

D7.1- Project Management Plan

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HISTORY OF CHANGES

Date	Version	Author(s)	Change Description
03.03.2023	1.0	Maria Grazia Ciminelli, Luisa Bettili	First Issue



ABSTRACT

The present document represents the deliverable D7.1 - Project Management Plan (PMP) of CENTAUR project and is produced under the Work Package WP7 - Project Management.

This document describes the project organisation in terms of team structure, roles, responsibilities and work plan by means of a comprehensive project handbook. It describes also the quality assurance procedure and the strategy to keep under control and mitigate the risks during the project implementation. It includes the risk register and describes how risks will be managed.

This Project Management Plan complements the project information provided in the Grant Agreement [AD1]. However, the Grant Agreement will remain the contractual reference.



1 INTRODUCTION

1.1 SCOPE OF THE DOCUMENT

Within HORIZON-CL4-2021-SPACE-01-43 - Copernicus Security and Emergency Services evolution [AD2], e-GEOS is the leader of the *COPERNICUS ENHANCED TOOLS FOR ANTICIPATIVE RESPONSE TO CLIMATE CHANGE IN THE EMERGENCY AND SECURITY DOMAIN* project Consortium. As such, e-GEOS has the full responsibility for the project and e-GEOS's nominated project manager and contract manager are the unique interfaces to EC for technical and contractual issues. e-GEOS is supported by thirteen partners.

The Project Management Plan (PMP) is the comprehensive document providing EC the evidences that the work is carried out in accordance to the project objectives. Moreover, within the PMP, any issue related to the project management are considered in a coherent approach, ensuring the fulfilment of Project objectives, activities and outcomes, within the expected period of time, level of completeness and accuracy.

The PMP has the objective of providing all the activities required for the organization, plan and control of Grant Agreement execution. A detailed description of the industrial approach is included, with the definition of the structure, organization, roles and responsibilities shared among the team.

A high level Work Breakdown Structure (WBS) definition and project GANTT are included in the present PMP.

The PMP is a living document that will be maintained through the entire lifecycle of the project, reporting the state of art, plans and controls of the project. Its components will need to be updated and re-baselined, if necessary, at the end of each stage, to reflect the state of art. The first authorized version of the Project Management Plan is considered as the basis against which performance will later be assessed when closing the project.

The PMP will be updated with an iterative approach at least according to the Reporting periods - Mid-term review (end of May 2024), but also in case of exceptional circumstances.

Irregular updates will be, for example, triggered by the following possible events:

- Acceptance of a Grant Amendment.
- Change in key personnel.
- Risk management plan changes, in particular for changes to the agreed strategy to manage risky events.
- Changes to the Consortium Board and to the involved stakeholders.
- Force majeure events.

1.2 DEFINITION, ABBREVIATIONS AND ACRONYMS

Table 1: Definitions, Abbreviations and Acronyms

Abbreviation/acronym	Definition
AB	Advisory Board
AI	Artificial Intelligence
CB	Consortium Board
Copernicus EMS or CEMS	Copernicus Emergency Management Service
DMP	Data Management Plan
EC	European Commission
EW	Early Warning
ECMWF	European Centre for Medium-Range Weather Forecasts
EFAS	European Flood Awareness System
EO	Earth Observation
EU	European Union
EW	Early Warning
FAIR	Findable, Accessible, Interoperable and Reusable
InSAR	Interferometric Synthetic Aperture Radar
KPI	Key Performance Indicators
ML	Machine Learning
PMP	Project Management Plan
QA	Quality Assurance
RPI	Risk Priority Index
SAR	Synthetic Aperture Radar
SC	Steering Committee

SEA	Copernicus Service in Support to EU External Access
(V) HR	(Very) High Resolution
WBS	Work Breakdown Structure
WPL	Work Package Leader
TL	Task Leader

1.3 APPLICABLE AND REFERENCE DOCUMENTS

ID	Document name
[AD1]	CENTAUR - 101082720 – Grant Agreement
[AD2]	HORIZON-CL4-2021-SPACE-01 - Strategic Autonomy in Developing, Deploying and Using Global Space-based Infrastructures, Services, Application and Data 2021, available at https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2021-space-01-12

[RD1]	Copernicus Service in Support to EU External Action: https://sea.security.copernicus.eu/
[RD2]	Copernicus Emergency Mapping Service – Rapid Mapping: https://emergency.copernicus.eu/mapping/copernicus-emergency-management-service#zoom=2&lat=17.44093&lon=29.71939&layers=0BT00



2 PROJECT OBJECTIVE

Climate change impact on human lives and security is continuously growing. Over the last 50 years, more than 11 000 reported disasters related to extreme weather and climate conditions have caused over 2 million deaths (WMO, 2021). In the last twenty years have seen the number of major floods more than double. Climate change is increasingly acknowledged within the EU's integrated approach to security. The related environmental degradation is recognized as a threat multiplier and an aggravating factor for political instability with serious implications for peace and security worldwide.

The overall objective of CENTAUR is to respond to societal challenges deriving from Climate Change threats by developing and demonstrating new service components for the Copernicus Emergency Management Service (CEMS) and Copernicus Service in Support to EU External Action service (SEA), aiming to:

- improving situational awareness and preparedness around climate change and its impact on complex emergencies and multi-dimensional (security) crises.
- anticipating the occurrence and possible knock-on effects of crisis events, in particular those triggered by climatic extremes, thus contributing to resilience and effective adaptation.

In the emergency domain, CENTAUR will address the flood-related threats to population, assets and infrastructures in urban areas. In the Security domain, CENTAUR will address water & food insecurity. The two work streams will be connected via a cross-cutting component focusing on exposure and vulnerability to climate change, as well as resilience and societal capacity for managing environmental risks and social conflict. Across work streams, indicators and models will be validated by different methods.

CENTAUR will integrate data coming from multiple heterogeneous sources, with a specific focus on those generated by other Copernicus services and, in particular, those of the Climate Change Service. It will combine these with meteorological data, socio-economic data, and data coming from new sensors (e.g. traditional and social media). Thus, it will enhance current capacities to produce composite risk indexes and to perform multi-criteria analyses in the emergency and security domains.

CENTAUR targets a pre-operational working solution that is compatible with ongoing and future CEMS and SEA operations. In this perspective, and to pave the way towards medium term operational status, CENTAUR will perform demonstrators on real scenarios, chosen or to be chosen with CEMS and SEA stakeholders, over pertinent events or areas most prone to crises, where CENTAUR will demonstrate its continuous monitoring, forecasting and event driven modes. A Cold Case demonstrator phase, after feedback and adaptation, will lead to an extensive Hot Case CENTAUR demonstrator phase. An Advisory Board has already engaged with key users, often linked to same crisis scenarios, who have expressed their interest in participating in the demonstration phase also facilitating the access to key information and data. CENTAUR will establish a "crisis observatory" to integrate new Hot Cases where opportunities arise in collaboration with the Advisory Board and Copernicus Services Users.

A layered approach is adopted within CENTAUR project:

- **Data in three dimensions (1st layer):** i) geospatial data including EO as well as thematic data captured from ground sensors and other geospatial datasets (Reference layers, LIDAR, drones, etc.); ii) meteorological data for numerical weather predictions; iii) open data include data lakes from various sources or unconventional "sensors", such as media of various types, documents, social outlets.
- **Indicators (2nd layer):** thematic information from data time series and simple indexes, obtained by simple combination of data according to models applicable to the phenomena observed or similar levels of processing, including the use of advanced processing methods in the domain of big data analysis and artificial intelligence such as Machine Learning. CENTAUR indicators will describe and characterize urban

floods, water and food insecurity and social, political and economic factors. Indicators may well describe a phenomenon alone or used to trigger another one.

- **Crisis Indexes (3rd layer):** is a result from the integration of urban flood and water & food indicators with Social, Economic and Political indicators, to detect a crisis event and/or its impact. They intend to provide quantitative assessment of statistical risk of occurrence of an event, obtained by simple combination of indicators or applying more innovative AI automatic classification algorithms.

The layered-approach performed within CENTAUR is visually described in the chart below (Figure 1).

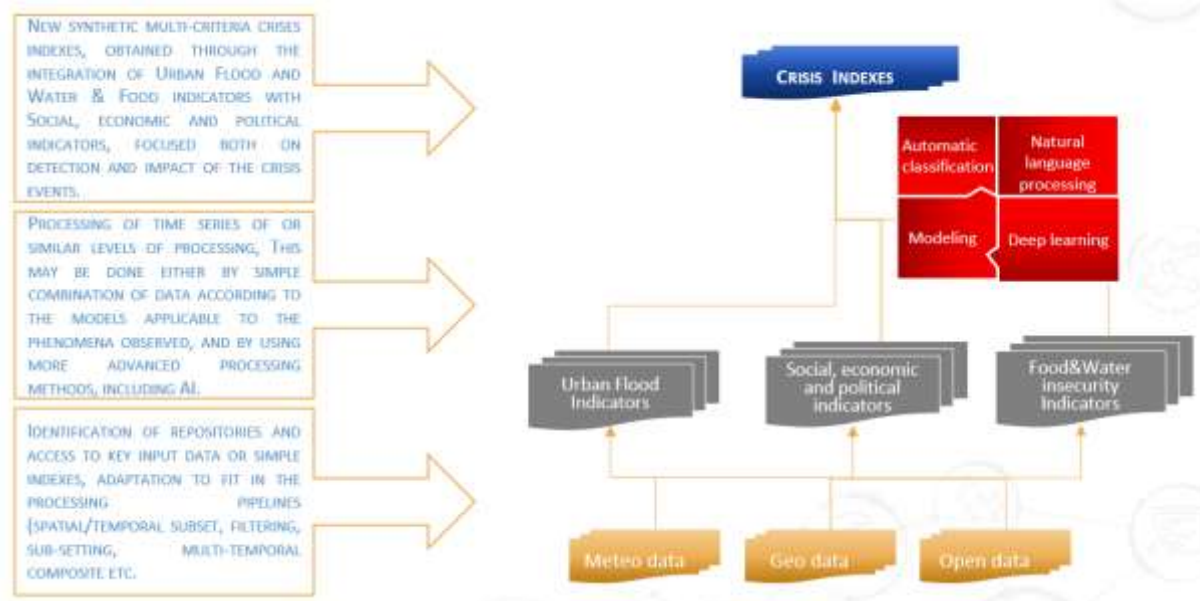


Figure 1: CENTAUR layered approach

Through the identification of a set of meaningful Indicators and Crisis Indexes, CENTAUR integrates them into deployment environment to provide:

- **Continuous monitoring service at regional and lower level:** Indicators of climate-driven extreme urban flood and water & food insecurity will be generated systematically at medium resolution over Areas of Interest, selected for the project demonstrators. Service pipelines will make use of historical time series for training models and run them on current data to identify short-term risks in real time. The pipelines will support other components of CENTAUR and can be made accessible to interested partners. This continuous monitoring mode will feed into the Support to Early Warning Systems (EWS) outlined below (Figure 2).
- **Web-based simulator:** based on the information collected through the above monitoring service, methodologies and tools for mid-term forecast will be developed. These tools will be implemented as part of a web-application that is able to run ‘what if’ analyses based on user-specified parameters like the expected frequency of climate hazards, the level of exposure of people and assets, or the susceptibility of local politics to conflict and instability, among others.
- **Support to early response systems:** based on the above monitoring tools, the developed services will also include Early Warning components for both the SEA and CEMS Services.

As alerts are raised, CENTAUR will move to an event driven setting, where indexes shall be updated, this time benefiting from actual measurements of key parameters and newly acquired data and information at higher

resolutions. Information are generated on a large scale over wide areas, aiming to provide wide-scale observatories of phenomena capable to switch on red lights corresponding to significant changes in the normal patterns of the indicators (Figure 2).

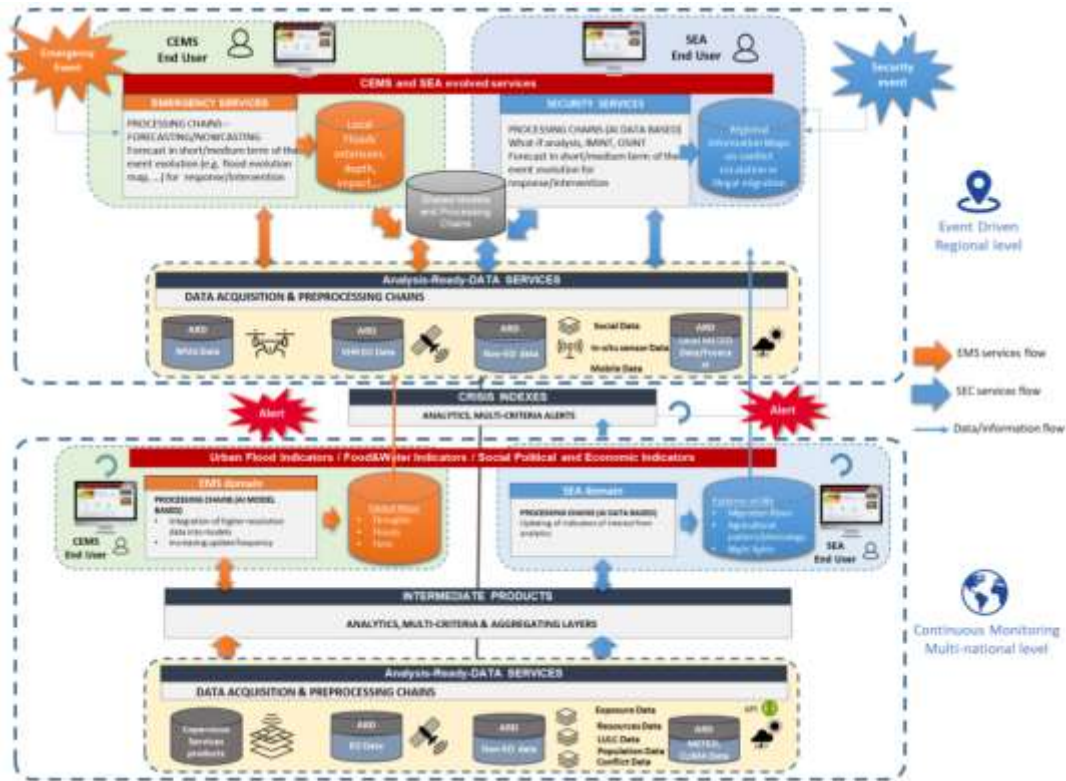


Figure 2: CENTAUR continuous monitoring flow at multinational level

The chart below provides an overview of CENTAUR project work logic (Figure 3).

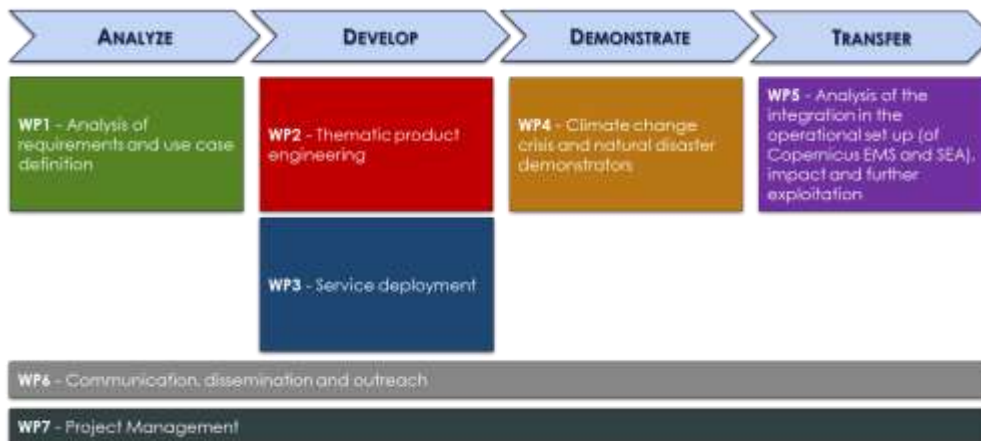


Figure 3: CENTAUR work logic

First phase: Analysis. This phase is fully user driven. A group of external experts representing a set of the user community in the context of Copernicus EMS and SEA services, specifically focused on thematic areas of urban

flood and Water& food security is involved since the initial phase of the project. The CENTAUR Team closely interacts with them to gather and analyse their needs and define the information content and use cases.

Second phase: Development. The Urban Flood and Water&Food Insecurity service pipelines as well as the CENTAUR multi-criteria analysis and indexes generation pipelines are designed and developed. Indicators, algorithms for the generation of each product are assessed and implemented in the processing chains; data sources are analysed and access to them is granted and the Centaur Platform is designed and developed.

Third step: Demonstration. Demonstrations consist in running CENTAUR’s system over cases selected on the basis of users’ needs and data availability, in particular: 1) Cold cases: i.e. well documented crisis situations in the past used to calibrate CENTAUR models and validate developed indexes and indicators, 2) Hot spots cases; i.e. areas where Copernicus EMS or SEA relevant situation are very likely to occur during the project’s lifetime. Those hot cases are used to assess the effectiveness of CENTAUR services in a life situation and allow to run them in pre-operational mode. Validation will be performed with the support of the user community involved in the project.

Fourth step is the Transfer Phase: During this phase all the issues to be addressed for the operationalization of the CENTAUR prototype and service integration in the Copernicus EMS and SEA Services are identified and analysed on the basis of lessons learnt from the demonstration phase. The objective of this phase is to prepare a road map for the integration of CENTAUR services in the Copernicus EMS and SEA operational services. Moreover, a feasible roadmap for the integration of CENTAUR in existing initiatives will be drawn, also outside the Copernicus context.

2.1 OBJECTIVES AND AMBITIONS

The overall objective of CENTAUR is broken down into the following specific objectives, all of them clearly linked to the Work Program expected outcomes and scope.

<p>OBJ1: Enhance Copernicus SEA service portfolio to better respond to climate security risks and effects</p>
<p>Developing mechanisms by which the service proactively produces information in the form of indicators, derived indexes and early alerts responding to concrete information needs of risk analysts and early response services in the EU and third countries, with a focus on security challenges in connection with climate change and environmental degradation.</p> <p>The contribute from CENTAUR to the Copernicus SEA is two-fold:</p> <ul style="list-style-type: none"> ➤ providing a service at an early phase of the intelligence chain, by anticipating and guiding the user to the location where crisis events are expected to take place. ➤ increasing the completeness of the Copernicus SEA products. <p>KPI 1.1: Copernicus SEA portfolio integrates at least one product or service for monitoring, assessing and detecting potential security risks in connection with climate change and environmental degradation.</p> <p>KPI1.2: Copernicus SEA portfolio adapts at least one product or service to better address potential security risks in connection with climate change and environmental degradation.</p> <p>KPI 1.3: Proactive intelligence analysis service running pre-operational over at least one area for the Food Security domain, selecting/defining proper monitoring and prediction of food/water indicators, based e.g. on precipitation, Crop temperature, evapotranspiration, root zone soil moisture</p>
<p>OBJ2: Enhance and adapt CEMS Early Warning component by developing meteorological indicators in support of urban floods early detection at the pan-European scale</p>
<p>Enhancing the information provided by state-of-the-art numerical prediction systems both in terms of precipitation intensity and localization by combining Machine Learning (ML) techniques and physical models and to develop methods that could be up-scaled to the pan-European level. Inundation probability will be derived to timely planning EO data acquisitions and triggering, as using open/social media. The ambition is to</p>

use the new improved meteorological indicator to enhance CEMS Early Warning (EW) component by offering EFAS an urban flood prototype layer thus improving also the current pre-tasking performances (time and localization).

KPI 2.1: Measuring success for ML driven high resolution precipitation, detecting extreme intensity precipitation (above 95th percentile) at least 48h ahead when verified against local observations or the precipitation from the OPERA network with an error smaller than 20% and a spatial correlation for 6 hours accumulation better than 60%.

KPI 2.2: CEMS pre-tasking success (75%), in terms of number of pre-tasking alert, timeliness and improvement in the definition of the Areas of Interest for crisis-time satellite acquisitions.

OBJ3: Improve CEMS Mapping component by generating thematic products related to urban floods with enhanced accuracy through combined improved detection and crisis temporal analysis by modelling

Development of early indicators of potential floods to overcome SAR technique limitations in flooded urban areas, enabling interferometric pairs acquisitions and InSAR advanced application, to add a forecasted urban flood mapping to CEMS RM, with increased reliability and quality, optimising satellite resources, more reliable affected population and vulnerable asset assessments in both the pre-/post-event phases through combined EO and hydrological models.

KPI 3.1: Increase in urban flood mapping (>75%) using SAR and InSAR processing combined with urban flood modelling.

KPI 3.2: User recognise improvement in the pertinence of the current delineation/grading products as regards urban flood impacts (>75%, user survey).

OBJ4: Test new early response tools through end-to-end demonstration in real scenarios from the past (Cold Cases) and future crisis (Hot Cases)

CENTAUR demonstrators are designed to highlight the soundness and fit for purpose of its technological and thematic solutions, firstly, through well documented Copernicus SEA or EMS past crisis cold cases and, secondly, over hot spots which could occur over cold case sites or agilely over new areas. Cold and hot cases will showcase the continuous monitoring mode and the innovative power of predictive modelling on pre-event and event-driven production. Food & Water Security and urban flood events will be handled within the demonstrators along with a case involving both. The final ambition is to provide a CENTAUR service capable of integrating existing Copernicus Core Services (CEMS and SEA) at least in a pre-operational mode during real service activations, thus facilitating the transfer of research results to possible operations as requested in the Work Program.

KPI 4.1: Validate and demonstrate the suitability of the early warning system and foresight tools over the proposed Hot Cases demonstrators in over 50% of demonstrators.

KPI 4.2: Obtain at least 85% of user acceptance during the collection of feedback through questionnaires to the engaged end-users participation to the demonstrator events (100% users remain in demonstrators, 85% positive feedback).

KPI 4.3: CENTAUR's demonstrator service and product validation according to the planned criteria and quality standards (>80% flood extent accuracy in urban areas).

KPI 4.4: Products within CEMS & SEA delivery-times according to the Service Level Agreements as witnessed by Entrusted Entities (80% products fit to be assigned SL1 or SL2 mode timeliness).

KPI 4.5: feedback by the Entrusted Entities about the relevance and value adding of incorporating CENTAUR services into CEMS and SEA portfolios (100% if all Entrusted Entities are agreed).

KPI 4.6: feasibility of integrating CENTAUR products within the SEA and EMS operations by 2021-2027 time horizon. (100% if at least partial agreement on Copernicus integration in both domains).

KPI 4.7: At least one of the CENTAUR pre-operational solutions for the detection and analysis of climatic and environmental risks products (e.g. continuous monitoring system, crisis risk index, web simulator) are adopted by security analysts and other security sector stakeholders in the EU and third countries.

OBJ5: Improve temporal and spatial resolution of Copernicus EO-based downstream services (e.g. agriculture monitoring, inland water surface area)

KPI 5.1: Reduce the temporal/spatial resolution of at least two of the current datasets, products or services delivered by a Copernicus operational service by 50% using drone data or other data sources for Flood.
KPI 5.2: Implement and serve at least one new downstream service using input data or information coming from a Copernicus Service.
KPI 5.3: Engaged at least 5 stakeholders from downstream market.
KPI 5.4: Receive at least 70% of positive feedback about potential application of the CENTAUR indicators in the respective field.

OBJ6: Explore the extent to which data driven approach based on AI/ML techniques can be used to extract information and indicators from heterogeneous datasets and to predict the occurrence of crisis and describe their impact and evolution

KPI6.1: addition of multiple innovative forecasted crisis maps (food & water security, political stability, short-term flood risk, risk of damage in case of flood, social impact map of different types of risk, etc.).
KPI6.2: ability to generate maps with individual sources/types of information and their integration (separate vs. integrated layers where integration is embedded in the model of different indicators).
KPI 6.3: improvement of other more traditional map quality indicators owing to a more integrated and accurate input information and to more effective AI/ML modelling (thematic accuracy, speed of delivery, resolution, etc.).

OBJ7: Improve understanding on the cause-effect relation between climate change indicators with, water and food insecurity, population displacements and crisis

The ambition of CENTAUR is to improve the understanding of the link between climate and security and support the development of integrated approaches. A comprehensive review of the state of the art of available biophysical, social, economic and political indicators will be conducted. It will be followed by the design of a detailed conceptual model linking climate hazards, socioeconomic impacts and possible implications for human security, including a list of key variables and indicators.

Three specific sub-objectives can be derived: first, to identify and refine methodological approaches in specific areas with a high geopolitical relevance for the EU from a Climate Security perspective; second, to promote the understanding of the dynamics linking climate change and security in those areas; and three, to contribute to a climate-sensitive focus when implementing EU policies and instruments for conflict prevention and crisis management.

KPI 7.1: Publish at least 7 technical and scientific publications covering innovative methodological approaches to study the climate-food-water-security nexus, as well as key empirical results produced.

KPI 7.2: Exchange with at least 5 projects, initiatives dealing with climate security and related risks.

KPI 7.3: Organize at least two stakeholders' workshops

2.2 PROMOTION OF THE CENTAUR CONCEPT

Two main types of communication related activities are identified within CENTAUR:

- **Communication**, refers to the activities through which the project will be presented (e.g. project website, newsletter, leaflet) outside of its own community, to a wide variety of stakeholder groups presenting the benefits/impacts this project brings.
- **Dissemination**, refers to the publication of the results arising from or based upon the activities conducted in the framework of the project (e.g. new technical improvements achieved by partners, new improved product/services available for the end-users).

A Communication Plan of the project is currently under development (D6.1). Its goal is to ensuring efficiency of the communication, dissemination and exploitation activities to maximise the engagement and information exchange between the CENTAUR participants and the network of stakeholders. The objectives of the Communication Plan is to describe the Communication Strategy defining the tools and channels to address the project's stakeholder groups, specify objectives, key messages and impact maximisation measures.

The landscape of stakeholders targeted by this communication strategy entails four high-level audiences:

- Copernicus EMS and SEA Users: This entails the authorised users of these Copernicus services which comprise agencies and entities from the Member States, the EEAS (European External Action Service), European Commission relevant services, national institutions, and international bodies such as the UN. It also concerns potential new users such as law enforcement entities, ministries and local/regional authorities at Member State level, policy makers and other international organisations.
- Other audiences: This groups covers a wider range of organisations, which whilst not being users of the Copernicus services, should be strongly engaged in its user uptake activities as they are either potential beneficiaries of its outputs or key “partners” with whom cross-fertilisation and synergies should be sought (e.g. other Copernicus Core Services or the Copernicus Governance bodies).
- General public: This includes all audiences not covered by the above such as EU citizens / taxpayers, etc.

All communication and dissemination activities will promote the following three high level messages:

Description of the problem

Climate change’s impact on human lives and security is continuously growing over the last 50 years, the number of disasters has multiplied by a factor of five mainly driven by climate and weather extremes . In particular, the last twenty years have seen the doubling of major floods . Climate change is behind environmental degradation, environmental degradation is a threats multiplier and an aggravating factor for political instability with implication in terms of peace and security across the world.

What is CENTAUR

CENTAUR is to respond to societal challenges deriving from Climate Change threats by developing and demonstrating new service components for the Copernicus Emergency Management Service (CEMS) and Copernicus Service in Support to EU External Action service (SEA), aiming to: 1. Improve situational awareness and preparedness around climate change and its impact on complex emergencies and multi-dimensional (security) crises; 2. Anticipate the occurrence and possible knock-on effects of crisis events, in particular those triggered by climatic extremes, thus contributing to resilience and effective adaptation.

CENTAUR benefits

As alerts are raised, CENTAUR will move to an event driven setting, where indexes shall be updated, benefiting from actual measurements of key parameters and newly acquired data and information at higher resolutions. Information is generated on a large scale over wide areas, aiming to provide wide-scale observatories of phenomena capable to switch on red lights corresponding to significant changes in the normal patterns of the indicators.

3 PROJECT MANAGEMENT AND ORGANIZATION

In this section, the organization of the project is presented. In particular, the named individuals that lead the work packages and the tasks, and those who participate in the management of the project are identified.

The organization and management structure and procedures employed in the project will aim to promote optimal use of knowledge, expertise and experience of the partners in achieving project objectives. The Project Management will ensure, during all the project duration:

- Set up, maintenance and update of a clear and well defined Project baseline for all the project tasks.
- Overall control of technical activities, prompt identification of problem areas, if any, and subsequent adoption of solutions.
- Maintenance of a smooth and clear work sharing inside the Consortium.
- Delivery to the Consortium of constant directives and guidelines needed to run the project within specific time and resources allocation.
- Execution of actions and activities agreed upon in the course of the project.
- Maintenance of the documentation and deliverables scheme.
- Cost-effective project implementation and control suitable to provide EC and Consortium with project status updates.

All the above shall be based on the following fundamental set of tools:

- Project Description of Work.
- Work Package Descriptions and Related Schedule.
- Technical Progress/ Review Meetings and Reports.
- Internal Reviews/Working meetings.

3.1 CONSORTIUM COMPOSITION

CENTAUR Consortium combines the necessary industrial and scientific excellence required to achieve the ambitious objectives of the project. CENTAUR Team includes 14 partners (Figure 4):

- the Copernicus SEA Service Entrusted Entity - SatCen
- Six partners dedicated to the development and provisioning of the Copernicus EMS/Security Services – e-GEOS, Tracasa, CLS, GMV, UNISTRA/SERTIT, ITHACA.
- one partner experts in the weather models, forecast & prediction – ECMWF.
- one partner dedicated to the communication and dissemination duties – Spacetec.
- experts in socioeconomic and political aspects – Adelphi.
- two partners Land indicators expert and developers – Vito, DLR.
- two partners in charge of providing the AI technologies – Cherrydata, Hensoldt.

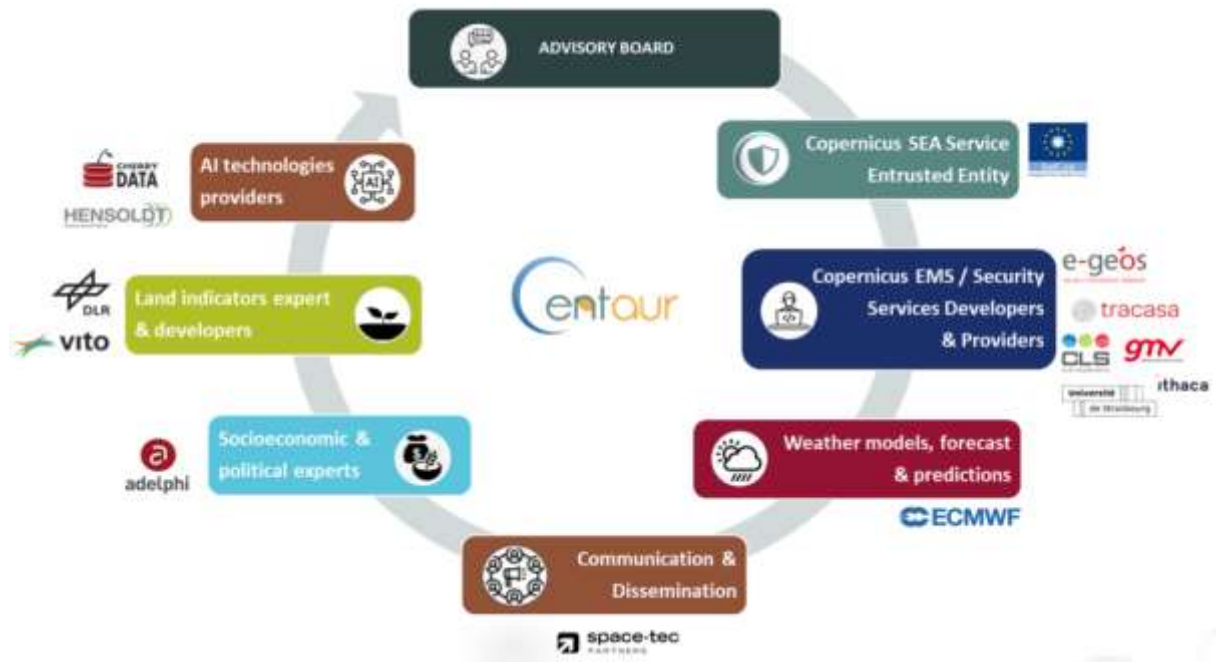


Figure 4: CENTAUR team

A brief description per company member of the CENTAUR Consortium is provided: **e-GEOS (CENTAUR Consortium Coordinator)**: an ASI (20%) / Telespazio (80%) company, is a leading international player in the geo-spatial business. e- GEOS offers a complete range of products and services in the Earth Observation and in the Geo-spatial Information application domains, based on both optical and radar satellites as well as on aerial surveys and in-situ data.

SATCEN: is an Agency of the Council of the European Union (EU) whose mission is to support the decision making and actions of the EU in the field of the Common Foreign and Security Policy (CFSP) and in particular the Common Security and Defense Policy (CSDP), including EU crisis management missions and operations. SATCEN has been involved in the Copernicus Security Services since its definition and preoperational setup (e.g. participating to FP7 projects such as G-NEXT and SAGRES) and runs operationally the Copernicus SEA Service since May 2017. With a long-standing experience in R&D activities, SATCEN has been involved in several projects related to Climate Security (H2020 GEM and E-SHAPE). In CENTAUR, SATCEN leads the Analysis of requirements and Use cases definition and participates to the user engagement and validation activities.

ECMWF is the European Centre for Medium-Range Weather Forecasts, being both a research institute and a 24/7 operational service, producing global numerical weather predictions. The Centre has one of the largest supercomputer facilities and meteorological data archives in the world. ECMWF operates two services from the EU’s Copernicus Earth observation programme, the Copernicus Atmosphere Monitoring Service (CAMS) and the Copernicus Climate Change Service (C3S) and contributes to the Copernicus Emergency Management Service (CEMS), through EFAS/GloFAS (floods) and EFFIS/GWIS (fires). The ECMWF Forecast Department is deeply involved in CENTAUR, bringing all its operational and research experience in terms of forecast and predictions of hydrological extreme events and droughts. ECMWF covers specific and cross-cutting activities relevant to Weather-related contents not only providing data and products, but also taking part to the indicators design and development.

GMV (AEROSPACE AND DEFENCE SA) is involved in CENTAUR through its Remote Sensing and Geospatial Services and Analytics division and the Institutional Ground Segments division. GMV has been a major contributor in

developing Europe's EO-based emergency management and operational security capabilities since the early stages, through its participation in the CEMS and in the Copernicus Security Service. Moreover, satellite data processing and analysis is at GMV's core business, with advanced analysis techniques, such as machine and deep learning, data fusion, cloud computing. Several recent projects have involved GMV on themes related to food security (H2020 AfriCultuReS) with the delivery for various regions in Africa of climatic, production, biophysical and economic information and flooding (ESA GDA-Climate Resilience and GDA-Water Resources clusters).

UNISTRA/SERTIT has a long-term experience in the CEMS: it is part of project management, activation management and a production site in CEMS Rapid Mapping and is Production Site, technical manager within FLEX and a Technical Point of Contact and Production Site in CEMS Disaster Risk & Recovery. Starting from its experience in these operational activities in the Copernicus Services, UNISTRA/SERTIT provides to CENTAUR not only the necessary involvement in the service evolution, but also the expert liaison with the GEOGLAM community, for the water and food security themes, through the involvement of its senior domain expert Dr. Inbal Becker-Reshef, member of the GEOGLAM-Committee on Earth Observation Satellites (CEOS) Technical Team, whose expertise is relevant to advancing the use of satellite information for agricultural monitoring, supporting decisions in food security and agricultural markets.

CLS is a subsidiary of the French Space Agency (CNES) and IFREMER, for more than 30 years has been contributing to major international space programs and research initiatives and has developed a wide range of operational services using satellite and in-situ data devoted to sustainability challenges. CENTAUR involves the CLS Environment & Climate Monitoring department, where the Rapid Mapping unit provides operational services within CEMS Rapid Mapping and its experience in the flood emergency context. The CLS activities in the project are relevant to the urban flood context.

ITHACA S.R.L is a limited company of the LINKS Foundation. It has 14 years of experience in engineering, operating value-added services in response to natural disasters, and supporting end-customers in various application domains (agriculture, forestry, environment, mobility, etc.). It also integrates additional datasets such as in situ data, aerial/drone data, IoT, and geospatial databases. Our competencies cover acquiring, managing, and elaborating geographic and cartographic data for EO-based applications, delivering methodologies, analytical services, and technical tools to provide operational geospatial application services. ITHACA is a partner of the Copernicus EMS Rapid Mapping and Risk and Recovery consortiums and takes part as a Production Site in the service coordination.

TRACASA is a Spanish company offering cartographic services, territorial studies, territorial information systems and solutions for the modernization of the administration. TRACASA is involved, through JRC, in the CEMS Mapping Validation, on the service outputs produced by the Rapid Mapping and Risk and Recovery Mapping. The wide spectrum of activities framed in the Validation Service has allowed it to become key to improve the Mapping component through the testing of new methodologies, data input type, or approach for the creation of emergency cartography in the frame of the CEMS. The TRACASA Territorial and Spatial Engineering Department bring its expertise in CENTAUR, in the demo validation and in the development of innovative indicators in the specific urban flood context.

VITO is an independent Flemish research organization in the area of clean tech and sustainable development and is a main partner of the project, through the direct involvement of its Remote Sensing Department; the expertise of VITO in the Remote Sensing processing to develop Agriculture applications, including developing countries is well-known. Since 2000, VITO is the basic provider of remote sensing data to EU JRC-MARS, providing a series of qualified bio-geophysical products on the status and evolution of the land surface, at global scale and at mid to low spatial resolution. VITO activities in CENTAUR relate to the food security context, in particular with the development of specific innovative indicators.

The **DLR** Land Surface Dynamics Department studies and quantifies global change as manifested on Earth's land surface, and addresses socially relevant issues. Information products for planning purposes as well as innovative methods for assessing earth observation data (multispectral, hyperspectral, SAR) are developed within a wide



range of geoscience topics at different spatial scales (global, regional, national, local), processing, thanks to huge computing capacity, lengthy time series and statistics. Results and outcomes cover specific themes, among others, relevant for CENTAUR, as Smart Cities and Spatial Development.

Adelphi is the leading independent think-and-do tank in Europe for climate, environment and development, with 280 strategists, and practitioners. Adelphi conducts conflict and risk analyses for international organisations and foreign policy and international development actors, in particular on risks and conflicts involving climate or the environment. Among relatable projects in place, HABITABLE, on the current linkages between climate impacts and migration and displacement patterns and CASCADES, identifying how the risks of climate change to countries, economies and peoples beyond Europe might cascade into Europe. The identification of security critical situations, in particular in the food security context, implies the development and tailoring of specific social, economic and political indicators. This activity is led by adelphi.

HENSOLDT Analytics (present SME status subject to change due to the effects of an acquisition in 2021) is a global leading provider of Open Source Intelligence (OSINT) systems and Natural Language Processing technologies, such as Automatic Speech Recognition, key elements for media monitoring and analysis. HENSOLDT Analytics focusses on end-to-end systems and tools that can efficiently extract and analyse information from open sources (TV, radio, blogs, social media, etc.) and turn them into actionable intelligence. HENSOLDT has developed a Media Mining System to gather, process, semantically enrich and visualize information in more than 30 languages from traditional as well as social media. In CENTAUR, HENSOLDT has a key role in the data extraction, identifying relevant data sources for all the areas of interests and the use-cases, defining set of relevant Open Source indicators to be integrated.

Cherrydata is a startup, funded in July 2018, spinoff of Politecnico di Milano (Italian school of engineering). Cherrydata offers software products and consulting services to support big data technology (BDT) projects through AI technologies. Cherrydata is experienced in designing and testing of algorithms aimed at the classification of satellite information, by complementing low-resolution with high-resolution data, as well as in social media automated crawling and geolocation of retrieved information. In CENTAUR, Cherrydata is responsible for the development of synthetic crises indices for urban flood and food security from the multi-source indicators.

SpaceTec Partners leads the communication and dissemination activities. Their broad array of services includes strategy and technology consulting, communication activities, and interdisciplinary project management mainly for public institutions (e.g. European Commission, European Space Agency, European GNSS Agency, European Parliament, National Ministries, etc.) in the space and space applications domain. SpaceTec Partners further engages in venture capital and provides business coaching for start-ups and SMEs. SpaceTec's areas of activity include space (earth observation, navigation, satellite communications, exploration and situational awareness), geo-information, security & defence, transportation & aviation, mobile & mobility, and energy.



3.2 ORGANIZATION AND ROLES

The management of CENTAUR project requires a well-structured organisation in order to provide a framework for the consortium partners to effectively share and analyse scientific, industry, societal, economic and regulatory knowledge and insight. The Consortium organizational structure will involve Management Key Personnel and Operational Bodies. The project management structure illustrated in Figure 5 is implemented in the project: each role is described in next paragraphs.

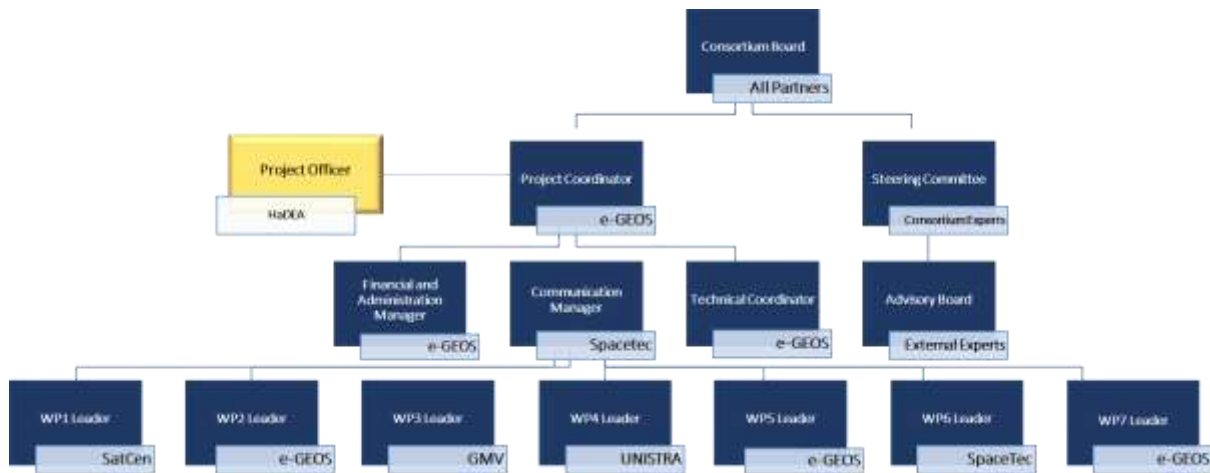


Figure 5: Project Management Structure

The organization structure designed for CENTAUR aims to assure to the project (Figure 6):

- a clear identification of project responsibilities and contact points.
- an easy management of escalation and decision processes.
- a direct and constant relation between the project Officer and the project Coordinator.
- a right considerable role to the communication and exploitation project aspects.

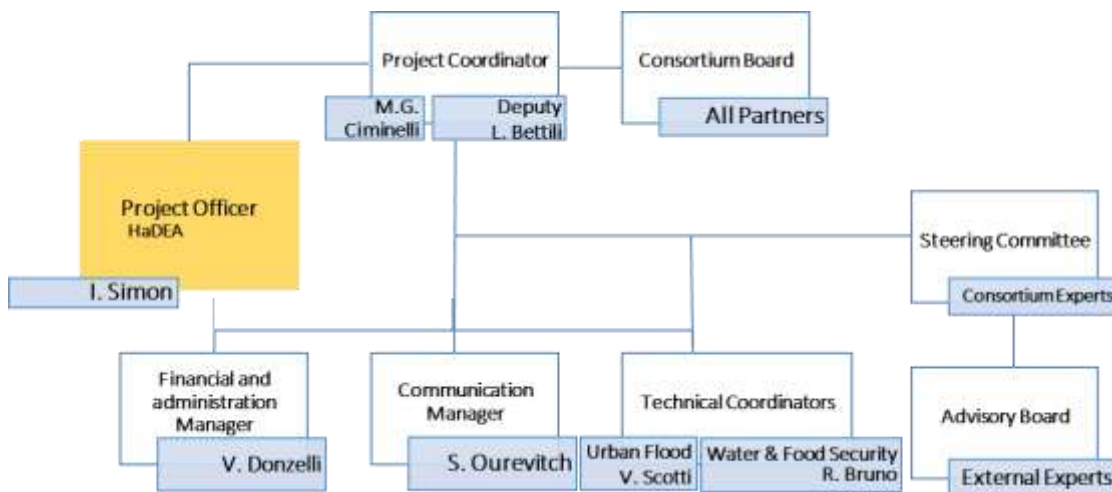


Figure 6: CENTAUR management organization

3.2.1 CENTAUR MANAGEMENT TEAM

Table 2: CENTAUR Management Team

ROLE	NAME	BENEFICIARY SHORT NAME	EMAIL ADDRESS
Project Coordinator	Maria Grazia Ciminelli	EG	mariagrazia.ciminelli@e-geos.it
Deputy Project Coordinator	Luisa Bettili	EG	Luisa.bettili@e-geos.it
Technical Coordinator – Urban Flood	Vincenzo Scotti	EG	vincenzo.scotti@e-geos.it
Technical Coordinator – Water&Food Security	Roberta Bruno	EG	roberta.bruno@e-geos.it
Communication Manager	Stephane Ourevitch	STP	ourevitch@spacetec.partners
Finance and Administrative Manager	Valeria Donzelli	EG	valeria.donzelli@e-geos.it
Advisory Board	External Experts Consortium	-	-
Steering Committee	Experts	-	-
WP1 Leader	Alexandre Arnal	SAT	alexandre.arnal@satcen.europa.eu
WP2 Leader	Luisa Bettili	EG	luisa.bettili@e-geos.it
WP3 Leader	Paloma Fonseca Hernandez	GMV	pfonseca@gmv.com
WP4 Leader	Stephen Clandillon	UNISTRA	s.clandillon@unistra.fr
WP5 Leader	Luisa Bettili	EG	luisa.bettili@e-geos.it
WP6 Leader	Stephane Ourevitch	STP	ourevitch@spacetec.partners
WP7 Leader	Maria Grazia Ciminelli	EG	mariagrazia.ciminelli@e-geos.it

Project Coordinator

The Project Coordinator (PC) is responsible for the overall project management and is the sole point of contact between the EC Project Officer and the Consortium. The PC is in charge of the management of all the organisational and programmatic details of the project, taking care that the activities are conducted according to the quality, costs and schedule constraints. The PC interfaces directly with the EC for every project aspects, ensuring that contractual milestones are timely achieved and that the foreseen deliveries accomplished, discussing and negotiating contract changes, with the support of the whole project organization structure. The PC interacted with the Technical Coordination of the project for any updates or constraints regarding the technical activities; also for the collection of the contributions required for the Progress Reporting of the activities to the EC. Moreover, the PC is in charge of the contract management activities, quality, configuration control and risks management.

In particular, Project Coordinator must:

- act as intermediary for all communications between the beneficiaries and the EC.
- request and review any documents or information required by the EC and verify their completeness and correctness before passing them on to the EC.

- collect, review, approve and submit the deliverables listed in Table 6 and in CENTAUR Grant Agreement [AD1] in accordance with the timing and conditions set out in it.
- submit to the EC Technical and Financial Review Reports (see section 3.3.2). These reports include requests for payment and must be drawn up using the forms and templates provided.
- inform the EC and the other beneficiaries about events, which are likely to affect significantly or delay the implementation of the action or the EC's financial interests, and circumstances affecting the decision to award the grant or compliance with requirements under the Agreement.
- submit and receive requests for amendment of the Grant Agreement on behalf of the beneficiaries, discuss them with the EC and, if the consortium agrees to an amendment requested by the EU, sign the amendment through the portal.
- ensure that all payments are made to the other beneficiaries without unjustified delay.
- keep the address list of members and other contact persons up to date and available on CENTAUR Sharepoint Teamsite.
- prepare meetings, propose decisions and prepare the agenda of the Steering Committee meetings, chair the meetings, prepare the minutes of the meeting and monitor the implementation of the meetings decisions.

Communication and Dissemination Manager

Communication and Dissemination Manager is in charge for all the communication and dissemination initiatives concerning the project activities and their results, having a large community and an extended basis of users informed about the project concept and aware of its potential benefits.

In particular, Communication and Dissemination Manager must;

- identify and set clear communication objectives.
- adopt strategic and targeted measures to promote the communication actions and results to a multitude of audiences, including the media and the public.
- assure the public disclosure of the results by any appropriate means, including through scientific publications on any medium.
- facilitate further use of project results recognising exploitable results and their stakeholders.

Financial and Administration Manager

The FPM carries overall managerial responsibility for financial and administrative issues. More specifically, the FPM is responsible for the following activities:

- fulfil the financial tasks described in the Grant and the Consortium Agreement.
- fulfil the administrative tasks foreseen in the project.
- prepare financial reporting tables and documents by also reviewing Financial Statement of other partners.
- issue the financial report according to the GA time schedule.

Technical Coordinators

Due to the two thematic areas, Urban Flood and Water&Food Security, over which the CENTAUR project is focused, two separate Technical Coordinators are identified addressing each specific thematic area.

The Technical Coordinators (TCs) will be responsible for the technical management of the activities performed within each thematic area (i.e. Urban Flood and Water&Food Security), throughout the entire lifecycle of the

project. TCs manage all technical aspects of the project, in close cooperation and daily contacts with all partners for any technical issues concerning either the realization of the products and/or the preparation of the foreseen technical documents and reports, with respect to the specifications and the schedule.

In particular, the Technical Coordinators is in charge of:

- organising and coordinating the technical activities.
- participating and organising technical project meetings.
- collaborating on and authorizing the technical project reports.
- ensuring that all technical skills, know-how and assets present in the consortium are used to the best.

WP Leader(s)

The Work Package Leader (WPL) is responsible for the task and work within the respective work package. The WPL is responsible for tracking the status of the Action Items list and updating the list on the SharePoint Teamsite.

The WPL will organise meetings/conferences whether necessary for the organisation of the activities within each related WP and is in charge of the related risks identification.

The WPL appoints a Deliverable Leader: whether not designated, the WPL his/herself will be responsible of any deliverable(s) produced within related WP.

Project Risk Manager

The CENTAUR Risk Manager, who is embodied in the PC, is responsible for identifying and reporting risks and issues; define appropriate mitigation actions; monitor and track the status of their implementation; communicate about Risk and Issue Status and actions undertaken.

The Project Risk Manager is responsible to update the Risks Register. Project Risk Manager is in charge to provide detailed and updated Risk analysis and mitigation actions using the methodology described at section 4.2.1. The Project Risk Manager is also required to update the list of risks and the associated actions.

3.2.2 CENTAUR OVERVIEW BODIES

Table 3: CENTAUR Overview Bodies

ID	Description	Chairing	Participants
CB	Consortium Board	PC (e-GEOS)	One member for each Consortium partners
SC	Steering Committee	PC (e-GEOS)	Consortium experts External Experts
AB	Advisory Board	PC (e-GEOS)	End-users Ethical expert/consultant

CENTAUR Consortium Board (CB)

The **Consortium Board** (CB), constituted by the Coordinator and one representative for each Partner is the Consortium formal decision-making body. It decides on major matters relating to management issues (e.g. project re-organisation, contractual matters, dissemination and exploitation matters, budget allocation, validation of new participants, suggestions for replacement, approval for adjustment measures, preparation of calls and competitive

selection of new partners in agreement with EC regulations, consolidation reports to be submitted to the European Commission). The Consortium Board represents the interest of all partners (Table 4).

Table 4: Consortium Board Members

ID	Role	Description	Short Name	Country	CA representative
1	COO	e-GEOS	e-GEOS	IT	M.Grazia Ciminelli
2	BEN	European Union Satellite Centre	SAT	ES	Alessandra Ussorio
3	BEN	European Centre for Medium Range Weather Forecast	ECMWF	UK	Francesca di Giuseppe
4	BEN	Vlaams Instelling Voor Technologisch Onderzoek N.V.	VIT	BE	Juan Garcia Quijiano
5	BEN	GMV Aerospace and Defence SA	GMV	ES	Beatriz Revilla-Romero
6	BEN	Hensoldt Analytics GmbH	HEN	AT	Gerhard Backfried
7	BEN	Spacotec Partners Srl	STP	BE	Stéphane Ourevitch
8	BEN	Universite de Strasbourg	UNISTRA/SERTIT	FR	Stehanie Battiston
9	BEN	Trabajos Catastrales sa Sociedad	TRA	ES	Isabel Goi
10	BEN	Collecte Localisation Satellites	CLS	FR	Vera Gastal
11	BEN	ITHACA Srl	ITH	IT	Burçu Koçoğlu
12	BEN	Deutsches Zentrum für Luft- und Raumfahrt eV	DLR	DE	Annekatriin Metz-Marconcini
13	BEN	Adelphi Research Gemmenutzige GmbH	ADE	DE	Adrien Detges
14	BEN	Cherrydata Srl	CHE	IT	Paolo Ravanelli

CENTAUR Steering Committee (SC)



The **Steering Committee** (SC) made up by internal subject matter domain expert, it steers the project implementation, reviews project strategy and advises the Coordinator and the Consortium Board in analyzing and approving project scope, results, as well as give advice on IPR and Ethical issues. The Steering Committee is currently under finalization; to be an effective operative project’s body it will be constituted by one representative for each partner to cover all required expertise within the project.

CENTAUR Advisory Board (AB)

The **Advisory Board** (AB) is constituted by relevant users and experts external to the consortium, which will be asked to support the activities of the projects through the provisioning of requirements for the development of the use cases, assessment of the services and products developed in the frame of the project (Letters of Intent in Annex). This Board can be continuously upgraded, depending on the topics to be addressed, and will work in close relation with the Steering Committee and the Project Coordinator, with the other entities and with the technological and service providers. A specific budget is allocated to cover travel and other expenses of AB members. In the following Figure 7 the currently composition of the Advisory Board is described vs. of thematic areas and support expected during the project phases

Entity department	AB Contact	Role in CENTAUR		Thematic Area	
		Advisor	Demonstrator	Urban Flood	Water&Food Security
Italian Civil Protection - Regional Department (IT)	Marco Gabusi	✓		✓	
Helpcode - NGO active in the education and training for children, Emergency and Security management (IT)	Alessandro Guarino	✓		✓	✓
Danish Refugee Council - Division of Evidence, Knowledge & Learning (D)	Alexander Kjaerum		✓		✓
German Foreign Office - Data Science Division (DE)	Thomas Mayer	✓			✓
Rediam - Red de Información Ambiental de Andalucía Environmental Information (ES)	Antonio Jesus Lara Fernandez		✓	✓	
Caisse centrale de réassurance (CCR) - Public Insurance Company (FR)	David Moncoulon	✓		✓	
United Nations Environment Programme (UNEP) - Climate Change and Security Programme (International)	Silja Halle	✓			✓
United Nations High Commissioner for Refugees (UNHCR) - Special Advisor for Climate Action (International)	Andrew Harper >> TBD by PO	✓	✓		✓
International Commission for the Protection of the Danube River International Commission for the (ICPDR) - Water Quality and Water Management (International)	Igor Liska	Role to be confirmed		✓	
United Nations Support Office in Somalia (UNSOS)	Jasenko Udovicic	✓	✓		✓
EU Situation Room (EEAS)	Ferruccio Migani	✓	Role to be confirmed		✓
JRC - Disaster Risk Management Unit Copernicus EMS service operations (EC)	Jean Françoise Pekel	✓	✓	✓	
Directorate General of Civil Protection and Emergencies, Ministero dell'Interno, Governo Spagnolo	Ariane Alvarez	✓	Role to be confirmed	✓	
Wav-e	Valeria Fabbroni	✓	✓	✓	✓

Figure 7: Advisory Board current composition, roles and related thematic area.



3.3 WORK BREAKDOWN AND SCHEDULE

A high-level summary of the WBS and the high level work logic, derived from the GA, are presented respectively in following Figure 8 and Figure 9. Moreover, in Figure 10, a high level time planning is provided.

The CENTAUR kick-off meeting was held on the 14th – 15th December 2022 host in e-GEOS premises as well as in teleconference and the GANTT has been designed considering the overall duration of the project, 36 months.

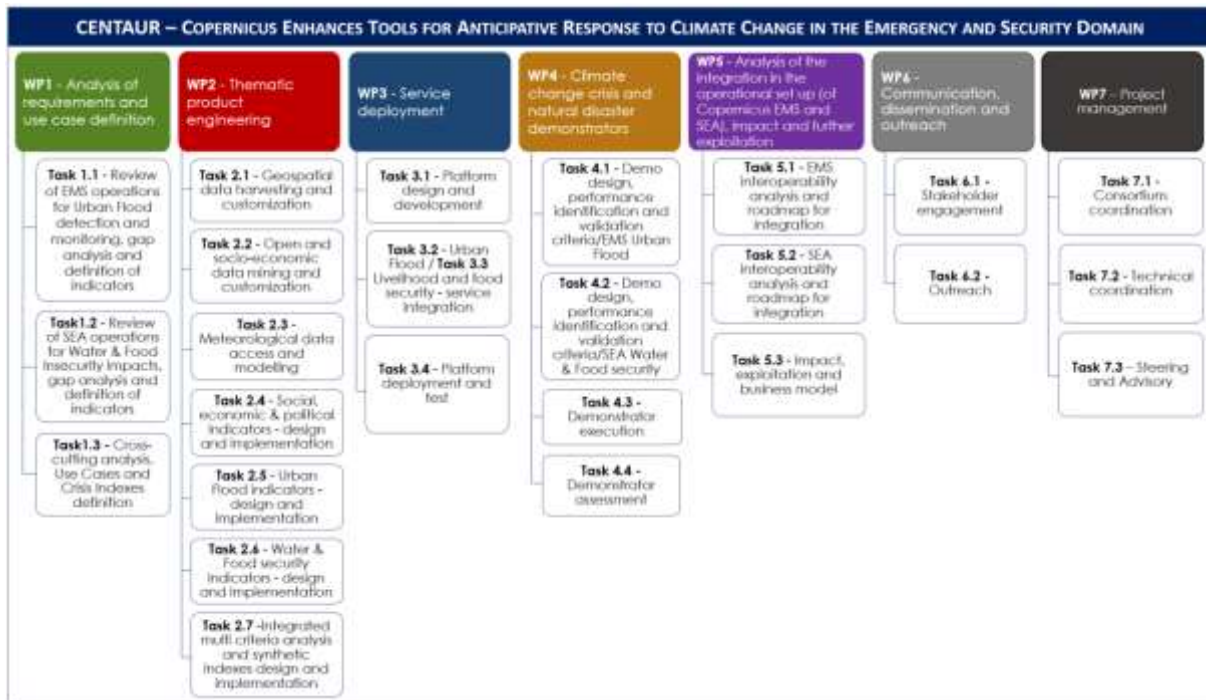


Figure 8: Project Work Breakdown Structure

Table 5: Work packages and Tasks leaders

WP	Tasks	Tasks Leaders
1	Task1.1	e-GEOS
	Task1.2	Satcen
	Task1.3	UNISTRA/SERTIT
2	Task2.1	GMV
	Task2.2	Hensoldt
	Task2.3	ECMWF
	Task2.4	Adelphi
	Task2.5	e-GEOS
	Task2.6	Vito
	Task2.7	Cherrydata
3	Task3.1	GMV
	Task3.2	e-GEOS
	Task3.3	Vito
	Task3.4	e-GEOS
4	Task4.1	UNISTRA/SERTIT
	Task4.2	Adelphi
	Task4.3	GMV
	Task4.4	UNISTRA/SERTIT
5	Task5.1	UNISTRA/SERTIT
	Task5.2	Satcen
	Task5.3	e-GEOS
6	Task6.1	Spacetec
	Task6.2	Spacetec
7	Task7.1	e-GEOS
	Task7.2	e-GEOS
	Task7.3	e-GEOS

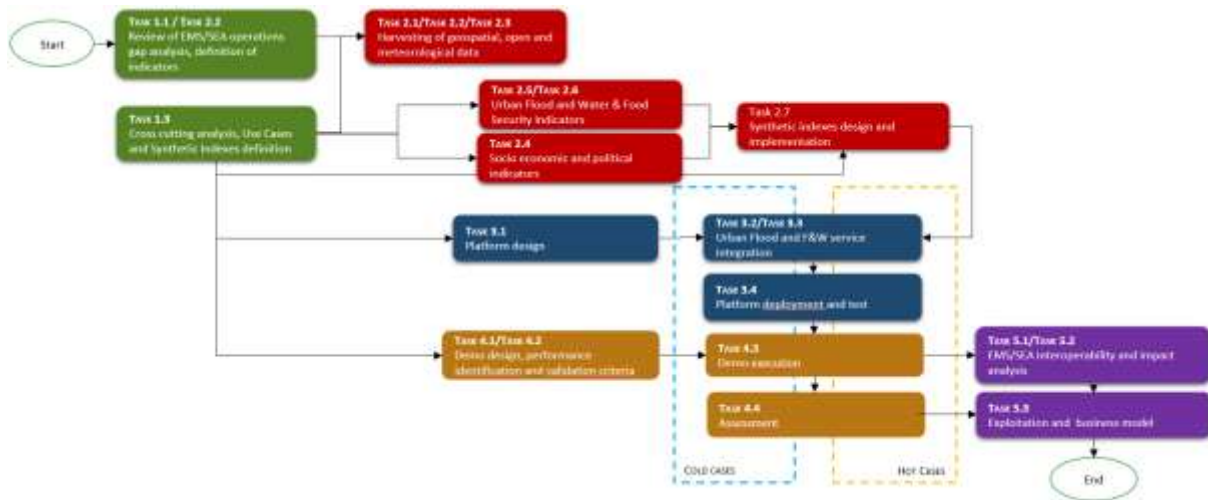
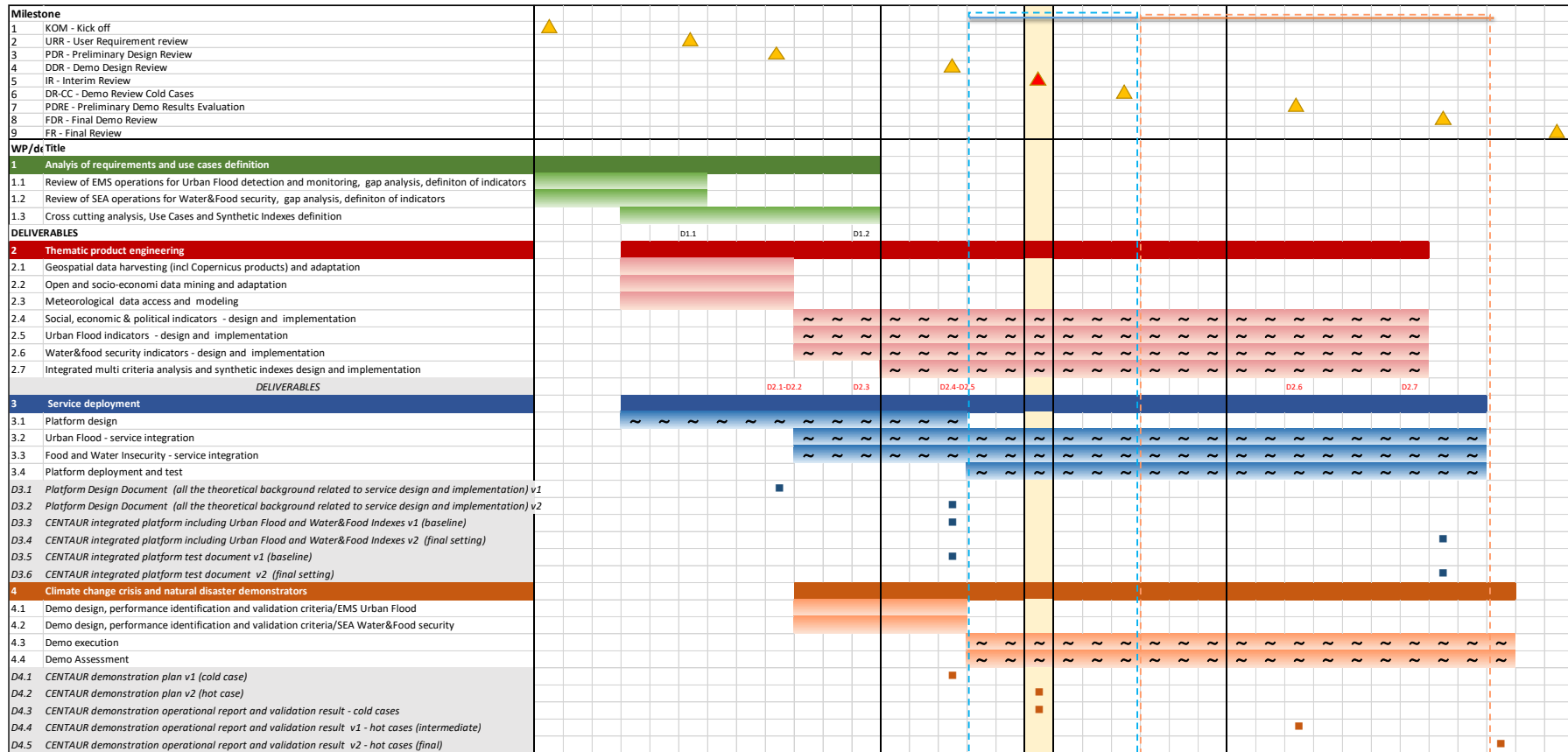


Figure 9: CENTAUR Study Logic

Further details on the time planning and related information are reported in CENTAUR Grant Agreement. The GANTT below will be continuously maintained by the Project Coordinator.



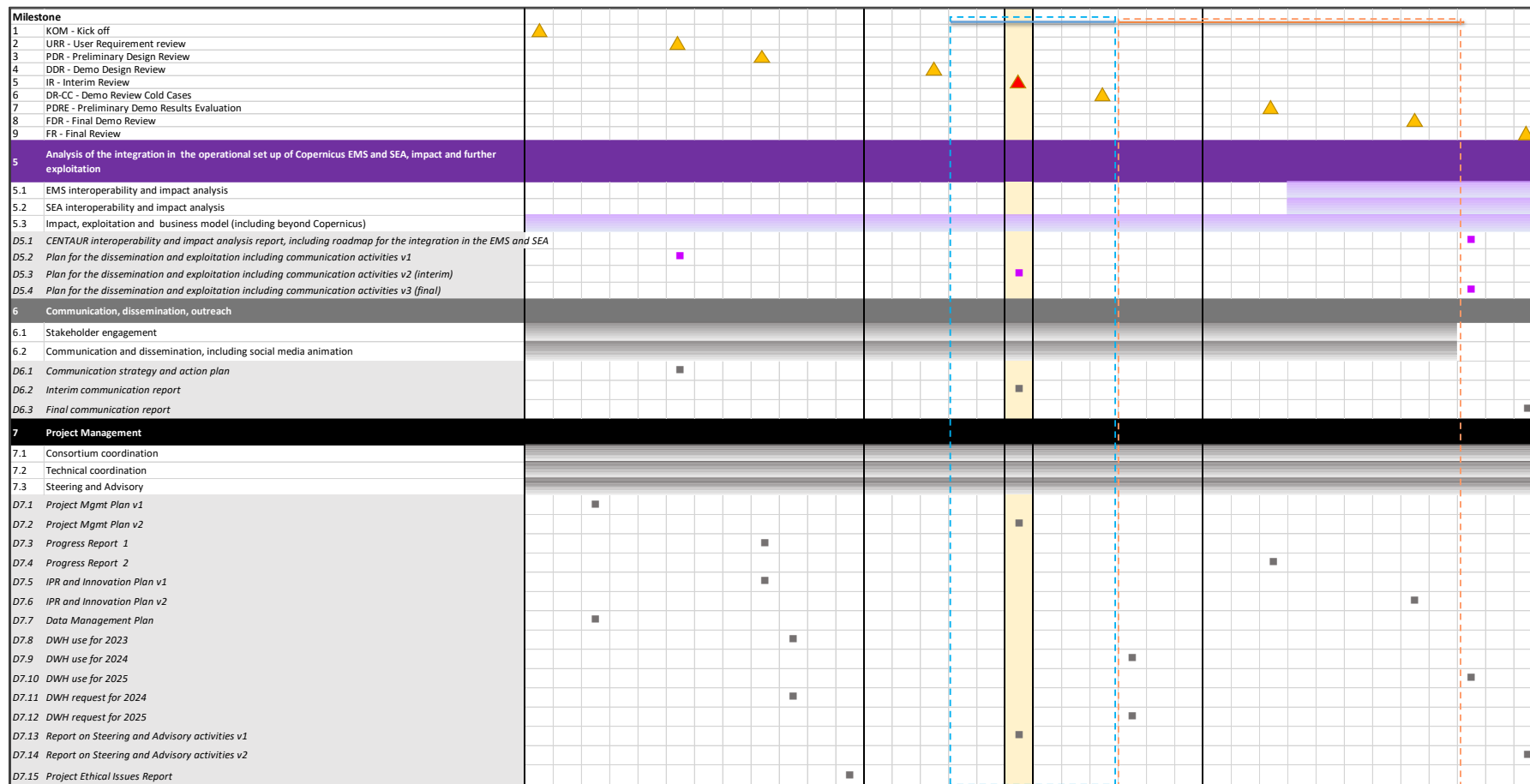


Figure 10: CENTAUR Gantt

3.3.1 CENTAUR DELIVERABLES

The following table shows the deliverables within CENTAUR with the associated Lead Beneficiaries (Table 6).

Table 6: Deliverables of CENTAUR Project

N.	DESCRIPTION	WP	LEAD BENEFICIARY	TYPE ¹	DISSEMINATION LEVEL ²	DUE DATE
D1.1	Report on Urban Flood and Water & Food security indicators	WP1	SAT	R	PU	6
D1.2	Report on CENTAUR Use Cases and Indexes definition	WP1	UNISTRA	R	PU	12
D2.1	Catalogue of CENTAUR data and related specifications	WP2	EG	R	PU	9
D2.2	Urban Flood and Water & Food Insecurity design	WP2	EG	R	PU	9
D2.3	Urban Flood and Water & Food Insecurity service pipelines v1 (baseline set up)	WP2	EG	DEM	PU	12
D2.4	Urban Flood and Water & Food Insecurity service pipelines v2 (tuning and adaptation)	WP2	EG	DEM	PU	15
D2.5	CENTAUR multi-criteria indexes design	WP2	CHE	R	SEN	15
D2.6	CENTAUR multi-criteria analysis and indexes generation pipelines v1 (using indicators from the baseline)	WP2	CHE	DEM	SEN	27
D2.7	CENTAUR multi-criteria analysis and indexes generation pipelines v2 (final setting)	WP2	CHE	DEM	SEN	31
D3.1	Platform Design Document (all the theoretical background related to service design and implementation) v1	WP3	GMV	R	PU	9
D3.2	Platform Design Document (all the theoretical background related to service design and implementation) v2	WP3	GMV	R	PU	15
D3.3	CENTAUR integrated platform including Urban Flood and Water & Food Indexes v1 (baseline)	WP3	GMV	DEM	PU	15
D3.4	CENTAUR integrated platform including Urban Flood and Water & Food Indexes v2 (final setting)	WP3	GMV	DEM	PU	32
D3.5	CENTAUR integrated platform test document v1 (baseline)	WP3	GMV	R	PU	15
D3.6	CENTAUR integrated platform test document v2 (final setting)	WP3	GMV	R	PU	32
D4.1	CENTAUR demonstration plan v1 (cold case)	WP4	UNISTRA	R	PU	15
D4.2	CENTAUR demonstration plan v2 (hot case)	WP4	UNISTRA	R	PU	18
D4.3	CENTAUR demonstration operational report and validation result - cold cases	WP4	UNISTRA	R	PU	18

¹ R: reporting. DEM: demonstrator

² PU: public. SEN: sensitive.

D4.4	CENTAUR demonstration operational report and validation result v1 - hot cases (intermediate)	WP4	UNISTRA	R	PU	27
D4.5	CENTAUR demonstration operational report and validation result v2 - hot cases (final)	WP4	UNISTRA	R	PU	34
D5.1	CENTAUR interoperability and impact analysis report, including roadmap for the integration in the EMS and SEA	WP5	EG	R	PU	34
D5.2	Plan for the dissemination and exploitation including communication activities v1	WP5	EG	R	PU	6
D5.3	Plan for the dissemination and exploitation including communication activities v2 (interim)	WP5	EG	R	PU	18
D5.4	Plan for the dissemination and exploitation including communication activities v3 (final)	WP5	EG	R	PU	34
D6.1	Communication strategy and action plan	WP6	STP	R	SEN	6
D6.2	Interim communication report	WP6	STP	R	SEN	18
D6.3	Final communication report	WP6	STP	R	SEN	36
D7.1	Project Mgmt Plan v1	WP7	EG	R	PU	3
D7.2	Project Mgmt Plan v2	WP7	EG	R	PU	18
D7.3	Progress Report v1	WP7	EG	R	PU	9
D7.4	Progress Report v2	WP7	EG	R	PU	27
D7.5	IPR and Innovation Plan v1	WP7	EG	R	PU	9
D7.6	IPR and Innovation Plan v2	WP7	EG	R	PU	32
D7.7	Data Management Plan	WP7	EG	DMP	PU	3
D7.8	DWH use for 2023	WP7	EG	DMP	PU	10
D7.9	DWH use for 2024	WP7	EG	DMP	PU	22
D7.10	DWH use for 2025	WP7	EG	DMP	PU	34
D7.11	DWH request for 2024	WP7	EG	DMP	PU	10
D7.12	DWH request for 2025	WP7	EG	DMP	PU	22
D7.13	Report on Steering and Advisory activities v1	WP7	EG	R	PU	18
D7.14	Report on Steering and Advisory activities v2	WP7	EG	R	PU	36

3.3.2 CENTAUR MILESTONES AND REVIEW MEETINGS

The details about Project Milestones, according the CENTAUR Grant Agreement [AD1] are given in Table 7. For each milestone, the due date (calendar date) and the verification means, which will be used to detect if a milestone is reached, are given.

Table 7: Milestones in CENTAUR project

N.	MILESTONE NAME	WP	LEAD BENEFICIARY	MEANS OF VERIFICATION	DUE DATE
1	KOM - Kick off	All	EG	Contract Signed	1
2	URR - User Requirement Review	1,5,6,7	EG	Due deliverables: D1.1, D5.2, D6.1, D7.1, D7.7 CENTAUR portal CENTAUR social accounts	6
3	PDR - Preliminary Design Review	2,3,7	EG	D2.1, D2.2, D3.1, D7.3, D7.5	9

N.	MILESTONE NAME	WP	LEAD BENEFICIARY	MEANS OF VERIFICATION	DUE DATE
4	DDR - Demo Design Review	1,2,3,4,7	EG	Due deliverables: D1.2, D2.3, D2.4, D2.5, D3.2, D3.3, D3.5, D4.1, D7.8, D7.11	15
5	IR - Interim Review	All	EG	Due deliverables: D5.3, D6.2, D7.1, D7.13 Review with EC Officer and Reviewers	18
6	DDR - CC Demo Review Cold Cases	4,6	EG	Due deliverables: D4.2, D4.3	21
7	PDRE - Preliminary Demo Results Evaluation	2,4,7	EG	Due deliverables: D2.6, D4.4, D7.7	27
8	FDR - Final Demo Review	2,3,7	EG	Due deliverables: D2.7, D3.6, D7.4	32
9	FR - Final Review	All	EG	Due deliverables: D4.5, D5.1, D5.4, D6.3, D7.9	36

In accordance with the reporting periods agreed in the GA, RV1: from month 1 to month 18 and RV2: from month 18 to month 36, the following Table 8 gives the dates and- requested input for the CENTAUR Review meetings. Participation of the coordinator and usually the WP leaders is recommended.

Table 8: CENTAUR Review Meetings

N.	Review Name	Reporting Period	Objective	Points of discussion
-	Kick-Off Meeting	M1 – December 2022	Official Start of the Project	Project Officer introduction Consortium introduction Project presentation
RV1	First Periodic Review	M18 – May 2024	Presenting the work carried out, main achievements and resources usage. Review top level Risks and Issues to ensure appropriate actions	Periodic Technical Report: - Activities performed (by work package) - Progress beyond the state of the art, expected results and potential impact. - Deviations: person-months Periodic Financial report: - individual financial statements for each beneficiary. - an explanation of the use of resources. Periodic summary financial statement.

N.	Review Name	Reporting Period	Objective	Points of discussion
RV2	Final Periodic Review	M36 – March 2025	- Discuss on the project scientific results and on the achievement of project objectives - Recommendations discussions.	- Every technical deliverables including the Final Project Results Report - Maturity Self-Assessment



4 PROJECT SPECIFIC PROCESSES

4.1 QUALITY MANAGEMENT PLAN

e-GEOS has developed an Integrated Management System in compliance with standards: ISO 9001:2015 Quality Management System – Requirements and as project coordinator ensures the management of Project Quality according to the official procedures of the company, both from Quality Assurance and Quality Control point of view.

e-GEOS has the following certifications:

- UNI EN ISO 9001:2015
- UNI EN ISO 14001:2015
- UNI ISO 45001:2018
- UNI CEI EN ISO IEC 27001:2017

e-GEOS system is also compliant with the AQAP 2110 / 2210

Figures, policies and instructions for the Quality Assurance activity that will be performed by e-GEOS during the CENTAUR Project execution for European Commission (EC) are briefly described.

Product/task quality controls are described in the relevant sections.

4.1.1 QUALITY ASSURANCE MANAGER

The Quality Assurance (QA) manager cooperates with the project team but he has resources, authority and organisational freedom to allow objective assessment and to initiate and verify corrective actions. The QA manager is then independent from the project organization, but he has the responsibility of all Quality Control (QC) activities, and he will interact with the corresponding Responsible of the counterparts.

He makes sure that the activities are carried out and the deliverables produced in compliance with the company quality procedures.

4.1.2 QUALITY ASSURANCE PROGRAM

The program is a planned and systematic pattern of all the actions necessary to provide adequate confidence that the product will satisfy given requirements for quality and will:

- demonstrate an organised approach to achieve them.
- ensure that quality requirements are evaluated and satisfied all along the phases of the contract.
- provide for detection of actual or potential deficiencies, system incompatibilities and trends or conditions which could result in unsatisfactory quality.
- provide timely and effective remedial and preventive action.

4.1.3 QUALITY AUDIT

The QA manager is responsible of auditing activities. He will analyse the results of the quality audit reports and will issue recommendations to the Project Manager.

Quality Audit is an internal confidential activity performed by e-Geos on the project according to the activities defined in the company standard.

The objectives of a Quality Audit are the following:

- verify that project management, production, and QC activities are compliant with the ones stated in the Project documentation;
- produce an evaluation report on the project status;
- define corrective actions in order to eliminate deviations.

The Project Manager and QA manager are responsible of achieving the corrective actions identified.

The report, when required, will also be available to the Customer.

4.1.4 CONFIGURATION MANAGEMENT PLAN

4.1.4.1 CONFIGURATION IDENTIFICATION PROCESS

All the documents/Deliverables must be uniquely identified. For this reason, the item coding rules are identified to ensure that primary requirement. Each item is identified according to the following rule:

<acronym of project>-<deliverable number>_<deliverable name>_<version number>

For example, the present document name is: CENTAUR-D7.1_ProjectManagementPlan_1.0.

4.2 RISKS MANAGEMENT STRATEGY

The following section describes the risk management strategy put in place for CENTAUR project.

e-GEOS, as project coordinator, ensures risk management according to Leonardo Group methodology and internal procedures.

The Risk Management unit of e-GEOS supports the Project Coordinator in carrying out the Risk Management activities.

The Risk Management process is applied at every stage of the project's development. It consists of an iterative process of estimating, evaluating, mitigating and controlling risks in order to ensure that adequate countermeasures are undertaken. Risk Analysis will be continuously undertaken by the PC, supported by Risk management unit and all team members, by means of measuring the effectiveness of the mitigation plan and ad hoc meetings. Risk analysis and the mitigation actions advancement will be addressed in each CB and SC meeting.

Since a project risk is understood as an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives, the CENTAUR project intends to identify not only threats but also opportunities.

A negative Risk must be managed in order to avoid that they become issues (prevention) or that their initially expected effect becomes actual (protection). Issues must be treated as soon as possible.

4.2.1 METHODOLOGY

In accordance with the official procedures, the risk management in CENTAUR can be broken down in a set of four main tasks (Figure 11).



Figure 11: Risk management iterative process

4.2.2 RISK IDENTIFICATION

In order to guarantee an effective project risk management the risk identification will be done:

- as soon as possible, starting from this bidding phase, with the view to define the budget and the economic evaluation.
- including all possible sources of risk, taking into account all perspectives (stakeholders) and different scenarios involved in the management of the project.
- iteratively repeated during the project life cycle. The identification process must be repeated especially upon the approaching of key events or significant changes in the project.
- clear risk description and with an appropriate level of detail so as to assign an owner who is responsible for their management, timing and so as to identify the most effective response actions.

In order to correctly identify the risk, it must be described in a rational and structured manner, distinguishing the causes from the risk events and from the effects on the project objectives and milestones. This method allows to better understand the nature of identified risk and facilitates the identification of the specific risk response actions.

4.2.2.1 RISK ASSESSMENT

Both qualitative and quantitative risk analysis are performed, in order to assess the RPI (Risk Priority Index), and identify appropriate mitigation actions and protective measures related to the residual risk. In this phase risks are evaluated in terms of impact on project objective and probability of occurrence:

Impact An assessment of the impact a risk consequence may have on an overall program. The following default five levels classification is adopted (Table 9).

Table 9: Five levels of risk classification for risk assessment

Impact	Impact Index (I _p)
N-negligible	1
Mi-Minor	2
Mo-Moderate	3
S-Serious	4
C-Critical	5

Probability The probability of occurrence is expressed as a percentage. It represents the Consortium’s assessment of the likelihood that a risk may happen. Default probabilities are identified (Table 10).

Table 10: Default level of risk probability

Probability	Probability Index (I _p)
Minimal (<10%)	1
Low (from 10% to 30%)	2
Medium (from 30% to 50%)	3
High (from 50% to 70%)	4
Very High (>70%)	5

The RPI (Risk Priority Index) is calculated through the formula: $RPI = I_p \times I_i$

Five levels scheme below (Figure 12) highlights three different Risk zones (Red, Yellow, and White):

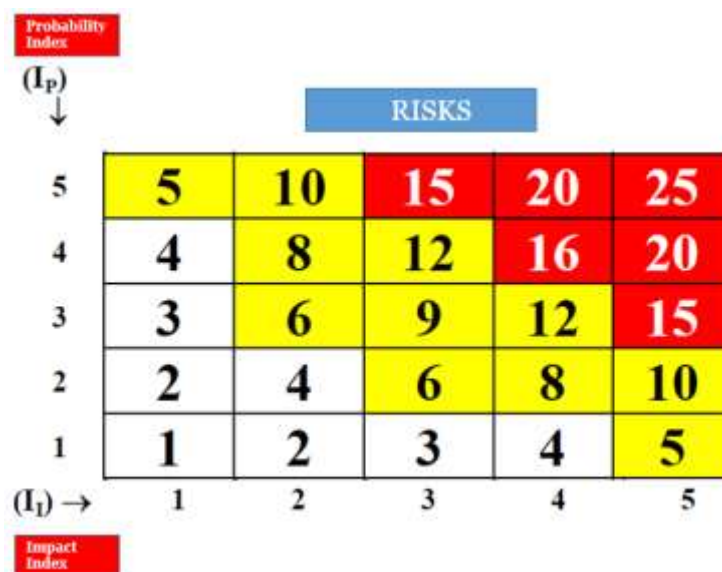


Figure 12: Risks matrix

Risks with “RPI” ≥ 5 , named “key risks” (Yellow + Red), must be managed through specific mitigation actions, while the Risks “falling” in the white zone must be constantly monitored by the PM.

Quantitative analysis aims at defining economic impacts of the risks.

4.2.2.2 RISK TREATMENT ACTION PLAN

The objective of this phase is the identification and choice of the mitigation actions to be implemented so as to reduce the probability of occurrence and/or the impact of each “key risk”. The resources in charge of carrying out the above actions are identified at the same time.

Main output of this phase is the completion of the Risk Matrix. In this matrix all the relevant results of the risk management process described above are reported, and in particular:

- the identified risks (ID and name).
- probability of occurrence (as a percentage) pre and post mitigation actions.
- impact on project objectives (5 levels classification) pre and post mitigation actions.
- identified mitigation actions (typology of mitigation).
- actions plan (identification of actions to be carried for the risk mitigation with identification of the action owner, dates and timelines).

All the identified mitigation actions will be included in the project tasks planning (in the same way as the other project execution tasks) and their costs include in the project budget. After the identification of the mitigation actions, the “residual risk” is estimated. The residual risk is defined as the remaining risks after the implementation of the mitigation actions. The risk evaluation phase and the risk treatment phase are repeated and the new Risk Register compiled.

4.2.2.3 RISK MONITORING AND REPORT

As often highlighted, an efficient Risk Management process cannot exclude a careful and constant monitoring activity of the trend and evolution of risks. The objective of this phase is to:

- update the risk status.
- verify the execution and effectiveness of the mitigation Actions Plan.
- identify and evaluate new risks, according to the already described risk management process.

The Project Coordinator, with the support of the Technical Manager, will continuously monitor the progress of work and risks of underperformance. An updated Risk Register will be transmitted regularly during the project to EC and any time that an event (external or internal to the project) could potentially impact the objective of the project.

In case EC notices a case or a risk of serious underperformance, EC may notify the Consortium of its observations and require the Consortium’s management to report at short notice proposing quick remedial actions.

The following diagram shows the different risk management phases (risk management sub-processes) logic.

The first CENTAUR Risk Register is reported in the following Table 11.

Table 11: Preliminary Risk Register

N.	Description	Probability	Impact	WP	Proposed Mitigation Measures
1	Insufficient resources and or personnel committed to project by partners.	Low	High		The Project Manager will monitor the project progress, organizing WP leaders and partners meeting, whether deviations from planning occurred and/or lack of resources allocated Involvement of adequate resources.
2	Underestimation of effort needed to complete activities.	Low	High		Project Manager and WP Leaders monitor resources consumption and eventually reallocate them (S curves of progress vs budget will be used at task level), project progress monitoring and WP leaders/partners (for urgent issues discussion) organization if issues are identified. Updated schedule will be submitted by the Partner the Coordinator at regular time (2 months).
3	Lack of communication between partners	Low	High		Regular meetings, conference calls. A centralized and collaborative project repository will be set-up: AGILE, collaborative environment/platform for communication will be set up. Each well-defined focal points identified by partners for tasks interaction and clear rules to cover communication aspects shall be detailed in the Consortium agreement.
4	Limited engagement of users in the demonstration design and execution	Medium	Medium	4, 7	A group of potential users have already been engaged during the proposal, providing interest in taking part to the project advisory and demonstration. Several of them have also signed a commitment letters. A dedicated activity for user engagement is part of WP6 and WP7

N.	Description	Probability	Impact	WP	Proposed Mitigation Measures
5	AI and machine learning techniques provides not completely mature results and needs very large training datasets that may not be available	Medium	High	4, 2	AI/ML techniques partially substituted by alternative techniques as recovery action if unsatisfactory results; frugal AI techniques (one shot methods, semi supervised learning, etc.) considered to exploit small training datasets.
6	Lack of ground truth/open data to train AI models	Medium	High	4, 2	Advanced ML techniques for good results, small training dataset, open data platforms usage to share preliminary data results
7	Unexpected changes/limitations to access of traditional and social media sources	Low	High	6, 1, 3, 4, 2, 7, 5	Providers may change or limit access to (parts of) their contents. Within CENTAUR, location-related contents are of high importance. Alternative sources may be used
8	Failing to get the support from the EMS and SEA reduce success probability (e.g. analysis of scenarios, impact, access to data, demonstration)	Low	Medium	1,2,3,4,5	Partners in the Consortium are strongly involved in the SEA and EMS operational Service, as service providers and Entrusted Entities. This will facilitate the access to documentation, the access to data during the demonstration and to plug CENTAUR prototypal products into "real" Hot Cases.
9	Complexity of the system may lead to delays in the availability of processing pipelines and affect the timing for the demonstration	Medium	High	2,3,4	The AGILE deployment of incremental working solution will allow to identify meaningful subset or basic version of the indicators and indexes to be generated during the Cold Case and Hot Cases.

4.3 PROJECT DOCUMENTS/DELIVERABLES AND THEIR LIFECYCLE

All project members must use appropriated CENTAUR templates, set up by our Communication Team and CENTAUR Sharepoint teamsite

4.3.1 FLOW RELATING TO AUTHORIZATION AND SUPERVISION

With the purpose of matching the relevant standards and programme expectations, it is foreseen an internal review followed by an approval process at project / deliverables level.

All technical documents and/or Deliverables must have the authorization of the CENTAUR Technical Coordinator, in addition of the Project Coordinator, before the final submission to the EC.

Each Deliverable Leader can evaluate the opportunity to ask for an external review, e.g. Advisory Board Members.

Moreover, a dedicated review session will be set up with the entire CENTAUR consortium to collect the main comments from each concerned partner, before the submission of the final delivery.





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