
D7.2	Fisheries and Aquaculture Observing Systems demonstration final report	WP7	1 - CNR	Report	Public	48
D7.3	Platforms of Opportunity and Ferryboxes demonstration final report	WP7	4 - SYKE	Report	Public	48
D7.4	Augmented Observing Systems demonstrations final report	WP7	2 - HCMR	Report	Public	48

D7.5	Report on the demonstration of silicate sensor on ARGO float in the Mediterranean Sea	WP7	10 - NKE	Report	Public	48
D7.6	Report on Animal Borne Instruments demonstrations	WP7	13 - CEIIA	Report	Public	48
D7.7	Report on final reached TRL of NAUTILOS technological products	WP7	2 - HCMR	Report	Public	48
D8.1	Technical documentation and operational field primary data capture systems	WP8	7 - ETT SPA	Report	Public	18
D8.2	Interoperability requirements definition	WP8	7 - ETT SPA	Report	Public	9
D8.3	Data management workflow	WP8	7 - ETT SPA	Report	Public	12
D8.4	Design of Thematic Assembly Center for innovative parameters	WP8	7 - ETT SPA	Other	Public	12
D8.5	Interoperability services and catalogues	WP8	7 - ETT SPA	Other	Public	15
D8.6	Model approach implementation and specifications	WP8	9 - UALG	Other	Public	12
D8.7	Fully developed Graphic User Interface	WP8	1 - CNR	Other	Public	18
D8.8	Citizen Science tools and Interface	WP8	1 - CNR	Other	Public	18
D8.9	Automatic image analysis tools	WP8	1 - CNR	Other	Public	18
D9.1	Evaluation of the impact of NAUTILOS observation strategies	WP9	9 - UALG	Report	Public	24
D9.2	OSSE assessment	WP9	3 - NIVA	Report	Public	48
D9.3	Advanced advection diffusion modelling tool	WP9	2 - HCMR	Other	Public	48
D9.4	Report on remote sensing matchups	WP9	3 - NIVA	Report	Public	48
D9.5	KPI definition for the NAUTILOS data management and dissemination infrastructure	WP9	7 - ETT SPA	Report	Public	24
D9.6	KPI assessment 1	WP9	7 - ETT SPA	Report	Public	36
D9.7	KPI Assessment 2	WP9	7 - ETT SPA	Report	Public	48
D10.1	Outreach, Communication and Dissemination Strategy	WP10	21 - EP	Report	Public	2
D10.2	NAUTILOS Project Website	WP10	21 - EP	Websites , patents filling, etc.	Public	4
D10.3	Policy Briefs	WP10	17 - EUROCEAN	Report	Public	36
D10.4	Dissemination impact reports - 1	WP10	17 - EUROCEAN	Report	Public	24
D10.5	Strategic Policy Agenda	WP10	17 - EUROCEAN	Report	Public	24
D10.6	Report on communication activities at key events	WP10	17 - EUROCEAN	Report	Public	36
D10.7	Report on established synergies	WP10	21 - EP	Report	Public	48
D10.8	Outreach, Communication and Dissemination Strategy 2	WP10	21 - EP	Report	Public	18
D10.9	Report on Citizen Science Campaigns (WP10)	WP10	2 - HCMR	Report	Public	48

D10.10	Dissemination Impact Reports - 2	WP10	17 - EUROCEAN	Report	Public	48
D11.1	NAUTILOS Exploitation Strategy	WP11	13 - CEIIA	Report	Public	3
D11.2	Open Access Instrumentation Roadmap	WP11	13 - CEIIA	Report	Public	24
D11.3	Brokerage Events Meeting Protocols	WP11	21 - EP	Report	Public	48
D11.4	NAUTILOS Environmental Impact Assessment - final	WP11	9 - UALG	Report	Public	45
D11.5	NAUTILOS Socio Economic Impact Assessment - final	WP11	13 - CEIIA	Report	Public	45
D11.6	NAUTILOS Environmental Impact Assessment	WP11	9 - UALG	Report	Public	24
D11.7	NAUTILOS Exploitation Strategy - final	WP11	13 - CEIIA	Report	Public	48
D11.8	NAUTILOS Socio Economic Impact Assessment	WP11	13 - CEIIA	Report	Public	24
D12.1	ESPCE report on collaborations and synergies	WP12	2 - HCMR	Report	Public	48
D12.2	Publication of ESPCE - related citizen science data and graphical maps in the citizen science interface	WP12	2 - HCMR	Other	Public	48
D12.3	Report on Citizen Science Campaigns (WP12)	WP12	3 - NIVA	Report	Public	48
D12.4	Educational material for the Capacity Building Learning Labs	WP12	17 - EUROCEAN	Report	Public	48
D13.1	H - Requirement No. 1	WP13	1 - CNR	Ethics	Confidential	3
D13.2	POPD – Requirement No. 2	WP13	1 - CNR	Ethics	Confidential	3
D13.3	A - Requirement No. 3	WP13	1 - CNR	Ethics	Confidential	3
D13.4	NEC - Requirement No. 4	WP13	1 - CNR	Ethics	Confidential	3
D13.5	EPQ - Requirement No. 5	WP13	1 - CNR	Ethics	Confidential	3
D13.6	DU - Requirement No. 9	WP13	1 - CNR	Ethics	Confidential	6
D13.7	GEN – Requirement No. 10	WP13	1 - CNR	Ethics	Confidential	18
D13.8	GEN – Requirement No. 11	WP13	1 - CNR	Ethics	Confidential	36
D13.9	GEN – Requirement No. 12	WP13	1 - CNR	Ethics	Confidential	48
D13.10	GEN – Requirement No. 13	WP13	1 - CNR	Ethics	Confidential	6

3. ROLES AND RESPONSIBILITIES

The NAUTILOS project defines the following responsibilities:

- Each task leader is responsible for the deliverables of their task
- The Work Package Leader and co-leader are responsible for checking that the deliverable will be done on time by the task leader and report to the Project Coordinator if any delay is foreseen.

- The review team 1 consisting of the Project Coordinator, Technical Innovation Manager, WP leader and co-leader should review the deliverables before submission and may return them for additional refinement if they feel this is necessary.
- After passing internal review (review team 1), it must pass cross-work package review by a peer work package (review team 2).
- Deliverables are transmitted to the EC by the project coordinator.

4. PEER REVIEW OF WORK PACKAGES

NAUTILOS deliverables are reviewed twice before submission to the EC. The first review is by the technical manager, project coordinator, WP leader and co-leader. The second review is by a peer work package. Peer Review of work packages is assigned in Table 5. Work package leaders are responsible to assign the reviewing task to personnel within their work package.

Reviewers are expected to provide constructive suggestions for improvement. Written comments may be provided directly in the document, always using “Track Changes” and reviewing comments. Therefore, if changes are made to the document, they should be clearly visible to the deliverable leading partner. After receiving review comments, the authoring team shall address them and if necessary, communicate with the reviewing team.

Table 5. Reviewing Work Packages in NAUTILOS

Work Package being reviewed	Reviewing Work Package
WP1	WP10
WP2	WP5
WP3	WP4
WP4	WP3
WP5	WP2
WP6	WP7
WP7	WP6
WP8	WP9
WP9	WP8
WP10	WP11
WP11	WP1
WP12	WP13
WP13	WP12

5. TIMELINE

The NAUTILOS project will follow the following timeline to assure timely quality execution of the deliverables:

WHEN	WHAT
60 days before the deadline	High level skeleton, incl. design of prototypes and expected length must be submitted to review team 1: coordinator, TIB (or a TIB representative) and the respective WP Lead and co-lead.
50 days before the deadline	The review team responds, approving and/or giving explicit and tangible guidance for improvements/changes.

30 days before the deadline	Once the first complete version of the deliverable is ready the deliverable is distributed to the review team 2 (WP) for final comments and amendments.
20 days before the deadline	The review team and partners involved respond with potential additional requests for revisions.
7 days before the deadline	The final deliverable is submitted to review team 1 . If no further comments the project coordinator gives final approval and submits.
Following the submission	The submitted deliverable may receive comments or request for improvement from the EC. The corrective actions will be implemented as soon as possible, not following the schedule above. The responsibility for improvements is with the WP and task lead, but can be delegated to specific partner, covering the topic in question.

6. FORMATTING

All report deliverables must be prepared in the Microsoft Word format – docx. For collaboration, partners may use other tools. To ensure consistency, a template will be constantly available on the ownCloud platform. All deliverables must use the template provided, be written in English and proofread using spell checker. When submitting the final deliverable, it must be converted to the PDF format, before uploading it.

IV. PROJECT POLICIES: INTERNAL COMMUNICATION

1. FREQUENCY

The following initial internal meeting frequency has been set during the project’s KOM. Whilst it will be subject to amendments and alteration it will serve as the initial structure for the project communication:

- Weekly between the project coordinator (CNR) and the project manager (EP)
- Bi-monthly (depending on the intensity of the work) WP/set of WPs meetings in ongoing work packages
 - Initiated and chaired by the respective WP leader/s
 - Follow the project dynamics
- Every three months between TIB members
 - Chaired by Technical and Innovation Manager
 - Operational issues, status reports
- Management meetings (every 6 months)
 - Chaired by the Project Coordinator
 - Project steering and strategy
- General Assembly meetings (during MMs, every 6 months)
- Other, ad-hoc meetings
 - E.g. technical teams, 1:1

2. TOOLS

2.1 Email

Email represents a primary means of communication within NAUTILOS. All partner representatives contact information is available on ownCloud and shared among all partners.

Several communication levels have been identified during the project preparation phase and the grant agreement preparation. Those include:

- Intra-WP: mostly between two or three partners; specific issues, technical communication, ad-hoc.
- Inter-WP: addressing the issues between different WPs, interfacing, dependencies. The communication is organized by the relevant WP leads.
- General Assembly: delegates are defined in the chapter I of this document. The communications are organized by the project coordinator.
- TIB: delegates are defined in the chapter I of this document. The communications are organized by the technical and innovation manager.

To enable a smoother and easier communication among those specific groups of partners distribution lists have already been created by EP (using the NAUTILOS website domain) including:

- All NAUTILOS partners,
- Work package leaders and co-leaders,
- General Assembly members,
- Technical and Innovation Board members,
- WP1 partners,
- WP2 partners,
- WP3 partners,
- WP4 partners,
- WP5 partners,
- WP6 partners,
- WP7 partners,
- WP8 partners,
- WP9 partners,
- WP10 partners,
- WP11 partners,
- WP12 partners.

2.2 Online Meetings and Web Conferencing Tools

Modern communication tools enable collaborative work and may greatly improve cooperation between different partners. Project teleconferences will be conducted within NAUTILOS when required, each based on its own schedule (e.g. WP meetings, task-specific meetings, TIB calls).

So far NAUTILOS partners have used the following web conferencing tools:

- Skype for small calls. Skype provides the opportunity for high-quality video presentations, voice calls, and instant messaging in a single interface.
- Microsoft Teams for larger meetings. Microsoft teams allows for online face to face meetings, screen sharing, co-authoring files, and whiteboarding in Microsoft Teams. The tool has a free plan, whilst a selection of NAUTILOS partners have the business plans which have extended functionalities.
- ZOOM for larger meetings. Zoom is a complete meetings tool package with high-quality video and a wide range of app integrations. Apart from screen sharing, it also provides cross-

platform messaging and file sharing. It allows partners to host larger virtual conferences (e.g. management meetings) and produce webinars, if required. The tool has a free plan, whilst a selection of NAUTILOS partners have the business plans which have extended functionalities.

The above list however does not prevent partners from utilising other web conferencing tools considering that they provide sufficient functionality and security during the respective meeting.

The chairperson of each teleconference shall decide the appropriate tool and invite all the relevant attendees.

2.3 Discussion space and/or forum

Internal communication tools have been discussed with partners with the options ranging from forums to business communication platforms such as Slack. Currently, most partners utilise Skype as a tool for immediate engagement with the respective partners with Skype IDs additionally shared within the contact list of NAUTILOS available at the project's ownCloud.

3. PUBLICATIONS

Publicizing the work and results of NAUTILOS is essential for meeting the project's objectives. Partners are encouraged to speak about the project in public venues and to publish results obtained through the project. In preparing speaking material and publications partners should focus on their own work and results.

- Any proposed publication relating to the Project, including contributions of foreground to standards, as well as press releases shall be sent to the Coordinator and to all other Parties within 30 days
- Any of the Parties may object to the publication within 30 days if:
 - The protection of foreground would be adversely affected,
 - The publication includes confidential information.
- One of the following disclaimers, the one applicable, shall be included with all publications:
 - *"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000825 (NAUTILOS). This output reflects only the author's view and the European Union cannot be held responsible for any use that may be made of the information contained therein."*
 - *"This [infrastructure][equipment][insert type of result] is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000825 (NAUTILOS)."*

All NAUTILOS templates include the disclaimer reported above.

V. PROJECT METHODOLOGY, PLANNING AND SCHEDULING

1. PROJECT MANAGEMENT METHODOLOGY: OPENPM²

NAUTILOS will utilise the OpenPM² is a project management methodology designed by the European Commission. Its purpose is to enable project teams to manage their projects effectively, and to deliver solutions and benefits to their organisations and stakeholders. While OpenPM² is suitable for any type of project, it is ideal for projects related to the public sector, or EU programmes and grants. Currently the European Commission, the European Council, EU External Action Services, the Committee of the Regions, ECB, EIB, SRB, CVRIA, CEFEFOP, OP, ESM, ESMA and over 20 EU Agencies located all over the

EU Member States use the following methodology. The methodology is also used by many consortia and hundreds of contractors involved in EU projects.

OpenPM² is a free version of the PM² developed by the Commission in 2007. It incorporates elements from globally accepted best practices, standards and methodologies. OpenPM² gives open access to the PM², widening the circle of beneficiaries across Europe and enriching the methodology with additional good practices and examples. It aims to improve project management competency in the EU.

PM² incorporates elements from a wide range of globally accepted project management best practices, captured in standards and methodologies. Its development has also been influenced by operational experience on various projects both within European Union Institutions and external bodies. The PM² Methodology provides:

- a project governance structure
- process guidelines
- artefact templates
- guidelines for using the artefacts
- a set of effective mindsets

PM² improves the effectiveness of project management by:

- improving communication and the dissemination of information
- clarifying expectations as early as possible in the project lifecycle
- defining the project lifecycle (from Initiating to Closing)
- providing guidelines for project planning
- introducing monitor and control activities
- proposing management activities and outputs (plans, meetings, decisions)
- providing a link to agile practices (Agile PM²)

As an initial step for its implementation all NAUTILOS templates have been designed to fully answer the methodology's requirements.

2. STRUCTURE BREAKDOWN: PERT DIAGRAM

NAUTILOS will run through a 48-month period and will be composed of 13 work packages, as illustrated in the PERT Diagram below. The work programme will consist of 4 phases dedicated to the implementation of NAUTILOS, namely:

- Development,
- Integration, validation and scenario testing,
- Demonstrations and
- Data Management and Modelling.

Throughout the implementation of activities composing these four phases there will be 5 horizontal Work Packages - one work package will be fully dedicated to the management of the whole project, including technical and administration (WP1), exploitation and impact (WP11), engagement with the European Strategy for Plastics in a Circular Economy (WP12), outreach, communication & dissemination activities (WP10) and ethics (WP13).

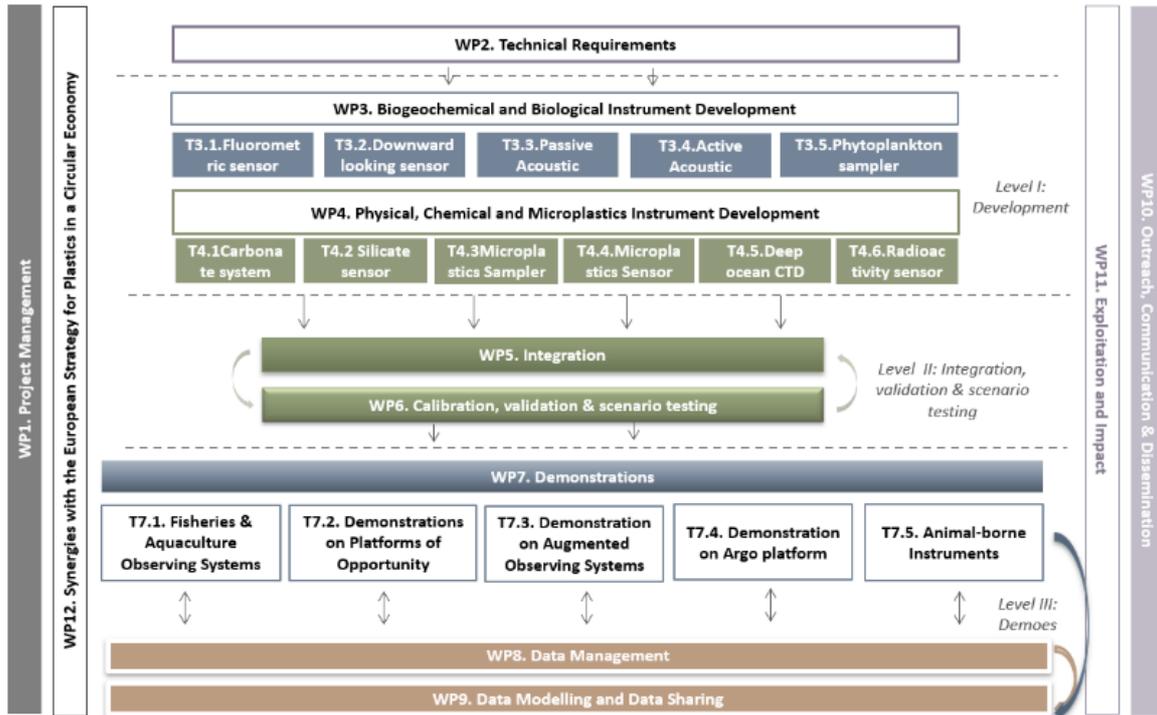


Figure 9. NAUTILOS PERT Diagram

3. PROJECT SCHEDULING: GANTT CHART

NAUTILOS' methodology is based on the technological development of marine instrumentation from mid (TRL3-6) to high TRL levels (TRL6 to 9) with some of the technologies being brought to TRL 9 within the project's timeframe. The step-by-step process which goes to the technological demonstration phase in WP7 goes through the following stages:

- Requirements stage (WP2) and Development Specifics (WP3, WP4)
- Integration (WP5)
- Calibration, Validation and Scenario Testing (WP6)
- Demonstrations
- Data Flow
- Data modelling

So as to manage the complexity of the project partners have developed a detailed GANTT Chart which provides a visual overview of the project schedule with specific timeframes per work package and task as well as an outline of the WP/Task leaders:

Table 6. NAUTILOS GANNT Chart: Timing the Work Packages and components

PROJECT PLANNING	WP leader	Year		Year 1												Year 2												Year 3												Year 4											
		Month	Start	End	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
1 Project Management	CNR	1	48	[Gantt bars for Project Management]																																															
1.1. Scientific and Technical Management	CNR	1	48	[Gantt bar]																																															
1.2. Communication and Administrative	EP	1	48	[Gantt bar]																																															
1.3. External Advisory Board	CNR	1	48	[Gantt bar]																																															
1.4. Data Management Plan	CNR	1	48	[Gantt bar]																																															
1.5. Quality Assurance	EP	1	48	[Gantt bar]																																															
1.6. Ethics in the context of marine observation	CNR	1	48	[Gantt bar]																																															
2 Technical Requirements	SCT	1	9	[Gantt bars for Technical Requirements]																																															
2.1 Political and societal drivers and	CNR	1	6	[Gantt bar]																																															
2.2 Technical requirements, standard sensor	NIVA	1	9	[Gantt bar]																																															
2.3 Requirements for integration of sensors into	SCT	1	9	[Gantt bar]																																															
3 Biogeochemical and Biological Instrument	Aquatec	1	18	[Gantt bars for Biogeochemical and Biological Instrument]																																															
3.1 Fluorometric Sensors	HESSO	1	18	[Gantt bar]																																															
3.2 Downward-looking sensors for ocean	NIVA	1	18	[Gantt bar]																																															
3.3 Passive Acoustic Sensors	Aquatec	1	18	[Gantt bar]																																															
3.4 Active Acoustic Profiling Sensor	Aquatec	1	18	[Gantt bar]																																															
3.5 Sampler for phytoplankton and other	NIVA	1	18	[Gantt bar]																																															
4 Physical, Chemical and Microplastics	NKE	1	24	[Gantt bars for Physical, Chemical and Microplastics]																																															
4.1 Carbonate system/ocean acidification	NIVA	1	24	[Gantt bar]																																															
4.2 Silicate Electrochemical sensor	NKE	1	24	[Gantt bar]																																															
4.3 Submersible Nano- and Microplastics	CST	1	24	[Gantt bar]																																															
4.4 Microplastic sensors	CSEM	1	24	[Gantt bar]																																															
4.5 Deep ocean CTD	ULFE	1	24	[Gantt bar]																																															
4.6 Deep ocean low-level radioactivity sensor	HCMR	1	24	[Gantt bar]																																															
5 Integration	EL	1	36	[Gantt bars for Integration]																																															
5.1 Interface and Communication between	EL	1	18	[Gantt bar]																																															
5.2 Sensor integration on UAV, USV, ASV and	EL	7	36	[Gantt bar]																																															
5.3 Sensor integration into ships of opportunity	CNR	21	34	[Gantt bar]																																															
5.4 Sensor integration into floats, buoys and	NKE	1	36	[Gantt bar]																																															
5.5 Sensor integration for animal tagging	CEIA	1	18	[Gantt bar]																																															
6 Calibration, Validation and Scenario Testing	NIVA	9	36	[Gantt bars for Calibration, Validation and Scenario Testing]																																															
6.1 Laboratory Validation and calibration for	HCMR	18	36	[Gantt bar]																																															
6.2 Laboratory Validation and calibration	NIVA	20	36	[Gantt bar]																																															
6.3 Controlled scenario testing of platforms and	EL	9	36	[Gantt bar]																																															
7 Demonstrations	HCMR	6	48	[Gantt bars for Demonstrations]																																															
7.1 Fisheries and Aquaculture Observing	CNR	24	48	[Gantt bar]																																															
7.2 Demonstration on platforms of opportunity	SYKE	34	48	[Gantt bar]																																															
7.3 Demonstrations on Augmented Observing	HCMR	36	48	[Gantt bar]																																															
7.4 Demonstration on ARGO platform	NKE	36	48	[Gantt bar]																																															
7.5 Animal-borne instruments	CEIA	6	48	[Gantt bar]																																															
8 Data Management	CNR	1	18	[Gantt bars for Data Management]																																															
8.1 Data Quality Assessment, Assurance and	ETT	1	18	[Gantt bar]																																															
8.2 Data assembly and integration for	ETT	1	18	[Gantt bar]																																															
8.3 Data Processing and Model Setup	UALG	1	12	[Gantt bar]																																															
8.4 Graphic User Interface, incl. Citizen Science	CNR	7	18	[Gantt bar]																																															
8.5 Automatic Image Analysis	CNR	1	18	[Gantt bar]																																															
9 Data Modelling and Data Sharing	UALG	13	48	[Gantt bars for Data Modelling and Data Sharing]																																															
9.1 Hydrodynamic simulation experiments	UALG	13	48	[Gantt bar]																																															
9.2 Biogeochemical and physical/circulation	NIVA	13	48	[Gantt bar]																																															
9.3 Marine Litter and Microplastics Modelling	HCMR	13	48	[Gantt bar]																																															
9.4 Satellite remote sensing algorithm	NIVA	18	48	[Gantt bar]																																															
9.5 Data Integration in European Platforms, Data	ETT	18	48	[Gantt bar]																																															
10 Outreach, Communication and	EO	1	48	[Gantt bars for Outreach, Communication and]																																															
10.1 Communication and Dissemination Strategy	EP	1	48	[Gantt bar]																																															
10.2 Communication and Dissemination	EO	1	48	[Gantt bar]																																															
10.3 Policy Stakeholder Engagement	EO	1	48	[Gantt bar]																																															
10.4 Citizen Science Campaigns	HCMR	1	48	[Gantt bar]																																															
10.5 Synergies building with relevant initiatives,	EP	1	48	[Gantt bar]																																															
11 Exploitation and Impact	CEIA	1	48	[Gantt bars for Exploitation and Impact]																																															
11.1 Exploitation Strategy and Campaign	CEIA	1	48	[Gantt bar]																																															
11.2 Instrumentation Roadmap, Scalability, replica	CEIA	1	48	[Gantt bar]																																															
11.3 NAUTILOS Environmental Impact Assessment	UALG	1	48	[Gantt bar]																																															
11.4 Socio-Economic Impact Assessment +Atlantic (Ceia)	CEIA	1	48	[Gantt bar]																																															
12 Synergies with the European Strategy for Pla	HCMR	1	48	[Gantt bars for Synergies with the European Strategy for Pla]																																															
12.1 Establishing collaborations in relation to the E	HCMR	1	48	[Gantt bar]																																															
12.2 Citizen Science Plastics-Related Campaigns	HCMR	1	48	[Gantt bar]																																															
12.3 Capacity Building for the European Strategy fc	EO	1	48	[Gantt bar]																																															
13 Ethics	CNR	1	48	[Gantt bar]																																															

Currently project partners are collaborating on translating and expanding the GANTT Chart outlined above into a project management software tool (ClickUp) which would allow them to schedule, manage dependencies and prioritise activities within NAUTILOS within a timeline.

NAUTILOS tasks will be linked with dependencies, dependency-path tracking will be used to uncover potential bottlenecks and prevent inefficiencies and dynamic progress percentages would provide a detailed snapshot of the current project's progress.

The dynamic timeline would let partners schedule tasks, keep up with project progress, manage deadlines, and handle bottlenecks.

Work on it is expected to be finalised by M3.

APPENDIX 1: REFERENCES AND RELATED DOCUMENTS

Deliverable 1.1 has been developed in accordance with the provision outlined within the following related documents:

- NAUTILOS Grant Agreement,
- NAUTILOS Consortium Agreement Nr. 101000825.

ID	Reference or Related Document	Source or Link/Location
1	NAUTILOS Grant Agreement	NAUTILOS ownCloud
2	NAUTILOS Consortium Agreement Nr. 101000825.	NAUTILOS ownCloud