



EUNADICS-AV DELIVERABLE (D -N°: D2)

Project Management Plan

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Author(s): Matthias Themeßl

Reviewer(s): *Gerhard Wotawa*

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Abstract

This document lays out the project relevant structures, communication processes and responsibilities which are essential to monitor the project's progress and guarantee the project's success. Furthermore, this project management plan defines the project's data sharing policy internally as well as towards external project stakeholders and users.

The EUNADICS-Av project has received funding from the European Union's Horizon 2020 research programme for Societal challenges - smart, green and integrated transport under grant agreement no 723986

Executive Summary

With 21 partners (also called parties in this document) from 12 European countries and various disciplines involved, the project “European Natural Airborne Disaster Information and Coordination System for Aviation” – in short EUNADICS-AV needs a management and coordination framework and structure in order to enable and assure the completion of the proposed project results with the foreseen high scientific and technical standards.

The general objective of a project management plan is to ensure the correct and timely execution of the project’s foreseen working plan and tasks, to support all partner with an effective and efficient administration and coordination and to prepare processes and structures to adapt to necessities that may occur during the project duration.

Therefore the precise objectives of this management plan are

- the definition of procedures and steering tools for a successful project implementation, monitoring and completion
- the definition of key responsibilities and a project respective time schedule and
- a description of risk and quality management.

Furthermore, it defines the EUNADICS-AV data sharing policy internally as well as externally with users and stakeholders.

The project management plan is based on the H-2020 Grant Agreement no 723986 and the Description of the Action (DoA), and the EUNADICS-AV Consortium Agreement (CA).

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1. Introduction

1.1 Purpose of the project management plan

The EUNADICS-AV project management plan is considered to support and guide project participants through all aspects of the project's management and coordination activities.

1.2 Project summary

The operational meteorological community and infrastructure in Europe plays a very decisive role in the effort to strengthen disaster resilience. To address this particular responsibility, the network of European National Meteorological Services (NMSs), EIG EUMETNET, has decided to develop this proposal. It is well recognized that hydrometeorological events constitute the large majority of all disasters that occur worldwide. In this area, a lot has been achieved under the EUMETNET umbrella, for example the establishment of the METEOALARM program. Additional work, however, is needed with regard to a hazard category that we refer to as “airborne hazards” (environmental emergency scenarios), including volcano eruptions, nuclear accidents, forest fires and desert dust events. Therefore, the logical next step is the expansion of EUMETNET activities into the emergency response coordination area.

Aviation is one of the most critical infrastructures of the 21st century. Even comparably short interruptions can cause economic damage summing up to the billion-Euro range. As evident from the past, aviation shows certain vulnerability with regard to natural hazards. Safe flight operations, air traffic management and air traffic control is a shared responsibility of EUROCONTROL, national authorities, airlines and pilots. All stakeholders have one common goal, namely to warrant and maintain the safety of flight crews and passengers. Currently, however, there is a significant gap in the Europe-wide availability of real time hazard measurement and monitoring information for airborne hazards describing “what, where, how much” in 3 dimensions, combined with a near-real-time European data analysis and assimilation system. In practice, this gap creates circumstances where various stakeholders in the system may base their decisions on different data and information. The main objective of EUNADICS-AV is to close this gap in data and information availability, enabling all stakeholders in the aviation system to obtain fast, coherent and consistent information. This would facilitate the work of all stakeholders in the system, on one hand the European Aviation Crisis Coordination Cell (EACCC), the Air Traffic Management (ATM) and Air Traffic Control (ATC) functions, and on the other hand airline flight dispatching and individual flight planning. This new mechanism would take into account and create input to existing national and international systems, including the Volcanic Ash Advisory Centers (VAACs) delivering products for aviation in case of a volcanic eruption, and the World Meteorological Organisation (WMO) designated Regional Specialized Meteorological Centers (RSMCs) with activity specialisation Atmospheric Transport Modelling in charge of providing products in case of a nuclear accident and emergency. Such a system, relying on existing structures rather than creating new ones, would have a unique potential of significantly increasing the resilience of the aviation system. Thus, the economic benefit from the successful implementation of EUNADICS-AV could exceed

the requested funding by orders of magnitude. By conducting this work under the framework of EUMETNET, there will also be a unique chance to improve coherence and consistency among the risk assessments undertaken in the Member States in the respective aviation hazard scenarios covered by EUNADICS-AV.

2. Participating Institutions

Table 2.1 shows all partners in the EUNADICS-AV project including the respective main contact person.

Participant No *	Participant organisation name	Country	Main contact person
1 ZAMG (Coordinator)	ZENTRALANSTALT FUER METEOROLOGIE UND GEODYNAMIK	AT	Gerhard Wotawa Matthias Themessl Marcus Hirtl
2 CNR	CONSIGLIO NAZIONALE DELLE RICERCHE	IT	Gelsomina Pappalardo Lucia Mona
3 DLR	DEUTSCHES ZENTRUM FUER LUFT- UND RAUMFAHRT EV	DE	Kaspar Graf Hans Schlager
4 BIRA-IASB	INSTITUT D'AERONOMIE SPATIALE DE BELGIQUE	BE	Nicolas Theys Hugues Brenot
5 BRIMATECH	BRIMATECH SERVICES GMBH	AT	Florian Lipok Suzanne Katzler- Fuchs Dieter Meinhard
6 PLUS	PARIS-LODRON-UNIVERSITAT SALZBURG	AT	Carl-Herbert Rokitansky Kurt Eschbacher
7 INGV	ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA	IT	Mauro Coltelli Simona Scollo
8 ECMWF	EUROPEAN CENTRE FOR MEDIUM- RANGE WEATHER FORECASTS	UK	Vincent-Henri Peuch
9 UPC	UNIVERSITAT POLITECNICA DE CATALUNYA	ES	Arturo Vargas
10 STUK	RADIATION AND NUCLEAR SAFETY AUTHORITY	FI	Juhani Lahtinen
11 ULB	Université libre de Bruxelles	BE	Lieven Clarisse Rosa Astoreca
12 ACG	AUSTROCONTROL G.M.B.H	AT	Markus Kerschbaum
13 BMLVS	BUNDESMINISTERIUM FUER LANDESVERTEIDIGUNG UND SPORT	AT	Karl Gruber Adelheid Obwaller

14 FLIGHTKEYS	FLIGHTKEYS GmbH	AT	Raimund Zopp Felix Hackl
15 FMI	Finnish Meteorological Institute	FI	Gerrit Leeuw Mikhail Sofiev
16 IMO	Icelandic Meteorological Office	IS	Sigrún Karlsdóttir Sara Barsotti
17 KNMI	Royal Netherlands Meteorological Institute	NL	Arnoud Apituley John van de Vegte
18 MF	Meteo-France	FR	Matthieu Plu Laaziz El Amraoui
19 SMHI	Swedish Meteorological and Hydrological Institute	SE	Lennart Robertson Michael Kahnert Monica Wallgren
20 RMI	Royal Meteorological Institute	BE	Andy Delcloo Quentin Laffineur
21 MeteoSwiss	BUNDESAMT FUER METEOROLOGIE UND KLIMATOLOGIE	CH	Alexander Haefele

Table 2.1: List of EUNADICS-AV participating parties.

3. Work Plan - Structure and Leads

3.1 Work package description

The EUNADICS-AV proposal foresees eight different work packages (WPs): one for management (WP 1), four thematically focused technical work packages (WP 3-7), and two cross-cutting work packages, one dealing with data/product delivery/dissemination (WP 8) and the other with risk assessments/stakeholder requirements/international cooperation (WP 2). Each WP will consist of a number of tasks and sub tasks, which will incorporate the expertise of the consortium partners. The overall WP plan has been agreed by all parties and implements a commonly agreed work plan, deliverables and milestones.

A short description of the different work packages is presented below with the responsible WP leader given in brackets.

- **WP 1 - Project Management and Coordination (ZAMG)**

This WP provides the management functions and operates the Project Office.

- **WP 2 - Integration of Stakeholder/User requirements, hazard risk assessments and international cooperation (BRIMATECH)**

This WP deals with the identification of stakeholders and user needs and requirements and hazard risk assessments. One major goal is to provide appropriate input to the Safety Management System of the European Aviation Safety Plan and the plans/systems of various stakeholders. Furthermore, WP 2 will ensure proper coordination with national, European and international initiatives and organisations for sharing experiences and results, will establish communications and cooperation agreements (for partnership) with data providers at national and international level, and will ensure communications and

cooperation agreements with user communities. The added value of the technological solutions developed for the users shall be documented, and be integrated in WP 8.

- **WP3 - Observation infrastructure (CNR)**

The overall objective of this core activity of EUNADICS-AV is to integrate, harmonise and thus enhance the European observing capabilities for natural airborne hazards, including aerosols, trace gases and radioactivity. The WP deals with ground-based, airborne and space-based platforms as well as with in-situ and remote-sensing instrumentation. The work includes routine measurement activities as well as special campaign measurements during crisis situations.

- **WP 4 - Data integration and assimilation (FMI)**

The overall goal of the work package is to further develop the methodology of data assimilation/inverse modelling of aerosols, trace gases and radioactivity, utilizing state-of-the-art atmospheric transport and dispersion models. Data assimilation techniques shall be optimized with regard to expected data availability during a crisis situation, so that additional measurements can create an added value immediately. The final product of the WP is 4D (space- and time- resolving) consistent analysis fields for concentrations of such air constituents.

- **WP 5 - Early Warning Systems (BIRA-IASB)**

In this WP, measurement-based early warning systems for selected hazard scenarios shall be set up and tested, including volcanic ash, aerosols and radioactivity.

- **WP 6 - Aviation product development and integration (MF)**

WP 6 aims at developing a pre-operational demonstration service to support key end users (NMS, VAACs, RSMCs, EACCC, among others) for the case of a volcanic ash or nuclear crisis affecting especially (but not limited to) the European air space. This pilot implementation integrates results from WP 3 and WP 4.

- **WP 7: System testing and exercises (PLUS)**

In this WP, the systems put in place in WP5 and WP 6 shall be validated and tested. For this purpose, realistic cases shall be described in an end-to-end scenario, simulating not only the hazard, but also the system response and the product reception by stakeholders, including EACCC, ATC, ATM, airline flight dispatchers and pilots. The involvement of a military partner will allow simulating and optimizing civil-military coordination activities as well, including communication, data and information exchange and flexible air space use for re-routing as well as airborne monitoring activities. The participation of an SME dealing with future flight trajectory management solutions will allow testing the seamless inclusion in common airline flight planning/dispatching systems.

- **WP 8 - Data and product delivery, exploitation and dissemination (KNMI)**

In this work package two product delivery chains are implemented, namely the dissemination of aerosol data and data assimilation products delivered in work package 3 and 4 (broader range of relevant hazard and crisis scenarios), and the test of a dissemination of the near-real-time pilot implementation products from WP5 and WP 6 to NMSs, VAACs, RSMCs, EACCC and to the 4DWxCube MET portal to SESAR/SWIM. Information Exchange Requirements (IER) and the resulting Interface Requirements Specifications (IRS) shall be collected and tested. A project web site will be realised and hosted.

3.2 Break down of working tasks and time management

Based on the general structure outlined in Section 3.1, a detail working plan and time schedule was established in order to assure a successful completion of all deliverables in time and to align the working tasks that are inter-dependent.

Table 3.1 shows the project Gantt chart with the respective working tasks and their associated schedules, Table 3.2 shows the planned deliverables including the responsible lead project partners and table 3.3 the respective milestones.

As the functioning of such a multidisciplinary project heavily depends on the collaboration of the partners and thus on timely completion of preparatory work and tasks, it is crucial that the outlined dates in the following tables are met. Especially the project deliverables will be furthermore used as project monitoring and development tracking indicators.

No.	Task	Year 1				Year 2				Year 3			
		I	II	III	IV	I	II	III	IV	I	II	III	IV
WP1	Management & coordination												
T1.1	Overall project management and coordination	D											
T1.2	Financial management				D				D				D
T1.3	In- and external communication				D				D				D
T1.4	Organisation of project meetings				D				D				D
WP2	Stakeholder requirements, risk assessments, international cooperation												
T2.1	Methodological approach, basis for survey												
T2.2	Assessment of existing data								D				
T2.3	Surveying the requirements of users in regard to scenarios leading to airborne hazards												
T2.4	Case studies for pan-European risk and exposure assessment for airborne natural/technical hazards											D	
T2.5	Communications and cooperation with international initiatives												D
T2.6	Service Sustainability												D
WP3	Observation infrastructure												
T3.1	Satellite remote sensing				D				D			D	
T3.2	Ground-based and aircraft-based remote sensing								D			D	
T3.3	Ground based and airborne based in-situ measurements								D			D	
T3.4	Ground-based and upper air observations of artificial								D			D	

T8.4	VAAC interface to EUNADICS-AV Portal				D									
T8.5	NMS interface to EUNADICS-AV Portal				D									
T8.6	4DWxCube interface to EUNADICS-AV Portal				D									

Table 3.1: Gantt chart of the EUNADICS-AV project.

Deliverable (number)	Deliverable name	WP number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
D1	POPD - Requirement No. 1	1	ZAMG	ETHICS	CO	M3
D2	Project Management Plan	1	ZAMG	R	PU	M1
D3	Mid-term report	1	ZAMG	R	PU	M18
D4	Final Report	1	ZAMG	R	PU	M36
D5	Report on User Requirements	2	BRIMATECH	R	PU	M24
D6	Report on existing data and approaches	2	BRIMATECH	R	PU	M21
D7	Report on Case Study simulation	2	PLUS	R	PU	M30
D8	Document on the implemented institutional framework for cooperation in data exchange including data policy	2	ZAMG	R	PU	M18
D9	Summary report on cooperation in data and information exchange with monitoring networks and crisis measurement stakeholders	2	CNR	R	PU	M36

D10	Action plan for the sustainable use of EUNADICS-AV results beyond project lifetime	2	BRIMATECH	R	PU	M36
D11	Inventory of satellite products	3	DLR	R	PU	M8
D12	Inventory of ground based data suitable for satellite validation	3	KNMI	R	PU	M12
D13	Tailored satellite products	3	KNMI	R	PU	M20
D14	Validation of tailored satellite products	3	FMI	R	PU	M28
D15	Identification of existing research airborne remote sensing platforms for fast response service	3	DLR	R	PU	M20
D16	Assessment and cross- calibration among existing ground-based remote sensing networks	3	CNR	R	PU	M28
D17	Identification of existing and available research and operational aircraft for fast response service	3	DLR	R	PU	M12
D18	Assessment and cross validation among existing ground based in situ observation networks	3	FMI	R	PU	M28
D19	Report on different real-time aerosol radioactivity and gamma spectrometric monitoring networks	3	FMI	R	PU	M28
D20	Report on existing	3	DLR	R	PU	M12

	aircrafts for the radioactivity measurements of the upper atmosphere					
D21	Report on existing unmanned upper atmosphere radioactivity monitoring methods for fast response service	3	FMI	R	PU	M18
D22	Report on the estimation of radiation doses inside aircraft cabins for indication of safe and non-safe fly zones	3	UPC	R	PU	M24
D23	Harmonised metadata for the defined data types and selected datasets for assimilation and validation	4	KNMI	R	PU	M22
D24	Observation operator for lidar- and aircraft-type datasets	4	FMI	R	PU	M18
D25	Source apportionment methodologies for radioactivity, volcano, and forest fires	4	ZAMG	R	PU	M24
D26	Case studies with multi-source data assimilation	4	MF	R	PU	M30
D27	Gap identification and suggestions for infrastructure improvement	4	CNR	R	PU	M36
D28	System definition and	5	BIRA-	R	PU	M15

	design document for Early Warning Systems		IASB			
D29	Implementation of multi-platforms NRT demonstration system for the monitoring of hazardous aerosol plumes	5	BIRA-IASB	DEM	PU	M30
D30	Implementation of interfaces to alert and monitoring information on nuclear events	5	ZAMG	DEM	PU	M30
D31	Description of multi-hazards multi-platforms NRT demonstration system, Report on verification of system performances against requirements	5	BIRA-IASB	R	PU	M36
D32	System definition and design document for aviation services	6	MF	R	PU	M18
D33	Implementation of a demonstrator for particles and SO2 analysis	6	FMI	DEM	PU	M30
D34	Implementation of a demonstrator for nuclear dispersion	6	MF	DEM	PU	M30
D35	Delivery of products relevant to aviation for the selected cases	6	ZAMG	DEM	PU	M36
D36	Scenario definition and design document	7	PLUS	R	PU	M15

D37	Tracer experiment analyzed and compared with tracer dispersion forecast	7	ZAMG	R	PU	M30
D38	Benefit Assessment Report on new integrated prototype products and impact on European airspace	7	PLUS	R	PU	M36
D39	Project web site	8	KNMI	R	PU	M1
D40	Dissemination plan	8	KNMI	R	PU	M8
D41	ICD between data providers and EUNADICS-AV Portal	8	KNMI	R	PU	M10
D42	Description of the plugin infrastructure for building community extensions to the core delivery system	8	KNMI	R	PU	M24
D43	ICDs between the EUNADICS-AV Portal and the VAAC/NMS/SESAR-SWIM systems	8	BIRA-IASB	R	PU	M12
D44	Integrated test report and lessons learned on interface prototyping	8	KNMI	R	PU	M32

Table 3.2: List of Deliverables planned in EUNADICS-AV in respect to the given WPs. Delivery dates are based on the project start date October 2016. The following coding is applied in the listing.

Type:

Use one of the following codes:

- R: Document, report (excluding the periodic and final reports)
- DEM: Demonstrator, pilot, prototype, plan designs
- DEC: Websites, patents filing, press & media actions, videos, etc.
- OTHER: Software, technical diagram, etc.

Dissemination level:

Use one of the following codes:

<p>PU = Public, fully open, e.g. web</p> <p>CO = Confidential, restricted under conditions set out in Model Grant Agreement</p> <p>CI = Classified, information as referred to in Commission Decision 2001/844/EC.</p>
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Milestone number	Milestone name	Lead Beneficiary	Due Date (in months)	Description	Work Package No.
M1	Project Kickoff Meeting	ZAMG	2	Kickoff Meeting of EUNADICS-AV in Vienna successfully conducted	1
M2	Internal Web Site available	ZAMG	2	Project Intranet/sharing of documents	1
M3	Final Assembly/Final Report	ZAMG	36	Final Assembly successfully conducted, final Report submitted	1
M4	Analysis of hazard risks finished	BRI	24	Case studies for selected aviation hazards finished, hazard risk assessment performed.	2
M5	Implementation of the Institutional framework for cooperation in data exchange including data policy	ZAMG	24	Implement Agreements of data Exchange in a crisis Situation with various data providers	2
M6	Agreement on the sustainable use of project results	BRI	36	Agree on use/operations/further development of the Systems developed during EUNADICS-AV	2
M7	Survey of existing and planned satellite products complete	DLR	8	See Deliverable 11	3

M8	Evaluation and validation of existing satellite products complete	KNMI	20	see Deliverable 13	3
M9	Improvement of existing satellite products complete	FMI	28	see Deliverable 14	3
M10	Identification of existing ground-based remote sensing networks and aircraft remote sensing techniques	CNR	20	Survey completed	3
M11	Identification of common data products from the different ground-based remote sensing networks	CNR	12	Survey completed and data quality validated	3
M12	Fast response service and identification of measurements gaps	CNR	28	Survey completed and data quality validated	3
M13	Identification of existing data products from in situ observation networks and airborne measurements	FMI	20	Survey completed	3
M14	Integration of identified proximal and distal data related to volcanic eruptions	FMI	12	Integration completed and data quality validated	3

M15	Fast response service and identification of measurements gaps (in-situ)	FMI	28	Survey completed and data quality validated	3
M16	Assessment of existing research and operational networks of ground based real-time aerosol radioactivity measurements	FMI	28	see Deliverable 19	3
M17	Assessment of existing operational networks of real-time spectrometric measurement of ambient gamma radiation	FMI	28	See Deliverable 19	3
M18	Identification of existing aircrafts for the radioactivity measurements of the upper atmosphere	DLR	12	See Deliverable 20	3
M19	Identification of existing unmanned upper atmosphere radioactivity monitoring methods for fast response service	FMI	18	See Deliverable 21	3
M20	Estimation of doses inside the aircraft cabin for indication of safe and non-safe fly zones	UPC	24	See Deliverable 22	3

M21	Assimilation and validation datasets are identified and ready	KNMI	12	See Deliverable 23	4
M22	Observation operators for lidar- and aircraft-type data are created	FMI	18	See Deliverable 24	4
M23	Multi-source multi-model assimilation evaluation case studies are concluded	MF	30	See Deliverable 26	4
M24	Pilot implementation concept consolidated	BIRA-IASB	15	See Deliverable 28	5
M25	Complete implementation of NRT demonstration system: monitoring and alerting information	BIRA-IASB	30	See Deliverable 29	5
M26	Description and verification of performances multi-hazards multi-platforms NRT demonstration system are concluded	BIRA-IASB	36	See Deliverable 31	5
M27	Synthesis of user requirements for the design of the demonstrators	MF	12	List of user requirements	6

M28	Choice of the test cases	MF	18	List of selected cases	6
M29	Prototype demonstrator for particles and SO2	FMI	24	Preliminary outputs of the demonstrator	6
M30	Definition of scenarios, user needs and requirements and KPI'	PLUS	18	Document describing scenarios, user requirements and KPIs available	7
M31	Integration of prototype products and implementation of disaster scenarios into NAVSIM/USBGSim environment and the Flightkeys cost optimizing flight planning system	PLUS	18	Implementation Report available	7
M32	Operational integration of tracer experiment results	DLR	24	Report available	7
M33	Human-in-the-loop exercises for assessing the influences on the European ATM-System	PLUS	30	Exercise Report finished	7
M34	Final installation of the delivery system	KNMI	30	Installation Report available	8

M35	Dissemination event, like a hackaton/databattle, targeted at stimulating commercial reuse of EUNADICS-AV Open Data and Services	KNMI	32	Event took place	8
M36	Final installation of the prototype VAAC extension	BIRA-IASB	24	Installation report	8
M37	Final installation of the prototype NMS extension	ECMWF	24	Installation report	8
M38	Final installation of the prototype SESAR/SWIM extension	PLUS	24	Installation report	8
M39	Test report of the prototype VAAC extension	BIRA-IASB	30	Report available	8
M40	Test report of the prototype NMS extension	ECMWF	30	Report available	8
M41	Test report of the prototype SESAR/SWIM extension	PLUS	30	Report available	8
M42	Agreement with EASA	ZAMG	3	An agreement between the coordinator and EASA with regard to the EASA contribution to EUNADICS-AV is established (as a linked third-party with in-kind contribution against payment)	1

Table 3.3: List of milestones planned in EUNADICS-AV in respect to the given WPs. Due dates are based on the project start date October 2016.

4. Project Management Structure

A project like EUNADICS-AV needs an adequate, lean management structure. The consortium has 20 partners, including seven (7) National Meteorological Services (NMSs). Partners come from 12 different European countries. The following project governance structure is proposed:

4.1 Administrative Steering Committee

The administrative steering committee represents the ultimate decision-making body of the consortium. This committee consists of the coordinator, who functions as chair, plus one representative from the other participating organisations. The committee will meet once a year in person and will conduct video conferences in between as required. This committee will consider major issues requiring the votes of all project participants, such as changes in financial arrangements or major changes in the scientific plans. The committee also deals with the identification of risks and the resolution of conflicts within the consortium. The committee undertakes to reach a consensus. If a consensus cannot be reached, the committee will decide with majority vote. In case of equal votes, the coordinator decides. All voting regulations are also described in the CA.

4.2 Executive Board

The Executive Board, also referred to as Technical Steering Committee in the Consortium Plan (description of the action), functions as the supervisory body for the execution of the project which shall report to and be accountable to the Administrative Steering Committee. This board will be strongly informed and actively involved in the project development, follow up the technical progress of the project, make proposals e.g. how technical questions are solved, and will propose amendments if required. This board will consist of the coordinator plus the WP leaders from WP 2-WP 8. The committee will meet once a year in person and monthly by video conference. Intermediate meetings can be called at any time by the project coordinator in case this is deemed necessary. The board will reach decisions by consensus. In case of disagreement, the issue is dealt with by the administrative steering committee.

4.3 Project Coordinator

The project coordinator has overall responsibility for ensuring the success of the EUNADICS-AV project from inception to completion. The coordinator is the legal entity acting as the intermediary between the Parties and the Funding Authority. The coordinator shall, in addition to his responsibilities as a party, perform the tasks assigned to it as described in the Grant Agreement and the CA which include

- day-to-day management

- financial management
- monitoring the progress of EUNADICS-AV and its tasks
- monitoring the compliance by the project participant with their obligations given in table 3.2 and table 3.3
- reporting (periodically and continuously) and communicating with the EU project officer
- reporting to the EUMETNET Director General, the EUMETNET Assembly and the respective advisory committees
- convening and chairing General Assembly and steering board meetings (as set out in the following)
- keeping the address list of members and other contact persons updated and available
- collecting, reviewing, verifying consistency and submitting reports, other deliverables (including financial statements and related certifications) and specific requested documents to the Funding Authority
- reviewing drafts of the project deliverables and issuing recommendations for their improvement, and approve the final version
 - if one or more of the parties is late in submission of any deliverable, the coordinator may nevertheless submit the other parties' deliverables and all other documents required by the Grant Agreement to the Funding Authority in time.
- transmitting documents and information connected with the EUNADICS project to any other parties concerned
- structuring and fostering the information exchange between the project members
- administering the financial contribution of the Funding Authority and the respective distribution to the project partners.

The coordinator of EUNADICS-AV is Gerhard Wotawa

Contact details:

Dr. Gerhard Wotawa, M.A.

Head of Division Data, Methods, Modeling

ZAMG - Zentralanstalt für Meteorologie und Geodynamik

Hohe Warte 38

A-1190 Vienna

Austria

Tel.: +43 1 36026 2002, Mobile: +43 664 88 414 962

Fax: +43 1 369 12 33

E-Mail: gerhard.wotawa@zamg.ac.at

In his activities, the coordinator will be advised by a SESAR Program Expert (consultant with multi-year experience with regard to aviation/SESAR program management), and supported

by the EUMETNET European Affairs manager. A communication manager will be responsible for dissemination activities.

4.4 Project manager and project office

The project manager and the project office assist and facilitate the work of the coordinator and the steering boards (set out in the following) for executing the decisions of the consortium as well as the day-to-day management.

The project manager is Matthias Themessl

Contact details:

Dr. Matthias Themessl
 Head of Staff Unit Project Coordination
 Division Data, Methods, Modeling
 ZAMG - Zentralanstalt für Meteorologie und Geodynamik
 1190 Wien, Hohe Warte 38
 Tel: +43(0)664 8841 4979
 E-Mail: matthias.themessl@zamg.ac.at

4.5 WP leaders

Work package leaders have been determined by the consortium and are responsible for their respective working tasks. If there are inter-relationships with other working tasks they are additionally responsible for the required information exchange at the level and intensity needed. Work package leaders are themselves responsible to receive contributions from project according to their demands but to allow to keep the deadlines outlines in Section Reporting.

Number of WP	Name	Organisation	Email
WP1	Gerhard Wotawa	ZAMG	gerhard.wotawa@zamg.ac.at
WP2	Florian Lipok	BRIMATECH	fl@brimatech.at
WP3	Lucia Mona	CNR	lucia.mona@imaa.cnr.it
WP4	Mikhail Sofiev	FMI	Mikhail.Sofiev@fmi.fi
WP5	Nicolas Theys	BIRA-IASB	Nicolas.Theys@aeronomie.be
WP6	Matthieu Plu	MF	matthieu.plu@meteo.fr
WP7	Carl-Herbert Rokitansky	PULS	roki@cosy.sbg.ac.at
WP8	Wim Som de Cerff	KNMI	wim.som.de.cerff@knmi.nl

Table 4.1: List of EUNADICS-AV WP leaders.

4.6 Project Advisory and User Board

This committee shall consist of a representative from EUMETNET, EASA, EUROCONTROL, the Copernicus Atmosphere Monitoring Service (CAMS), from the

European Cockpit Association, from the Copernicus services unit of DG ENTR (G2), from EUMETSAT, from ESA, from WMO and from one interested NMS not involved as third party in the consortium. Further members can be invited as appropriate. The advisory board will consider the progress of the project and its final results, and will provide advice to the coordinator and the Executive Board. The board will meet at least 3 times with the members of the Executive Board, at least twice in person.

Figure 4.1 summarises the depicted project management structure with the interdependencies indicated as arrows.

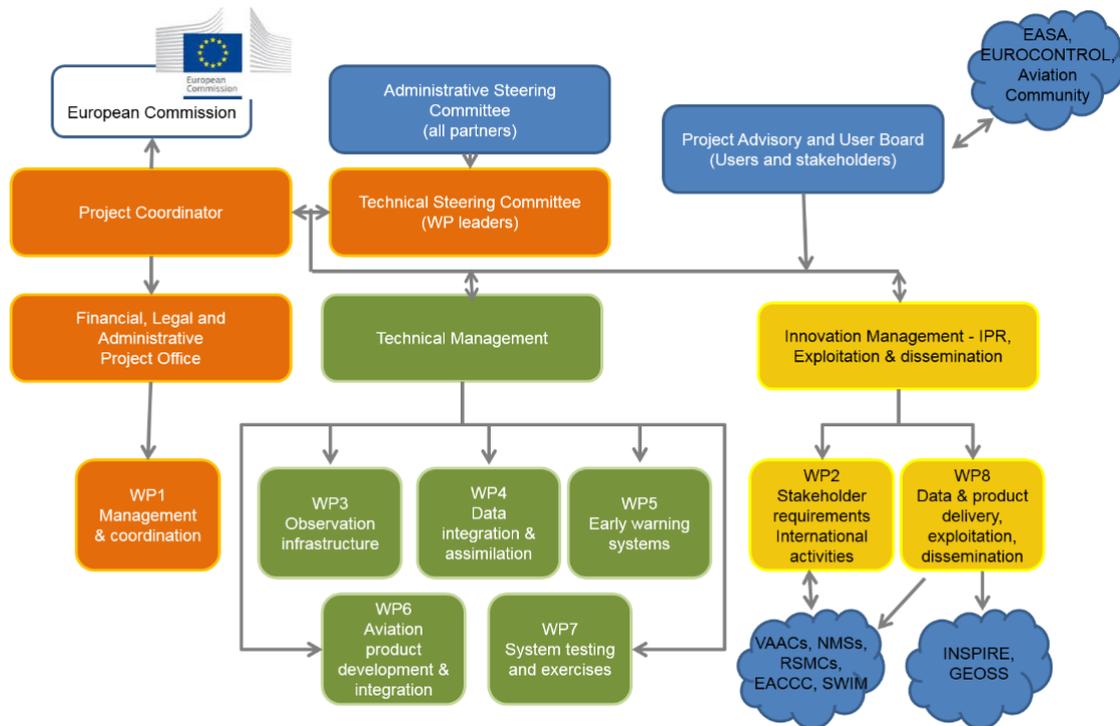


Figure 4.1: The project management structure of the EUNADICS-AV project.

Conflict management within the project takes place on the lowest possible level, namely within a work package. If a conflict cannot be resolved on WP level, it will be escalated to the Administrative Steering Committee. The Administrative Steering Committee undertakes to address and resolve conflicts unanimously. If conflicts cannot be resolved by unanimous vote, a special session of the Administrative Steering Committee can be called by the project coordinator, where a majority vote applies. In the unlikely case that the conflict could still not be solved regulations defined in the consortium and Grant Agreements apply.

5. Communication

5.1 Internal communication and responsibilities

EUNADICS-AV is centred on communication activities. Work package 1 deals with the communication with the EU, the assigned Project Officer, the Copernicus Atmosphere

Monitoring Service and mass media. Communication with users and stakeholders is part of work package 2, in order to develop hazard risk assessments and a resilience management guideline. In work package 3, dealing with the different monitoring infrastructures, technical communication with monitoring infrastructure providers is needed. In work package 8, the public web site is maintained, and the data dissemination activities performed including communication with the users of the products. Last but not least, the communication with data providers, public and private entities, with WMO and GEO Secretariat is performed in work package 2 under the sub-topic “International activities”.

Considering the project work plan the different WPs are highly cross-linked and therefore need a structured communication, data and information flow. Figure 5.1 illustrates the logic of the data flow between the S&T work packages WP3 (Observation infrastructure) + WP4 (Data integration and assimilation), the service integration work packages WP 5 (Early warning Products) and WP 6 (aviation product development), the validation work package WP 7 (system testing and exercises) and the dissemination work package WP 8 and highlights the need of steady communication and exchange.

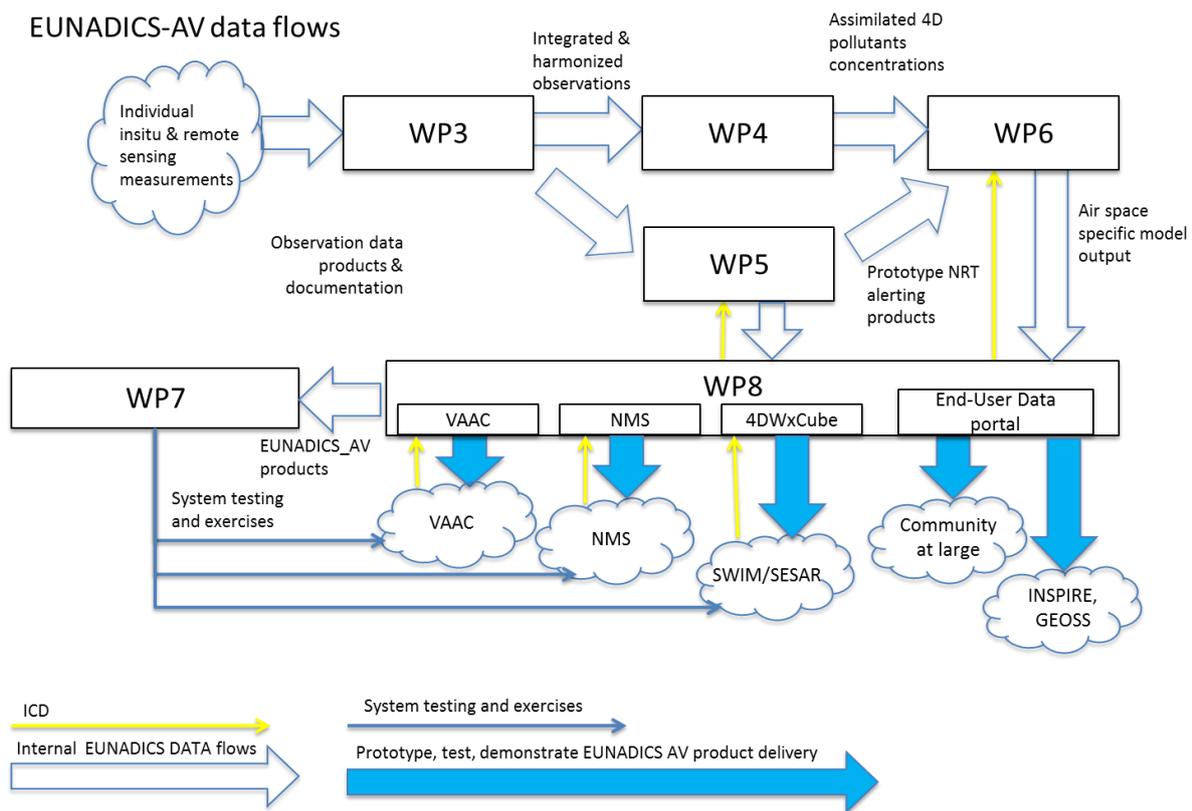


Figure 5.1: Schema of data flow within EUNADICS-AV between WP3 and WP8, including external stakeholders.

In order to guarantee the required internal communication, different tools and standardised data flows are implemented. Top-down those in section outlined committees and boards are put in place to guarantee a steady information flow from the coordination to the research

performing parties. The considered web-meetings are organised with the help of “Skype for business” which in addition is provided by the ZAMG to all project parties for project related online meeting purposes. This communication offer adds to the project’s climate friendly research efforts.

Furthermore, bottom up knowledge exchange and information distribution systems are provided. For this purpose, an internal web-based project knowledge hub is set up by KNMI based on Redmine (<http://www.redmine.org/>). Partners can login in as follows: <https://dev.knmi.nl/>

For any usage registration is required and the respective user administration is organised by Arnoud Apituley (arnoud.apituley@knmi.nl). This online hub contains general information about the project, the participants and their contact information, the due dates of reports and deliverables, the delivered reports, and all information about meetings (schedules, presentations). For information exchange any user can upload documents and files. KNMI as task leader as well as the project office will maintain the Redmine system and be responsible for regular updates. If documents have to be developed jointly, Google documents are proposed for the working phase and only final versions should be uploaded to Redmine. In addition to the web-platform, mailing lists have been established in order to easily share information with selected sub-groups. There exist a mailing list for addressing all people involved in the EUNADICS project (eunadics-all@zamg.ac.at), the EUNADICS-AV project office (eunadics-office@zamg.ac.at), the Executive Board (eunadics-execboard@zamg.ac.at) as well as a mailing list for addressing the Administrative Steering Committee (eunadics-asc@zamg.ac.at). Furthermore, mailing lists for all WPs have been implemented and can be used by eunadics-WPX@zamg.ac.at replacing the X by the number of the WP. The respective contact details of each mailing list can be found in the internal knowledge hub system.

Any changes, e.g. considering the contact details, shall be communicated via e-mail to the project office in order to be applied to all related mailing lists and documents.

Recognising that most of the project partners collaborate in various national and international projects, EUNADICS-AV email correspondences should be headed by “EUNADICS” in order to be easily traceable and contain a self-explaining title with deadlines included e.g. “EUNADICS: Comments on Minutes of kick-off due Dec 16 2016”. The emails should be written concisely with clear addressee given if questions are raised.

5.2 External communication and stakeholder involvement

In relation to communication to international organisations, the project will benefit from the existing communication and coordination structures built up by the EUMETNET secretariat. This will assure constant contacts with various entities based in Brussels, including the Commission, EASA and EUROCONTROL. This is also an important prerequisite for the success of this undertaking. Certain project members will furthermore bring in their already established relationships in order to inform Copernicus Atmosphere Monitoring Service (CAMS) (ECMWF), VAAC as well as airlines and pilots (flightkeys and the Austrian airforce). For the communication in direction to EUROCONTROL, EUNADICS-AV is also

supported by Olaf Dlugi as an external expert consultant. EASA assigned Kevin Hallworth (kevin.hallworth@easa.europa.eu) as technical contact point.

Equally important is the communication with all European national meteorological services (NMSs) in the framework of EUMETNET. The project coordinator and the EUMETNET Executive Director will regularly report to the organs, including the Science and Technology Advisory Committee, the Policy and Financial Advisory Committee and finally the Assembly. The decision to submit this proposal under the EUMETNET umbrella, which happens for the first time ever, was supported by all 31 member NMSs, which shows the commitment of the organisation.

Any communication with international bodies have to be coordinated with the coordinator and/or the Executive Board and results of these communications have to feed back to these bodies.

To attract the scientific community project presentations are planned at thematically-related conferences or at conference side-events. A respective standard presentation with the project logo and based on the project corporate design will be provided and a conference participation plan and strategy will be discussed at the first joint meeting of the Executive Board and the Administrative Steering Committee.

Besides contributions in reviewed open access journals, EUNADICS-AV seeks for an own special section in a suitable open access scientific journal. The project office will contact various journals in this respect and the related decision will be made in the Administrative Steering Committee

As EUNADICS -AV is heavily based on user-requirements in order to deploy useful project results, strong communication and co-production efforts are needed and put in place in work package 2 of EUNADICS-AV. Within these tasks, stakeholders are identified and their requirements are gathered by expert interviews and workshops as planned in Cologne in 2017 (at EASA premises). In general, some user groups will be addressed with particular emphasis. To approach the general public, EUNADICS-AV maintains an official project web-site (www.eunadics.eu) which provides general information on the project itself, its partners, actual news as well as project results after their completion. The public website will be continuously updated by KNMI as task leader after consultation with the project office and the project coordinator, shall offer brochures and information materials as press releases and, if possible a movie for download. The project consortium and project partners are motivated to cross-link their web pages with the EUNADICS-AV project web page in order to increase its relevance for search engines.

Press releases at specific events (e.g. the kick-off meeting) are planned and a standard press-release is provided by the project office and made available via the Redmine system in English for easy translation and adaptation by partners (to be used in their own country). Finally, the EUNADICS-AV assemblies shall not be closed events, but shall have segments to interact with data providers, users and policy makers as outlined in Section 5.3.

Any publicity, including presentations at conferences, seminars or any type of information or promotional material must specify that the project has received EC research funding and display the European emblem. All publications shall include the following statement: *The*

research leading to these results has received funding from the European Union's Horizon 2020 Research and Innovation Programme, under Grant Agreement no 723986'.

5.3 Meetings

A number of face-to-face meetings have already been fixed among the participating parties. Some of the proposed meetings are aligned with project relevant activities and e.g. aim at fostering the establishment of contacts also with regional stakeholders.

The following project meetings are planned:

- Kick off Meeting, November 2016, Vienna Austria
- Regular (monthly) Executive Board web-meetings
- Stakeholder Workshop, September 2017, Cologne, Germany
- back-to-back with stakeholder workshop 1st annual assembly,
- EUNADICS-AV Open Science Conference, June 2018, Rome, Italy
- back-to-back with EUNADICS-AV Open Science Conference midterm review meeting
- EUNADICS-AV user training, May 2019, De Bilt, Netherlands
- Final Assembly, October 2019, Paris or Toulouse at Meteo France

Further internal (progress) meetings will be scheduled based on the actual requirements of the respective teams and their task and WP leaders.

At the annual assemblies, all project participants will be informed about the actual state of the project according its content by the respective WP leaders and the coordinator will present the administrative and financial retrospect and outlook.

A meeting agenda will be issued 3 weeks prior to the meeting (in draft format and allowing partners to make contributions) and travel/accommodation details should be circulated by the host organisation 6-8 weeks in advance of meeting where possible.

Minutes will be issued within 2 weeks of each meeting and a final version will be available on Redmine.

5.4 Reporting

Over the course of the project, continuous as well as periodic reporting to the European Commission (EC) has to be provided via the ECAS participants' portal. Continuous reporting via deliverables are due by the dates given in table 3.2. Two formal periodic reports must be submitted to the European Commission. One will be due at the project mid-term stage (M18) and one at the concluding stage of the project (M36). These periodic reports mainly contain information about the project development and the financial expenditures. In both cases the coordinator and the project office will inform all parties about the required information and provide templates for their provision. In order to prove occurred costs and working activities a

H2020, regulation compliant Excel time sheet which records the actual working hours per task will be provided by the project office.

Concerning any reporting, WP leaders will be responsible to review and to provide the required information to the coordinator 6 weeks prior to the delivery deadline using the e-mail address eunadics-office@zamg.ac.at. The WP leaders themselves have to arrange their internal deadlines with the respective task leaders according to their schedules in order to accomplish this 6 weeks before submission deadline. The coordinator will review drafts of the project deliverables and issue recommendations for their improvement and approve the final version. If needed, the Executive Board will be consulted for recommendations at least two weeks before submission deadline. Approved reports will be uploaded to the participant's portal by the Coordinator assisted by the project office.

6. Risk and Quality management

Regarding risk management, a backup person in most of the participating party was assigned (compare table 2.1) to assure the continuity of the project. Missing backup persons will be defined in the progress of the project. A further list, which even indicates any working task member will be provided on Redmine. The consortium is also committed towards the creation of a family-friendly working environment, and the establishment of fair work-life balances. Furthermore, required research staff must be announced internationally with sufficient lead time. Regarding gender issues, the European-wide promotion of gender equality is supported unequivocally by the consortium, and gender issues will be dealt with by the coordinator and the Administrative Steering Committee as a matter of highest concern. All participating organisations have an adequate gender policy in place.

As EUNADICS-AV highly depends on data and stakeholder requirements, legal, privacy as well as ethical issues have to be considered. Chapter 7 will deal with the issue of data sharing. Concerning any ethical issues the coordinator will have the overall responsibility for the respective management and precaution measures. If any ethical issues arise on the WP level which have not been foreseen the respective parties are asked to contact the coordinator to solve this issue.

Especially concerning WP2, stakeholders will be informed about how their inputs from the interviews will be applied and how privacy issues are dealt with. For documentation reasons, such an information sheet has to be signed by the interviewer and the expert.

Regarding quality management, control, evaluation and corrective mechanisms and procedures have already been and will be furthermore installed at different levels. First of all, WP leaders have to monitor and evaluate the quality of the research performed. Based on regular meetings, the Executive Board will be continuously informed about the progress in each WP and about possible problems and will assist with recommendations. Furthermore, external experts (Mr. Dlugi, Ms. Arnold) are included in the quality monitoring of the project and will furthermore assure a demand-driven orientation of the provided results. Finally, the project coordinator will review all EUNADICS results before publishing and function as the

final quality assurance level. Templates for reports and reporting, aligned with the H2020 requirements, will be provided by the project office to standardise the level of quality. Besides, the project office will also gather and archive all provided reports, deliverables and related outputs of EUNADICS-AV. In close collaboration with the coordinator they will monitor the timely delivery of the documents according to the DOA and assure the upload to and communication with the EC.

Furthermore, the internal Redmine system will be used to track the project activity and set issues. There the WP leaders have to indicate the responsibility within each working task as well as state of completion given in percentage as shown in a pre-version phase in Fig. 6.1

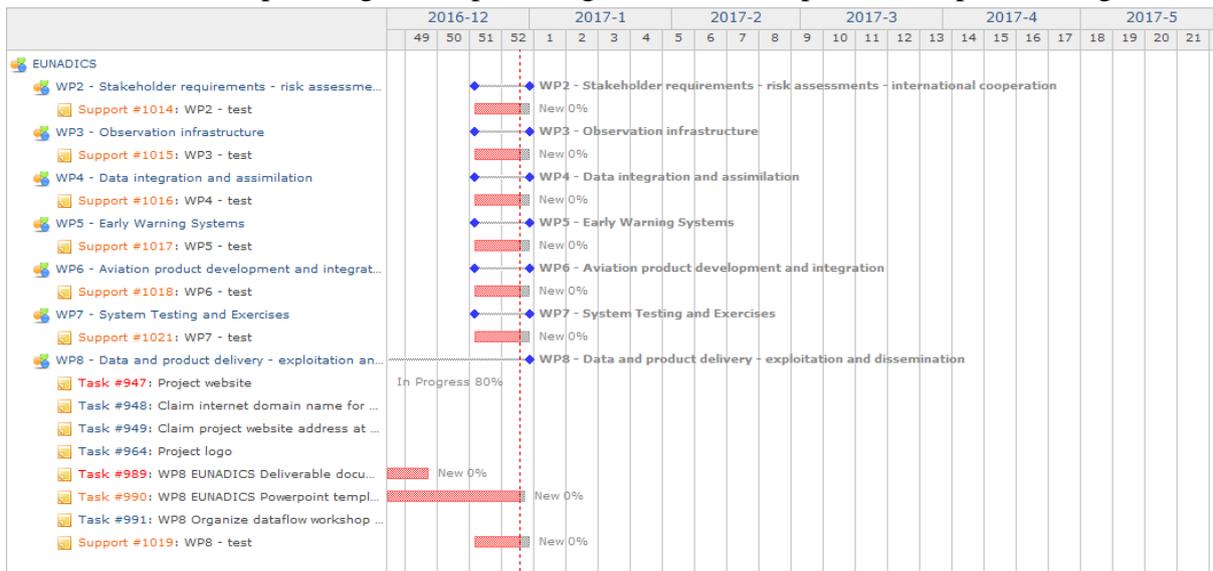


Figure 6.1 Test implementation of the activity tracking in the Redmine system.

7. Data Sharing Policy

In general, EUNADICS-AV has no ambitions to establish and operate a data centre, but it will connect to existing data centres. In this context, the project considers three different data sharing use cases:

- a) Sharing of EUNADICS data and products within the project
- b) Sharing of EUNADICS data and products with
 - a. Users
 - b. Scientific Community
 - c. General Public
- c) Sharing of third-party data.

The EUNADICS-AV data portal (Work Package 8) will be OGC-compliant (interoperability) and INSPIRE-compliant. All results will be disseminated also through existing channels, namely GEOSS and the WMO Information System (WIS).

7.1 Sharing of EUNADICS data and products within the project

Based on the consortium agreement, all partners will share data and information needed for project execution freely with other partners for the duration of the project. After the end of the project, certain restrictions may apply (see Annex 1 of the CA). For effective data exchange, all produced data will be based on well-defined standards (netCDF, CF convention; ISO 19115 INSPIRE for metadata, OPeNDAP/FTP as access protocols). CNR will provide input on an explicit CF convention defined (work in progress).

7.2 Sharing of EUNADICS data and products with users

In general, all formal EUNADICS-AV deliverables are public and thus accessible via the EUNADICS web page. Data and data analysis outputs produced during the project in the Work Packages 3 and 4 (non-real time) shall be available based on the principles of the COPERNICUS license (“free, full and open access to Data and Service Information without any express or implied warranty, including as regards quality and suitability for any purpose”). Near-real time early warning outputs (Work Package 5) and outputs produced for aviation (Work Package 6) will be freely available to defined users according to the conditions in the SLA, without any express or implied warranty, including as regards quality and suitability for any purpose. Non-real-time early warning and aviation products will be available based on the principles of the COPERNICUS license (“free, full and open access without any express or implied warranty, including as regards quality and suitability for any purpose”). Data and outputs produced during the exercises (Work Package 7) will be available based on the principles of the COPERNICUS license (“free, full and open access without any express or implied warranty, including as regards quality and suitability for any purpose”).

It is recognized that some data collected/produced may be considered as sensitive. The consortium undertakes to follow relevant guidelines and recommendations from the Commission and main stakeholders.

Information products suitable for the general public during emergency situations will be defined and developed.

7.3 Sharing of third party data

Agreements with third parties on data delivery/exchange shall be concluded, to the extent possible, according to the principles of free data exchange. Data ownership will remain with the data producers. In distributing such data, full reference to the data policy of data providers will be made.

