Please check our wiki for help on navigating the form.

Horizon 2020

Call: H2020-SPACE-2018-2020

(Space 2018-2020)

Topic: LC-SPACE-05-EO-2019

Type of action: CSA

Proposal number: 870468

Proposal acronym: NEURONE

Deadline Id: H2020-SPACE-2019

Table of contents

How to fill in the forms

The administrative forms must be filled in for each proposal using the templates available in the submission system. Some data fields in the administrative forms are pre-filled based on the steps in the submission wizard.

1 - General information

Topic	LC-SPACE-05-EO-2019	Type of Action	CSA
Call Identifier	H2020-SPACE-2018-2020	Deadline Id	H2020-SPACE-2019

Acronym	NEURONE
Proposal title	Next gEneration in-sitU data foR cOperNicus Evolution

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months	*30*
Free keywords	*Copernicus, Copernicus evolution, Copernicus Services, Copernicus Space Component, In-Situ data, Research Infrastructure, Gap Analysis, Inventory, In situ research infrastructure*

Abstract

In situ data is an important input for Copernicus data and information validation and quality enhancement. Furthermore, in situ data are of paramount importance for calibration and validation activities related to the Copernicus Space Component (CSC). A number of in situ infrastructures built by national or international programmes are capable of providing essential data to Copernicus. However, the operational use of the in-situ data by Copernicus and the CSC has not been fully exploited, mainly due to the fact that the in situ landscape is very complex and fragmented, encompassing a vast range of instrumentation, methodologies and operation principles to name a few. It is therefore vital to map the current State of Play of Copernicus requirements for in situ data and compare it to the existing in situ infrastructure landscape to define the gaps. At the same time, there is a need to record the current status of in situ data homogenization and interoperability, in order to design a future implementation of a unified observation system tailored to Copernicus needs.
In this context, the overarching objective of the proposed NEURONE project is to build upon the efforts of the European Environment Agency (EEA) to compile a comprehensive overview of the current state of play on in situ contributions to Copernicus, with a view on identifying and analysing the data-, governance-, technological- and sustainability- related challenges and gaps of the in situ infrastructures of Copernicus interest. This information will be utilized for constructing a roadmap for the evolution of the “Copernicus in situ Interface Layer”, a system to provide homogeneous and interoperable in situ observations for the validation and quality enhancement of Copernicus data and information in a cost-effective way.

Remaining characters 187

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under Horizon 2020 or any other EU programme(s)? ○ Yes ◉ No

Please give the proposal reference or contract number.	
xxxxxx-x	

Declarations

1) The coordinator declares to have the explicit consent of all applicants on their participation and on the content of this proposal.	☒
2) The information contained in this proposal is correct and complete.	☒
3) This proposal complies with ethical principles (including the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct).	☒

4) The coordinator confirms:

- to have carried out the self-check of the financial capacity of the organisation on http://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html or to be covered by a financial viability check in an EU project for the last closed financial year. Where the result was "weak" or "insufficient", the coordinator confirms being aware of the measures that may be imposed in accordance with the H2020 Grants Manual (Chapter on Financial capacity check); or	◉
- is exempt from the financial capacity check being a public body including international organisations, higher or secondary education establishment or a legal entity, whose viability is guaranteed by a Member State or associated country, as defined in the H2020 Grants Manual (Chapter on Financial capacity check); or	○
- as sole participant in the proposal is exempt from the financial capacity check.	○

5) The coordinator hereby declares that each applicant has confirmed:

- they are fully eligible in accordance with the criteria set out in the specific call for proposals; and	☒
- they have the financial and operational capacity to carry out the proposed action.	☒

The coordinator is only responsible for the correctness of the information relating to his/her own organisation. Each applicant remains responsible for the correctness of the information related to him and declared above. Where the proposal to be retained for EU funding, the coordinator and each beneficiary applicant will be required to present a formal declaration in this respect.

According to Article 131 of the Financial Regulation of 25 October 2012 on the financial rules applicable to the general budget of the Union (Official Journal L 298 of 26.10.2012, p. 1) and Article 145 of its Rules of Application (Official Journal L 362, 31.12.2012, p.1) applicants found guilty of misrepresentation may be subject to administrative and financial penalties under certain conditions.

Personal data protection

The assessment of your grant application will involve the collection and processing of personal data (such as your name, address and CV), which will be performed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. Unless indicated otherwise, your replies to the questions in this form and any personal data requested are required to assess your grant application in accordance with the specifications of the call for proposals and will be processed solely for that purpose. Details concerning the purposes and means of the processing of your personal data as well as information on how to exercise your rights are available in the privacy statement. Applicants may lodge a complaint about the processing of their personal data with the European Data Protection Supervisor at any time.

Your personal data may be registered in the Early Detection and Exclusion system of the European Commission (EDES), the new system established by the Commission to reinforce the protection of the Union's financial interests and to ensure sound financial management, in accordance with the provisions of articles 105a and 108 of the revised EU Financial Regulation (FR) (Regulation (EU, EURATOM) 2015/1929 of the European Parliament and of the Council of 28 October 2015 amending Regulation (EU, EURATOM) No 966/2012) and articles 143 - 144 of the corresponding Rules of Application (RAP) (COMMISSION DELEGATED REGULATION (EU) 2015/2462 of 30 October 2015 amending Delegated Regulation (EU) No 1268/2012) for more information see the Privacy statement for the EDES Database.

2 - Participants & contacts

#	Participant Legal Name	Country	Action
1	NATIONAL OBSERVATORY OF ATHENS	EL	
2	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	FR	
3	CONSIGLIO NAZIONALE DELLE RICERCHE	IT	
4	EUROGOOS	BE	
5	ILMATIETEEN LAITOS	FI	
6	BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION	ES	
7	EUROPEAN ASSOCIATION OF REMOTE SENSING COMPANIES	BE	
8	DRAXIS ENVIRONMENTAL S.A.	EL	
9	HELMHOLTZ-ZENTRUM FUR UMWELTFORSCHUNG GMBH - UFZ	DE	
10	UMWELTBUNDESAMT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG (UBA GMBH)	AT	
11	INTEGRATED CARBON OBSERVATION SYSTEM EUROPEAN RESEARCH INFRASTRUCTURECONSORTIUM	Finland	

2 - Administrative data of participating organisations

PIC	***Legal name***
999653677	*NATIONAL OBSERVATORY OF ATHENS*

Short name: NOA

Address of the organisation

Street LOFOS NYMFON

Town ATHINA

Postcode 11810

Country Greece

Webpage www.noa.gr

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....22/04/2008 - no

SME self-assessment ..... unknown

SME validation sme.....22/04/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: IAASARS ☐ not applicable

☐ Same as proposing organisation's address

Street: Vas. Pavlou & I. Metaxa

Town: Penteli

Postcode: 15236

Country: Greece

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Vassilis**

Last name: **AMIRIDIS**

E-Mail: **vamoir@noa.gr**

Position in org.: Research Director

Department: IAASARS ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Vas. Pavlou & I. Metaxa

Town: Penteli Post code: 15236

Country: Greece

Website: www.astro.noa.gr

Phone: +302 108109116 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Omiros	Giannakis	ogiannakis@noa.gr	*+302 108109130*

PIC	***Legal name***
999997930	*CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS*

Short name: CNRS

Address of the organisation

Street RUE MICHEL ANGE 3

Town PARIS

Postcode 75794

Country France

Webpage www.cnrs.fr

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....18/11/2008 - no

SME self-assessment ..... unknown

SME validation sme.....18/11/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Institut des Geosciences de l'Environnement ☐ not applicable

☒ Same as proposing organisation's address

Street: RUE MICHEL ANGE 3

Town: PARIS

Postcode: 75794

Country: France

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Paolo** Last name: **Laj**

E-Mail: **paolo.laj@univ-grenoble-alpes.fr**

Position in org.: Senior Scientist

Department: Institut des Geosciences de l'Environnement ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Cedex 9

Town: Grenoble Post code: CS 40700

Country: France

Website: http://www.cnrs.fr/

Phone: +xxx xxxxxxxxx Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Sabine	Philippin	s.philippin@opgc.univ-bpclermont.fr	+xxx xxxxxxxxx
Isabelle	Raynaud	a.spv-europe@dr11.cnrs.fr	+xxx xxxxxxxxx
Carole	Bienvenu	carole.bienvenu@univ-grenoble-alpes.fr	+xxx xxxxxxxxx

PIC	***Legal name***
999979500	*CONSIGLIO NAZIONALE DELLE RICERCHE*

Short name: CNR

Address of the organisation

Street PIAZZALE ALDO MORO 7

Town ROMA

Postcode 00185

Country Italy

Webpage www.cnr.it

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....18/05/2016 - no

SME self-assessment ..... unknown

SME validation sme.....05/12/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Istituto di Metodologie per l'Analisi Ambientale ☐ not applicable

☐ Same as proposing organisation's address

Street: C.da S. Loja

Town: Tito (PZ)

Postcode: 85050

Country: Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Lucia** Last name: **Mona**

E-Mail: **lucia.mona@imaa.cnr.it**

Position in org.: Researcher

Department: Istituto di Metodologie per l'Analisi Ambientale ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: C.da S. Loja

Town: Tito (PZ) Post code: 85050

Country: Italy

Website: www.imaa.cnr.it

Phone: +390 971427257 Phone 2: +xxx xxxxxxxxx Fax: +390 0971427271

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Gelsomina	Pappalardo	gelsomina.pappalardo@imaa.cnr.it	+390 971427265

PIC	***Legal name***
950397271	*EUROGOOS*

Short name: EUROPEAN GLOBAL OCEAN OBSERVING SYSTEM

Address of the organisation

Street AVENUE LOUISE 231

Town BRUXELLES

Postcode 1050

Country Belgium

Webpage http://eurogoos.eu

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status..... unknown

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

No department involved

Department name: *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street: *Please enter street name and number.*

Town: *Please enter the name of the town.*

Postcode: *Area code.*

Country: *Please select a country*

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Glenn** Last name: **Nolan**

E-Mail: **glenn.nolan@eurogoos.eu**

Position in org.: Secretary General and LEAR

Department: EUROGOOS ☒ Same as organisation name

☐ Same as proposing organisation's address

Street: AVENUE LOUISE 367

Town: Brussels Post code: 1050

Country: Belgium

Website: www.eurogoos.eu

Phone: +324 71529933 Phone 2: *+xxx xxxxxxxxx* Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Vicente	Fernandez	vicente.fernandez@eurogoos.eu	*+xxx xxxxxxxxx*

PIC	***Legal name***
999591306	*ILMATIETEEN LAITOS*

Short name: FMI

Address of the organisation

Street Erik Palmenin aukio 1

Town HELSINKI

Postcode 00560

Country Finland

Webpage www.fmi.fi

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status..... unknown

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Space and Earth Observation Centre ☐ not applicable

☐ Same as proposing organisation's address

Street: Erik Palmenin aukio 1

Town: Helsinki

Postcode: 00101

Country: Finland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Jouni** Last name: **Pulliainen**

E-Mail: **jouni.pulliainen@fmi.fi**

Position in org.: Research professor

Department: Space and Earth Observation Centre ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Erik Palmenin aukio 1

Town: Helsinki Post code: 00101

Country: Finland

Website: www.space.fmi.fi

Phone: +358 505895821 Phone 2: *+xxx xxxxxxxxx* Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Ali	Arslan	ali.nadir.arslan@fmi.fi	*+358 504629944*

PIC	***Legal name***
999655520	*BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION*

Short name: BSC

Address of the organisation

Street Calle Jordi Girona 31

Town BARCELONA

Postcode 08034

Country Spain

Webpage www.bsc.es

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....01/03/2005 - no

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Earth Sciences Department ☐ not applicable

☒ Same as proposing organisation's address

Street: Calle Jordi Girona 31

Town: BARCELONA

Postcode: 08034

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Carlos** Last name: **PEREZ GARCIA-PANDO**

E-Mail: **carlos.perez@bsc.es**

Position in org.: Atmospheric Composition Group Leader/AXA Prof. on Sand and Dust Storms

Department: Earth Sciences Department ☐ Same as organisation name

☒ Same as proposing organisation's address

Street: Calle Jordi Girona 31

Town: BARCELONA Post code: 08034

Country: Spain

Website: https://www.bsc.es/

Phone: +349 34137722 Phone 2: *+xxx xxxxxxxxx* Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Sara	BASART	sara.basart@bsc.es	*+349 34134038*
Francesco	BENINCASA	francesco.benincasa@bsc.es	*+xxx xxxxxxxxx*
Dorota	Jouet	dorota.jouet@bsc.es	*+349 34134082*

PIC	***Legal name***
952204478	*EUROPEAN ASSOCIATION OF REMOTE SENSING COMPANIES*

Short name: EARSC

Address of the organisation

Street RUE BERANGER 26

Town BRUXELLES

Postcode 1190

Country Belgium

Webpage www.earsc.org

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....01/06/1989 - no

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: European Association of Remote Sensing Companies ☐ not applicable

☒ Same as proposing organisation's address

Street: RUE BERANGER 26

Town: BRUXELLES

Postcode: 1190

Country: Belgium

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Rory** Last name: **Donnelly**

E-Mail: **rory.donnelly@earsc.org**

Position in org.: Business Manager

Department: EUROPEAN ASSOCIATION OF REMOTE SENSING COMPANIES ☒ Same as organisation name

☒ Same as proposing organisation's address

Street: RUE BERANGER 26

Town: BRUXELLES Post code: 1190

Country: Belgium

Website: www.earsc.org

Phone: +324 70793240 Phone 2: *+xxx xxxxxxxxx* Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Geoff	Sawyer	geoff.sawyer@earsc.org	*+xxx xxxxxxxxx*

PIC	***Legal name***
996151686	*DRAXIS ENVIRONMENTAL S.A.*

Short name: DRAXIS

Address of the organisation

Street THEMISTOKLI SOFOULI STR 54-56

Town THESSALONIKI

Postcode 54655

Country Greece

Webpage www.draxis.gr

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....no

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....yes

Enterprise Data

SME self-declared status.....31/12/2013 - yes

SME self-assessment .....31/12/2013 - yes

SME validation sme.....07/12/2000 - yes

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

No department involved

Department name: *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street: *Please enter street name and number.*

Town: *Please enter the name of the town.*

Postcode: *Area code.*

Country: *Please select a country*

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: ○ Male ◉ Female

First name: **Machi**

Last name: **Simeonidou**

E-Mail: **msimeonidou@draxis.gr**

Position in org.: Managing Director

Department: DRAXIS ENVIRONMENTAL S.A.

☒ Same as organisation name

☒ Same as proposing organisation's address

Street: THEMISTOKLI SOFOULI STR 54-56

Town: THESSALONIKI

Post code: 54655

Country: Greece

Website: www.draxis.gr

Phone: +302 310274566

Phone 2: *+xxx xxxxxxxxx*

Fax: +302 310 253819

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Christodoulos	Keratidis	keratidis.ch@draxis.gr	*+302 310274566*

PIC	***Legal name***
999994632	*HELMHOLTZ-ZENTRUM FUR UMWELTFORSCHUNG GMBH - UFZ*

Short name: UFZ

Address of the organisation

Street PERMOSERSTRASSE 15

Town LEIPZIG

Postcode 04318

Country Germany

Webpage www.ufz.de

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....29/09/2008 - no

SME self-assessment ..... unknown

SME validation sme.....29/09/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Department Monitoring and Exploration Technologies ☐ not applicable

☒ Same as proposing organisation's address

Street: PERMOSERSTRASSE 15

Town: LEIPZIG

Postcode: 04318

Country: Germany

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Michael** Last name: **Mirtl**

E-Mail: **michael.mirtl@ufz.de**

Position in org.: Chairman of LTER Europe / eLTER ESFRI Coordinator

Department: Department Monitoring and Exploration Technologies ☐ Same as organisation name

☒ Same as proposing organisation's address

Street: PERMOSERSTRASSE 15

Town: LEIPZIG Post code: 04318

Country: Germany

Website: https://www.ufz.de/index.php?en=34217

Phone: +493 412351281 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Annette	Schmidt	annette.schmidt@ufz.de	*+493 412351663*

PIC	***Legal name***
999452014	*UMWELTBUNDESAMT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG (UBA GMBH)*

Short name: EAA

Address of the organisation

Street SPITTELAUER LANDE 5

Town WIEN

Postcode 1090

Country Austria

Webpage www.umweltbundesamt.at

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....04/01/1999 - no

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Ecosystem Research and Environmental Information Management ☐ not applicable

☒ Same as proposing organisation's address

Street: SPITTELAUER LANDE 5

Town: WIEN

Postcode: 1090

Country: Austria

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Herbert** Last name: **Haubold**

E-Mail: **herbert.haubold@umweltbundesamt.at**

Position in org.: Senior Project Manager

Department: Ecosystem Research and Environmental Information Management ☐ Same as organisation name

☒ Same as proposing organisation's address

Street: SPITTELAUER LANDE 5

Town: WIEN Post code: 1090

Country: Austria

Website: www.umweltbundesamt.at

Phone: +431 313045910 Phone 2: *+xxx xxxxxxxxx* Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Johannes	Peterseil	johannes.peterseil@umweltbundesamt.at	*+431 313043443*
Andreas	Littkopf	andreas.littkopf@umweltbundesamt.at	*+431 313043371*

PIC	***Legal name***
922983713	*INTEGRATED CARBON OBSERVATION SYSTEM EUROPEAN RESEARCH INFRASTRUCTURECO*

Short name: ICOS ERIC

Address of the organisation

Street ERIK PALMENIN AUKIO 1

Town HELSINKI

Postcode 00560

Country Finland

Webpage www.icos-ri.eu

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status..... unknown

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Ecosystem Research and Environmental Information Management ☐ not applicable

☒ Same as proposing organisation's address

Street: ERIK PALMENIN AUKIO 1

Town: HELSINKI

Postcode: 00560

Country: Finland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Alex** Last name: **Vermeulen**

E-Mail: **alex.vermeulen@icos-ri.eu**

Position in org.: Director Carbon Portal

Department: Carbon Portal ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Sölvegatan 12

Town: Lund Post code: 22362

Country: Sweden

Website: https://www.icos-ri.eu

Phone: +462 2494214 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Jouni	Heiskanen	jouni.heiskanen@icos-ri.eu	+xxx xxxxxxxxx

3 - Budget

No	Participant	Country	(A) Direct personnel costs/€	(B) Other direct costs/€	(C) Direct costs of sub-contracting/€	(D) Direct costs of providing financial support to third parties/€	(E) Costs of inkind contributions not used on the beneficiary's premises/€	(F) Indirect Costs / € (=0.25(A+B-E))	(G) Special unit costs covering direct & indirect costs / €	(H) Total estimated eligible costs / € (=A+B+C+D+F+G)	(I) Reimburse-ment rate (%)	(J) Max.EU Contribution / € (=H*I)	(K) Requested EU Contribution/ €
1	National Observatory Of Athens	EL	294750	115000	0	0	0	102437,50	0	512187,50	100	512187,50	512187,50
2	Centre National De La Recherche	FR	210000	15000	0	0	0	56250,00	0	281250,00	100	281250,00	281250,00
3	Consiglio Nazionale Delle Ricerche	IT	180000	15000	0	0	0	48750,00	0	243750,00	100	243750,00	243750,00
4	Eurogoos	BE	184500	15000	0	0	0	49875,00	0	249375,00	100	249375,00	249375,00
5	Ilmatieteen Laitos	FI	80640	10000	0	0	0	22660,00	0	113300,00	100	113300,00	113300,00
6	Barcelona Supercomputing Center -	ES	108000	5000	0	0	0	28250,00	0	141250,00	100	141250,00	141250,00
7	European Association Of Remote	BE	40800	6000	0	0	0	11700,00	0	58500,00	100	58500,00	58500,00
8	Draxis Environmental S.a.	EL	139500	15000	0	0	0	38625,00	0	193125,00	100	193125,00	193125,00
9	Helmholtz-zentrum Fur Umweltforschu	DE	16065	2000	0	0	0	4516,25	0	22581,25	100	22581,25	22581,25
10	Umweltbundesamt Gesellschaft	AT	62100	9000	0	0	0	17775,00	0	88875,00	100	88875,00	88875,00

11	Integrated Carbon Observation	FI	64000	10000	0	0	0	18500,00	0	92500,00	100	92500,00	92500,00
	Total		1380355	217000	0	0	0	399338,75	0	1996693,75		1996693,75	1996693,75

4 - Ethics

1. HUMAN EMBRYOS/FOETUSES		Page
Does your research involve Human Embryonic Stem Cells (hESCs)?	○ Yes ◉ No	
Does your research involve the use of human embryos?	○ Yes ◉ No	
Does your research involve the use of human foetal tissues / cells?	○ Yes ◉ No	
2. HUMANS		**Page**
Does your research involve human participants?	○ Yes ◉ No	
Does your research involve physical interventions on the study participants?	○ Yes ◉ No	
3. HUMAN CELLS / TISSUES		**Page**
Does your research involve human cells or tissues (other than from Human Embryos/ Foetuses, i.e. section 1)?	○ Yes ◉ No	
4. PERSONAL DATA		**Page**
Does your research involve personal data collection and/or processing?	○ Yes ◉ No	
Does your research involve further processing of previously collected personal data (secondary use)?	○ Yes ◉ No	
5. ANIMALS		**Page**
Does your research involve animals?	○ Yes ◉ No	
6. THIRD COUNTRIES		**Page**
In case non-EU countries are involved, do the research related activities undertaken in these countries raise potential ethics issues?	○ Yes ◉ No	
Do you plan to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?	○ Yes ◉ No	
Do you plan to import any material - including personal data - from non-EU countries into the EU?	○ Yes ◉ No	
Do you plan to export any material - including personal data - from the EU to non-EU countries?	○ Yes ◉ No	
In case your research involves low and/or lower middle income countries, are any benefits-sharing actions planned?	○ Yes ◉ No	
Could the situation in the country put the individuals taking part in the research at risk?	○ Yes ◉ No	

7. ENVIRONMENT & HEALTH and SAFETY		Page
Does your research involve the use of elements that may cause harm to the environment, to animals or plants?	○ Yes ◉ No	
Does your research deal with endangered fauna and/or flora and/or protected areas?	○ Yes ◉ No	
Does your research involve the use of elements that may cause harm to humans, including research staff?	○ Yes ◉ No	
8. DUAL USE		**Page**
Does your research involve dual-use items in the sense of Regulation 428/2009, or other items for which an authorisation is required?	○ Yes ◉ No	
9. EXCLUSIVE FOCUS ON CIVIL APPLICATIONS		**Page**
Could your research raise concerns regarding the exclusive focus on civil applications?	○ Yes ◉ No	
10. MISUSE		**Page**
Does your research have the potential for misuse of research results?	○ Yes ◉ No	
11. OTHER ETHICS ISSUES		**Page**
Are there any other ethics issues that should be taken into consideration? Please specify	○ Yes ◉ No	

I confirm that I have taken into account all ethics issues described above and that, if any ethics issues apply, I will complete the ethics self-assessment and attach the required documents. ☒

How to Complete your Ethics Self-Assessment

5 - Call-specific questions

Extended Open Research Data Pilot in Horizon 2020

If selected, applicants will by default participate in the Pilot on Open Research Data in Horizon 2020[1] , which aims to improve and maximise access to and re-use of research data generated by actions.

However, participation in the Pilot is flexible in the sense that it does not mean that all research data needs to be open. After the action has started, participants will formulate a Data Management Plan (DMP), which should address the relevant aspects of making data FAIR – findable, accessible, interoperable and re-usable, including what data the project will generate, whether and how it will be made accessible for verification and re-use, and how it will be curated and preserved. Through this DMP projects can define certain datasets to remain closed according to the principle "as open as possible, as closed as necessary". A Data Management Plan does not have to be submitted at the proposal stage.

Furthermore, applicants also have the possibility to opt out of this Pilot completely at any stage (before or after the grant signature). In this case, applicants must indicate a reason for this choice (see options below).

Please note that participation in this Pilot does not constitute part of the evaluation process. Proposals will not be penalised for opting out.

We wish to opt out of the Pilot on Open Research Data in Horizon 2020.	○ Yes	◉ No

Further guidance on open access and research data management is available on the participant portal: http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-dissemination_en.htm and in general annex L of the Work Programme.

[1] *According to article 43.2 of Regulation (EU) No 1290/2013 of the European Parliament and of the Council, of 11 December 2013, laying down the rules for participation and dissemination in "Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)" and repealing Regulation (EC) No 1906/2006.*

NEURONE: Next gEneration in sitU data foR cOperNicus Evolution

Technical Annex 1-3

ID	Participant Organisation Name	Country	Logo
1	**NATIONAL OBSERVATORY OF ATHENS (NOA) – Coordinator**	EL (Greece)	
2	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (**CNRS**)	FR (France)	
3	CONSIGLIO NAZIONALE DELLE RICERCHE (**CNR**)	IT (Italy)	
4	EUROPEAN GLOBAL OCEAN OBSERVING SYSTEM (**EuroGOOS**)	BE (Belgium)	
5	ILMATIETEEN LAITOS (**FMI**)	FI (Finland)	
6	BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION (**BSC**)	ES (Spain)	
7	EUROPEAN ASSOCIATION OF REMOTE SENSING COMPANIES (**EARSC**)	BE (Belgium)	
8	DRAXIS ENVIRONMENTAL S.A. (**DRAXIS**)	EL (Greece)	
9	HELMHOLTZ-ZENTRUM FUR UMWELTFORSCHUNG GMBH (**UFZ**)	DE (Germany)	
10	UMWELTBUNDESAMT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG (**EAA**)	AT (Austria)	
11	INTEGRATED CARBON OBSERVATION SYSTEM EUROPEAN RESEARCH INFRASTRUCTURECONSORTIUM (**ICOS ERIC**)	FI (Finland)	

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1. EXCELLENCE

1.1 CONTEXT AND MOTIVATION

In situ data is an important input for Copernicus Services (CSs) generation and quality enhancement through model initialisation and assimilation. Furthermore, in situ data are of paramount importance for calibration and validation (CalVal) activities related to the Copernicus Space Component (CSC). Finally, in situ data are essential to develop and improve processing algorithms, to align satellite observations with reference measurements of known accuracy, to provide corrections and to confirm that the Copernicus data and information meet the requirements and user needs.

A number of in situ Research Infrastructures (RIs) built by national or international programmes are capable of providing essential in situ data to Copernicus. However, the operational use of the in situ data by CS and CSC has not been fully exploited, mainly due to the fact that the in situ landscape is very complex and fragmented, encompassing a vast range of instrumentation, methodologies and operation principles to name a few. To facilitate the operational provision of cross-cutting in situ data to Copernicus, the EC has mandated the European Environment Agency (EEA) to monitor the Copernicus-related in situ landscape, also called "Copernicus in situ Component". The Copernicus In Situ Component maps the landscape of in situ data availability, identifies data access gaps and manages partnerships with data providers to improve access and use conditions.

Several activities in the Copernicus In Situ Component with the EEA have concluded to two reports on the "State of Play" (December 2017, July 2018), where the requirements for in situ data have been recorded and comparisons to existing observation system have been implemented to define the gaps. It is vital to continue this effort towards re-mapping the current state of play of Copernicus in situ data requirements, to compare it to the existing in situ landscape and re-define the gaps. At the same time, there is a need to record the current status of in situ data homogenization and interoperability, in order to design a future implementation of a unified observation system tailored to Copernicus needs. This establishment is difficult due to the fact that the Copernicus-tailored in situ "observing system" cannot be designed from scratch but has to be integrated from a collection of disparate RIs and National and International observing programs, each with different goals, methods and governance. As a result, much of the work in designing an integrated observing system addressing Copernicus' needs involves ensuring that these existing programs and products can be homogenized and integrated coherently into a holistic system that is fit-for-purpose and cost-effective.

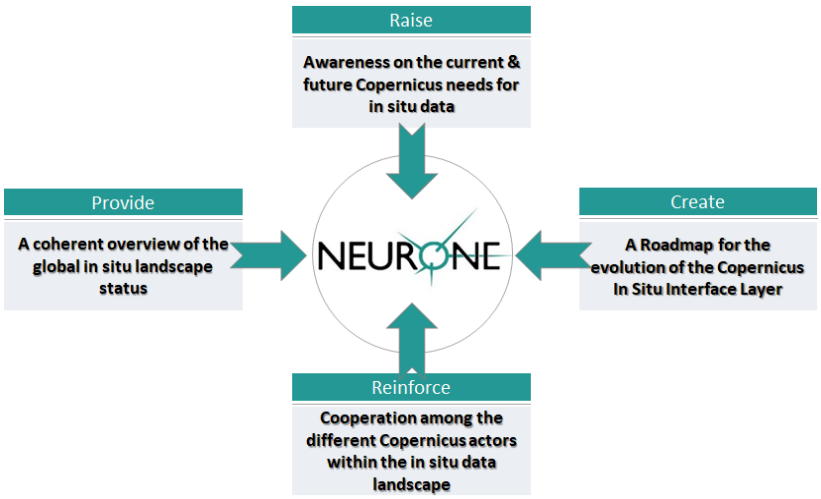

Figure 1: NEURONE aspiration

In this context, the overarching objective of the proposed NEURONE project is to build upon EEA efforts to compile a comprehensive overview of the current state of play on in situ contributions to Copernicus, with a view on identifying and analysing the data-, governance-, technological- and sustainability- related challenges and gaps of the in situ infrastructures of Copernicus interest.

This information will be utilized for constructing a roadmap for the evolution of the "Copernicus in situ Interface Layer", a system to provide homogeneous and interoperable in situ observations for the validation and quality enhancement of Copernicus data and information in a cost-effective way.

1.2 OBJECTIVES

In view of the overarching objective of NEURONE and in order to meet the expected impacts specified by the Call, NEURONE has defined five (5) key objectives that will govern the respective activities carried out in the project:

O1 **To map the present and future Copernicus requirements for in situ data**

NEURONE aims to perform a detailed requirement mapping process across the CSs and CSC, in order to build the baseline of the required in situ data contributions to Copernicus. The baseline will acknowledge previous EEA efforts and activities (including reports) and will be updated through a direct interaction and consultation with the Entrusted Entities of the CSs and the CSC. The expected evolution of the Copernicus in situ requirements will be discussed and outlined as well.

O2 **To provide a coherent status overview of the in situ infrastructures of Copernicus interest**

Based on the Copernicus requirements, NEURONE will map the in situ infrastructures of interest at a global level, to identify data gaps and shortcomings, including aspects on quality, access, standardization and timeliness of data delivery. NEURONE will use as a starting point the information available within the ENVRI community and the outcomes of the ENVRIplus project, while co-located NEURONE-ENVRI-FAIR scheduled meetings will increase the interaction with European RIs. Liaison with WMO and EUMETNET will provide NEURONE links to National and International in situ programs and networks of relevance *(see letter of support from EUMETNET)*. Finally, NEURONE will integrate catalogues of in situ data from GEO-related projects *(using resources from the Greek GEO Office operating at NOA)*.

O3 **To assess the sustainability of the in situ observing systems and define their maturity for operational and cost-effective Copernicus product validation and quality enhancement**

The sustainability and maturity of the in situ component is of high importance for the long-term operational needs of Copernicus. NEURONE aims to re-open the dialogue within the in situ communities to gather information on the specific needs and related costs for long-term maintenance and operation. Issues related to the gaps and maturity of the identified infrastructures for Copernicus product validation and quality enhancement will be assessed and recorded.

O4 **To propose a roadmap for the evolution of the "Copernicus in situ interface layer"**

Special focus will be placed on drafting a roadmap for the evolution of the "Copernicus in situ interface layer", an interface layer that will be defined in NEURONE to make in situ data operationally available and accessible to Copernicus users and operators so as to ensure the operational and cost-effective Copernicus product validation and quality enhancement. Guidelines and best practices on interoperability will be taken into account to construct a conceptual design for the interface layer (starting from the ENVRI Reference Model and international associations such as the Research Data Alliance). NEURONE will seek for synergies within the existing e-infrastructure landscape to define the appropriate IT solutions for the interface layer (e.g. GEANT, EOSC, HPC, DIAS, *see also the letter of support from EOSC-Hub*).

O5 **To facilitate the dynamic and continuous osmosis of the Copernicus in situ stakeholders ecosystem**

NEURONE aims to act as a catalyst towards reinforcing the cooperation among different Copernicus actors, including but not limited to the Entrusted Entities, the in situ infrastructure communities and the CSC. To that extent, the project aspires to establish an ecosystem consisting of the NEURONE "Advisory" and "Copernicus Consultation" Boards and foster fruitful discussions and synergies. The information content outcome of the cooperation among different Copernicus actors in NEURONE will be recorded and archived in the "NEURONE Knowledge Hub", a place that will integrate the NEURONE in situ metadata and project's outcomes in terms of roadmaps and reports, to sustain the NEURONE legacy after the project's end. To multiply the effects of NEURONE activities, a detailed Dissemination, Communication, Exploitation and Engagement strategy will be deployed *(described in section 2.2)* aiming to maximise the project reach, while at the same time facilitate creative dialogue within the NEURONE led and participating events.

1.3 RELATION TO THE WORK PROGRAMME

NEURONE is addressing the H2020 Work Programme *"5.iii. Leadership in Enabling and Industrial Technologies - Space"* and more specifically the call "LC-*SPACE-05-EO-2019: Copernicus evolution –a gap analysis to prepare future activities for Copernicus data and information validation and quality enhancement*". The work proposed within NEURONE aims to fulfil the overarching scope of the call, i.e. "***to devise a sustainable and cost-effective Copernicus products validation framework capable of meeting present and future requirements for data and information validation and quality enhancement delivered by Copernicus services and Space Component***". This specific challenge of the topic, as well as other requirements indicated in the Call, are analysed below on the basis of NEURONE's proposed solutions on how to address them.

"Specific Challenge: … it is mandatory to map the Copernicus requirements for in situ data and compare it to the existing observation system to find gaps"

NEURONE brings together several key partners with strong expertise in the field of Earth Observations and Research Infrastructures with different expertise in relation to Space and in situ Copernicus Components. The NEURONE consortium has conducted in the past a coherent overview[1,2] of the State of Play of the in situ infrastructures for Copernicus, including several recommendations that needed immediate attention. Building upon this previous experience and expertise, NEURONE has structured a detailed work plan to address the Call's specific challenges and deploy an extensive scan of the in situ landscape for identifying the appropriate infrastructures for use in Copernicus, followed by a deep analysis of findings, towards the definition of gaps and shortcomings for the development of future roadmaps *(more details in the Implementation section)*.

"The proposal should take into account the on-going activities in the Copernicus in situ component with the European Environmental Agency (EEA) as the Entity entrusted by the European Commission to coordinate and develop this fundamental Copernicus component[3]"

NEURONE will build upon past and ongoing work of the EEA and will seek the close collaboration with the Agency. NEURONE's partners have proven evidence of previous collaboration with EEA that NEURONE will capitalise upon to ensure the successful completion of envisioned activities. NEURONE consortium includes partners that are core members of the ENVRI Community of Environmental Research Infrastructures (e.g. ICOS, EuroGOOS, CNRS, CNR, FMI), that have closely collaborated with EEA in accomplishing the "Lot 1 In Situ Observations, State of Play Report", but also with GEO for the requirements within the GEO User Needs and Gaps Foundational Task. NEURONE will invite EEA representatives to participate in the Advisory Board to facilitate valuable exchange of ideas and knowledge *(as an EU Agency, EEA cannot be included in the Advisory Board prior of the acceptance of any proposal)*. Moreover, the beneficiary EAA (Environment Agency Austria) is a member of the EIONET and cooperates with the EEA on an operational regular basis. Importantly, EAA coordinates the ETC/ULS which is strongly involved in the production of the Copernicus Land Monitoring Service and thus provides pertinent in-depth knowledge. Finally, NOA and FMI will liaise with GEO through the Greek GEO Office to ensure the global perspective of NEURONE and enhance the collaboration with national and international networks as well as with regions where limited or no information is available, such as Middle East, North Africa and the Balkans (e.g. GEO-CRADLE NOA project).

"Proposals are expected to integrate relevant and knowledgeable actors from at least the four core domains covered by this topic: Copernicus services; Copernicus space data providers; In situ national and European (research-) infrastructures; European e-infrastructures… Participation of industry, SMEs…. Involvement of post-graduate scientists, engineers, researchers is encouraged"

The NEURONE consortium secures the participation of and links with all four core domains mentioned in the Call. The Copernicus services are strongly associated to the project through the participation of key persons in the "Copernicus Consultation Board" *(CAMS, EMS and CLMS have provided LoS and more will be integrated if NEURONE will be accepted for implementation)*. The Entrusted Entities have been conducted by NEURONE and agreed at a first place to provide their requirements for in situ observations and make themselves available for interviews and for participating in the workshops, so as to efficiently exchange ideas and provide the needs. Moreover, both

[1] EEA/IDM/15/026/LOT1, Lot 1 In situ - Observations, State of Play Report

[2] GEO Foundational task GEOSS In Situ Earth Observation Resources https://www.earthobservations.org/activity.php?id=134

[3] https://insitu.copernicus.eu/library/reports/ResearchInfrastructuresandCopernicusFinalversionNov2017.pdf

European Space Agencies agreed to participate in NEURONE's Advisory Board and to join the scheduled workshops in order to provide their needs for satellite CalVal activities and Fiducial Reference Measurements *(see letters of support from ESA, EUMETSAT)*. The main body of the NEURONE consortium is consisted by representatives from European Research Infrastructures that also participate in ENVRI (*ICOS, FMI, CNR, CNRS, EuroGOOS, eLTER (represented by EAA and UFZ)*). The ENVRI community along with the ENVRI-FAIR project will be the NEURONE gateway to National organisations but also European countries and International collaborating networks, thus ensuring that all in situ information will be appropriately gathered. WMO, EUMETNET and GEO liaison by the Greek GEO Office will contribute to this cause as well. NEURONE will adopt good practices followed in ENVRIplus as a starting point for establishing design frameworks to address the need for interoperable services for topics as identification, citation, curation, provenance and cataloguing of in situ data. Finally, the European e-infrastructures are represented in NEURONE through the participation of the Barcelona Supercomputing Centre (BSC), a partner with strong links to HPC, GÉANT, EOSC and DIAS. BSC will be responsible for designing the concept of the proposed interface from RIs to Copernicus, in close coordination with the development in the ENVRI-FAIR project, using the consultation of the EGI, EUDAT and EOSC-hub members of the NEURONE Advisory Board *(see letter of support from EOSC-hub),* including lessons learned from the Open Information Linking effort in ENVRIplus (Oil-E) and the Copernicus In Situ Component Information System (CIS^2). The remote sensing industry and SMEs are represented in NEURONE through the participation of EARSC, while the Copernicus Academy and Relays Office in Greece will provide a getaway to the CopHub Copernicus Academy Hub of Knowledge, to maximize the NEURONE communication with the European Academia *(see also the "Consortium as a Whole" description)*.

1.4 Concept and Approach, Quality of the Coordination and Support Measures

The overall concept of NEURONE is directly tied with and driven by the expected impacts described in the Call. At the core of the proposed activities lies the establishment of a coordination network that will foster the better exploitation of the in situ data and the evolution of the in situ infrastructures towards an operational part of the Copernicus In Situ Component, to converge on the so-called in NEURONE: "Copernicus in situ interface layer".

VISION	**To pave the way for the development of a future "Copernicus in situ interface layer" to collect and provide homogeneous and interoperable in situ observations for the validation and quality enhancement of Copernicus data and information in a cost-effective way.**
MISION	**To provide a comprehensive overview of the current State of Play on in situ contributions to Copernicus, with a view on identifying and analyzing data gaps, governance and sustainability issues of the current in situ infrastructures at national and global level.**
CONCEPT	**Build a wide NEURONE ecosystem to reinforce cooperation among the different Copernicus actors and the in situ landscape and raise awareness on the current and future Copernicus needs for in situ data.**

1.4.1 Main pillars that underpin the NEURONE concept

The NEURONE concept highlights four principles that serve as the key pillars underpinning the development, the implementation and the sustainability of the NEURONE outcomes. In more detail:

Pillar 1

The first pillar of NEURONE will be the **continuous exploitation of synergies and cross-fertilisation (P1)** at several levels such as:

- Lessons learned and best practices from past and ongoing projects and initiatives. At a first place, this will be pursued internally, i.e. through the experience of several partners who play instrumental roles in key relevant

initiatives (e.g. ICOS, NOA, CNRS, CNR, EuroGOOS). NEURONE partners have been extensively involved in such initiatives and will be the catalysts for the development of synergies.

- Alignment with Copernicus and ENVRI priorities/visions: NEURONE has been conceptualized in close relation to the overarching strategic objectives of the aforementioned priorities.
- NEURONE will strongly connect with key international initiatives such as GEO and large European projects (e.g. EOSC-hub, Next-GEOSS, EuroGEOSS, ENVRI-FAIR) to provide a comprehensive mapping process and gap analysis.

Pillar 2

The second pillar of NEURONE is its **impact-driven methodology (P2),** conceptualised in a way that allows (1) addressing the expected impacts of the Call; (2) allowing concrete assessment of the effectiveness of the activities within the lifespan of the project; (3) ensuring that the proper actions for maximization of the impact in terms of reach and depth are taken; (4) providing recommendations for the assessment (and boost) of long-term impacts.

Pillar 3

NEURONE has been shaped combining a **top-down and a bottom-up approach (P3)**. This entails accounting the Copernicus evolution strategy for the in situ infrastructures' improvement and expansion (top-down), but also fostering the coordination of the in situ activities and their linkage to the greater strategic view of Copernicus (bottom-up).

Pillar 4

NEURONE is conceptualised not as a "one-off" project but rather as an **initiative that will have a lasting and sustainable effect (P4)**. NEURONE will initiate discussions on short- and long-term evolution of the **Copernicus in situ interface layer**, delivering roadmaps for sustainable and cost-effective solutions.

1.4.2 Overall approach

Project coordination and management (**WP1**) will be slightly more sophisticated than typical H2020 projects, to cope with the diversity and complexity of the NEURONE ecosystem involved. Therefore, the project coordination will be assisted by a **Project Liaison** (**Task 1.2**) mechanism, which will: (i) build concrete bridges with the relevant projects and initiatives; (ii) establish and maintain an effective liaison network in the Copernicus, GEO, WMO, EUMETNET communities to name a few; (iii) ensure that the project's activities and outcomes are in line with EC.

The activities of NEURONE, extending over a period of **30 months**, will start with **mapping the Copernicus requirements and inventorying the current state of the in situ infrastructures (WP2)** that includes:

- **Mapping of current and future in situ data requirements of the Copernicus Services and Copernicus Space Component (CSC) (Task 2.1)**, building on top of previous reports and utilising the knowledge baseline provided respectively by NEURONE's Copernicus Consultation Board (CCB) and Space Component (also members of the Advisory Board-AB).
- **Mapping of the global in situ infrastructures of value for Copernicus (Task 2.2)** by establishing a thorough inventory of the in situ observations, including currently available and (to be) accessible data.
- **Recording good practices and definitions from on-going projects between the Entrusted Entities and the in situ infrastructures (Task 2.3)**, including CalVal activities and good examples of Fiducial Reference Measurements, as well as ITT studies launched/run by the entrusted entities.
- **Recording the available solutions provided by the e-infrastructures (Task 2.4)** and are fit-for-purpose for the Copernicus in situ interface layer future development

The in situ infrastructures' mapping will be carried out starting from exploiting, consolidating and extending the information from available in situ metadata databases (available e.g. by EEA, ICOS and EuroGOOS), while applying specific focus on highlighting interoperability and complementarity of the different items. The analysis of the current and future Copernicus requirements will be spearheaded by EuroGOOS, ICOS and NOA, who have a concrete mandate of bridging the different stakeholder communities (end-users, policy makers, service providers, scientists), while the CSC requirements and needs will be organized by CNR and NOA.

The outputs of the activities performed within WP2 will enable the execution of an in-depth **gap analysis** (**Task 3.1)** of the existing in situ infrastructures and capacities, vis-à-vis the needs of Copernicus. This gap analysis will serve as a guideline for the elaboration of appropriate **Maturity Indicators for the in situ infrastructures (Task 3.2)**, that will allow to capture the level and measure the progress of each infrastructure involvement, in relation to the Copernicus vision and the potential for in situ data exploitation in an operational environment. This potential ranges from direct off-the-shelf solutions, to assets that need to be further developed through new activities. In order for the in situ component to be able to attract more contributors through Copernicus, mapping the "in situ infrastructure maturity" in each thematic area seems an imperative and a first step for establishing the right channels and best practices exchange between stakeholders. Based on the results of the gap analysis and through the elaboration of the maturity indicators, NEURONE will set forth to identify the **in situ infrastructures' priorities and needs for Copernicus (Task 3.3)**. CNR will have the lead of this WP, due to the Institute's wide-range of applications and links to ENVRI and Copernicus.

The outputs of the gap analysis and the corresponding priorities specified in WP3, will allow the elaboration of a **Roadmap for the evolution of in situ infrastructures as a Copernicus in situ interface layer (Task 4.1),** while along with the information collected in WP2, the **IT requirements for the Copernicus in situ interface layer (Task 4.2)** for this future development will be defined. WP4 aims at providing the necessary conceptual design for the future establishment of a sustainable Copernicus in situ interface layer, that will benefit CSs and CSC across all domains. CNRS has the previous expertise with EEA, ENVRI and Copernicus to lead this WP with the contribution of the consortium and strong input on e-infrastructures by BSC and ICOS as lead in ENVRI-FAIR work-package on development of the common data services of the ENVRI RIs.

Communication, dissemination and engagement (WP5) are of paramount importance to enable the maximisation of the impact of NEURONE activities. To that end, the project will define and implement a concrete communication strategy, entailing the development of several communication tools tailored to corresponding audiences. It will also actively pursue the dissemination of the project's results to the targeted communities, through the active participation in workshops (e.g. ENVRI-FAIR, Copernicus Fora, etc., a preliminary list of events is included in **section 2.2**). The wider engagement of the different stakeholders, including policy makers, end-users, monitoring network operators, data and service providers is not only one of the main objectives of NEURONE but also key enabler for the success of its activities. The effectiveness of the stakeholder engagement activities will be also supported by the liaison activities in WP1 and the contributions of the NEURONE Advisory and Copernicus Consultation Board members.

Achieving and delivering the NEURONE ecosystem is a key objective of the project and towards that objective NEURONE will perform its outmost to foster interaction, synergies and fruitful dialogue, to enable the transformation of NEURONE outcomes in meaningful and actionable impact. The NEURONE ecosystem will be supported by **Task 1.2 Project Liaison (WP1) and** through **the NEURONE Dissemination, Communication, Events & Engagement activities (Task 5.3)** activities, pursued via the involvement of "super-connectors" including the EEA, ENVRI and the Copernicus Consultation Board (LoS), data providers and the CSC represented by ESA and EUMETSAT in NEURONE's Advisory Board.

Furthermore, NEURONE aspires to have a long-lasting effect even beyond its lifetime **(WP6)**, stimulating the development and further uptake of Copernicus operational services to meet the future user needs and capacities. In that frame, the **NEURONE's Legacy work package (WP6)** has a bi-fold aim a) to ensure the sustainability of EURONE through the setup of **the NEURONE Knowledge Hub (Task 6.1)** and b) by performing **Task 6.2 Connecting NEURONE to the SMEs/Market** where connections of NEURONE with SME's- downstream application developers and the market is foreseen (ensuring that the needed in situ data for the downstream market is included in roadmap preparations).

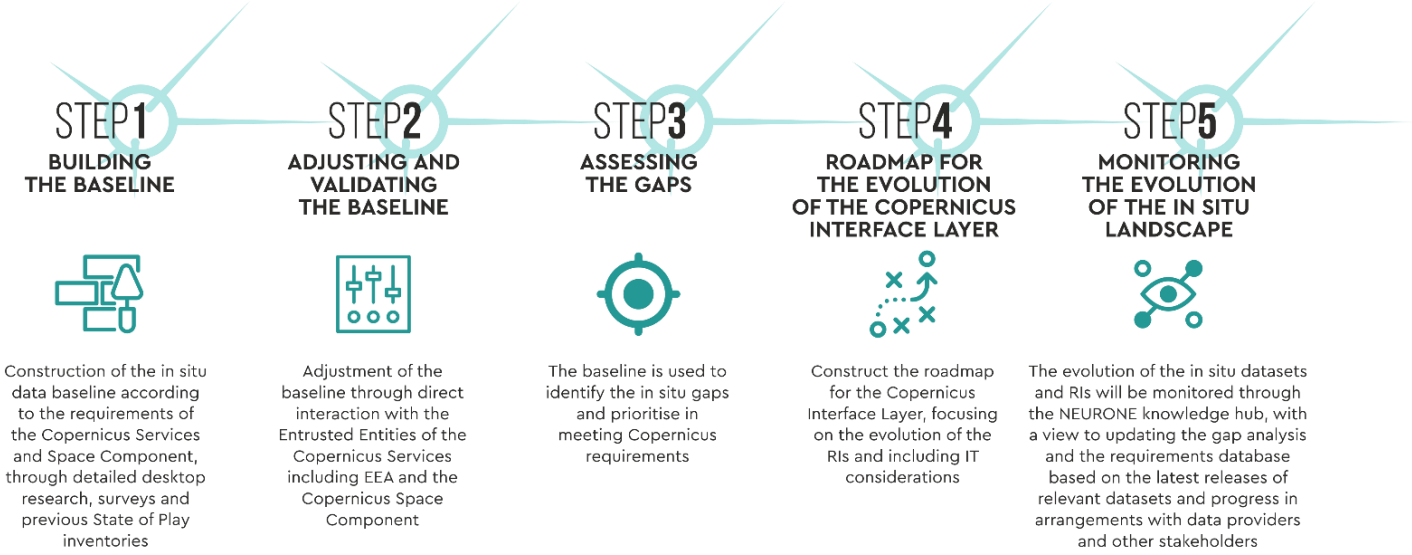

Figure 2: The NEURONE methodological approach

The successful establishment and value of the **NEURONE ecosystem** is on one hand ensured through the active and meaningful participation/involvement of the consortium members bringing to the table major competencies, representations and their own networks of actors:

- NOA will liaise with GEO through the Greek GEO Office and EAA (which is a member of the GEO In Situ Foundational Task)
- CNR, ICOS and CNRS will ensure the connection with ENVRI and ENVRI-FAIR
- ESA and EUMETSAT will involve the Copernicus Space Component
- Representatives from the Copernicus Entrusted Entities will engage the Copernicus Services developers
- A clear link to the EEA is established through EAA which coordinates the ETC/ULS and is an EIONET-member
- BSC will connect to e-infrastructures and experts from DIAS, EOSC, HPC and GEANT
- EARSC will guarantee the representation of the EO downstream service providers community and SMEs

and on the other hand, by delivering and providing a common **"Knowledge sharing place" within the Knowledge Hub,** where experienced actors provide a holistic view of the current environment. In total, NEURONE manages to cover the whole global supply chain of in situ data generation/utilisation, starting from RI's, to Copernicus services and up to the end-users of those data/models and SMEs.

By facilitating constructive discussions and feedback within its ecosystem and the Knowledge Hub, NEURONE will enable to showcase the added value and effectiveness of NEURONE activities and **will be the value multiplying factor of NEURONE's legacy.**

Last, but not least, in view of further supporting and promoting the sustainability of the project, NEURONE will also define and implement an **exploitation and IPR (Task 6.3)** strategy, inspired by the ambition of the project and taking into account IPR considerations.

In total, NEURONE aspires to showcase where in situ current gaps are, what improvements can and shall be made, while at the same time to pave the way for improved RIs and even more quality-enhanced Copernicus Services.

1.4.3 The NEURONE ecosystem

NEURONE will bring together the Copernicus stakeholders and the CSC with in situ infrastructures and EEA. ENVRI will play a vital role on connecting NEURONE to the European RI landscape, while GEO, WMO and EUMETNET will boost reaching national and international in situ infrastructures and related actors. Connections with the Copernicus downstream service developers are also an essential part of the NEURONE ecosystem (SMEs, EARSC). Links with academia and industry will be established through the Copernicus Academy & Relays networks respectively.

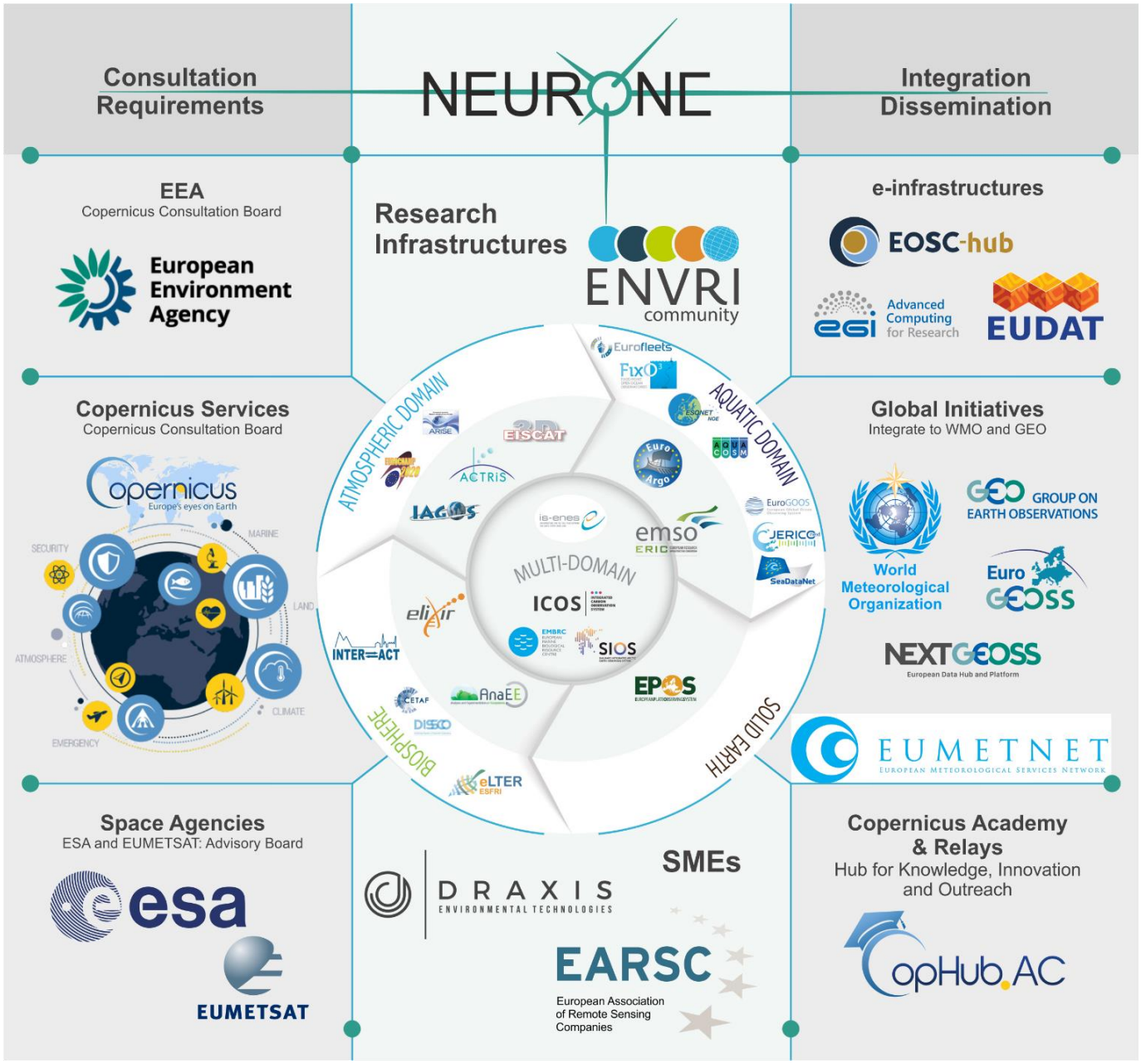

Figure 3: The NEURONE ecosystem

1.4.4 National, regional and international activities linked to the Project

The NEURONE consortium capitalises and extends further on top of the work performed in earlier activities, initiatives and projects of its core partners. An indicative selection of those is included below:

Table 1: Examples of initiatives linked to NEURONE

Project Title / acronym	Partner	Scope
ENVRIplus and ENVRI-FAIR	CNR, CNRS, EuroGOOS, FMI, ICOS, EAA	The ENVRI cluster of European RI in the environmental domain
Numerous ESA- and EUMETSAT- funded satellite CalVal projects related to Sentinels, SMOS missions	NOA, CNR, FMI	In situ data for CalVal activities of ESA and EUMETSAT, to provide Fiducial Reference Measurements
GEO CRADLE	NOA	Developed National EO sector maturity cards and a gap analysis on skills requirements for EO uptake in the Balkans, Middle East and North African regions.

ILTER (International Long Term Ecosystem Monitoring)	ICOS	Globally operating in situ monitoring network, GEO contributing organisation (EAA delegates Chair and Secretariat)
EOSC-Hub	BSC, ICOS	EOSC-hub: a single contact point for European researchers and innovators to discover, access, use and reuse a broad spectrum of resources for advanced data-driven research.
NEXT-GEOSS	NOA	NextGEOSS is a centralised European EO data hub and platform, where the users can connect to access data and deploy applications. The concept revolves around providing the data and ICT resources needed, together with cloud services, seamlessly connected to provide an integrated ecosystem for supporting Earth observation-based applications and services.
EUROGEOSS-Showcases	CNRS, CNR, NOA, FMI, ICOS	The project demonstrates the use of EO applications in the field of Environment
ESA-CCI Snow and ESA SnowPEX	FMI	Use of in situ data for EO product (CDRs on snow cover) validation
GMES-PURE project (Partnership for User Requirements Evaluation, 2013 - 2014)	FMI	To support the EC in capturing current and emerging requirements of users of Copernicus marine and atmosphere services
ETC/ULS (Urban Land and Soil Systems)	EAA (coordinates)	Supporting the European Environment Agency (EEA) by creating seamless European wide spatial reference data and develop and analyse various land related indicators.
ERA-PLANET	NOA, CNRS, CNR, FMI	The overarching goal of ERA-PLANET is to strengthen the European Research Area in the domain of Earth Observation in coherence with the European participation to Group on Earth Observation (GEO) and the Copernicus.
E-SHAPE (EuroGEOSS Showcases)	NOA, CNR, CNRS, DRAXIS, EAA	Development of user uptake for Pilots, across sectorial, regional/national and international spheres, providing support through e.g. identification of suitable datasets and building sustainable business models.
COST Action ES1404, A European network for a harmonized monitoring of snow (HarmoSnow)	FMI	To enhance the capability of the research community and operational services to provide and exploit quality-assured and comparable observation data on the variability of the state and extent of snow.
ALTER-NET (A Long-Term Biodiversity, Ecosystem and Awareness Research Network),	UFZ, EAA	ALTER-NET aims to translate the concepts of Natural Capital and Ecosystem Services into operational frameworks that provide tested, practical and tailored solutions for integrating ES into land, water and urban management and decision-making.
OpenNESS (Operationalisation of Natural Capital and Ecosystem Services)	UFZ	OpenNESS aimed to translate the concepts of Natural Capital and Ecosystem Services into operational frameworks that provide tested, practical and tailored solutions for integrating ES into land, water and urban management and decision-making.
Copernicus Climate Change Service (312a-Lot 4) on Ozone	FMI	To develop Climate Data Records of ozone Essential Climate Variables.
Clever Cities (H2020, since 2018) – Co-designing Locally tailored Ecological solutions for Value added, socially	EAA	Nature based solutions to improve urban life, EAA focusses on data management

inclusivE Regeneration in Cities		
HELM (Harmonised European Land Monitoring, FP7),	EAA	Interactive project involving the European public entities mandated for national land monitoring to work towards the integration of national LULC data bases into European ones, EAA coordinated
ECOPOTENTIAL (Improving future ecosystem benefits through Earth Observations)	EAA	Addresses the data-to-information-to-decision-making process for ecosystem services, using novel approaches of Earth System and Natural Sciences.
Horizon 2020 GAIA-CLIM project (2015 - 2018) (http://www.gaia-clim.eu)	FMI	To establish sound methods for the characterisation of satellite-based EO data by surface-based and sub-orbital measurements (non-satellite measurements).
WMO Integrated Greenhouse Gas Information System (IG^3IS)	ICOS	IG^3IS is the international coordinating mechanism to guide greenhouse gas emission-reduction actions on the basis of sound scientific evidence. It leverages methods for combining atmospheric measurements and emission inventory data to better inform emission reduction policies and measures.

1.4.5 Gender Analysis

Gender equality is a common value of the European Union, as outlined in the "Strategy for equality between women and men 2010-2015". The NEURONE partners support policies advocating equal opportunity for women and men, and specifically support the involvement of women in their field of activities. Thus, NEURONE within the implementation phase of its activities will address the needs of both female and male actors and will take into account gender-specific ways to deal with the knowledge and information derived in the development of these. **NEURONE fully respects sex and gender considerations,** incorporating the concerns and experiences of women and men in the project activities – incl. the design, the management, the implementation, and the methods of delivery and communication of results will be chosen taking into account the gender dimension in order to be considered unbiased. The partners are committed to involve men and women across the project activities in a balanced way. Special attention will be taken within WP1, where an un-official small working group will be established, aiming to perform an initial gender analysis and subsequent regular monitoring and analysis of gender participation, gender disaggregation of data, and any gender-sensitive aspects that may derive. Last but not least, even from the start **effort was placed at the consortium level first, with twenty (21) women will be involved, representing 42% of the effort dedicated to the project**; with a significant number of them holding important roles in the project's management structure.

2. IMPACT

2.1 EXPECTED IMPACTS

The creation of solid foundations for the provision of improved and sustainable in situ information in Copernicus, relies on coordinated activities amongst the leading in situ players from the European RIs and International networks, including Copernicus stakeholders. NEURONE has established a multi-actor consortium, bringing together a diverse network of partners and stakeholders aiming to foster the Copernicus In Situ Component evolution, as well as to initiate and execute a number of extensive activities towards the formation of an actionable roadmap of prioritized activities for the Copernicus in situ interface layer evolution.

In view of this overall aim, NEURONE is expected to deliver a multitude of impacts. Within the next two sections we describe how NEURONE is addressing the four specific expected impacts as identified in the call, and a series of other-indirect impacts that are expected to be realised in the long term.

2.1.1 NEURONE impacts in relation to the call

- **Impact 1: To complete a comprehensive overview of the status of research infrastructures already used by Copernicus**

NEURONE is following an extensive list of activities to deliver a detailed record and evaluation of the currently existing in situ data and infrastructures and their maturity level, as well as to provide an assessment of the in situ current and foreseen contribution to individual Copernicus services and CSC. The active engagement and effective coordination of multi-sector partners (highly esteemed representatives from the entire range of stakeholders, including institutional members, scientists, decision makers, and private sector/SME representatives) will enable the accurate and extensive in situ gap analysis in NEURONE. NEURONE consortium will ensure that all critical information available will be included in the overview. This is ensured by the participation in NEURONE of Institutes that leaded the previous successful overview of the in situ landscape, summarized in the 2017 and 2018 State of Play report of the EEA (e.g. CNRS, EuroGOOS, ICOS).

- **Impact 2: To enable the identified research infrastructures to better respond to Copernicus operational needs**

One of the critical components of NEURONE consortium is the strong participation of the European RIs and the direct links to ENVRI, and through ENVRI towards other national/international in situ infrastructures. NEURONE will be implemented by partners that operate research infrastructures, thus the connection to the in situ communities is strong. It is expected that through the interactions of NEURONE participants with the wider in situ communities, the awareness in respect to Copernicus will be enhanced and the operational needs will be efficiently disseminated. The combined picture provided by the outputs of the gap analysis and the benchmarking of the different in situ infrastructures to the maturity indicators, will enable the definition of priorities and needs to ensure the alignment with the future Copernicus In Situ Component.

Moreover, the institutions participating in NEURONE have been working towards achieving the RI awareness and response to Copernicus needs and have already established collaboration. This begun with individual projects that brought together the individual Copernicus Services with targeted in situ infrastructures. The majority of these activities have provided strong links with EU-funded and GEO projects including the Greek GEO Office links, but also international initiatives in the framework of the WMO (GAW/WMO, GCW/WMO, GCOS/WMO, TCCON/NASA JPL, ICOS/EU, INTERACT /EU, ACTRIS/ EU) and other networks (GEO Expert Advisory Group, GEO Carbon and GHG, GEOBON, ILTER, ERA-NET).

- **Impact 3: To enable the missed in situ observations required to improve the accuracy of the satellite Copernicus products and monitor their quality in operation**

NEURONE partners have a long-standing tradition on implementing CalVal activities for ESA and EUMETSAT, especially as it concerns Sentinel missions but also research missions such as the Earth Explorers. For example, NOA and CNR are mobilizing research equipment of the ACTRIS RI to implement the Cape Verde ASKOS CalVal activity for ESA Sentinels and Aeolus missions in 2020, which aims to increase synergies along with other RIs. Marine and atmospheric component will be monitored with state-of-the-art instrumentation to contribute on EUMETSAT validation activity on SST, while atmospheric corrections will be provided by ACTRIS. The campaign will have a high

impact also on the evaluation of CAMS (through ECMWF's participation), but also WMO's SDS-WAS desert dust services. Such experiments add value on the definition of the missed in situ observations for satellite CalVal, but also contribute on increasing the in situ instrumental synergies for cross-service evaluation and multi-mission validation on an operational schedule or long-term monitoring at specific sites of interest. Another important example is the CalVal of greenhouse gas satellite missions that are planned to assist in monitoring the progress in the implementation of the Paris agreement, using the full column observations from the TCCON network and atmospheric corrections using co-located ICOS stations.

NEURONE will fully exploit the experience of previous CalVal activities performed by its partners to enable the identification of missed in situ Fiducial Reference Measurements that are crucial for present and future Sentinel and essential missions. NEURONE will facilitate and improve sensors' calibration and products' validation practices that are of utmost importance for the CSC activities. ESA and EUMETSAT will provide their preferences and plans for in situ data that essential for the CSC.

- **Impact 4: Reinforce the cooperation among different Copernicus actors (entrusted entities, space data providers, in situ data providers and research infrastructures) in the in situ data network**

NEURONE has already included in its core activities a diverse group of Copernicus and contributing to Copernicus actors. In that frame, NEURONE has established two core bodies, entitled "NEURONE Advisory Board" and "NEURONE Copernicus Consultation Board", and their members are expected to play a vital role towards the successful outcomes of the project. Key stakeholders and entrusted entities have agreed to participate in NEURONE Boards, while others that cannot commit before NEURONE acceptance will be invited to attend in addition, including EEA. Furthermore, synergies and cross-fertilisation activities are expected to take place throughout the duration of the project, aiming at the maximum reach and engagement of supporting actors and stakeholders at a global scale. Another legacy of NEURONE will be the outcome of its Workshops and the establishment of a network of experts in order to exploit synergies and knowledge diffusion at several levels.

2.1.2 NEURONE extended impact

- **NEURONE enhances cross-cutting activities**

The cross-cutting in situ data requirements, that intersect across multiple services, will be identified and analysed by NEURONE and are going to establish cross-cutting multipurpose observations to obtain maximum benefit and improve the centralized data management. The intended common agreement on these requirements will benefit all Copernicus services including cross-cutting themes.

- **NEURONE identifies gaps and needs for innovative technologies**

Having established the current and future requirements of in situ data and by exposing the current "in situ gap", NEURONE targets the needs for the development of new technologies to fill the gap on monitoring new data types, physical and biochemical parameters that can add value to Copernicus ecosystem with respect to the needs of its services.

- **NEURONE advocates the in situ data interoperability**

NEURONE will enhance data interoperability, through its contribution on the definitions for harmonized and standardised in situ data and metadata in respect to Copernicus needs.

- **NEURONE actuates in situ infrastructures' conformance to more effective data policies**

Although some Pan-European Research Infrastructures (RIs) have already applied open and free data policy (e.g. EuroArgo, ACTRIS, ICOS, IAGOS), some RIs provide limited access to data either due to lack of proper licensing or due to the fact that their unrestricted and free sharing of data is under development (e.g. EMBRC). NEURONE will assist overcoming those challenges that are associated with accessing in situ data and catalogues of descriptive metadata for various local datasets, with the information that will be consolidated in the NEURONE Knowledge Hub platform. NEURONE will contribute on enabling the existing and developing infrastructures to establish a common data policy framework that will be compatible with Copernicus and will enhance data exchange agreements.

- **NEURONE actuates more informed policy making**

NEURONE's roadmap for future expansion and data improvements of in situ infrastructures is expected to support well informed and robust policy decisions making in many sectors. Calibrated and accurate in situ data that will be traceable to quality standards, readily interpretable and freely available, will promote the environmental awareness amongst decision makers.

- **NEURONE populates funding shortcomings for the in situ infrastructures**

Activities within NEURONE will reinforce the significance of the need for more sustainable funding streams for the in situ infrastructures. By demonstrating the importance of viable observing systems, NEURONE will increase awareness on the needs and costs associated with the infrastructures (e.g. for coordination, development, compilation and adaptation of data for research purposes).

2.1.3 NEURONE Legacy

The success of the NEURONE project has relevance and impact far beyond that of the partners directly involved in this coordination and support action conducted throughout the duration of the project. NEURONE considers as of outmost importance and aspires to make NEURONE Knowledge Hub the reference point for in situ data information (metadata will be the sole information retained and catalogued), through cross-network knowledge sharing hub for in situ infrastructures, SME's (downstream application developers and in situ data users), Copernicus and contributing to Copernicus actors, researchers, policy and decision makers. In order to achieve this mission, NEURONE will invest in disseminating and communicating project outcomes and available materials to external stakeholders also outside EU, with the purpose of motivating other key players to become engaged users of the Knowledge Hub and having a durable and significant impact both globally but also beyond the duration of the project.

2.2 MEASURES TO MAXIMISE IMPACT

NEURONE intends to ensure a high level of impact by implementing a focused dissemination, communication, networking and exploitation programme leading to enhanced public awareness and uptake of outputs by RI's, Copernicus Infrastructure bodies and SMEs, within EU but also at a global scale.

NEURONE will focus on maximising the effectiveness and impact by differentiating the dissemination strategy and communication actions towards 4 main groups, namely (1) national and international in situ infrastructures; (2) Copernicus and contributing to Copernicus entities; (3) Scientific Community; (4) Industry and SMEs. The main elements are:

Dissemination – Ongoing multiple activities covering newsletters, website, the Knowledge Hub and other media production, along with increasing awareness of the project details, objectives and results by engagement with various audiences at workshops, conferences and public events (see also the NEURONE's list of events).

Exploitation - Ongoing multiple activities will take place, aiming to establish and ensure sustainable exploitation routes that will ensure the post-project legacy and impact. Central to this will be the NEURONE Knowledge Hub, and around it, NEURONE aims to build synergies with all members of the in situ supply chain and the SME's downstream applications.

Communication – establishing a strong project identity for NEURONE, primarily to forge good public relations but also to ensure cohesion amongst project partners. Central to this will be a public-friendly website, supplemented by other social media channels and a standardised design style for all project outputs. Strategic and targeted communication actions to a multitude of audiences, including the media and the public are foreseen. Social media will be exploited also to increase public involvement and achieve a two-way communication and feedback.

NEURONE Advisory Board (AB)

NEURONE will invite and engage a number of key stakeholders outside the consortium to form the **NEURONE Advisory Board** and to assist evaluate and provide external advice and guidance to the partners. The **NEURONE**

Advisory Board will consist of key actors from ESA, EUMETSAT, EUMETNET, EOSC-Hub *(see also letters of support in Annex)*, directly related to NEURONE, while more members will be engaged in the future, targeting WMO and GEO key-persons. It is anticipated that the AB will further assist by suggesting and facilitating participation at key events, media coverage and regional/local outreach. Participation and presentation of NEURONE partners in AB members-led events is also expected. NEURONE, through the AB also aspires to build an "excellence node" by connecting to the Copernicus Consultation Board and to foster maximum interaction.

NEURONE - Copernicus Consultation Board (CCB)

NEURONE aims to build a networking platform to foster Copernicus in situ stakeholder interaction and engagement in an organized way. The Copernicus Consultation Board will consist of EEA and the six (6) Copernicus services: CAMS, C3S, CMEMS, CLMS, CEMS, Security. The ambition is to build concrete links with the Copernicus Consultation Board, also beyond the project activities, and involve them within the NEURONE ecosystem in a synergistic scheme established on top of the NEURONE Knowledge Hub with other national and international in situ infrastructures. Up to the proposal phase, NEURONE has engaged four (4) representatives from the Copernicus Services (head of CAMS and C3S, representatives from CEMS and CLMS, *see also the letters of support*).

NEURONE Knowledge Hub

NEURONE core activity and a central aspect of it' legacy is the formation of the **NEURONE Knowledge Hub,** that will include: (i) a pool of RIs and other in situ monitoring networks relevant to Copernicus; (ii) catalogues of descriptive metadata for various local datasets from in situ monitoring networks; (iii) information on relevant past and ongoing projects on research infrastructures from local to global level, (iv) a portfolio of best practice examples for the use of Copernicus in situ datasets.

2.2.1 Dissemination

The main objective of dissemination is to reach research infrastructures and Copernicus actors through the effective flow of information and publicity about the project's aims and objectives and promote the NEURONE brand, so it becomes synonymous with the future in situ quality standards. In order to ensure wide take-up of the NEURONE results (e.g. NEURONE Roadmap, Copernicus in situ interface layer etc) the consortium will:

- Define dissemination objectives associated with quantifiable indicators;
- Identify the different target groups, key messages, communication channels and activities, schedule rollout and implement the plan in alignment with the adoption actions and the exploitation plan. The dissemination program will blend different channels and tools;
- Monitor and continuously evaluate results against the target values (indicators) and make necessary amendments.

NEURONE will draft a detailed Dissemination Plan in task "T5.1. Communication, Dissemination & Exploitation strategy" under the WP5. The plan will include communication strategies on national, EU and International levels, tools for dissemination and communication approaches, also in accordance with the regional specificities of the Research Infrastructures, Copernicus actors and related audience. The NEURONE Project website will host the NEURONE Knowledge Hub and links will be established to partners and to identified complimentary global, EU and national initiatives, websites. Furthermore, the midterm and final report on the DEC plan implementation will include: a first assessment of the activities performed. The tools that were utilised, an outlook for the second half of the project, a first benchmark of activities and tools, lessons learnt, information for developed multimedia and dissemination material, interaction with the NEURONE Advisory board and members of the NEURONE ecosystem, use of social networks and feedback received by all associated members.

Finally, monitoring and evaluation of Dissemination Plan will be continuous by both the WP5 leader as well as the project coordinator on the basis of the information provided by partners in the individual dissemination reports and feedback respectively.

2.2.2 Exploitation

NEURONE considers exploitation of its results as a core aspect and thus has formatted a dedicated task within **WP6: NEURONE Legacy** which is focused on defining actions for the sustainable exploitation of NEURONE's outcomes during and post-project, always in conjunction with IPR development.

During the project, NEURONE aims at providing tangible and exploitable results that serve:

- The concrete promotion of the know-how available/discovered through the Knowledge Hub, usage and exploitation of open IPR and, as a first stage towards in situ data interoperability, discovery, access, integration and re-use by EO actors in each Copernicus thematic domain.
- Setting up channels to strengthen the Copernicus in situ component, by linking, harmonizing and integrating ground-observation networks and in situ data hubs.
- Supporting European Environment Agency, European Commission and Copernicus Entrusted Entities when seeking solutions for providing access to required in situ data.
- Proposing new capacity building activities capitalizing on the NEURONE outcomes for matching RIs' assets with the Copernicus in situ and Space Component requirements identified in the NEURONE analysis phase.
- Maintain, support, further enhance and expand the NEURONE Knowledge Hub, including both additional material and resources, and underlying technologies (e.g. semantic querying, data mining, etc.) to foster the data and knowledge/IPR exploitation by the members of the NEURONE ecosystem and third parties.
- Fostering the development of new commercial products and services to meet operational Copernicus user needs.

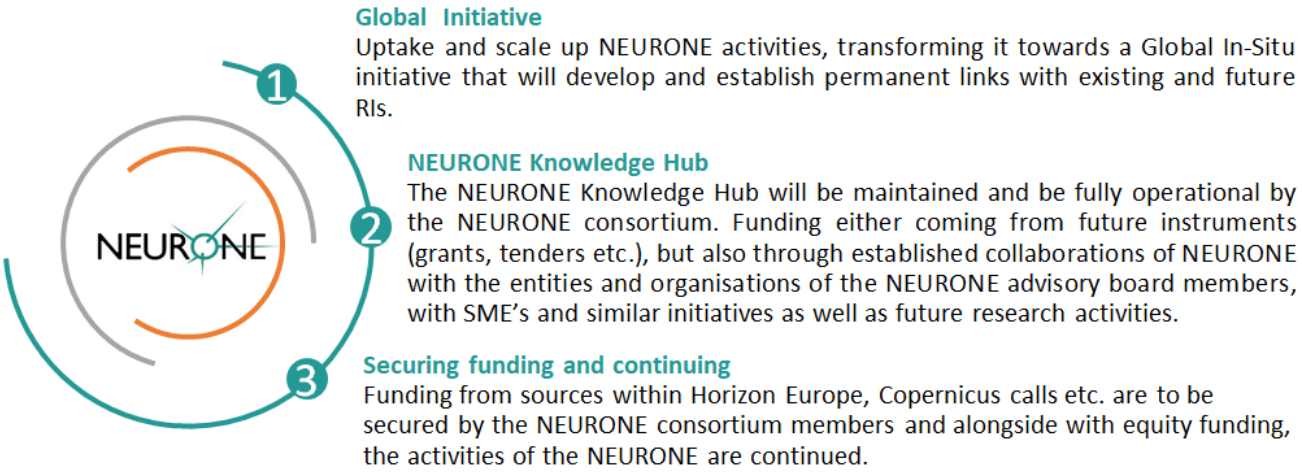

Figure 4: NEURONE exploitation routes

2.2.3 Communication

NEURONE will deploy a range of strategically planned actions and tasks to communicate its findings and activities to a diverse audience, including Copernicus community, contributing to Copernicus stakeholders, scientific community/academic researchers, policy-makers, general public, Research Infrastructures, SME's, etc. Project partners and WP5 leader will monitor and coordinate the communication activities to ensure that messages are consistent across the whole project. The latter is hugely important to assure that NEURONE impact will reach far beyond the end of the project.

NEURONE project communication will:

- raise public awareness and ensure maximum visibility of the project key facts, objectives, activities
- announce and promote NEURONE events, contributing to upgrade its attendance and engagement potential;
- support the dissemination objectives;

- establish close relationships with other projects-initiatives covering similar problems within other EU-funded or national programmes
- Communication will contribute to supporting dissemination and exploitation objectives while targeting stakeholders beyond dissemination and exploitation purposes such as the general public.

Furthermore, the NEURONE consortium will additionally exploit all tools and opportunities provided by the European Commission (Horizon Magazine, Euronews, Openaire, Cordis Wire, ERA-NET newsletters etc.) as well as Copernicus Academy & Copernicus Relays to communicate and disseminate the results as well as possible synergies with other similar activities establishments and initiatives in the frame of the regional workshops.

Project Website

The NEURONE website will be operational by month 2 and updated regularly. It will provide updates on progress and results from all the WPs, as well as downloadable digital brochures, press releases and infographics. Importantly, the website is not intended to be a passive repository of information but used actively as a knowledge-management tool.

The website aspires to become the Info-point for all in situ related information and will:

- inform on NEURONE activities and partners;
- act as a dissemination point by hosting all the 'public' deliverables; (other deliverable will be also put in a restricted area of the web-site accessible with limited access);
- disseminate policy briefs to summarise the reports in more accessible format;
- gather and publish information on events relating to the project;
- establish links with other relevant projects or initiatives.

NEURONE Advisory Board and Copernicus Consultation Board

NEURONE, through the Advisory Board also aspires to build an "excellence node" to foster Copernicus in situ stakeholder interaction in an organized way; but also, by leveraging on the members of the AB, to ensure maximum reach within their networks. Early members of the Advisory board include: ESA, EUMETSAT, EUMETNET, UK MetOffice and EOSC-Hub members. Iterations and discussions with more organisations are already in place with members of the EEA, WMO and GEO., The Copernicus Consultation Board (CCB) will connect NEURONE to the Entrusted Entities and the CSs. Early members of the CCB include ECMWF-CAMS, EMS-NOA and CLMS. Iterations of NEURONE with more organizations are in place with members of the ECMWF-C3S, Mercator Ocean and SatCen and interest to participate has been confirmed. The NEURONE boards are expected to grow further with the addition of both EU and global initiatives, such as EEA, WMO, GEO and Copernicus entities that have already confirmed their willingness to support NEURONE activities once the project receives funding.

Table 2: NEURONE Advisory and Copernicus Consultation Boards - preliminary members

Name	Organization	Advisory Board (AB) / Copernicus Consultation Board (CCB)
Angelika Dehn	**ESA**	*AB*
Bojan Bojkov	**EUMETSAT**	*AB*
Eric Petermann	**EUMETNET**	*AB*
Tiziana Ferrari	**EOSC-hub project coordinator**	*AB*
Simon Machin	**UK MetOffice/ EUMETNET**	*AB*
Vincent-Henri Peuch	**Copernicus Atmosphere Monitoring Service - CAMS**	*CCB*
Jean-Noël Thépaut	**Copernicus Climate Change Service (C3S)**	*CCB*
Andreas Littkopf	**European Topic Centre on Urban, Land and Soil Systems (ETC-ULS)**	*CCB*
Haris Kontoes	**BEYOND - Copernicus Emergency Mapping Service (EMS)**	*CCB*

NEURONE aims to capitalise at the highest-level, building on top of all activities and channels that the NEURONE Advisory Board and NEURONE Copernicus Consultation Board members are providing, and in close collaboration with the consortium members aims to deliver the NEURONE ecosystem. The NEURONE ecosystem members are expected to contribute to all communication material as well as to enhance the reach of the NEURONE communication activities.

Supplementary Communication tools

Marketing material: Marketing material, such as posters, handouts and leaflets will be produced and can be used by all audiences to promote the project consistently, raise the interest and facilitate communication and cooperation.

Logo and graphic identity: The NEURONE brand will be established. Given the highly recognisable branding (colours and general graphic) of the NEURONE logo, a set of templates will be designed by partner DRAXIS based on the same colour palette, fonts and design. This will ensure that the NEURONE visual identity is consistent.

Media Kit: A pre-packaged set of promotional materials will be developed and distributed through various mass media channels for publicity use. This media kit will be available also in electronic format at the project website as from its production and it will be easy to download and share.

Social media: social media focus will be on strengthening presence at a global scale.

Press releases will be used widely to communicate outside media outlets and to announce important news. Partners will also send the press release through their extended networks of contacts to maximise awareness and a copy will be uploaded onto the project website resources area so that they remain accessible to the general public.

Project newsletters will be released on a 6-month basis and will enable the consortium to update the project community with latest project activities and results. Each newsletter edition will be uploaded onto the project website resources area so that they remain accessible to the general public

Events

NEURONE events can be categorised in three main groups:

(a) NEURONE working meetings: NEURONE throughout its duration is planning to conduct several working-meetings with the Advisory Board members, the in situ infrastructures and the Copernicus Consultation Board in order to achieve the best possible feedback and input to the project reports and the roadmap. In parallel to these working meetings, a number of NEURONE related publications and open events are foreseen, aiming mainly to inform of the practical aspects of the discussions in place.

(b) NEURONE-led events (organiser): NEURONE is planning to organise two major project workshops in parallel to the annual **ENVRI-FAIR & COPERNICUS workshops/conferences** during the project duration.

(c) NEURONE extrovert events (participating entity): where the aim is for NEURONE partners to present its activities and scope during the project duration aiming to attract and engage more actors under the NEURONE network as well as to bring on board the NEURONE Knowledge Hub.

For the third category, "**NEURONE** extrovert events (participating entity)" **NEURONE** partners have already identified a list of events where they could potentially be present and inform the relative audiences of the Project activities, aim and objectives. A preliminary list of those events is presented in the table below.

Table 3: NEURONE extrovert events

Event title	Date	Audience
GEO Data Technology Workshop	*Yearly Spring*	International EO data community

European Geoscience Union General Assembly	*Yearly Spring*	Various stakeholders
EU Earth Science community	*3- 8 May 2020*	Science community
ENVRI community meeting	*not decided*	Environmental research infrastructures
GEO Week	*Yearly November 2020*	International EO community
ENVRI-FAIR general meetings	*not decided*	Various stakeholders
CMEMS EO sector User Uptake workshop (EARSC/ MOi)	*November 2019*	EO-sector intermediate users of CMEMS data
Agriculture workshop at PHI week (EARSC)	*September 2019*	EO community active in agriculture services and end users.
PHI Week (ESA)	*September 2019*	EO community
Thematic workshops at PHI Week (2020/21)	*September 2020/21*	Thematic end users and EO service providers
ILTER OSM (International Long Term Ecosystem Research Network Open Science Meeting)	*China, 2022*	Researchers and other stakeholders who collaborate in or with the LTER RI.
ISRSE (International Symposium for Remote Sensing of the Environment)	*Annually*	Different stakeholders interested in RS applications of the environment
eLTER project or community meetings	*not decided*	eLTER stakeholders and also shareholders
EIONET in situ and/or Copernicus related meetings	*not decided*	EEA and the national environment agencies' NFPs
EPA-Net in situ and/or Copernicus related meetings	*not decided*	EEA and the national environment agencies directors

Quantitative targets

Finally, NEURONE have set a number of key **impact indicators for dissemination and communication activities** and are presented in the table below.

Table 4: Dissemination & Communication Quantitative targets

Indicator	Target Value
Number of external events / conferences attended	10
Synergies with major initiatives and networks	>6
Number of visits to the NEURONE website	30k
Number of entities agreeing to participate in the NEURONE Knowledge Hub	8
Number of working meetings	12
Number of Advisory and Copernicus Consultation Board members	14
Number of participants in the NEURONE events	>30 per event
Number of promotional materials distributed	*700*
Number of newsletters	***7***

2.2.4 Knowledge management, IP and Data protection

NEURONE has foreseen a dedicated task dealing with IPR that will also provide the appropriate framework for access, use and re-use of the different types of data collected or generated in the project. IP management will be duly taken into account at the level of the consortium agreement covering all aspects and possible scenarios during but also post-project. To further strengthen this commitment the IPR task is jointly undertaken alongside the exploitation of NEURONE outcomes, aiming to monitor and address both at the same time in a secure and long-lasting approach. The consortium agreement will include a list of background and foreground IP, and the set the conditions for its utilization.

NEURONE project entails the collection of meaningful data and metadata with a view to producing insights that will successfully inform the project's activities, enabling us to deliver evidence-based results and ultimately achieve the objectives of the project. All personal data collected/generated to this end, e.g. through interviews , will be controlled and processed on the basis of informed consent, in full compliance with the General Data Protection Regulation (EU 2016/679) as well as other relevant applicable EU and national regulations, protecting the data subjects' rights and freedoms in relation to the processing of their personal data (further details in the ethical aspects of the project are provided in Section 5 of the proposal). To this end and following the "Guidelines on FAIR Data Management in Horizon 2020", NEURONE incorporates sound data management across its life cycle and beyond, with a view to making the project's data Findable, Accessible, Interoperable and Reusable (FAIR).

Especially within the **NEURONE Knowledge Hub** several types of in situ data and metadata are expected to be scrutinized and catalogued. For simplicity and robustness, only metadata information will be stored and retained online. The full amount of retained metadata will consist the NEURONE DB.

In that frame, a Data Management Plan (DMP), tailored to the project needs will be developed from the early stages of the project. The DMP will be a living document and it will be updated throughout the course of the project, covering the entire data management life cycle (even after the end of the project) addressing the following aspects: (i) Data summary; (ii) (iii) Metadata summary FAIR data (iv) Allocation of resources; (v) Data security; (vi) Ethical aspects; (vii) Other issues; and (vii) Annexes – Templates of documents. All documents drafted by the project parties including dissemination papers, reports etc. will include a disclaimer reminding about the copyright.

3. IMPLEMENTATION

3.1 WORK PLAN – WORK PACKAGES, DELIVERABLES AND MILESTONES

3.1.1 Overall Structure of the Work Plan

In line with the overall approach *(described in Section 1.4.2)*, the activities to be carried out in NEURONE are split into five (5) main WPs (WP2 to WP6), whilst management activities are being addressed through WP1. The overall logic of the work plan is in Figure 5, highlighting the relationships between the various WPs.

The work plan follows a simple logic: first we start by mapping the Copernicus requirements and inventorying the current state of the in situ infrastructures (WP2). Then we proceed to the analysis phase (WP3) where we conduct a thorough gap analysis by mapping the Copernicus Services and CSC needs against the in situ infrastructures, to formulate a set of maturity indicators pertaining to the level of maturity of current in situ infrastructures products and services, in the context of operational Copernicus applications. WP3 concludes with the summarising on the in situ priorities and needs in relation to Copernicus Services and CSC. The identified priorities will be consolidated in the Roadmap for the evolution of the in situ infrastructures as a Copernicus in situ Interface Layer (WP4), where we include definitions on the conceptual design for the IT implementation of the proposed Interface Layer. Finally, the establishment and the operation of the NEURONE Knowledge Hub will be ensured at WP6, to retain the NEURONE Legacy for follow-up projects/initiatives.

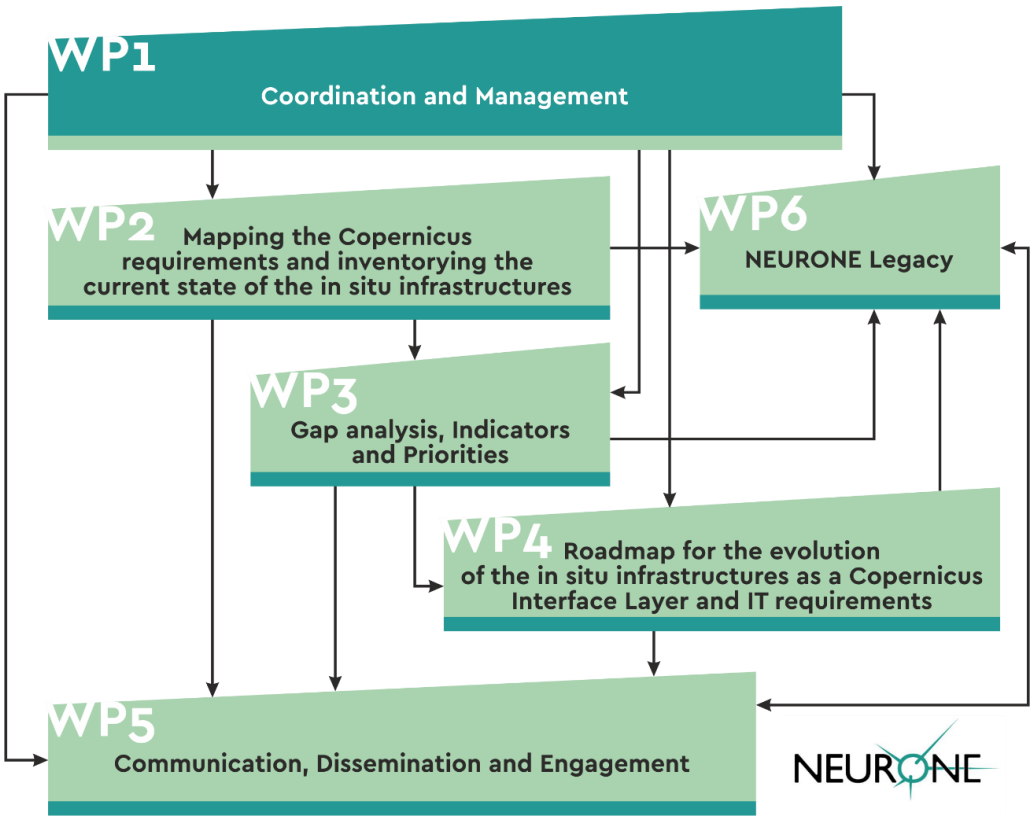

Figure 5: Overall Logic – Work Plan

3.1.2 Gantt chart and time schedule of activities

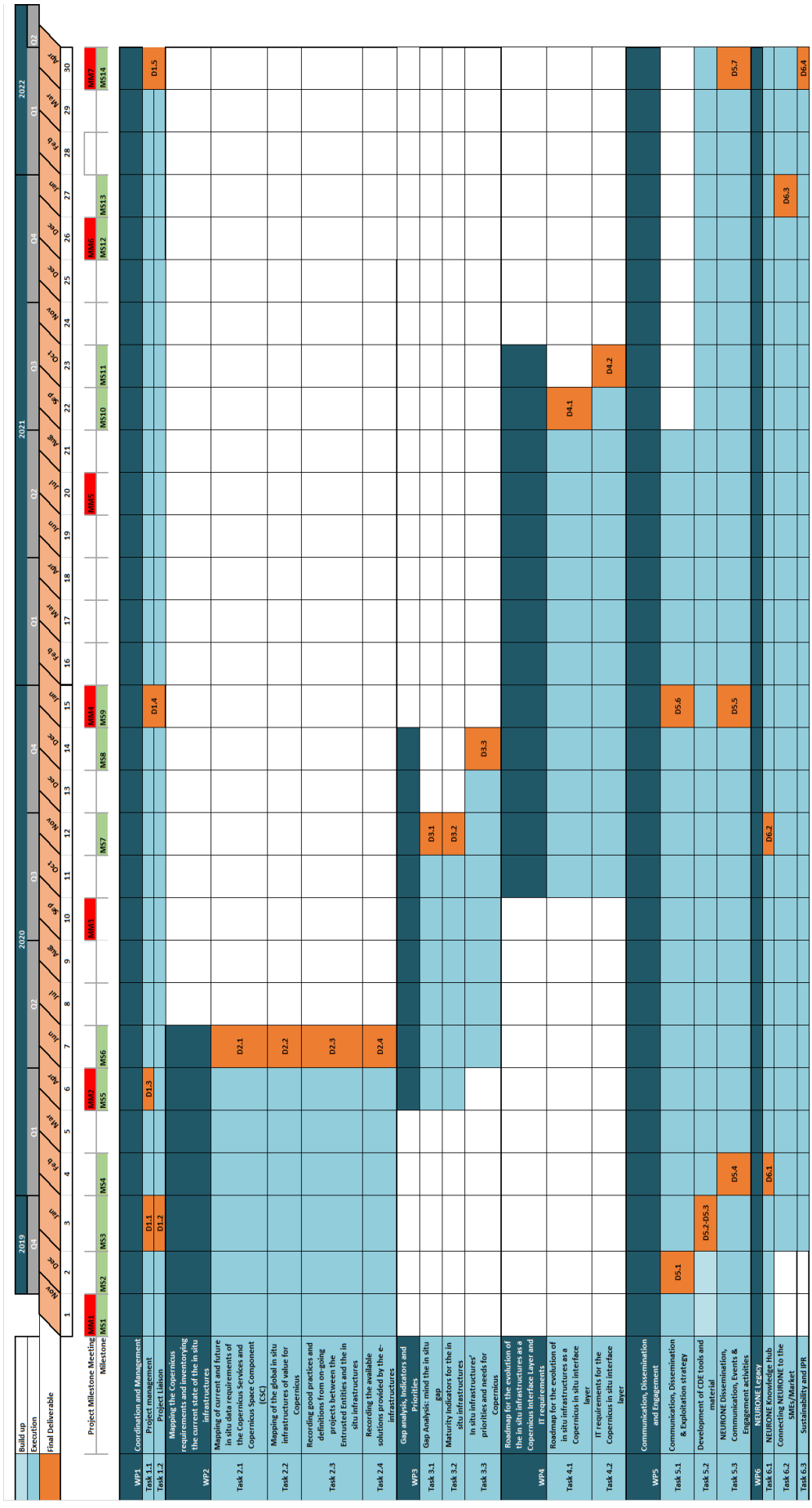

Figure 6: Gantt chart

3.1.3 Detailed Work Description

3.1.3.1 List of work packages

Table 5: List of work packages

WP #	Work Package Title	LP#	LP Name	P-Ms	Start M	End M
1	Coordination and Management	1	NOA	25	1	30
2	Mapping the Copernicus requirements and inventorying the current state of the in situ infrastructures	4	EuroGOOS	39.1	1	7
3	Gap analysis, Indicators and Priorities	3	CNR	37.9	6	12
4	Roadmap for the evolution of the in situ infrastructures as a Copernicus Interface Layer and IT requirements	2	CNRS	68.7	11	23
5	Communication, Dissemination and Engagement	8	DRAXIS	25	1	30
6	NEURONE Legacy	1	NOA	45.5	1	30
				241.2		

3.1.3.2 Work Package Description

Table 6: Description of WPs

WP number	1			**Lead beneficiary**							NOA	
WP title	Coordination and Management											
Participant number	**1**	2	3	4	5	6	7	8	9	10	11	**TOTAL**
Short name of participant	**NOA**	CNRS	CNR	EuroGOOS	FMI	BSC	EARSC	DRAXIS	UFZ	EAA	ICOS ERIC	
Person months/ participant:	**17**		1		2	4		1				25
Start month	1					**End month**			30			

Objectives

The objectives of WP1 are: **(1) managing the legal, financial and administrative issues** of the project and consortium, in line with the EC standards (e.g. quality, financial management, risks etc.); **(2) ensuring the smooth coordination between consortium members** and across activities, taking into account the thematic coordination of the project.

Description of Work

WP1 is led by NOA (Vassilis Amiridis)

Task 1.1 Project Management
(Lead: NOA, Partners: none)

Admin, legal, financial management of the NEURONE. The activities performed in this Task, under NOA's responsibility, aim to: (1) implement a technical and contractual interface between the consortium and the Project Officer, (2) coordinate and consolidate the NEURONE work packages to ensure their successful execution in terms of schedule, budget and technical objectives, (3) consolidate all the information necessary

for progress monitoring and assessment by the Consortium and submit Periodic Reports (Two periodic reports covering all the work, objectives, results and conclusions for months 1-15, months 16-30), (4) implement quality assurance processes to guarantee high-quality and timeliness of reporting and deliverables and (5) ensure proper administrative and financial management of the Grant Agreement by:

- Monitoring the partners' compliance with their obligations in accordance with the Grant Agreement;
- Ensure the maintenance of the Consortium Agreement and arbitrate issues of dispute among the consortium;
- Apply risk management processes and corresponding mitigation actions;
- Deliver the Data Management Plan according to H2020 standard practices;
- Set up the Advisory Board (AB) and the Copernicus Consultation Board (CCB), safeguarding a well-balanced, flexible and effective participation of highly esteemed representatives from the entire range of stakeholders, including institutional members, scientists, decision makers, and private sector/SME representatives

Task 1.2 Project Liaison
(Lead: FMI, Partners: NOA/CNR/BSC/DRAXIS)

This Task will be led by FMI and its primary objective is to establish a liaison network that will closely engage with high-level stakeholders (Copernicus services, Copernicus National User Forums,) from the Copernicus and RI community including national infrastructures in order to: (1) act as the primary contact for the different stakeholders to provide face-to-face interaction, exchange of know-how and best practices; (2) establish and maintain an effective liaison network in the broader community involved in Copernicus, Entrusted Entities (EUMETSAT, ESA, ECMWF, MERCATOR, EEA); (3) promote maximal traction and mutually beneficial synergy with ongoing activities undertaken by ENVRI community and ENVRI-FAIR project, other EU-funded and GEO projects (e.g. GEO-CRADLE) and WMO initiatives (GAW/WMO, GCW/WMO, GCOS/WMO, TCCON/NASA JPL, ICOS/EU, INTERACT /EU, ACTRIS/ EU) and other International networks (GEO Expert Advisory Group, GEO Carbon and GHG, GEOBON, ILTER, ERA-NET) and (4) ensure that the project's activities and outcomes are in line with EC and promote maximal traction and mutually beneficial synergy with ongoing global initiatives and projects.

Deliverables (brief description and month of delivery)

D1.1: **Project Management Plan** Due: **M3**, Responsible: **(NOA)**
D1.2: **Liaison strategy, targets & Advisory board establishment** Due: **M3**, Responsible: **(FMI)**
D1.3: **Data Management Plan** Due: **M6**, Responsible: **(BSC)**
D1.4: **Coordination Progress Report (vol. I)** Due: **M15,** Responsible: **(NOA)**
D1.5: **Coordination Progress Report (vol. II) & Liaison activities** Due: **M30,** Responsible: **(NOA)**

WP number	2			**Lead beneficiary**			EuroGOOS				
WP title	Mapping the Copernicus requirements and inventorying the current state of the in situ infrastructures										
Participant number	1	2	3	**4**	5	6	7	8	9	10	11	**TOTAL**
Short name of participant	NOA	CNRS	CNR	**EuroGOOS**	FMI	BSC	EARSC	DRAXIS	UFZ	EAA	ICOS ERIC	
Person months/ participant:	4	4	7	**4.5**	3.5	4	1	3	1.1	3	4	39.1
Start month	1					**End month**			7			

Objectives

The objectives of WP2 are: **(1) to map the current and future in situ data requirements of the Copernicus Services and CSC**for in situ observations and needs, utilising a combination of methods and tools; **(2) to inventory the global in situ infrastructures of value for Copernicus**; **(3) to gather information from on-going projects between the Entrusted Entities and the in situ infrastructures**, including the EEA reports and existing collaborations between the Copernicus Entrusted Entities and in situ infrastructures; **(4) to map the available solutions provided by the e-infrastructures** that could fulfil future needs of the Copernicus in situ interface layer.

Description of Work

WP2 is led by EuroGOOS (Glenn Nolan)

Task 2.1 Mapping of current and future in situ data requirements of the Copernicus Services and Copernicus Space Component (CSC)
(Lead: NOA, Partners: CNRS/EuroGOOS/FMI/UFZ/EAA/ICOS ERIC)

The objective of this Task is to map the Copernicus Services and CSC requirements. The mapping will include: (1) the identification of Copernicus and CSC current and future (when possible) requirements. This will be achieved through desk research, online surveys, stakeholder interviews and dedicated workshops; (2) the archiving of the collected information in the NEURONE knowledge hub.

Task 2.2 Mapping of the global in situ infrastructures of value for Copernicus
(Lead: CNRS, Partners: NOA/CNR/EuroGOOS/FMI/DRAXIS/UFZ/EAA/ICOS ERIC)

The in situ baseline required by Copernicus will be recorded based on a number of different methodologies, including preliminary desk research and taking advantage of existing knowledge and experience within NEURONE. In Task 2.2, we will establish a complete inventory of the global in situ infrastructures of value for Copernicus. The proposed methodology is the elaboration of a series of questions formulated for respondents in the various marine, terrestrial ecosystem, solid earth and atmospheric research infrastructures and national/international networks, represented thematically by the participants (CNRS, CNR, EuroGOOS, FMI, UFZ, EAA). Face to face interviews will be organised during the ENVRI meetings and other NEURONE events that target national and international in situ networks. The status of the relationship of each interviewed in situ infrastructure with Copernicus will be recorded as well. The surveys and interviews will include entries such as: (i) listing of in situ sensors such as ground stations, airborne and sea-borne sensors; (ii) cataloguing of the in situ parameters, including the geophysical parameter acquired, the type of measurement, resolution in space and time, data uncertainty and quality, timeliness, sustainability and traceability; (iii) measures of sustainability for the infrastructure as a whole, including funding risks and governance issues. The outputs of this inventory and the sustainability survey will be archived at the NEURONE knowledge hub.

Task 2.3 Recording good practices and definitions from on-going projects between the Entrusted Entities and the in situ infrastructures
(Lead: EuroGOOS, Partners: NOA/CNRS/FMI/UFZ/EAA/EARSC/ICOS ERIC)

Map existing and foreseen interactions between Entrusted Entities and in situ communities, including CalVal activities and targeted projects that are implemented by the in situ players for the Entrusted Entities. The information gathered by EEA will be registered to NEURONE knowledge hub as well. Practical experiences from ENVRI regarding existing operational interactions will be gathered as best-practice examples. The interactions of SMEs and the private sector at the national level will be mapped in addition, targeting downstream Copernicus services and national in situ networks.

Task 2.4 Recording the available solutions provided by the e-infrastructures
(Lead: BSC, Partners: NOA/CNR/CNRS/EuroGOOS/DRAXIS/ICOS ERIC)

In task 2.4, NEURONE will map the available solutions provided by the e-infrastructures for collecting, storing, processing and distributing in situ data. The inventory will include initiatives such as (i) EOSC; (ii) HPC; (iii) GEANT; (iv) DIAS and will take into account the status of development of Copernicus In Situ Information System (CIS2). The inventory will give special focus on available storage systems and European initiatives for Big Data handling and processing (EOSC-hub/EUDAT), software tools, libraries and platforms or services able to manage and expose data and metadata, communication protocols, including international well-known standards and Copernicus-based APIs. Interoperability issues and easy access to in situ data by the end users will be central concepts in this inquiry.

Deliverables (brief description and month of delivery)
D2.1: **Mapping of current and future in situ data requirements of the Copernicus Services and Copernicus Space Component (CSC) report,** Due: **M7,** Responsible: **(NOA)**
D2.2**: Mapping of the global in situ infrastructures of value for Copernicus report**, Due: **M7,** Responsible: **(CNRS)**
D2.3**: Recording good practices and definitions from on-going projects between the Entrusted Entities and the in situ infrastructures report**, Due: **M7,** Responsible: **(EuroGOOS)**
D2.4**: Recording the available solutions provided by the e-infrastructures report**, Due: **M7,** Responsible: **(BSC)**

WP number	3		**Lead beneficiary**					CNR			
WP title	Gap analysis, Indicators and Priorities										
Participant number	1	2	**3**	4	5	6	7	8	9	10	11	**TOTAL**
Short name of participant	NOA	CNRS	**CNR**	EuroGOOS	FMI	BSC	EARSC	DRAXIS	UFZ	EAA	ICOS ERIC	
Person months/ participant:	3	3	**9**	8	3	3		2	0.9	3	3	37.9
Start month	6					**End month**			14			

Objectives

The objectives of WP3 are: **(1) to conduct a thorough gap analysis** by mapping the Copernicus and CSC needs against the accurate picture of available in situ information; **(2) to formulate a set of maturity indicators** pertaining to the level of maturity of current in situ data, products and services, in the context of operational Copernicus Services; **(3) to define the in situ priorities and needs** in relation to CSs and CSC.

Description of Work

WP3 is led by CNR (Lucia Mona)

Task 3.1 Gap analysis: mind the in situ gap
(Lead: EuroGOOS, Partners: NOA/CNRS/CNR/FMI/UFZ/EAA/ICOS ERIC)

The aim of Task 3.1 is to execute an in-depth analysis of the in situ gaps, by utilizing the outcomes of WP2 and accounting the CSs and CSC requirements. The gap analysis will focus on: (1) missing in situ data (totally or partially); (2) in situ data accuracy and uncertainty information; (3) in situ data uptake including procedural issues (such as delivery delay, obsolescence of the infrastructure, low quality of data, automatic processing, secure transfer of the data, data exchange protocols, data policies, fairness and data documentation, requirements for Copernicus data and information quality enhancement and CSC CalVal activities, standardization and coordination with Copernicus Services). This task will determine and document the gaps between the existing in situ operations against the Copernicus needs.

Task 3.2 Maturity Indicators for the in situ infrastructures
(Lead: EAA, Partners: NOA/CNRS/CNR/EuroGOOS/UFZ/ICOS ERIC)

The gap analysis will serve as a guideline for the elaboration of appropriate Maturity Indicators for the in situ infrastructures, which will allow capturing the potential for exploitation of their data in an operational CSs or CSC CalVal environment. The indicators will be given specific weights to allow an overall "maturity score" for each infrastructure, based on parameters such as (and not limited to) (i) the maturity of the provided in situ products, based on the requirements (accuracy, timeliness, data and meta-data standards, data homogeneity across the in situ infrastructure etc); (ii) the capacity to provide in situ data for cross-cutting multi purposes

products validation; (iii) the accessibility of data; (iv) the financial sustainability of the infrastructure and political support it receives, (v) the professionalism of its organisational set up, and, in conclusion, its (vi) overall fitness-for-purpose to provide data for the CSs and CSC. The output of this task will be a guideline of self-evaluation framework for the in situ infrastructures to rank their maturity against Copernicus requirements.

Task 3.3 In situ infrastructures' priorities and needs for Copernicus
(Lead: CNR, Partners: NOA/CNRS/EuroGOOS/FMI/BSC/DRAXIS/UFZ/EAA/ICOS ERIC)

The aim of this task is the identification of priorities and actions that have to be devoted for filling the gaps identified in Task 3.1 and increase the maturity defined in Task 3.2. In this process NEURONE aims to disseminate the best practices implemented in some RIs towards the less mature in situ infrastructures. Common needs and priorities will be also outlined as a baseline for the roadmap definition of WP5. This activity will be based on a discussion forum that will be organized within NEURONE (NEURONE workshop) for identifying the bottlenecks in developing in situ services for Copernicus.

Deliverables (brief description and month of delivery)
D3.1: **Gap analysis report**, Due: **M12,** Responsible: **(EuroGOOS)**
D3.2: **Maturity Indicators for the in situ infrastructures report**, Due: **M12**, Responsible: (**EAA**)
D3.3: **In situ infrastructures' priorities and operational needs for Copernicus report**, Due: **M14**, Responsible: (**CNR**)

WP number	4		**Lead beneficiary**				CNRS				
WP title	Roadmap for the evolution of the in situ infrastructures as a Copernicus Interface Layer and IT requirements										
Participant number	1	**2**	3	4	5	6	7	8	9	10	11	**TOTAL**
Short name of participant	NOA	**CNRS**	CNR	EuroGOOS	FMI	BSC	EARSC	DRAXIS	UFZ	EAA	ICOS ERIC	
Person months/ participant:	14	**16**	14	5	2	10		3	0.7	3	1	68.7
Start month	11					**End month**			23			

Objectives

WP4 encompasses the items that constitute the concrete and tangible contribution of the project to the evolution of the Copernicus In Situ Component, during and beyond the project's lifetime. This entails the following elements: **(1) Roadmap for the evolution of in situ infrastructures as a Copernicus in situ interface layer**; **(2) Definition of the IT requirements for the Copernicus in situ interface Layer**.

Description of Work
WP4 is led by CNRS (Paolo Laj)

Task 4.1 Roadmap for the evolution of in situ infrastructures as a Copernicus in situ interface layer
(Lead: CNRS, Partners: NOA/CNR/EuroGOOS/FMI/UFZ/EAA/ICOS ERIC)

Based on the priorities and needs detailed in Task 3.3, a roadmap for the evolution of existing in situ infrastructures towards the Copernicus in situ interface layer will be proposed. This roadmap will provide the requirements among the in situ infrastructures to make the collection of disparate in situ data homogenously available and accessible to the Copernicus users and operators. The interface layer definitions will be based on the CS and CSC requirements and the in situ data needs and related gaps. Based on this information, the roadmap will provide a plan for the evolution of the in situ landscape for Copernicus including considerations

such as the future expansion of the RIs in terms of new instruments and technologies to fill data gaps, data accuracy improvements, timeliness, interoperability, homogenization and operationalization of services to name a few.

Already established data exchange mechanisms between different RIs will be investigated to provide examples for the development of a data retrieval process which encompasses all the RIs that will serve the Copernicus in situ infrastructure. Lessons learned within ENVRI will be exploited along with examples of RIs which practice co-location (e.g. eLTER and ICOS or ICOS and ACTRIS). Furthermore, existing data outlets by the RIs will be considered, and the mechanisms established for Virtual Access offered under INFRAIA H2020 projects.

Task 4.2 IT requirements for the Copernicus in situ interface layer
(Lead: BSC, Partners: NOA/CNRS/CNR/EuroGOOS/DRAXIS/UFZ/EAA/ICOS ERIC)

The objective of Task 4.2 is to specify the IT requirements for the future development of the Copernicus in situ interface layer. This will act as a guideline for the definition of possible adaptations on the currently implemented IT infrastructures, to facilitate the use of the In Situ data within Copernicus. Synergies with the existing European e-infrastructure frameworks and initiatives will be acknowledged for the aforementioned definitions (e.g. GEANT, EOSC, HPC, DIAS etc).

The Copernicus in situ infrastructure IT definitions will be approached by three different pillars: (i) the hardware part, including storage and processing needs and telecommunication access points; (ii) the technological part, including the portal technologies and semantics; and (iii) the data sharing policies.

The basic principles that will be taken into account for the definition of the IT requirements are: (1) the provision of easy access to the in situ data from the different in situ infrastructures; (2) the use of open standards to allow an easy data retrieval process (e.g. FAIR data); (3) the interoperability with external data networks and repositories; (4) data provenance principles: all steps of data life and all metadata should be tracked to ensure understandability and reproducibility; (5) the implementation of security standards (encryption) and prevention of data corruption.

Deliverables (brief description and month of delivery)
D4.1: **Roadmap for the evolution of in situ infrastructures as a Copernicus in situ interface layer** Due: **M22,** Responsible: **(CNRS)**
D4.2: **IT requirements for the Copernicus in situ interface layer** Due: **M23,** Responsible: **(BSC)**

WP number	5		**Lead beneficiary**				DRAXIS				
WP title	Communication, Dissemination and Engagement										
Participant number	1	2	3	4	5	6	7	**8**	9	10	11	**TOTAL**
Short name of participant	NOA	CNRS	CNR	EuroGOOS	FMI	BSC	EARSC	**DRAXIS**	UFZ	EAA	ICOS ERIC	
Person months/ participant:	4	3	1	3		3	3	**8**				25
Start month	1					**End month**			30			

Objectives
The overall aim of WP5 is to communicate and disseminate at multi-level the NEURONE activities, as well as to demonstrate, engage and attract in situ actors for including themselves to the NEURONE Knowledge Hub. In more detail the specific objectives of WP5 are to: (1) develop and implement a detailed dissemination, exploitation and communication plan; (2) develop a strong brand for NEURONE and a set of attractive promotional material; (3) draw the attention and engage maximum number of in situ infrastructures,

International in situ Networks, and SMEs; (4) ensure the participation of a critical mass of actors and their metadata in the NEURONE Knowledge Hub; (5) organize NEURONE workshops in collaboration with ENVRI-FAIR.

Description of Work

WP5 is led by DRAXIS

Task 5.1 Communication, Dissemination & Exploitation strategy
(Lead: EuroGOOS, Partners: NOA/CNR/CNRS/DRAXIS)

The main objective of Task 5.1 is the development of a communication, dissemination and exploitation (CDE) strategy. Task 5.1 will establish the main strategic plan for all CDE activities of the project and for achieving the widest visibility. This task includes (i) a more-extensive analysis and segmentation of the NEURONE target audience, (ii) the selection of the communication techniques best suited to reach each of these segments, e.g. awareness raising events, networking and matchmaking events in EU, synergies creation etc. (iii) the elaboration and update of the NEURONE Dissemination plan. All aforementioned activities will result to the development of the project dissemination, communication and Exploitation plan and establish the outmost-objectives of the NEURONE diffusion and engagement strategy. The exploitation activities of NEURONE will be deployed within **WP6 - Task 6.3 Sustainability and IPR**, aiming at building exploitation road map ensuring the sustainability of NEURONE outcomes (D6.2 and D6.4).

Task 5.2 Development of CDE tools and material
(Lead: DRAXIS, Partners: NOA/CNRS/BSC)

The main objective of this task is the development of the communication, dissemination and exploitation (CDE) material as well as the establishment and management/retention of the most efficient CDE tools per target audience. In line with the Task 5.1 results, Task 5.2 will format the NEURONE brand, format and deliver a set of promotional - communication materials (e.g. leaflet, Newsletter template etc.) and tools (e.g. website and social media) designed specifically to inform and attract the target audiences (online & offline) for maximum outreach and engagement.
The project website will also be the entry point for the NEURONE Knowledge Hub, established within WP6 (Task 6.1).
DRAXIS will also utilize and leverage on top of NEURONE partners existing CDE channels and tools (newsletters, events) and audience of networks so as to build and extend NEURONE reach to its maximum.

Task 5.3 NEURONE Dissemination, Communication, Events & Engagement activities
(Lead: NOA, Partners: CNRS/EuroGOOS/EARSC/DRAXIS/BSC)

The main objective of this task is the implementation of all planned Dissemination, Communication and Engagement activities of NEURONE (as described in section 2.2), as well as the implementation of NEURONE-led events.
Task 5.3 will also participate and assist in the **Task 1.2 Liaison** as well as support the NEURONE **"Advisory" and "Copernicus Consultation" Boards.** Especially the later ones (NEURONE Advisory and Copernicus Consultation Boards) would be solicited participation in the Project events.
In addition, Task 5.3 is responsible for all activities related to the organisation of a series of NEURONE dedicated work meetings and sessions/workshops in parallel to major events, such as the ENVRI-FAIR (ENVRI successor initiatives) annual workshop. NEURONE aims to capitalise on those events in three ways (a) to support stakeholder engagement (b) to collect information from the participants and receive feedback on its activities and (c) to further extend its reach and visibility, particularly in the SME ecosystem. NEURONE will also present the project and disseminate the results of its activities in a series of other related events (see a preliminary list of events in section 2.2). The planning of events has been arranged to coincide with project meetings.

Deliverables (brief description and month of delivery)
D5.1: **Communication, Dissemination & Exploitation plan** Due: **M2,** Responsible: **(EuroGOOS)**
D5.2: **NEURONE Website**, Due: **M3,** Responsible: **(DRAXIS)**
D5.3: **NEURONE dissemination material**, Due: **M3,** Responsible: **(DRAXIS)**
D5.4: **Stakeholder Engagement Strategic Plan**, Due: **M4,** Responsible: **(NOA)**
D5.5: **Mid-term Stakeholder Engagement activities**, Due: **M15,** Responsible: **(NOA)**
D5.6: **Mid-term Report on Dissemination Activities & Updated Plan**, Due: **M15,** Responsible: **(DRAXIS)**
D5.7: **Final Stakeholder Engagement & Dissemination Activities report** Due: **M30**, Responsible: **(NOA)**

WP number	6	Lead beneficiary	NOA
WP title	NEURONE Legacy		

Participant number	1	2	3	4	5	6	7	8	9	10	11	TOTAL
Short name of participant	NOA	CNRS	CNR	EuroGOOS	FMI	BSC	EARSC	DRAXIS	UFZ	EAA	ICOS ERIC	
Person months/ participant:	23.5	2	4				2	14				45.5

Start month	1	End month	30

Objectives

This work package encompasses the items that constitute the concrete and tangible contribution of NEURONE to the evolution of Copernicus In Situ Component, during and beyond the project's lifetime. This entails: **(1) setting up and operating the NEURONE Knowledge Hub**, **(2) establishing a reference system to monitor and assess** the impact of the various activities during and beyond the duration of the project and **(3) defining and implementing a sustainability scheme guaranteeing the long-term exploitation of the project results** and the sustainability of the expected impacts across the various activities.

Description of Work

WP6 is led by NOA (Omiros Giannakis)

Task 6.1 NEURONE Knowledge Hub
(Lead: NOA, Partners: CNRS/CNR/DRAXIS)

The aim of the Task 6.1 is το setup the NEURONE Knowledge Hub, which will gather and make available the following: (i) an information pool on the in situ infrastructures and other in situ monitoring networks relevant to Copernicus, etc.; (ii) catalogues of descriptive metadata for various local datasets from RIs and in situ monitoring networks; (iii) a portfolio of best practice examples for the use of Copernicus in situ datasets; (iv) a community focus tool offering the ability to exchange information on RI services amongst registered users.

The core function of the Knowledge Hub is to build concrete links with all in situ infrastructures players, extending to additional countries and interfacing with international initiatives. The gateway to and from the NEURONE Knowledge hub will be provided through the NEURONE webpage which will be realised through the production of the functional and technical specification document (M4), detailing the respective requirements to be fulfilled.

Task 6.2 Connecting NEURONE to the SMEs/Market
(Lead: EARSC, Partners: NOA/DRAXIS)

This Task will ensure that position of the downstream commercial sector is considered in the methodologies developed and implemented in the previous Work Packages. EARSC will review the implementation plans for the gap analysis investigations and ensure that consideration of the used and needed in situ data for the downstream market is included in roadmap preparations. This consideration is crucial to ensuring the long-term viability and relevance of the NEURONE outputs.

Task 6.3 Sustainability and IPR
(Lead: DRAXIS, Partners: NOA/CNRS/CNR)

In order to define and implement an appropriate scheme that will allow the optimal exploitation of NEURONE's outcomes and the Knowledge Hub, the project will develop a sustainability plan that builds in parallel to **Task**

5.1 Communication and Dissemination & Exploitation strategy and the initial exploitation scenarios (as described in section 2) and includes actions towards:

- Assessing the viability and feasibility of the different exploitation scenarios building upon the outcomes of stakeholder interaction (Task 5.3).
- Fostering wider and better-targeted use of the created knowledge.
- Exploitation through NEURONE Knowledge Hub, that aspires to gather all in situ service/data/products cataloguing of metadata) and promoting them in Europe and in global markets
- Supporting the priorities outlined in the NEURONE's roadmap towards the evolution of in situ infrastructures to optimally serve Copernicus, while enabling the exploitation of the results generated by the project in future Copernicus activities.

Finally, a dedicated report will be prepared defining the framework for the exploitation of background IP, the commercialization of foreground IP developed within the project (if any), and all issues related to data exploitation.

Deliverables (brief description and month of delivery)
D6.1: **NEURONE Knowledge hub portal Specifications (Functional & Technical)** Due: **M4,** Responsible: **NOA)**
D6.2: **Initial exploitation & IPR**, Due: **M12,** Responsible: **(DRAXIS)**
D6.3: **NEURONE Knowledge hub portal report** Due: **M27,** Responsible: **(NOA)**
D6.4: **Final sustainability plan including IPR report** Due: **M30,** Responsible: **(DRAXIS)**

3.1.3.3 List of major deliverables

Table 7: List of deliverables

Del. #	Deliverable name	WP #	Part. Name	Type	Diss. level	Del. Mo.
D5.1	Communication, Dissemination & Exploitation plan	5	EUROGOOS	R	CO	2
D1.1	Project Management Plan	1	NOA	R	CO	3
D1.2	Liaison strategy, targets & Advisory board establishment	1	FMI	R	CO	3
D5.2	NEURONE Website	5	DRAXIS	OTHER	PU	3
D5.3	NEURONE dissemination material	5	DRAXIS	OTHER	PU	3
D5.4	Stakeholder Engagement Strategic Plan	5	NOA	R	CO	4
D6.1	NEURONE Knowledge Hub Portal Specifications (Functional & Technical)	6	NOA	R	CO	4
D1.3	Data Management Plan	1	BSC	R	PU	6
D2.1	Mapping of current and future in situ data requirements of the Copernicus Services and Copernicus Space Component (CSC)report	2	NOA	R	CO	7
D2.2	Mapping of the global in situ infrastructures of value for Copernicus report	2	CNRS	R	CO	7
D2.3	Recording good practices and definitions from on-going projects between the Entrusted Entities and the in situ infrastructures report	2	EUROGOOS	R	CO	7
D2.4	Recording the available solutions provided by the e-infrastructuresreport	2	BSC	R	CO	7

D3.1	Gap analysis report	3	EUROGOOS	R	PU	12
D3.2	Maturity Indicators for the in situ infrastructures Report	3	CNRS	R	PU	12
D6.2	Initial exploitation & IPR	6	DRAXIS	R	PU	12
D3.3	In situ infrastructures priorities and operational needs for Copernicus report	3	CNR	R	PU	14
D1.4	Coordination Progress Report (vol. I)	1	NOA	R	CO	15
D5.5	Mid-term Stakeholder Engagement activities	5	NOA	R	PU	15
D5.6	Mid-term Report on Dissemination Activities & Updated Plan	5	DRAXIS	R	PU	15
D4.1	Roadmap for the evolution of in situ infrastructures as a Copernicus in situ interface layer	4	CNRS	R	PU	22
D4.2	IT requirements for the Copernicus in situ interface layer	4	BSC	R	PU	23
D6.3	NEURONE Knowledge hub portal report	6	NOA	R	PU	27
D1.5	Coordination Progress Report (vol. II) & Liaison activities	1	NOA	R	CO	30
D5.7	Final Stakeholder Engagement & Dissemination Activities report	5	NOA	R	PU	30
D6.4	Final sustainability plan including IPR report	6	DRAXIS	R	PU	30
D5.1	Communication, Dissemination & Exploitation plan	5	EUROGOOS	R	CO	2
D1.1	Project Management Plan	1	NOA	R	CO	3
D1.2	Liaison strategy, targets & Advisory board establishment	1	FMI	R	CO	3

3.1.4 Pert Chart

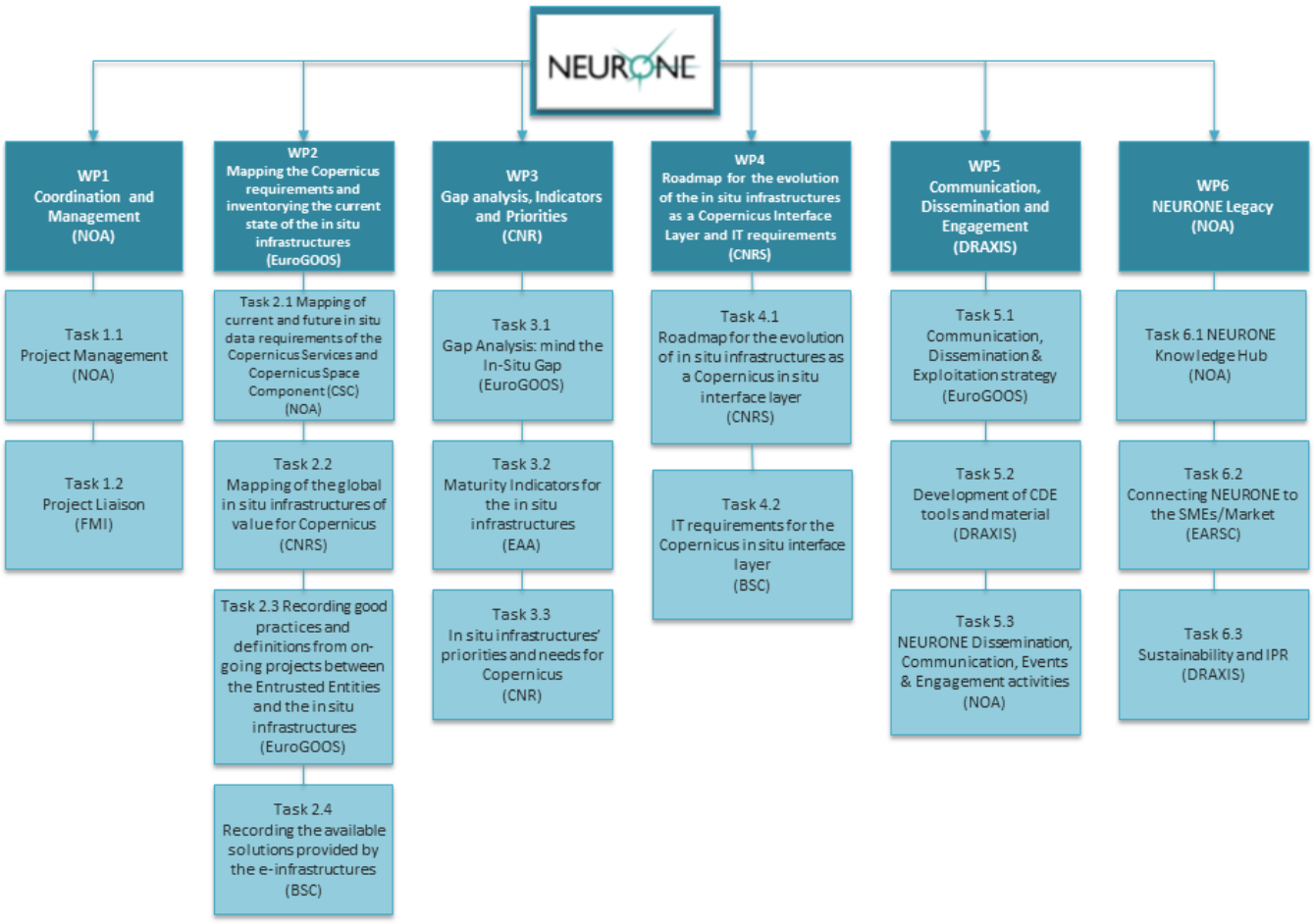

Figure 7: Pert Chart

3.2 Management Structure and Procedures

The management and coordination of NEURONE will be carried out through the dedicated WP1, led by NOA. Project Coordination and Management includes the overall management, communication and coordination between the different partners, as well as the monitoring of the progress of the entire project, by means of the supervision of the achieved milestones, the management of the risks and the establishment of contingency plans, gender equity, and other non-technical aspects. The practical managerial framework, organisational structure and decision-making mechanisms, have been tailored to the size and complexity of the project, according to best practices in management of CSA projects and taking full advantage of previous experience from European and international projects. Lessons learnt have been duly embedded in the proposed management structure and procedures, in order to make it leaner and increasingly efficient and cost-effective.

3.2.1 Organisational Structure

The general organisational structure is presented on Figure 8. It consists of two main levels:

The **governance level** deals with strategic issues and includes the **Project Coordinator (PC)** and the **General Assembly (GA)**. The PC will ensure a single line of command and reporting and a single point of contact to the EC Project Officer. The PC is responsible for: (i) ensuring the overall project coordination and official representation, (ii) reporting to EC services and contacting them for administrative purposes; (iii) coordinating the periodic reports; (iv) internal reviewing procedures; (v) coordinating the final report; and (vi) resolving conflicts.

The role of the **GA** is to make decisions concerning any important top-level management or strategy issues. The **GA** is chaired by the **PC** and composed of **representatives from each partner**. It is envisaged that the **GA** will convene - at minimum - next to all periodic meetings (Kick-off and Review Meetings), supporting the project coordination

by defining for the next reporting period: (i) A comprehensive and attainable strategy for the completion of the project objectives, with appropriate levels of control, (ii) The overall macro management issues which affect the running of the project, including financial, technical, planning, control and exploitation matters, and review of project risks, (iii) The control procedures for ensuring the appropriate resources utilisation with respect to the work plan, (iv) The subsequent contractual agreements, (v) The appropriate corrective actions to be taken in the case of progress problems or conflicts, (vi) The top level decisions in matters related to the Contract. Details of the procedures for the **GA** will be included in the **Consortium Agreement (CA)**.

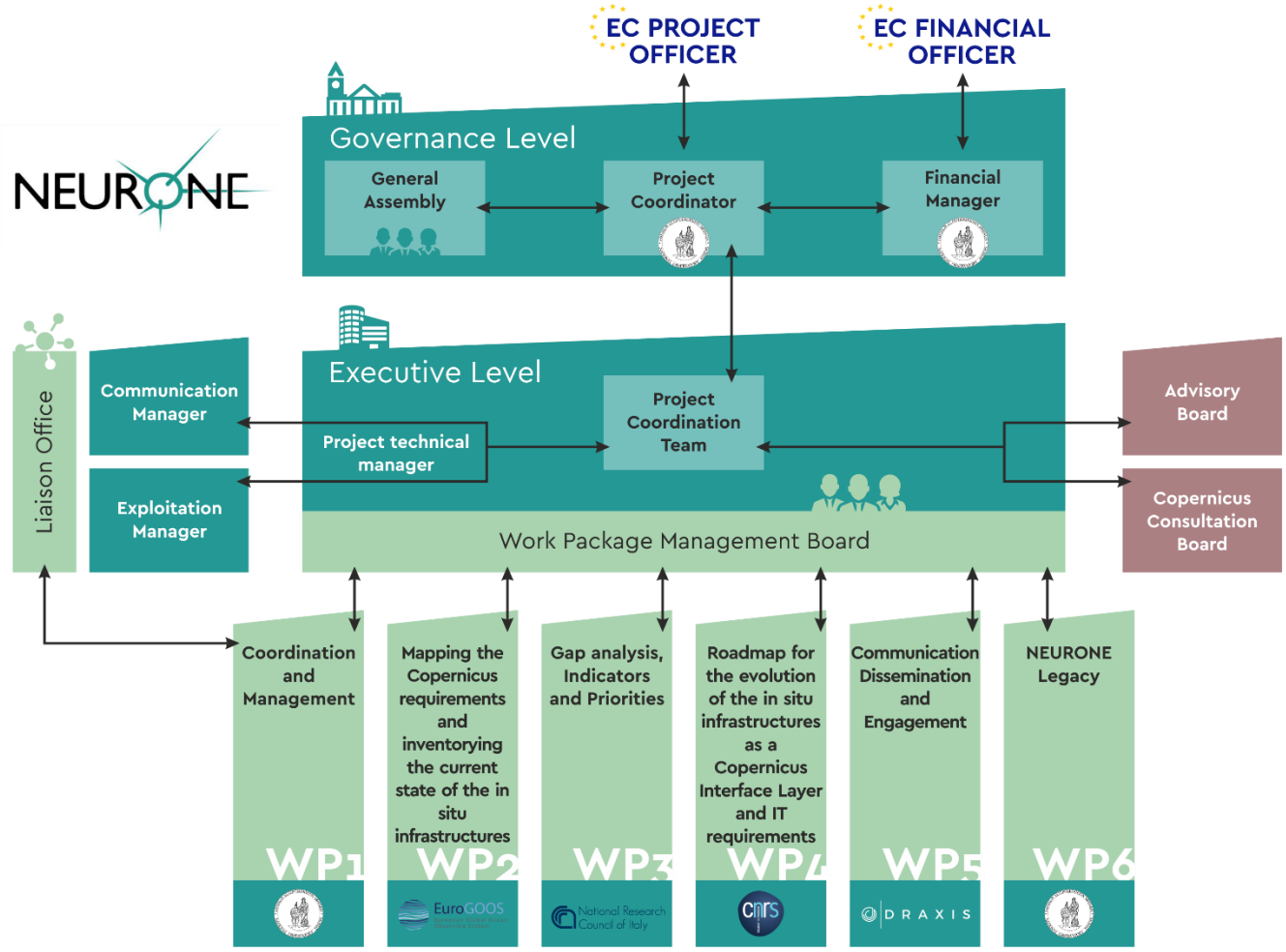

Figure 8: Organization Structure

The **executive level** deals with the daily organizational and programmatic steering of the activities with respect to targeted objectives, team organization, planning and milestones, as described by the Work Breakdown Structure. In order to ensure smooth and effective implementation of the project, management at the executive level will be performed by the **Project Coordination Team (PCT)** with the support of the **WP Management Board (WMB)**.

The **PCT**, is chaired by the **PC**, and comprises of the **Project Technical and Quality Assurance Manager (TQM)** and the **Financial Manager (FM)**. The **PCT** is responsible for the continuous monitoring of the progress of WP activities and for implementing potential corrective actions to ensure timely delivery of the project, including, (i) Overall maintenance of work progress schedules and achievement of the project objectives, (ii) project liaison (through Task 1.2), (iii) Decision making, assisted by the WMB reports and suggestions, (iv) Control of the quality of project outputs and deliverables, (v) Management and mitigation of risks and contingencies, (vi) Sound and efficient management of the Community financial contribution. The PCT will be assisted by the **Dissemination Manager (DM)**, the **Exploitation Manager (EM)** and the **Liaison Officer (LO)** for the respective activities.

The **WMB**, comprising of all top-level WP leaders, is responsible for reporting to **PCT** and proposing the direction of the work across the different activities; ensuring cooperation between the different WPs; assisting the PCT in the effective management of the project; and taking the right decisions on releasing the Community financial contribution to the project partners in respect to on-going activities. The **WMB** receives recommendations from the **Advisory Board (AB)** (see below) and the external entities represented therein and incorporates them in the execution of the different activities in an efficient manner. The **WMB** will meet as often as required (see milestone

meeting schedule below), via teleconference or by physical meetings. The WP leaders themselves will thus be fully responsible for the management of their respective WPs and for coordinating the inputs of the involved partners.

3.2.1.1 Key roles

Dr Vassilis AMIRIDIS (VA, NOA) is a Research Director of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. VA will act as the overall **Project Coordinator** responsible for ensuring that the project runs efficiently, the resources are properly allocated, and that deliverables are developed and delivered according to the work plan and quality standards. He will ensure the effective cooperation between the partners and the PCT, WMB, GA, and AB boards. He is working on climate research and he focuses on the impact of atmospheric aerosols and clouds on radiation and extreme weather. His research is mainly based on advanced ground-based and space-borne remote sensing observations (passive and active remote sensing techniques) and theoretical models.
VA is responsible for the operation and data exploitation of the **Panhellenic Geophysical Observatory of Antikythera (PANGEA)**, deploying the Aerosol Remote Sensing National Facility according to ACTRIS. He is also **in charge of the operations for a number of ESA CalVal programs** for ADM-Aeolus and EarthCARE respectively (ASKOS, VADAM and ACROSS), **employing the official ESA ground-based mobile lidar systems for Fiducial Reference Measurements (ESA-EVE and EMORAL)**, which have been developed by IAASARS/NOA and Raymetrics. His lidar-related activities have been acknowledged by the European Aerosol Research Lidar Network (EARLINET), which has elected **VA as an EARLINET Council member for the periods 2012-2016 and 2016-2020**. Moreover, **VA is the National Representative for Greece in Interim ACTRIS council (ACTRIS IAC)**. He also acted as the **Greek National Delegate for the COPERNICUS Committee for the period 2014-2017**. Starting from 2018, **VA is member of the Steering Group of the "Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS)" of the World Meteorological Organization (2018 - 2022)**. In 2016, **VA received the ERC Consolidator Grant** for establishing high level atmospheric research in the geophysical observatory of Antikythera, a unique infrastructure that is developed to study desert dust dynamics, transport and interaction with radiation and clouds.
He has participated in 42 research projects and experimental campaigns, in 7 of which as coordinator and 6 as Principal Investigator for IAASARS/NOA. He has more than 90 publications in peer-reviewed scientific journals and his work received approximately 2400 citations from third-party (h-index = 30, source: ISI Web of Knowledge). Moreover, VA participated in numerous conferences, co-chaired 8 of them and invited to present his work 7 times. He is a member of the editorial board of EGU's Atmospheric Measurement Techniques Journal (Copernicus Publications, Impact Factor = 3.2) and Remote Sensing (Impact Factor = 3.9) and he is active reviewer in ~25 scientific Journals in his field. VA is leading the Group for Remote Sensing of Aerosols, Clouds and Trace Gases (ReACT) in IAASARS/NOA, currently composed of 20 members (8 Postdocs, 9 PhDs and 3 support personnel). **VA coordinated 7 competitive research projects and acted as a PI for NOA for 6 more, attracting a research funding of 4.3 M€ in total.**

Dr Paolo LAJ (CNRS) is a senior scientist at Université-Grenoble-Alpes (Physicien). He is the acting co-coordinator of ACTRIS-2 and ENVRIplus and has been involved in a number of EU projects since FP4 (ACCENT, EUCAARI, CIME, ACE2, EUSAAR, PEGASOS, ACTRIS, ACTRIS-2, ACTRIS PPP, ENVRIPLUS, ENVRI FAIR). He is author or co-author more than 120 research articles in the field of aerosols and clouds and their interactions. He is a member of WMO expert group on aerosols. Paolo Laj is participating in the European Environment Agency's lead project for coordination of the in situ component of the Copernicus Programme Services. He also actively contributed to the establishment of the GEO foundational task on in situ observations. As a member of BEERI, he will be one of the NEURONE partners ensuring the connection with ENVRI and EOSC.

Dr Lucia MONA (CNR) is a researcher at CNR-IMAA. She is responsible of the EARLINET (European Aerosol Research Lidar NETwork) database and its link to the ACTRIS data portal. She is the responsible of the ACTRIS data center node for aerosol remote sensing. Dr Mona has a researcher profile that combines expertise on developments of lidar systems, instruments integration/combination, analysis methodologies, exploitation of state-of-the-art measurements for different application fields and integrated studies with models. She is leading the AEROSAT (International Satellite Aerosol Science Network) Working Group on Aerosol Typing. She is member of the Regional Steering Group of the SDS-WAS (Sand and Dust Storm Warning Advisory and Assessment System) of the WMO.

Dr Glenn NOLAN (EuroGOOS) is the Secretary General of EuroGOOS. He is responsible for the Secretariat office that supports the association to fulfil its main goals, i.e. to: identify European priorities of operational oceanography and promote their implementation; foster collaboration and co-production at regional, European and global levels; ensure coordination with international initiatives. He has a Ph.D in Physical Oceanography. His main research interests are in the field of physical and operational oceanography and he has been leading scientist in several international and national projects in this area. He has more than 40 papers in peer-reviewed journals and books and has acted as a research supervisor and lecturer as well as a journal reviewer. Glenn is currently a member of various advisory bodies including the GOOS steering committee, Copernicus Marine Service advisory committee, Euro-Argo advisory board, EC GEO high-level working group and the EC Atlantic Seabed mapping working group. Glenn currently chairs the GOOS Regional Alliances Forum. He will act as the **EM** of the project's outcomes and promoting the sustainability of the project's components both within planned activities and in cooperation with external parties.

Dr Herbert HAUBOLD (EAA) holds a PhD in Geological Sciences from The University of Texas at Austin and is a Certified Senior Project Manager (International Project Management Association Level B). Since 2002, he works for the Environment Agency Austria (EAA) as project Coordinator and also as an internal project management advisor and trainer. He currently is Project Manager of eLTER H2020 (see projects). Before, he was Coordinator of the FP6/FP7 projects GNU (GMES Network of Users) and HELM (Harmonised European Land Monitoring) and he participated in a range of other Earth Observation related European research projects and activities, including GeoLand and GSE Forest Monitoring (on land monitoring); BalkanGEOnet (capacity building); PROMOTE, MACC, obsAIRve (atmosphere monitoring). He currently represents Austria in the Copernicus User Forum and is a member of GEO/GEOSS Austria and the Austrian Interministerial Group for Space and he is the secretary of the association ILTER (International Long Term Ecosystem Research – www.ilter.network.

Prof. Jouni Pulliainen (FMI has published 120 peer-reviewed journal articles and over 300 publications in total. His h-index is 33 and number of citations over 3500. From 2001 to 2006 he was a professor of space technology at Helsinki University of Technology, specializing in remote sensing. He is currently a research professor at the Finnish Meteorological Institute (FMI) and director of the Space and Earth Observation Centre of FMI (FMI-SPACE). FMI-SPACE employs 100 researchers and technical staff members, 20 of those in Sodankylä. A major activity of FMI-SPACE is research related to satellite CAL-VAL and EO algorithm development. FMI-SPACE is also responsible for the satellite ground segment operations at Sodankylä, northern Finland, that encompassing the National Satellite Data Centre (NSDC). Recently, Pulliainen's research work has focused on the active and passive remote sensing of environmental processes of the cryosphere and boreal forest zone applying space-borne microwave and optical data. He has been a principal investigator or project manager for several nationally funded and international research projects, including several ESA and EC contracts. Memberships in international and national scientific committees and organizations include ESA Advisory Committee on Education (2001-2007); ESA CoreH2O MAG (2007-2013), National Committee of COSPAR (2010 onwards), delegate of Finland to SAON board (2011 onwards), member of ESA Earth Science Advisory Committee (ESAC, 2013-2017), delegate of Finland to ESA Earth Observation Program Board (PB-EO, 2017 onwards). He will act as the **LO** to coordinate related activities, facilitate communications to identified target groups and provide regular updates to the WMB.

Ir. Alex Vermeulen (ICOS) is director of the ICOS Carbon Portal. He has a strong background in (micro)meteorology, air quality modelling, observation techniques and data acquisition and ecosystem science. He has authored or co-authored more than 60 peer-reviewed scientific publications (h-index 26). He has been involved as PI or coordinator in international cooperation projects since 1994. He started as junior scientist on a project on ammonia deposition and acidification research at ECN (Energy Research Center of the Netherlands). Since 1990 he worked in climate research in the field of greenhouse gas emission and concentration measurements and transport modelling. He has been project leader since 1994 and has been assistant group leader (~20 people) from 2005-2012. Since June 2014 he is Director of the Carbon Portal, leading a group of 12 scientists and technicians at Lund and Wageningen University, in the Carbon Portal a completely FAIR data portal has been built from scratch based on linked open data. As ECN project leader he participated in European projects like European Methane (FP4), AEROCARB, RECAB (FP5), CarboEurope-IP, IMECC, GEOMON, EuroHydros, GHG-Europe, and ACTRIS (FP7). He coordinated the CHIOTTO (FP5, RTD, 5 M€, 10 partners) and the InGOS (FP7, IA, 12 M€, 38 partners) project. Currently he is involved as PI and task leader in the H2020 projects EUDAT2020, ENVRIplus, ENVRIFAIR and RINGO. In ENVRI-FAIR he leads the work package on ENVRI community wide data services. He leads the atmospheric composition part of the EEA Copernicus in situ project. Furthermore, he is chair of the WMO GAW Greenhouse Gas Scientific Advisory Board and member of the WMO IG^{3}IS executive committee.

Dr Omiros GIANNAKIS (NOA) is a Senior Research Scientist of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. He will act as the **TQM** and provide support to ensure the smooth running of the project, maintaining the schedule of the deliverables and progress / financial reporting. He has been the PI and co-PI of ESA projects and he contributed in the coordination of several European (FP7, H2020) projects. He has a solid knowledge of programmatic, strategic and business aspects of the EU Space Programmes and has been involved in several projects. He is working on various subfields of space physics, including data analysis of space-borne measurements, space physics, space weather, algorithms design and development.

Stavroula PAPATHEOCHARI (NOA) will act as the **FM,** reporting to the PC, and providing support to (i) collect all costs incurred during the reporting periods, broken down by type and activity; (ii) report costs to the EC: summary of the cost statements, cost certificates, person-month level justification, and summary financial reports by the coordinator; (iii) obtain certificates on financial statements from auditors when needed. Panagiotis has a large experience in financial management of big EC and national projects also assuming project financial reporting responsibilities in NOA Special Account Office.

A Dissemination Manager and an Exploitation manager will be assigned from DRAXIS to ensure the coordination of the different dissemination and exploitation activities in a timely and efficient way.

Advisory Board (AB) and Copernicus Consultation Board (CCB): Amongst the main foundations of NEURONE, lies the alignment to the priorities of in situ infrastructures and Copernicus (services and space component). This will be assisted and guided by a number of known experts to be included in the project's **AB** and **CCB**. The **AB** will convene three times during the lifetime of the project, while communication ports will remain open on an ad hoc basis. The **CCB** will be frequently contacted throughout the project duration and will participate in NEURONE workshops. The **LO** will be responsible for the liaison with the **AB** and the **CCB**.

3.2.1.2 Decision-making Mechanisms

The decision-making mechanism can be characterised as a six-stage process including (1) the identification of the problem or issue to be addressed, (2) the generation of resolving options, (3) the assessment of the impact of the options, (4) the formal decision taking, (5) the implementation, and (6) the subsequent monitoring and evaluation of the project. In each case, appropriate information is collected, resources are employed, and outputs are generated. The activities associated with each stage of the project should not be undertaken in isolation, but in the context of the whole project, recognising the requirements of future stages and thus enabling the best overall solution to be developed. The **Consortium Agreement** will define decision-making mechanisms in detail, as well as the rules of distribution of the EC financial contribution among partners.

In case of conflicts, issues will be resolved "locally" (i.e. within the WP) by the involved partners, and in coordination with the WP leader. In case this is not feasible, the issue will be passed on to the **WMB**, chaired by the **PC** who has the casting vote, and if the conflict cannot be solved at this level either, then it will be brought in front of the **GA**.

Although all partners are committed to the project success, unpredictable changes in the internal situation of a partner might result in its inability to achieve the project goals. Procedures that deal with potentially defaulting partners will be set forth in the **Consortium Agreement**.

3.2.1.3 Internal Communication

Internal Communication: Communication means are used as appropriate, including tele- or video conferencing and e-mail. Any important information discussed in a meeting or over the telephone is confirmed by e-mail or minutes of meetings. A project specific collaborative area for sharing documents (e.g. RedMine) will be used, for which access will be granted to each consortium partner (and also to the PO if requested) by NOA.
Periodicity of meetings: The project team will undertake efforts to optimize travel by cost-effective travel management; enhancing virtual meetings by video conferencing; Periodicity and type of foreseen meetings will be agreed between the partners (at least one physical meeting per year is foreseen). The project meetings will be scheduled before or after major events that NEURONE will participate (e.g. EC events, workshops with stakeholders).

Coordination between Work Packages: Proper communication is of paramount importance for NEURONE. NEURONE foresees regular interaction meetings between the Work Packages in order to leverage on common overall activities and lessons learnt.

3.2.1.4 Meetings

Meetings are considered the optimal means to verify the project status, as they permit the bringing together of all involved teams and organisations at the same place and time, to discuss problems, to submit proposals for resolving issues, and provide different points of view. Considering the geographic spread of partners, NEURONE will offer several meeting place options and will also utilise modern teleconferencing tools (e.g. WebEx, Skype) to ensure continuous coordination and reduce costs. A preliminary schedule of the milestone meetings (including **Progress Meetings PMs**) has been developed to allow for an evaluation of the travel costs.

Table 8: Preliminary Schedule of Milestone Meetings

Milestone Meeting	ID	Project Month	Location	Subject
MM1	KO	M0	Athens	Kick-off meeting
MM2	PM1/WS1	M6	EEA – Copenhagen	Project update meeting / Requirements and Inventories
MM3	PM2	M10	ENVRI-FAIR	Project meeting
MM4	MTR	M15	Brussels	Mid Term Review
MM5	PM3	M20	Kythera	Progress Meeting
MM6	PM5/WS2	M26	ENVRI-FAIR	NEURONE Workshop
MM7	FR	M30	Brussels	Final Review
KO: Kick-off; PM: Project Meeting; MTR: Mid-Term Review; FR: Final Review; WS: Workshop				

Emphasis will be placed on the participation of NEURONE representatives in other workshops and meetings of significant interest to the project (e.g. ENVRI-FAIR workshops). In addition to the official and contractually mandated meetings, internal project meetings are also foreseen and strongly encouraged, with aim to review the status of the specific detailed tasks or WPs. For all meetings, the **PC** (or WP leader) will provide a detailed agenda, record the minutes and identify clear action items, in order to maintain traceability of subjects discussed and of the related decisions taken.

3.2.1.5 Milestones

Table 9: List of Milestones

Milestone number	Milestone name	Related WP	Due date	Means of verification
MS1	Kick-off Meeting	WP1	M1	Kick off meeting
MS2	CDE plan submission	WP5	M2	The plan has been completed
MS3	NEURONE website is up and running	WP5	M3	Operational functionality of website
MS4	NEURONE Knowledge hub specification	WP6	M4	Deliverables D6.1
MS5	Successful completion of NEURONE – led events	WP5	M6	NEURONE press release
MS6	Completion of mapping the Copernicus requirements and inventorying the current state of the in situ infrastructures	WP2	M7	Deliverables D2.1 - D2.4
MS7	Completion of gap analysis	WP3	M12	Deliverables D3.1
MS8	Completion of in situ infrastructures' priorities and needs for Copernicus	WP3	M14	Deliverables D3.3
MS9	Mid Term Review	ALL	M15	Deliverable acceptance at mid-term
MS10	Roadmap for the evolution of in situ infrastructures as a Copernicus in situ interface layer	WP4	M22	Deliverables D4.1

MS11	Completion of IT requirements for the Copernicus in situ interface layer	WP4	M23	Deliverables D4.2
MS12	Successful completion of NEURONE – led events	WP5	M26	NEURONE press release
MS13	NEURONE Knowledge hub	WP6	M27	NEURONE knowledge hub is online and accessible
MS14	Final Sustainability and IPR Plan	WP6	M30	Submission and acceptance of all deliverables

3.2.2 Quality Assurance

The WP leaders make detailed work plan at the start of the project that also contains indicators for quality assurance. These indicators could be for example a review by the TQM, the Project Coordination Team or External Advisory Board. The work package progress is reviewed bi-annually. High standard of project deliverables is secured through TQM and PC organized internal reviews together with the WP leaders in the Project Coordination Team.

3.2.3 Risk Management

Potential risks which could hinder the smooth implementation of the project have been identified and are described in the table below along with the proposed contingency/mitigation measures.

Table 10: Critical risks for implementation

Description of Risks	WP(s) involved	Proposed mitigation measures
Difficulties in coordination and tasks delivery due to in situ data diversity	Across WPs	NEURONE has taken consideration of the in situ data differences in its management approach; the RI coordinators have strong relevant experience and ties with the participating entities; NOA's project coordination team has extensive experience of managing diverse consortia.
Inadequate participation of in situ data and Copernicus service providers	WP2/WP5	CNRS, CNR, EuroGOOS have a rich network, which they will actively mobilise throughout the project; NEORONE has secured multiple LoS from key umbrella organisations and initiatives to ensure that a critical mass of stakeholders is engaged from the beginning of the project; and will also tap in the networks represented through the advisory board.
Limited external interaction leading to non-sustainability	Across WPs	Through Task 1.2 but also across the different WPs, the project will develop cooperation, integration and coordination of thematic activities, maximise synergies and promote cross-fertilization with other on-going activities.
Difficulties in delivery of portal and Knowledge Hub	WP6	NOA and DRAXIS have significant experience in technical web development and will ensure that the technical specifications are clearly drafted and understood; flexibility has been built into the timing of the delivery ensuring minimum impact of potential delays.
Third-party content, copyright and licensing	WP2	NEURONE i) builds upon previous work and avoid duplications (e.g. inventories), building strong a-priori links to several previous projects; ii) lays out a concrete data policy (see Knowledge Hub) and make end-users aware of third-party copyrights.
Difficulty to measure concrete impacts (during and beyond)	WP6	NEURONE commitment to fostering sustainable solutions and to measuring the impact of its activities will be pursued through a combination of the dedicated WPs (Task 3.2 and Task 6.2) and an appropriate methodology within and beyond the project's lifetime.

3.3 Consortium as a Whole

The NEURONE consortium brings together eleven (11) organisations as full partners from eight (8) European countries (Greece, France, Italy, Belgium, Finland, Spain, Germany and Austria), representing the most important players, and forming a highly complementary team that possesses the full range of skills and expertise necessary to carry out the proposed activities successfully. In more detail:

- **NOA** operates a wide range of ground-based national facilities aiming to support research and services in the Earth System Science domain. In this context, NOA operates the "PANhellenic GEophysical observatory of

Antikythera (PANGEA)", at the island of Antikythera, a National Hub for the continuous monitoring of Essential Climate Variables (ECVs), space-based monitoring infrastructure and acquisition facilities (e.g. X-/L-band stations, MSG-Seviri, ESA's CGS - Mirror Site acquisition facilities), and provides near real time observations and services to operational program frameworks of EC, ESA, Copernicus.

- **CNRS** is co-coordinator of ACTRIS-2 and ENVRIplus and has been involved in a number of EU projects since FP4 (ACCENT, EUCAARI, CIME, ACE2, EUSAAR, PEGASOS, ACTRIS, ACTRIS-2, ACTRIS PPP, ENVRIPLUS, ENVRI FAIR).
- **CNR** is currently leading activities at EU and international levels to foster the integration of observations across many key international networks engaged in systematic long-term observations of the atmosphere and to ensure implementation of common observing techniques, data and metadata strategies. CNR is responsible for the ACTRIS aerosol remote sensing database as tool for data collection and provision to internal and external users. CNR has a recognised expertise in supporting and promoting observational activities for climate, environmental and ocean monitoring, based on the integration of different kinds of observational techniques (in situ, remote sensing, satellite) and to improving the comparability of data streams, creating uniform data quality standards, sharing of QA/QC approaches, and realising observational program synergies.
- **EuroGOOS** provides access to the main oceanographic institutes in Europe through its members. EuroGOOS has conducted extensive mapping of in situ observing systems and infrastructure for the oceanic domain. They have partnered with EUMETNET and ICOS in delivering requirements, gap analysis and sustainability studies for the EEA Copernicus in situ coordination project since 2017. They have also been central to mapping carried-out in significant H2020 projects including AtlantOS, JERICO NEXT and INTAROS with foci on the Atlantic, coastal system and Arctic respectively.
- **BSC** international activity includes the coordination of the two World Meteorological Organisation (WMO) regional centres specialised in sand and dust warning and forecasting, as well as the participation in climate services initiatives like the Climate Services Partnership (CSP).
- **EAA** has expertise on the condition of the environment and environmental changes as well as on measures to avoid or reduce environmental pollution, designs and operates national environmental databases and is involved in multiple co-operations with national and international institutions. It plays an important role in the EIONET, in that it is the National Focal Point (NFP) for the EEA as well as a partner in several European Topic Centres and it is the National Reference Centre of the EEA in several areas.
- **UFZ** is running the German LTER office. Research is conducted on seven own LTER sites and one LTERS-platform. These research infrastructures are embedded in the TERENO earth observation network of the Helmholtz-Association aiming to record the long-term ecological, social and economic impact of global change at the regional level. Consortium members from the UFZ have strong experience in conducting research on climate and land use change impacts on biodiversity and socio-ecological research as well as the related monitoring activities.
- **FMI** leads the EUMETSAT's Atmospheric Composition Monitoring Satellite Application Facility and participates on EU funded Copernicus Atmosphere Monitoring service project. Recent projects deal with the technical feasibility and economic viability of a service to monitor air pollution from ships, developing air quality monitoring products based on satellite data for the needs of national authorities and private companies.
- **EARSC's** key goal is to help promote the industry and to help develop the market for EO services. EARSC is representing the European providers of geo-information services in its broadest sense creating a network between industry, decision makers and users and covering the full EO value chain from data acquisition through processing, fusion, analysis to final geo-information products & services.
- **ICOS ERIC** as a long-term European Research Infrastructure has been developed over the last 10 years to be the observational backbone of a European GHG research, information and verification system and as such an important building block in a global information system. ICOS has established cooperation with global organisations such as WMO and GEO to further develop global research programs and provide valuable knowledge as well as technical support for the decarbonization processes following the COP 21 Paris Agreement. ICOS ERIC has an established data infrastructure, which is already connected to EUDAT while ICOS is exploring further integration into the European Open Science Cloud. The data infrastructure which will also serve as an interface to COPERNICUS and GEOSS and the important knowledge on data management is an important asset of ICOS ERIC.

3.4 RESOURCES TO BE COMMITTED

NEURONE comprises 241,2-person months of resources from the 11 partners over a period of 30 months. The main effort has been allocated in WP2, WP3 and WP4 for substantive input of the majority of the partners throughout the project. Under WP1 (Project management), effort has been allocated to NOA, CNR, FMI, BSC and DRAXIS for contribution related to periodic reports. Effort for all other meetings, workshops is accounted for within the relevant WP. The table below summarises the staff effort in person-months for each WP and participant. The effort in each WP is proportional to the weight of the activity with respect to the objectives of the project and aligned with the LC-SPACE-05-EO-2019 Call focus. The largest effort (28%) is allocated to WP4 (Roadmap for the evolution of RIs as a Copernicus Interface Layer), closely followed by WP6 (19%) on the NEURONE's legacy. A 16% of the total effort is allocated to mapping the Copernicus requirements and the in situ landscape (WP2) and a 16 % to the gap analysis, indicators and priorities (WP3) while 10% is allocated to management activities (WP1). Communication, dissemination and Engagement (WP5) account for 10% of the effort. The following table provides the effort distribution summary.

Table 11: Summary of effort distributed per partner – per WP

	WP1	WP2	WP3	WP4	WP5	WP6	TOTAL	%
1-NOA	17	4	3	14	4	23.5	**65.5**	**27%**
2-CNRS	0	4	3	16	3	2	**28**	**12%**
3-CNR	1	7	9	14	1	4	**36**	**15%**
4-EuroGOOS	0	4.5	8	5	3	0	**20.5**	**8%**
5-FMI	2	3.5	3	2	0	0	**10.5**	**4%**
6-BSC	4	4	3	10	3	0	**24**	**10%**
7-EARSC	0	1	0	0	3	2	**6**	**2%**
8-DRAXIS	1	3	2	3	8	14	**31**	**13%**
9-UFZ	0	1.1	0.9	0.7	0	0	**2.7**	**1%**
10-EAA	0	3	3	3	0	0	**9**	**4%**
11-ICOS ERIC	0	4	3	1	0	0	**8**	**3%**
Total P/Ms	**25**	**39.1**	**37.9**	**68.7**	**25**	**45.5**	**241.2**	
%	**10%**	**16%**	**16%**	**28%**	**10%**	**19%**		

The pie charts of Figure 8 summarise the budget distribution following different criteria. Personnel Costs account for 69% of the total budget, Other Direct Costs that include travel expenses for consortium partners and AB/CCB member participations to the scheduled meetings is 11%, while 20% is Indirect costs.

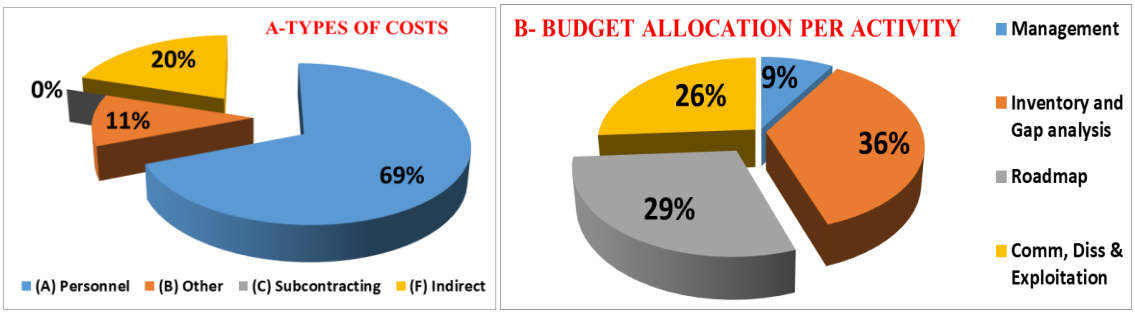

Figure 9: Breakdown charts of budget: A-Types of costs; B- Budget allocated per Country; & C-Budget allocated per type of activity

Table 12: Other direct cost' items (travel, equipment, other goods and services, large research infrastructure)

NOA	Cost (€)	Justification
Travel	62.000	Travel costs covering the participation of the Project Coordinator, Project Technical and Quality Assurance Manager, and any other NOA members required to attend Project Meetings, partner to partner meetings, Workshops and Conferences.

Other goods and services	53.000	This category represents funds reserved for i) cost reimbursement for the advisory board and Copernicus consultation board members attending NEURONE meetings and workshops; ii) costs associated with the organization of NEURONE workshops (incl. room, catering costs etc.); iii) for dissemination material (leaflets, brochures, banners etc.);
Subcontracting		
Total	**115.000**	
CNRS	**Cost (€)**	**Justification**
Travel	15.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
Total	**15.000**	
CNR	**Cost (€)**	**Justification**
Travel	15.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
Total	**15.000**	
EuroGOOS	**Cost (€)**	**Justification**
Travel	15.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
Total	**15.000**	
FMI	**Cost (€)**	**Justification**
Travel	10.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
Total	**10.000**	
BSC	**Cost (€)**	**Justification**
Travel	5.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
Total	**5.000**	
EARSC	**Cost (€)**	**Justification**
Travel	6.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
Total	**6.000**	
DRAXIS	**Cost (€)**	**Justification**
Travel	15.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		

Subcontracting		
Total	**15.000**	
UFZ	**Cost (€)**	**Justification**
Travel	2.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
Total	**2.000**	
EAA	**Cost (€)**	**Justification**
Travel	9.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
ICOS ERIC	**Cost (€)**	**Justification**
Travel	10.000	Costs related to travel and subsistence costs for project meetings and other NEURONE events.
Other goods and services		
Subcontracting		
Total	**10.000**	

NEURONE: Next gEneration in sitU data foR cOperNicus Evolution

Technical Annex 4-5

ID	Participant Organisation Name	Country	Logo
1	**NATIONAL OBSERVATORY OF ATHENS (NOA) – Coordinator**	EL (Greece)	
2	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (**CNRS**)	FR (France)	
3	CONSIGLIO NAZIONALE DELLE RICERCHE (**CNR**)	IT (Italy)	
4	EUROPEAN GLOBAL OCEAN OBSERVING SYSTEM (**EuroGOOS**)	BE (Belgium)	
5	ILMATIETEEN LAITOS (**FMI**)	FI (Finland)	
6	BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION (**BSC**)	ES (Spain)	
7	EUROPEAN ASSOCIATION OF REMOTE SENSING COMPANIES (**EARSC**)	BE (Belgium)	
8	DRAXIS ENVIRONMENTAL S.A. (**DRAXIS**)	EL (Greece)	
9	HELMHOLTZ-ZENTRUM FUR UMWELTFORSCHUNG GMBH (**UFZ**)	DE (Germany)	
10	UMWELTBUNDESAMT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG (**EAA**)	AT (Austria)	
11	INTEGRATED CARBON OBSERVATION SYSTEM EUROPEAN RESEARCH INFRASTRUCTURECONSORTIUM (**ICOS ERIC**)	FI (Finland)	

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4 MEMBERS OF THE NEURONE CONSORTIUM

4.1 PARTICIPANTS (APPLICANTS)

Partner 1 (Coordinator): National Observatory of Athens (NOA)

Organisation description

The **National Observatory of Athens (NOA - http://www.noa.gr)** as Research Centre has a continuous presence in science and education activities at international level, for more than 170 years. It is the first research Institution that was founded in Greece (1842) after the establishment of the modern Greek state (1832). The activities of NOA are organized around 3 Institutes: the **Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS**, submitting the proposal on behalf of NOA), the **Institute for Environmental Research and Sustainable Development (IERSD**, participating under IAASARS/NOA), and the **Geodynamics Institute (GI)**.

IAASARS/NOA has been actively involved in climate science, space applications and Earth Observation (EO) with remarkable achievements in leading research, and operational activities in the context of EU flagship programs/initiatives namely Copernicus and GEO, while at the same time is the national contact point for the representation of Greece in environmental European Research Infrastructures (RIs). The Institute has important human capacity with high skills in the relevant sciences. A strategic goal of NOA/IAASARS is to operate a wide range of ground-based national facilities aiming to support research and services in the Earth System Science domain. In this context, NOA operates the **"PANhellenic GEophysical observatory of Antikythera (PANGEA)"**, at the island of Antikythera, a National Hub for the continuous monitoring of Essential Climate Variables (ECVs). streaming real-time information to the Greek State, Academia and research centers, focusing in particular on: (i) the provision of certified data and expertise on issues related to climate change, air quality and natural disasters, (ii) timely provision of services and information to public bodies in support of decision-making for the management of natural disaster crises and (iii) improvement of climate projections at the regional scale, for effective mitigation and adaptation. Moreover, NOA/IAASARS owns and operates significant **space-based monitoring infrastructure and acquisition facilities** (e.g. X-/L-band stations, MSG-Seviri, ESA's CGS - Mirror Site acquisition facilities), attributing to its leading role in Space and EO domains, at both national and international level. Taking advantage of the existing infrastructures, and the secured access to space agencies as ESA, NASA, DLR, CSA, JAXA, as well as the use of ground-based infrastructure and advanced numerical models, **the Institute provides near real time observations and services to operational program frameworks of EC, ESA, Copernicus** and to authorities and entities, at national and European level (e.g. ministries, civil protection authorities, municipalities, regional services, environmental organizations). The research team of NOA/IAASARS brings dedicated research skills in the observation of the atmospheric environment and in particular the investigation of physical processes and interactions in the atmosphere based on atmospheric and meteorological observations and modelling with emphasis on extreme events, climate and climate change studies (past, present and future climate trends, assessment of impacts).

Contributions of NOA to international (or national) initiatives and networks:

- NOA hosts the Focal Point in Greece of the Global Earth Observing System of Systems (GEOSS), operating one of the very few national GEO Offices in the World (http://www.greekgeo.noa.gr/).
- NOA is a member of the Copernicus Academy Network of Hellenic Partners (CAN-HelP) to become a Copernicus ambassador for Greece, thus supporting the European Commission's initiative to stimulate awareness and spread knowledge about the Copernicus programme across Europe.
- NOA represents Greece in ACTRIS and the Interim ACTRIS Council.

- NOA co-coordinates the PANhellenic infrastructure for Atmospheric Composition and climatE chAnge (PANACEA) RI which is included in the National Roadmap for RIs aiming at developing a coordinated system for monitoring of atmospheric composition, solar radiation variations, climate change and related natural hazards in Greece and coordinate the national contributions to ACTRIS and ICOS European RIs.
- NOA coordinates the Product Validation and Evolution Teams in Greece for the CalVal activities of ESA missions such as ADM-Aeolus, EarthCARE and Sentinel-5p.
- NOA hosts the UNESCO Chair for Natural Disasters, established within the framework of UNESCO-BRESCE.
- NOA is a Copernicus certified product and service provider for Risk and Recovery at worldwide level.
- NOA hosts the Secretariat of the South Eastern European (SEE) Disasters Risk Assessment and Mitigation Network (IAASARS).
- NOA is integral part of the CEOS Support to Disaster Risk Management (DRM) platform of ESA.

Capabilities matching proposal tasks

- Active participation in **European Research Infrastructures** (ACTRIS, ICOS).
- Operation of the **"PANhellenic GEophysical observatory of Antikythera (PANGEA)"**, at the island of Antikythera, a National Hub for the continuous monitoring of Essential Climate Variables (ECVs)
- Strong **networking with international Space communities** (Researchers, Service Providers, Industry, End-Users), and **Space Agencies and organisations** (ESA, NASA, DLR, EUMETSAT).
- **Experts in handling and communicating Copernicus** in the wider community of stakeholders. Strong outreach activities through the **Copernicus Academy Network** of Greek Partners, the NOA's Visitor Centre, and existing communications channels.
- Members of **ESA** Sentinel and Earth Explorer **Cal Val Teams**.
- **Organization of significant space-relevant workshops**:

- 2nd South Eastern Europe GEO Workshop on Integrating Earth Observation Data and Services for Monitoring the Environment and protecting the Citizens, 20-21 October 2014.
- International Conference "Adaptation Strategies to Global Environmental Change in the Mediterranean City and the Role of Global Earth Observations", 10-11 June 2014.
- 8th GEO European Projects Workshop (GEPW-8), 12-13 June 2014.
- Space & Security Conference, Athens, Greece, 19-20 June 2014.

- **Significant infrastructure, technical equipment and operational services including:**

- Operation of **in-situ monitoring networks** including sophisticated lidar systems, sunphotometric networks and surface in-situ sensors for deriving climate-related parameters and specialized atmospheric chemical composition. The advanced lidar systems of NOA (one in-situ and one mobile), are designed to monitor atmospheric episodes in 24/7 basis and support via ground-truth observations the evaluation of atmospheric models and satellite products.
- A fully operational, on a 24/7 basis, **Ground Segment (GS) facilities** (satellite acquisition stations, servers/archives), for receiving, cataloguing, processing, archiving, and querying of a multitude of EO satellite missions that cover the regions of SE Europe, Balkans, Middle East, and North Africa. The satellite missions handled by the NOA's GS are EOS Aqua, Terra, SUOMI NPP, NOAA/AVHRR, Metop, FY, EUMETSAT MSG-Seviri. These GS facilities are part of the worldwide Direct Broadcasting network of satellite data and include a VxEos X/L Band Satellite Acquisition Station and a Meteosat Second Generation SEVIRI Ground Station System.
- A fully operational **Collaborative Ground Segment** for Sentinel missions (The Hellenic National Mirror Site) for receiving, cataloguing, processing, archiving, and querying of Sentinel data from all current and planned Copernicus missions (S-1, S-2, S-3, S5P). The NOA's Mirror Site coverage is extending beyond the limits of SE Europe, Balkans, Middle East, and North Africa.
- Maintenance of operational **modelling** capacities for simulating the atmospheric environment and providing future climate projections, including modelling capabilities for dispersion of **Volcanic ash/Smoke/Desert**

Dust incorporating FLEXPART and WRF atmospheric models.

- A space based real time fire and smoke dispersion monitoring and damage assessment system, known as **FIREHUB**, that has been awarded the first Copernicus Masters prize for the Best Challenge Service. This system is part of the European Fire Monitoring Center EFFIS.
- The fully operational **NOANET GPS** network and the **HellENIc GeoMagnetic Array** (**ENIGMA** – the ultra-low frequency (ULF) magnetometer) networks of NOA, both tied with the routinely derived InSAR based ground deformation assessments for Geophysical hazards monitoring (earthquakes, volcanoes, and landslides) in the regions of SE Europe, and Balkans.
- A **floods observatory** where all major flood events in SE Europe and the Balkans are registered and a pre-operational floods early warning system for Greece and neighboring transnational water courses.
- Post-crisis damage assessment and atmospheric component assessment using **UAV facilities**.
- A pre-operational space-based system for **Urban Heat Island** monitoring in the region of SE Europe expandable to the Global level.

Main role in the project

NOA assumes the role of **Project Coordinator** and contributes to several tasks of NEURONE.

NOA will lead **WP1, WP6, Task 1.1, Task 2.1**, **Task 5.3** and **Task 6.1** and contribute to **Task 1.2**, **Task 2.2**, **Task 2.3**, **Task 2.4**, **Task 3.1**, **Task 3.2, Task 3.3, Task 4.1, Task 4.2, Task 5.1, Task 5.2, Task 6.2** and **Task 6.3.**

Short CVs of Key Personnel

Dr. Vassilis Amiridis (male), Research Director, was born in Göteborg, Sweden, in 1971. He is a Research Director of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. He is working on climate research and he focuses on the impact of atmospheric aerosols and clouds on radiation and extreme weather. His research is mainly based on advanced ground-based and space-borne remote sensing observations (passive and active remote sensing techniques) and theoretical models.

He is responsible for the **operation and data exploitation of the PANGEA Climate Observatory of Antikythera**, deploying the 24/7 PollyXT sophisticated lidar system, part of the European Aerosol Research Lidar Network (EARLINET). He is also in charge of the operations for a number of **ESA CalVal programs** for ADM-Aeolus and EarthCARE respectively (ASKOS, VADAM and ACROSS), **employing the official ESA ground-based mobile lidar systems (ESA-EVE and EMORAL)**, which have been developed by IAASARS/NOA and Raymetrics. His lidar-related activities have been acknowledged by the European Aerosol Research Lidar Network (EARLINET), which has elected him as an **EARLINET Council member** for the periods 2012-2016 and 2016-2020. Moreover, he is the **National Representative for Greece in Interim ACTRIS council (ACTRIS IAC)**. He also acted as the **Greek National Delegate for the COPERNICUS Committee for the period 2014-2017**. Starting from 2018, he is member of the **Steering Group of the "Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS)" of the World Meteorological Organization - WMO (2018 - 2022)**. In 2016, **he received the ERC Consolidator Grant** for establishing high level atmospheric research in the geophysical observatory of Antikythera, a unique infrastructure that is developed to study desert dust dynamics, transport and interaction with radiation and clouds.

He has participated in 42 research projects and experimental campaigns, in 7 of which as coordinator and 6 as Principal Investigator for IAASARS/NOA. He has more than 90 publications in peer-reviewed scientific journals and his work received approximately 2400 citations from third-party (h-index = 30, source: ISI Web of Knowledge). Moreover, he participated in numerous conferences, co-chaired 8 of them and invited to present his work 7 times. He is a member of the editorial board of EGU's Atmospheric Measurement Techniques Journal (Copernicus Publications, Impact Factor = 3.2) and Remote Sensing (Impact Factor = 3.9) and he is active reviewer in ~25 scientific Journals in his field. He is leading the Group for Remote Sensing of Aerosols, Clouds and Trace Gases (ReACT) in IAASARS/NOA, currently composed of 20 members (8 Postdocs, 9 PhDs and 3 support personnel). He coordinated 7 competitive research projects and acted as a PI for NOA for 6 more, attracting a research funding of 4.3 M€ in total.

Dr. Omiros Giannakis (male), Senior Research Scientist, was born in Athens, Greece, in 1974. He is a Senior Research Scientist of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. He is working on various subfields of space physics, including data analysis of space-borne measurements, space physics, space weather, algorithms design and development. He is an expert in space radiation models and analysis of the physical environment in space and its effects on space systems, shielding and interactions (dose, degradation, charging, and single event effects). He has participated in 20 research projects, in 2 of which as coordinator and Principal Investigator for IAASARS/NOA. He has 9 publications in peer-reviewed scientific journals (h-index = 5, source: ISI Web of Knowledge).

Dr. Stavros Solomos (male) is a Post-Doc Researcher of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. He is working on Meteorology, Atmospheric modeling, dust forecasting, atmospheric hazards. He is Committee Member for Greece in COST Action CA 16202, INDUST: International Network to Encourage the Use of Monitoring and Forecasting Dust Products. He has participated in more than 26 international and national projects related to atmospheric processes, natural hazards, satellite assimilation and climate change. He has 27 publications in peer-reviewed scientific journals (h-index = 22, source: ISI Web of Knowledge).

Dr. Eleni Marinou (female) is a Research collaborator of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. She is working on Atmospheric physics, Aerosol-cloud interactions, Cloud microphysics, remote sensing. She has participated in 7 projects part of them funded by ESA and EU-FP7 and in 6 experimental campaigns such as INUIT-BACCHUS-ACTRIS, CHARADMexp, ACEMED. She has 29 publications in peer-reviewed scientific journals (h-index = 12, source: ISI Web of Knowledge).

Mrs. Stavroula Papatheochari (female) is a Research Associate of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. She is working on Environmental Science and Waste Management. She has participated in in more than 10 scientific projects related to environmental studies.

Dr. Alexandra Tsekeri (female) is a Post-Doc Researcher of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. She is working on Neural network approach for retrieving aerosol properties from multispectral, multiangle polarization measurements. She has participated in 9 funded research projects, EUFAR and ACTRIS campaigns. She has 13 publications in peer-reviewed scientific journals (h-index = 7, source: ISI Web of Knowledge).

Dr. Ioannis Papoutsis (male) is an Associate Researcher of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA). He has more than 7 years of experience in international EO activities, providing technical guidance and undertaking management roles. He is Leader of the Geohazards monitoring group in BEYOND Center of Excellence, Project manager for activations within Copernicus Emergency Management Service, the Risk & Recovery action, Technical manager for several FP7, ESA, GMES (Copernicus) projects (linkER, SAFER, TELEIOS, LDA, MASSIVE). He has 40 publications in peer-reviewed journals and international conferences and workshops.

Mrs. Vasiliki Daskalopoulou (female) is a PhD candidate of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. She is working on Atmospheric Physics, Space Environment, Radiative Transfer. She has participated in D-TECH ERC, ESA MULTIPLY, EKAD. She has 1 publication in peer-reviewed scientific journals and 2 conference papers.

Mrs. Anna Gialitaki (female) is a PhD candidate of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS) of the National Observatory of Athens (NOA) in Greece. She is working on Atmospheric Physics, Lidar Remote Sensing, Aerosols properties. She has participated in D-TECT ERC project, PRE-TECK experimental campaign PANACEA. She has 1 publication in peer-reviewed scientific journals and 2 conference papers.

Relevant products/ services/ publications

Solomos, S., Ansmann, A., Mamouri, R.-E., Binietoglou, I., Patlakas, P., Marinou, E. and Amiridis, V.: Remote sensing and modelling analysis of the extreme dust storm hitting the Middle East and eastern Mediterranean in September 2015, Atmos. Chem. Phys., 17(6), 4063–4079, doi:10.5194/acp-17-4063-2017, 2017.

Marinou, E., Amiridis, V., Binietoglou, I., Tsikerdekis, A., Solomos, S., Proestakis, E., Konsta, D., Papagiannopoulos, N., Tsekeri, A., Vlastou, G., Zanis, P., Balis, D., Wandinger, U. and Ansmann, A.: Three-dimensional evolution of Saharan dust transport towards Europe based on a 9-year EARLINET-optimized CALIPSO dataset, Atmos. Chem. Phys., 17(9), 5893–5919, doi:10.5194/acp-17-5893-2017, 2017.

Amiridis, V., Marinou, E., Tsekeri, A., Wandinger, U., Schwarz, A., Giannakaki, E., Mamouri, R., Kokkalis, P., Binietoglou, I., Solomos, S., Herekakis, T., Kazadzis, S., Gerasopoulos, E., Proestakis, E., Kottas, M., Balis, D., Papayannis, A., Kontoes, C., Kourtidis, K., Papagiannopoulos, N., Mona, L., Pappalardo, G., Le Rille, O. and Ansmann, A.: LIVAS: a 3-D multi-wavelength aerosol/cloud database based on CALIPSO and EARLINET, Atmos. Chem. Phys., 15(13), 7127–7153, doi:10.5194/acp-15-7127-2015, 2015.

Amiridis, V., Wandinger, U., Marinou, E., Giannakaki, E., Tsekeri, A., Basart, S., Kazadzis, S., Gkikas, A., Taylor, M., Baldasano, J. and Ansmann, A.: Optimizing CALIPSO Saharan dust retrievals, Atmos. Chem. Phys., 13(23), 12089–12106, doi:10.5194/acp-13-12089-2013, 2013.

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Relevant projects or activities

NOA 01 – D-TECT: "Does dust TriboElectrification affect our ClimaTe?"**, NOA Budget = 1.97 M€, European Research Council (ERC) Consolidator Grant 2016,** H2020, Excellent Science, Project ID: 725698, Period: 2017 – 2022

D-TECT aims to parameterize the physical mechanisms responsible for dust triboelectrification, assess the impact of electrification on dust settling, quantify the climatic impacts of the process, particularly the effect on the dust size evolution during transport, on dry deposition and on CCN/IN reservoirs, and the effect of the electric field on particle orientation and on radiative transfer.

NOA 02 – GEO-CRADLE: "Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East, and Balkans and Developing Links with GEO related initiatives towards GEOSS", **NOA Budget = 0.98 M€, H2020-SC5-2015-one-stage**, Project ID: 690133, Period: 2016 – 2019.

GEO-CRADLE aims at promoting the uptake and exploitation of Earth Observation activities in North Africa, Middle East and the Balkans. To this end, the project has brought together 25 partners from 3 continents, to work in a highly-complementary team that combines a strong background in EO coordination activities with proven scientific excellence in four key thematic areas (adaptation to climate change, improved food security & water extremes management, access to raw materials, and access to energy).

NOA 03 – MarcoPolo: "Monitoring and Assessment of Regional air quality in China using space Observations, Project Of Long-term sino-european co-Operation", **NOA Budget = 0.11 M€, FP7-SPACE-2013-1**, Project ID: 606953, Period: 2014-2016.

MarcoPolo aimed at using European and Chinese expertise to improve air quality monitoring, modelling and forecasting over China by improving emission database using satellite data with a focus on emission estimates from space and their refinement for anthropogenic and biogenic sources through spatial downscaling and source sector apportionment. New emission inventories will serve as input to air quality modelling on regional and urban scales, and it is expected to improve considerably existing air quality information and forecasts to be supported by validation and following international standards and recommendations) interactively customized at MarcoPolo website.

NOA 04 – DUST-GLASS: "Improving global dust prediction and monitoring through data assimilation of satellite-based dust aerosol optical depth", **NOA Budget = 0.16 M€, H2020-MSCA-IF-2016**, Project ID: 749461, Period: 2017-2019.

DUST-GLASS aims at improving global dust prediction and monitoring by optimizing an advanced data

assimilation system (LETKF scheme) coupled with a sophisticated atmospheric-dust model (NMMB-MONARCH).

NOA 05 – MULTIPLY: "Development of a European HSRL airborne facility", **NOA Budget =0.27 M€, ESA RFQ: RFQ/3-14235/14/NL/CT**, Period: 2014-2019.

The aim of MULTIPLY is to develop a novel multi-wavelength HSRL system (3β + 2α + 3δ) for airborne CalVal of future ESA missions. The system will be capable of retrieving the aerosol extinction, backscatter and depolarization profile distributions.

Relevant infrastructure and equipment

PanHellenic Geophysical Observatory of Antikythera (PANGEA)

NOA has installed the first instruments at Antikythera, including a sophisticated lidar system, the NASA-AERONET sun-photometer, an advanced polarimeter and an electrometer. More instruments will be installed soon, while the users can already acquire data from PANGEA by visiting the respective data centers (NASA-AERONET and PollyNET).

X/L Band Satellite Acquisition Station

IAASARS/NOA Ground Segment includes an X-, and L-band satellite acquisition station for reception, acquisition, and processing of the direct broadcast downlinks from satellite missions including the EOS Aqua & Terra satellites (MODIS - Moderate Resolution Imaging Spectroradiometer), the NPP (VIIRS, ATMS, etc), the future NPOESS, the NOAA, the FYI, and the MetOP satellites. The IAASARS/NOA Ground Segment is equipped with the proper processing, archiving, and cataloguing facilities for handling in real time data from the missions above, as well as the future Copernicus satellite missions (Sentinels) through ESA's Ground Segment. Those Ground Segment facilities foster the development of a wide range of environmental monitoring services, such as: aerosol pollution indexes assessment, dust and volcanic ash alerts, smoke dispersion forecasts, wildfire detection and monitoring, geo-hazard activity monitoring and assessment (earthquakes/volcanoes/landslides), and urban heat Island mapping.

Partner 2 : The French National Centre for Scientific Research (CNRS)

Organisation description

The French National Centre for Scientific Research (CNRS) is a government-funded research organization, under the administrative authority of France's Ministry of Research. With about 33.000 staff (researchers, engineers, technicians and administrative staff) and a 2014 budget of 3.29 billion euros, CNRS is the largest fundamental research organization in Europe. It is organized through ten institutes and is involved in all scientific fields including life sciences, physics, chemistry, mathematics, computer science, earth science and astronomy, humanities and social sciences, environmental sciences and sustainable development, and engineering. CNRS conducts some twenty interdisciplinary programs to promote exchange between fields, ensure economic and technological development, and to solve complex societal problems. More than 95% of the 1100 CNRS laboratories, which are spread throughout the French territory, represent joint research units with universities and industry.

CNRS is represented in the project by 2 institutes: Institut des Geosciences de l'Environnement (IGE), and Laboratoire de Météorologie Physique (LAMP). Furthermore, involved in the project is one joint research units: Université Grenoble Alpes (UGA).

The Institut des Geosciences de l'Environnement (IGE), is a public research laboratory in Earth and Environmental Sciences, created on 1 January 2017 by the merge of LGGE (Laboratory of Glaciology and Geophysics of the Environment) and LTHE (Laboratory of Transfers in Hydrology and Environment). The IGE is a joint research unit of CNRS, IRD, Université Grenoble Alpes (UGA) and Grenoble-INP. IGE conducts research on climate, the water cycle, cryosphere and natural and anthropized environments with the aims to better understand the processes that govern the various geophysical compartments (ocean, atmosphere physics and chemistry, cryosphere, watersheds, critical zone), their interactions and responses to human pressures, and the processes of adaptation and resilience of societies.

The Laboratoire de Météorologie Physique (LAMP), Clermont-Ferrand, has a long-standing experience in the experimental and modelling studies of clouds and their interactions with solar radiation and atmospheric gaseous and particulate compounds. The main research activities deal with the formation of new particles, the role of aerosols in the formation of iced and mixed-phase clouds and their impact on the Earth's radiation budget. It implements the gas, aerosol and cloud observation site of Puy-de-Dôme, labelled global GAW station, where some of the aerosol chemical, physical and optical properties are monitored since 1996. LaMP has co-ordinated, participated, and managed a number of EU projects from FP4 to H2020 and participates in several national and international programmes.

Capabilities matching proposal tasks

- In-depth understanding of European in-situ networks and research and innovation landscape as CNRS is involved in several Environmental ESFRI RIs.
- In-depth knowledge of challenges connected to in-situ data provision and dissemination
- In-depth knowledge of the ERA landscape for Earth Observations

Main role in the project

CNRS and Linked Third Party UGA will lead **WP4**, **Task 2.2**, **Task 4.1** and contribute to **Task 2.1**, **Task 2.3**, **Task 2.4**, **Task 3.1**, **Task 3.2**, **Task 3.3**, **Task 4.2**, **Task 5.1**, **Task 5.2**, **Task 5.3**, **Task 6.1** and **Task 6.2**.

Short CVs of Key Personnel

Dr. Paolo Laj (male) is a senior scientist at Université-Grenoble-Alpes (Physicien). He is the acting co-coordinator of ACTRIS-2 and ENVRIplus and has been involved in a number of EU projects since FP4 (ACCENT, EUCAARI, CIME, ACE2, EUSAAR, PEGASOS, ACTRIS, ACTRIS-2, ACTRIS PPP, ENVRIPLUS, ENVRI FAIR). He is author or co-author more than 120 research articles in the field of aerosols and clouds and their interactions. He is a member of WMO expert group on aerosols. Paolo Laj is participating in the European Environment Agency's lead project for coordination of the In-Situ component of the Copernicus Programme Services. He also actively contributed to the establishment of the GEO foundational task on in-situ observations. As a member of BEERI, he will be one of the NEURONE partners ensuring the connection with ENVRI and EOSC.

Dr. Sabine Philippin (female) is European project manager based at CNRS-LAMP and has been involved in the management of EU-funded projects and as PI of transnational activities since 2004 (ACCENT FP6, EUSAAR FP6, ACTRIS FP7, ACTRIS-2 H2020, ENVRIplus H2020, ACTRIS PPP). She has a background in atmospheric sciences with experience in aerosol characterization and near-surface measurements.

Relevant products/ services/ publications

EEA Tender Report: Research Infrastructures and Copernicus, 2017

Coordinating ACTRIS-in-situ service provision for COPERNICUS

130 publications in the field of atmospheric science since 1990

Relevant projects or activities

CNRS 01 – EU H2020 project ACTRIS PPP (ACTRIS Project Preparation Phase), Grant agreement n° 739530 (2017-2019).

CNRS 02 – EU H2020 projects ACTRIS-2 (Aerosol, Clouds, and Trace gases Research Infrastructure-2), Grant agreement n° 654109 (2015-2019) and ACTRIS, Grant agreement n° 262254 (2011-2015).

CNRS 03 – EU H2020 ENVRI-FAIR (ENVironmental Research Infrastructures building Fair services Accessible for society, Innovation and Research), Grant agreement n° 824068 (2019-2022)

CNRS 04 – EU H2020 project ENVRIPLUS (Environmental Research Infrastructures Providing Shared Solutions for Science and Society), Grant agreement n° 654182 (2015-2019).

CNRS 04 – EU H2020 project ERA-PLANET (The European Network for Observing our Changing Planet) Grant Agreement n° 689443 (2017-2020)

CNRS 06 – Participation in **GEO In Situ task force**

Relevant infrastructure and equipment

CNRS exploits a large number of significant infrastructures including data center, calibrations facilities, observational sites and exploratory platforms.

Partner 3: National Research Council of Italy (CNR)

Organisation description

The **National Research Council of Italy** is the main public research performing organization in Italy, reporting directly to the Ministry of the Education, University and Research. CNR mission is to carry out, **promote, spread, transfer and improve research activities** in the main sectors of knowledge growth and of its applications for the scientific, technological, economic and social development. The climate, atmosphere, marine and earth observation activities are carried out by Department of Earth System Science and Environmental Technologies with aim to gather knowledge and predict the behaviour of the Earth system and its resources, so as to help a sustainable future for the planet and mankind.

In the consortium two institutes of CNR are involved: the Institute of Methodologies for Environmental Analysis and the Institute of Marine Sciences.

The **Institute of Methodologies for Environmental Analysis** (CNR-IMAA) research activities involve more than 150 researchers and make use of laboratories and facilities of international relevance in the field of the Earth Observation. The IMAA scientific mission is the study of the atmosphere and of the Earth's surface by using remote sensing techniques, environmental and geophysical monitoring, the evaluation of the impacts of the anthropogenic activities system and the implementation of optimising models to assess the best resources allocation. The CNR-IMAA plays an ever-increasing role of excellence in the international community for observationally-based atmospheric studies. CNR-IMAA has a leadership role in the remote sensing community, characterized by a high scientific productivity and by the proven capability to provide support and technological transfer to end users. CNR-IMAA has coordinated and participated in a large number of national, European and international projects. At present, CNR-IMAA is coordinating the ACTRIS-2 H2020 research infrastructure project on aerosol, clouds and trace gases and is currently participating in several H2020 projects: ACTRIS-PPP, EUNADICS-AV, ENVRIFAIR and in the DustClim ERA4CS project .The CNR-IMAA is also currently coordinating BARON4C3S, a Copernicus project for rationalising, harmonising and improving access to open and free observational records and data streams from selected in-situ GCOS-relevant Baseline and Reference observing networks. In the past, CNR-IMAA has been a partner in several FP6, FP7 and H2020 and ESA projects (like ACTRIS, GEOMON, EARLINET-ASOS and ESA-CALIPSO and ESA-LIVAS).CNR-IMAA is currently leading activities at EU and international levels to foster the integration of observations across many key international networks engaged in systematic long-term observations of the atmosphere and to ensure implementation of common observing techniques, data and metadata strategies. CNR-IMAA is responsible for the ACTRIS aerosol remote sensing database as tool for data collection and provision to internal and external users. Specific expertise at CNR-IMAA relates to improving the comparability of data streams, creating uniform data quality standards, sharing of QA/QC approaches, and realising observational program synergies.

The **Institute of Marine Sciences of CNR (CNR-ISMAR)**,is a 200-person Institute distributed in 6 sections (Venice, Rome, Naples, La Spezia, Trieste, Bologna), dealing with marine science, ISMAR conducts research in global ocean, Mediterranean and polar regions, focusing on evolution of oceans and their continental margins, submarine volcanoes, faults and slides and their potential impacts onshore; influence of climate change on oceanic circulation, acidification, bio-geochemical cycles and marine productivity and the natural and anthropogenic factors impacting economically and socially on coastal systems from pre-history to the industrial epoch. ISMAR has a recognised expertise in supporting and promoting observational activities for climate, environmental and ocean monitoring, based on the integration of different kinds of observational techniques (in-situ, remote sensing, satellite). ISMAR has a recognized skill is System of Systems design and development for Earth and Space Sciences and in the development and implementation of QC/QA procedures for satellite marine measurements, in situ data and autonomous navigation instruments. implementation of operational systems providing products from satellite and remotely sensed data from monitoring the marine ecosystem state of the global ocean and Mediterranean Sea. ISMAR is strongly involved in the Copernicus Marine

Environmental Monitoring Services (CMEMS) leading the Ocean Colour and the Sea Surface Temperature Production Centers (CMEMS-OCTAC, 77-CMEMS-TAC-OC, 78-CMEMS-TAC-SST**)**; Copernicus Climate Service (C3S) leading the C3S_511 service (Quality Assessment of ECV Products); C3S-global shipping (tools to aid the decision-making processes and support medium and long-term planning of shipping sector); C3S_512 (on Quality Assurance for the Climate Data Store). CNR-ISMAR has been chosen as Leading Laboratory of the DANUBIUS-RI Modelling Node and as co-leader of the Architecture WP within the DANUBIUS Preparatory Phase CSA and it is involved in the activities of JERCOEuro-ARGO EMSO LifeWatch LTER-Europe. In the last years, CNR-ISMAR has developed competences in the fields of data management and interoperable spatial data infrastructures in different EU and national projects (SeaDataNet, SeaDataClouds, ADRIPLAN, RITMARE, CoCoNet, PORTODIMARE). ISMAR has expertise in operational oceanography also acknowledges a sound experience for what concerns in situ infrastructure design and operation, as demonstrated by the participation to the major European marine infrastructure projects (EuroSITES, FixO3 and EMSO-ERIC).

Capabilities matching proposal tasks

- Hosting the ACTRIS aerosol remote sensing data center
- Hosting an ACTRIS central facilities for the aerosol remote sensing component
- Active participation as ACTRIS site for aerosol remote sensing measurements and for cloud remote sensing measurements
- Expertise in developing suitable and tailored products for specific applications: for example for aviation hazard s under implementation within EUNADICS –AV project and within the InDust COST action
- Expertise in harmonization, traceability and accessibility issues for the data
- Link with international community about the FAIRness and Open Data issues
- Members of international committees of the WMO like GAW, and SDS WAS Regional Steering Group, IOC/WMO GOOS Steering Group
- Hosting the Copernicus Marine Environmental (CMEMS)Dissemination Unit Service giving the access to all the CMEMS observational and model products
- Leading and Hosting the CMEMS Ocean Colour Production Center
- Leading and Hosting the CMEMS Sea Surface Temperature Production Center
- Hosting H2020 – JERICO NEXT (Joint European Research Infrastructure network for Coastal Observatory – Novel European eXpertise for coastal observaTories)

Main role in the project

CNR will lead **WP3**, **Task 3.3**, **Task 4.1** and contribute to **Task 1.2**, **Task 2.2**, **Task 2.4**, **Task 3.1**, **Task 3.2**, **Task 4.1, Task 4.2, Task 5.1, Task 6.1** and **Task 6.3**

Short CVs of Key Personnel

Dr. Lucia Mona (female) is a researcher at CNR-IMAA. She is responsible of the EARLINET (European Aerosol Research Lidar NETwork) database and its link to the ACTRIS data portal. She is the responsible of the ACTRIS data center node for aerosol remote sensing. Dr Mona has a researcher profile that combines expertise on developments of lidar systems, instruments integration/combination, analysis methodologies, exploitation of state-of-the-art measurements for different application fields and integrated studies with models. She is leading the AEROSAT (International Satellite Aerosol Science Network) Working Group on Aerosol Typing. She is member of the Regional Steering Group of the SDS-WAS (Sand and Dust Storm Warning Advisory and Assessment System) of the WMO.

Dr. Gelsomina Pappalardo (female) is a Research Director at CNR-IMAA, head of Lidar Group and of the CNR-IMAA Atmospheric Observatory (CIAO). She has over 25 years research experience in the field of atmospheric studies with lidar techniques. She has authored or co-authored more than 60 papers in the peer-reviewed

literature. Dr. Gelsomina Pappalardo participated as PI in several national and international projects. She is the coordinator of the H2020 ACTRIS-2 Project. Dr. Gelsomina Pappalardo is co-chair of GALION and member of the Scientific Advisory Group for Aerosols of the Global Atmosphere Watch (GAW) aerosol program of WMO. Dr. Pappalardo is the Chair of the ESFRI Strategy Working Group for Environmental Science and Italian ESFRI delegate.

Dr. Giuseppe D'Amico (male) is a researcher at CNR-IMAA, member of the Lidar Group and of the CNR-IMAA Atmospheric Observatory (CIAO). He has over 14 years' research experience in the field of aerosol atmospheric remote sensing studies with lidar techniques. Dr. Giuseppe D'Amico is the main developer of the EARLINET Single Calculus Chain (SCC) the standard and traceable ACTRIS tool to retrieve aerosol optical properties from raw lidar measurements. He has long experience in developing algorithm for the retrieval of aerosol vertical profiles, standardized quality control procedures and data traceability and interoperability. Dr. Giuseppe D'Amico is also involved in the designing and the implementation of ACTRIS aerosol remote sensing node infrastructure.

Dr. Rosalia Santolieri (female) is Research Director at CNR and is currently serving as acting director of CNR-ISMAR. More than 30 years of experience in physical and satellite oceanography, operational oceanography, climate variability, satellite and model data qualification and validation. President of the Italian Oceanographic Commission, National body of the Intergovernmental Oceanographic Commission (IOC). Member of IOC/GOOS Steering Committee, established by UNESCO/IOCto define Ocean Essential Variable a design the future Ocean Observing system. Member of IOC Executive CouncilMember of the EuroGOOS Executive Directors Board. Responsible for the MONGOOS Satellite Observing System. Responsible, for the Italian Space Agency, of the Italian ocean colour validation and calibration activity. Coordinator of the Ocean Colour Production Centerof MyOcean, MyOcean2, MyOcean Follow-on andnow CMEMS; ECV Quality assessment leader in C3S. Scientific coordinator of 21 international scientific projects (EU and ESA). She is member of IOCCG, GHRSST Science Team and of Sentinel-3 Working Group on Quality Indicator for Ocean Colour and SSTof ESA and EUMESAT, CIRM Mission Advisory Group. She is author or co-author of more than 140 publications in the internationally referred literature, reference books (h-index 31)

Dr. Bruno Buongiorno Nardelli (male) researcher at the National Research Council, Global Ocean Satellite group, since 2002. He got a degree in Physics in 1997 (Univ. 'La Sapienza', Rome), and a Ph.D. in Marine Science and Engineering (Univ. Federico II, Napoli) in 2004. His activities are based on the joint analysis of satellite and in situ data through statistical analyses, dynamical methods and numerical modelling, focusing specifically on ocean dynamics from (sub) mesoscale to climatological scales and its interaction with marine life. He has been involved in several international projects working on the processing of temperature, salinity and sea level observations from space for operational applications and scientific studies, and took part to several oceanographic surveys, also as Scientific Coordinator. He is presently the leader of the SST Thematic Assembly Centre (TAC) of the Copernicus Marine Environment Monitoring Service (CMEMS) and coordinates CNR activities within CMEMS Multi Observations TAC. He also leads the Work Package on Oceanic Essential Climate Variables of C3S_511 service. He is the coordinator of the Italian national "knowledge platform" within Bluemed CSA project, focused on the definition of the European Research & Innovation strategies for Blue Growth in the Mediterranean. He is author/co-author of 49 publications (ISI), of several book/monographs chapters and conference proceedings

Relevant products/ services/ publications

G. Pappalardo, A. Amodeo, A. Apituley, A. Comeron, V. Freudenthaler, H. Linné, A. Ansmann, J. Bösenberg, G. D'Amico, I. Mattis, L. Mona, U. Wandinger, V. Amiridis, L. Alados-Arboledas, D. Nicolae, and M. Wiegner Atmos. Meas. Tech., 7, 2389-2409, https://doi.org/10.5194/amt-7-2389-2014, 2014.

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Droghei, R., Buongiorno Nardelli, B. and Santoleri, R.(2018). A New Global Sea Surface Salinity and Density Dataset From Multivariate Observations (1993–2016). Frontiers in Marine Science, 5, p.84.

Relevant projects or activities

CNR 01 – ACTRIS PPP: Aerosols, Clouds and Trace Gases Research Infrastructure Preparatory Phase Project (INFRADEV-2) H2020 n. 739530 CNR budget 505625.00 €

ACTRIS Preparatory Phase Project (PPP) has a significant role in enabling the transition from a project-based network of research facilities to a centrally coordinated integrated pan-European RI. ACTRIS PPP brings together a wide community of research performing organizations, research funding organizations and ministries needed to take the decisions and actions to move forward in the implementation of the ACTRIS. The main objectives of ACTRIS PPP are to develop the organizational, operational and strategic frameworks of the RI. The work includes legal, governance, financial, technical, strategic, and administrative aspects. The main outcomes of PPP are signature-ready documents for establishment of a legal entity with well-defined operations and a sound business plan.

CNR 02 – ENVRI-FAIR: ENVironmental Research Infrastructures building Fair services Accessible for society, Innovation and Research CNR budget 593 437.50 €

ENVRI-FAIR is the connection of the Cluster of Environmental Research Infrastructures (ENVRI) to the European Open Science Cloud (EOSC). The overarching goal is that at the end of the proposed project, all participating RIs have built a set of FAIR data services which enhances the efficiency and productivity of researchers, supports innovation, enables data- and knowledge-based decisions and connects the ENVRI Cluster to the EOSC.

CNR 03 – DustClim: Dust Storms Assessment for the development of user-oriented Climate Services in Northern Africa, Middle East and Europe CNR budget 377.500,00 €

DustClim will make a significant step forward in the way SDS affects society. In alignment with the mission of the WMO Sand and Dust Storm Warning Advisory and Assessment System, the objectives of DustClim are to produce and deliver an advanced and thoroughly evaluated dust regional model reanalysis for Northern Africa, Middle East and Europe covering the satellite era of quantitative aerosol information, and to develop dust-related services tailored to specific applications.

CNR 04 – ACTRIS2: (Aerosol, Clouds, and Trace gases Research Infrastructure) H2020., n654109, CNR budget 1102388.00 €

The ACTRIS-2 Integrating Activities (IA) addresses the scope of integrating state-of-the-art European ground-based stations for long-term observations of aerosols, clouds and short-lived gases. It consolidates and improves services offered within FP7 funded Integrated Infrastructures Initiative ACTRIS (2011-2015). ACTRIS-2 takes up the overarching objectives of ACTRIS to further integrate the European ground-based stations and to construct a user-oriented RI, unique in the EU-RI landscape, for aerosols, clouds, and short-lived gas-phase species.

CNR 05 – EUNADICS-AV: European Natural Airborne Disaster Information and Coordination System for Aviation — EUNADICS-AV H2020 n. 723986, CNR budget 556250.00€

EUNADICS-AV is a European project where several European organizations work together in a consortium to achieve their mutual goals. The abbreviation EUNADICS-AV stands for European Natural Airborne Disaster Information and Coordination System for Aviation. The main objective of this European project is closing the significant gap in European-wide data and information availability during airborne hazards.

CNR 06 – 85-OD-MF-CMEMS: In CMEMS CNR is leading the dissemination service given access to all observational and forecasting products of marine service of the global ocean and European Seas (85-OD-MF-CMEMS LOT1, 85-OD-MF-CMEMS LOT2); Budget: 3.200.000,00

85-OD-MF-CMEMS is the CMEMS Dissemination service. The Service organize, manage and give access to all the NRT & reprocessed observational data and model forecasts and re-analysis of the global ocean and the European Seas produced by the CMEMS productions centres. The service provides access to177/970 products/dataset corresponding toa data Volume of 900 Tb). More than 15.000 users are registered to CMEMS Service availability : 98-99% Downloads: 239 212 GB in the last month

CNR 07 – CMEMS OCTAC (2015-2021): Coordinator& Service Manager of the Ocean Colour Operational service. The service has been implemented by two contracts: PCTAC-phase 2 - Budget (2018-2021: 2.800.000,00; OCTAC phase 1- Budget (2015-2018) = 2.500.000,00

The OCTAC implement a Ocean Colour (OC) Service for Copernicus marine applications providing Global and regional (Atlantic, Arctic, Baltic, Mediterranean, and Black Seas) high quality core OC products based on Satellite observations. OC-TAC products are currently used by European, National and regional level intermediate/end users (intergovernmental bodies, National Environmental Agencies, ESA and European Projects etc.) to monitor marine conditions and are acquired by the CMEMS MFCs for ecosystem model assimilation/validation

CNR 08 – EU CMEMS SST-TAC (2018-2021): Coordinator & Service Manager the Sea Surface Temperature service for global ocean and European Sea, Dissemination of all global and regional SST products, Budget: 1.900.000,00

The SST-TAC Service for Copernicus marine applications providing Global and regional (Atlantic, Arctic, Baltic, Mediterranean, and Black Seas) high quality core multi-sensors SST products based on Satellite observations

CNR 09 – EU C3S_511 (2018-2010): Coordinator & Service Manager of Copernicus Climate Service on Quality Assessment of ECV Products Budget: :€ 4.888.000,00

CNR is prime coordinator and contractor of Copernicus Climate Service C3S_511 aiming to the assessment of Essential Climate Variable (ECV) products derived from observations and from climate reanalysis

CNR 10 – EU E-MOBY: "Preliminary Design of the Copernicus Ocean Colour Vicarious Calibration Project: Infrastructure, Project Planning and Costing".Budget: 150.000,00

CNR is the coordinator of E-MOBY. This is an EUMETSAT projectdevises scientific, technical and managerial solutionsfor the "Preliminary Design of the Copernicus Ocean Colour Vicarious Calibration Project: Infrastructure, Project Planning and Costing". In one year the project will investigate the optimal location, design the field segment, design the ground segment by ensuring reliable solutions for data acquisition, data processing, data products and data services; devise the operations for the field segment (operation procedure for servicing, rotation in the field, refurbishment and replacements) and ground segment (data acquisition scheduling, operational data transmission, data processing, archive and dissemination, maintenance)

Relevant infrastructure and equipment

CIAO – CNR IMAA Atmospheric Observatory, a well-established ground-based remote-sensing observatory for the study of weather and climate. The observatory consists of a combination of advanced systems able to provide high quality long-term observations of aerosol and cloud properties. Since 2000, systematic observations of aerosol, water vapour and clouds have been collected and the acquisition of new active and passive microwave profilers has strengthened the equipment required for performing accurate aerosol and cloud observations. Currently, CIAO represents the largest ground-based remote-sensing station in the

Mediterranean Basin and is one of the first atmospheric observatories in Europe.

Processing and storing infrastructure: CNR IMAA is a central node of the ACTRIS DC and it is currently equipped with technical solutions guarantying long-term storage of ACTRIS products and the processing of the raw lidar data into Level 1, Level 2 and Level3 data. The infrastructure allows also for guaranteeing the access to the data and the monitoring of data provision. Each component is redundant from hardware point of view ensuring the operation of the node even when one single component does not work properly. The data backup is male regularly using a specific SAN which allow the recovery in case of a critic failure of the primary SAN.

ISMAR is central note of the Copernicus Marine Environmental Monitoring Services (CMEMS) leading the Ocean Colour and the Sea Surface Temperature Production Centers, the CMEMS Dissemination Service, participating to the Multi-Observation Center and the In Situ TAC. CNR-ISMR Marine Operational System of the GOS (Group of Ocean Satellite monitoring and marine ecosystem studies) ensure that state-of-the-art ocean products are produced with an efficient delivery service, they also ensure that they capitalise on new satellite missions and new scientific and technical research and developments, and also, pay attention to the needs of the user through operational maintenance, upgrading infrastructure and software, and targeting specific system development for the evolution of the products and information. GOS computer facilities hosts more than 1000 Tb distributed over several NAS (disk-based) servers for online and offline satellite data; (forthcoming) future improvement: expanding of the disk-based system up to 800 Tb, adding a tape-library SAN system for offline long-term archived data.

CNR-ISMAR Observing systems and services to monitor physical, chemical and biological oceanographic parameters and support risk assessment, prevention and management; The CNR-ISMAR in situ observing system is interconnected with H2020 – JERICO NEXT (Joint European Research Infrastructure network for Coastal Observatory – Novel European eXpertise for coastal observaTories); .

ISMAR contributes to SeaDataNet, SeaDatanet-ii, SeadataCluds. Seadatanet is a standardized infrastructure for managing the large and diverse data sets collected by the oceanographic fleets and the automatic observation systems. The SeaDataNet infrastructure network and enhance the currently existing infrastructures, which are the national oceanographic data centres or data focal points.

Partner 4 : European Global Ocean Observing System (EuroGOOS AISBL)

Organisation description

EuroGOOS identifies priorities, enhances cooperation and promotes the benefits of operational oceanography to ensure sustained observations are made in Europe's seas underpinning a suite of fit-for-purpose products and services for marine and maritime end-users. EuroGOOS is the European component of the Global Ocean Observing System of the Intergovernmental Oceanographic Commission of UNESCO (IOC GOOS). EuroGOOS Secretariat is in Brussels, serving 42 members and supporting five regional systems (ROOS) in Europe. The EuroGOOS ROOS coordinate and support development and joint oceanographic service production in European maritime regions. The ROOS, the EuroGOOS working groups, and networks of observing platforms (task teams) provide fora for cooperation, unlock quality marine data and deliver common strategies, priorities and standards towards the European leadership in oceanography. The EuroGOOS members and the many networks work towards integrated, sustained and fit-for-purpose European ocean observing, underpinning the EOOS framework.

Capabilities matching proposal tasks

EuroGOOS provides access to the main oceanographic institutes in Europe through its members. EuroGOOS has conducted extensive mapping of in-situ observing systems and infrastructure for the oceanic domain. They have partnered with EUMETNET and ICOS in delivering requirements, gap analysis and sustainability studies for the EEA Copernicus in-situ coordination project since 2017. They have also been central to mapping carried-out in significant H2020 projects including AtlantOS, JERICO NEXT and INTAROS with foci on the Atlantic, coastal system and Arctic respectively.

Main role in the project

EuroGOOS will lead **WP2**, **Task 2.3**, **Task 3.1** and **Task 5.1** and contribute to **Task 2.1**, **Task 2.2**, **Task 2.4**, **Task 3.2**, **Task 3.3**, **Task 4.1, Task 4.2** and **Task 5.3**

Short CVs of Key Personnel

Dr. Glenn Nolan (male) is the Secretary General of EuroGOOS. He is responsible for the Secretariat office that supports the association to fulfil its main goals, i.e. to: identify European priorities of operational oceanography and promote their implementation; foster collaboration and co-production at regional, European and global levels; ensure coordination with international initiatives. He has a Ph.D in Physical Oceanography. His main research interests are in the field of physical and operational oceanography and he has been leading scientist in several international and national projects in this area. He has more than 40 papers in peer-reviewed journals and books and has acted as a research supervisor and lecturer as well as a journal reviewer. Glenn is currently a member of various advisory bodies including the GOOS steering committee, Copernicus Marine Service advisory committee, Euro-Argo advisory board, EC GEO high-level working group and the EC Atlantic Seabed mapping working group. Glenn currently chairs the GOOS Regional Alliances Forum.

Ms. Dina Eparkhina (female) is an ocean science policy and communications expert and head of communications at EuroGOOS. She is involved in the EuroGOOS strategic work, including the development of the European Ocean Observing System (EOOS) framework, while also managing the EOOS communications. She was programme committee member and lead organizer of several major European science-policy conferences, to name a few, the EU Presidency events EurOCEAN conferences 2010 and 2014, and the EOOS forums 2016 and 2018. She is also managing the EuroGOOS ocean literacy activities. Dina has been involved in many European Commission projects, some are: FP6 MarinERA and FP7 SEAS-ERA (marine ERA-NETs), FP7 CLAMER (ocean and climate nexus and the public perception), H2020 COLUMBUS (maritime knowledge transfer), H2020

ENVRIplus (environmental research infrastructures), and a series of projects with the European Environment Agency where Dina manages communications underpinning the EEA's role as coordinator of the Copernicus In Situ Component. She is a member of several international science communication panels.

Dr. Vicente Fernandez (male) is EuroGOOS Science Officer with a main role in H2020 AtlantOS project, analysing present ocean observing capabilities and defining data requirements for the establishment of an integrated ocean observing system for the Atlantic Ocean. He holds a Ph.D. in Physical Oceanography and a M.Sc. in Environmental Engineering and Management. He has an extensive experience in numerical ocean modelling, ocean data analysis and management and coastal High Frequency Radar ocean observing systems. During his carrier he has worked in several oceanographic research centres, operational agencies, private companies, as well as an environmental met-ocean consultant using observational data and ocean modelling products and services in applications related with offshore industrial activities, as environmental impact assessment or risk analysis for the marine oil & gas sector. He has published more than 20 publications in peer-reviewed journals.

Relevant products/ services/ publications

Miloslavich P, Seeyave S, Muller-Karger F, Bax N, Ali E, Delgado C, Evers-King H, Loveday B, Lutz V, Newton J, Nolan G, Peralta Brichtova A.C., Traeger-Chatterjee C, Urban E. Challenges for global ocean observation: the need for increased human capacity, Journal of Operational Oceanography. 2018. DOI: 10.1080/1755876X.2018.1526463

OperationalOceanographyservingSustainableMarineDevelopment.ProceedingsoftheEightEuroGOOS International Conference. 3-5 October 2017, Bergen, Norway. E. Buch, V. Fernández, D. Eparkhina, P. Gorringe and G. Nolan (Eds.) EuroGOOS. Brussels, Belgium. 2018. ISBN 978-2-9601883-3-2

McMeel O, Calewaert J-B. Maritime Sensor Technologies for the European Market: Research, Development and Implementation. Good practice guide. McMeel O and Eparkhina D (Eds.). COLUMBUS project. 2018

She, J., Eparkhina D., Nolan G (Eds.) European operational oceanography: Delivering services for Blue Growth and ecosystem-based management. EuroGOOS Policy Brief. 2016. Brussels. Belgium.

She, J., Allen, I., Buch, E., Crise, A., Johannessen, J.A., Le Traon, P-Y., Lips, U., Nolan, G., Pinardi, N., Reißmann, J.H., Siddorn, J., Stanev, E. and Wehde, H. Developing European operational oceanography for Blue Growth, climate change adaptation and mitigation, and ecosystem-based management. Ocean Sci., 12, 953-976. 2016

Lana, A., Marmain J, Fernández V, Tintoré J, Orfila A. Wind influence on surface current variability in the Ibiza Channel from HF Radar. Ocean Dynamics, Vol. 66, pp 483-497. 2016

Relevant projects or activities

EuroGOOS coordinates five European regional systems, the EuroGOOS Regional Operational Oceanographic Systems (ROOS), four working groups, spanning pan-European data management, technology development and coastal oceanography, and seven infrastructure networks, EuroGOOS Task Teams, dedicated to European ocean technologies. EuroGOOS also chairs the EOOS steering group. In addition to this, EuroGOOS is involved in several European Commission projects supporting and developing the pan-European oceanographic research, innovation and services, among others:

EUROGOOS 01 – EEA Copernicus in-situ: coordination partners with EUMETNET and ICOS in delivering inventories and pilot projects on in-situ coordination for all Copernicus services. (2017 to 2021)

EUROGOOS 02 – AtlantOS: international trans-Atlantic consortium aiming to optimize and enhance the integrated Atlantic Ocean Observing System to obtain a sustainable, efficient and fit-for-purpose integrated system that goes beyond the state-of-the-art. (2015-2019)

EUROGOOS 03 – INTAROS: aiming to help build an efficient integrated Arctic Observation System by extending, improving and unifying existing systems in the different regions of the Arctic, contributing to the implementation of the EU Arctic Strategy. INTAROS brings together expertise from Europe, North America and Asia. (2016-2021)

EUROGOOS 04 – JERICO-NEXT: contributes to the implementation of the coastal part of the European Ocean

Observing System, cooperating with other European initiatives such as ESFRI (EURO-ARGO, EMSO, EMBRC), Ocean of Tomorrow sensor innovation projects and emerging European networks. (2015-2019)

EUROGOOS 05 – EMODnet-Physics: contributing to the EMODnet portal with layers of physical data and their metadata available for open use. It is based on a strong collaboration between EuroGOOS member organizations and EuroGOOS regional systems, ROOS. (2017-2019)

EUROGOOS 06 – SeaDataCloud: works to advance SeaDataNet services and increase their usage adopting cloud and high-performance computing technology. SeaDataNet is driving several EMODnet portals and complementing the Copernicus Marine Environmental Monitoring Service, CMEMS. (2016-2020)

EUROGOOS 07 – ENVRIplus: provides a strategic forum for European environmental research infrastructures, towards a more coherent, interdisciplinary and interoperable cluster across Europe. (2015-2019)

Relevant infrastructure and equipment

Infrastructure not directly provided by EuroGOOS. This is provided by EuroGOOS members involved ion day to day service delivery based on in-situ measurements.

Partner 5: Finnish Meteorological Institute (FMI)

Organisation description

The Finnish Meteorological Institute (**FMI**-www.fmi.fi) is a research and service organization under the Ministry of Transport and Communications of Finland. It provides operational and research information related to weather and climate for the needs of the public and decision-makers. This includes the production of numerical weather predictions. FMI is the largest research institute in Finland related to space activities (Earth Observation and space research).

FMI-SPACE (Space and Earth Observation Centre, http://space.fmi.fi) coordinates NSDC and several international initiatives focusing on (a) satellite observations of atmospheric composition and related applications, (b) monitoring of the cryospheric processes, including the development of EO-aided water management. These include numerous projects funded by the European Space Agency (ESA) that, among other achievements, resulted in the implementation of the GlobSnow approach for the monitoring of global and regional snow cover. Several EU-funded projects are concerned with the development of satellite-based indicators for environmental monitoring and situational awareness systems. FMI-SPACE also leads the EUMETSAT's Atmospheric Composition Monitoring Satellite Application Facility and participates on EU funded Copernicus Atmosphere Monitoring service project. Recent projects deal with the technical feasibility and economic viability of a service to monitor air pollution from ships, developing air quality monitoring products based on satellite data for the needs of national authorities and private companies. FMI-SPACE team belongs to two Academy of Finland Centres of Excellence: (a) Centre of Excellence in Atmospheric Science, and (b) Inverse Modeling and Imaging (the LUT team also belongs to the latter one).

Capabilities matching proposal tasks

- Sodankylä infrastructure of FMI-SPACE serves as a primary station of numerous international research infrastructure networks, such as WMO Global Atmosphere Watch (GAW), WMO Global Cryosphere Watch (GCW), NASA/JPL TCCON (Total Carbon Column Observing Network), European Integrated Carbon Observation System (ICOS) and GCOS Reference Upper-Air Network (GRUAN).
- Sodankylä facility of FMI-SPACE is a partner of the EU-funded International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT) and of the University of the Arctic.
- Sodankylä site of FMI-SPACE is an essential platform for European Union, EUMETSAT, ESA and NASA to develop products and the scientific end-use of data from such globally essential environment and climate monitoring satellites: Target site of NASA OCO2 (atmospheric CO2 concentration), ESA TROPOMI/Sentinel 5 Precursor (atmospheric methane and CO, ozone and solar UV radiation as well as short-lived air pollutants), ESA SMOS (Soil Moisture and Ocean Salinity Mission and NASA SMAP mission (Soil Moisture – Active and Passive).
- The Finnish National Satellite Data Centre (NSDC) of FMI-SPACE is a Copernicus Collaborative Ground Segment (CGS) consisting of Collaborative Acquisition Station (CAS) for local downlink of Sentinel-1 and Collaborative Archiving Centre (CAC) for mirroring, distributing and archiving data from Sentinel 1, 2, 3 and 5P.
- FMI-SPACE is in charge of Copernicus User Forum and Copernicus Relay in Finland

Main role in the project

FMI will lead **Task 1.2** and contribute to **Task 2.1**, **Task 2.2**, **Task 2.3, Task 3.1**, **Task 3.3** and **Task 4.1**

Short CVs of Key Personnel

Prof. Jouni Pulliainen (male) has published 120 peer-reviewed journal articles and over 300 publications in total. His h-index is 33 and number of citations over 3500. From 2001 to 2006 he was a professor of space technology at Helsinki University of Technology, specializing in remote sensing. He is currently a research professor at the Finnish Meteorological Institute (FMI) and director of the Space and Earth Observation Centre of FMI (FMI-SPACE). FMI-SPACE employs 100 researchers and technical staff members, 20 of those in Sodankylä. A major activity of FMI-SPACE is research related to satellite CAL-VAL and EO algorithm development. FMI-SPACE is also responsible for the satellite ground segment operations at Sodankylä, northern Finland, that encompassing the National Satellite Data Centre (NSDC). Recently, Pulliainen's research work has focused on the active and passive remote sensing of environmental processes of the cryosphere and boreal forest zone applying space-borne microwave and optical data. He has been a principal investigator or project manager for several nationally funded and international research projects, including several ESA and EC contracts. Memberships in international and national scientific committees and organizations include ESA Advisory Committee on Education (2001-2007); ESA CoreH2O MAG (2007-2013), National Committee of COSPAR (2010 onwards), delegate of Finland to SAON board (2011 onwards), member of ESA Earth Science Advisory Committee (ESAC, 2013-2017), delegate of Finland to ESA Earth Observation Program Board (PB-EO, 2017 onwards).

Prof. Johanna Tamminen (female) is a Research Professor at the FMI and has over 25 years of experience in atmospheric remote sensing and mathematical and statistical methods to analyse and characterize satellite data. She has published over 85 peer-reviewed articles (about 2300 non-self-citations, H-index 24 web-of-knowledge). Since 2018 she has been leading the Earth Observation Unit of FMI's Space and Earth Observation Centre, which consist of three groups and 30 scientists. She is a Co-Principal Investigator of Ozone Monitoring Instrument (OMI) on-board NASA's EOS-Aura satellite (since 2005), member of ESA Mission Advisory Group (MAG) for Sentinel 5 Precursor mission (2012-2018) and MAG for Anthropogenic CO2 Monitoring Mission. She is leading satellite validation projects for GOSAT, OCO-2/3, TanSat and TROPOMI/S-5P satellites. She is the vice director of Finnish Academy funded Centre of Excellence in Inverse Modelling and Imaging. She has participated on several national and international research projects on atmospheric research and remote sensing as responsible leader, team leader and work package leader.

Dr. Ali Nadir Arslan (male) received the D.Sc. (Tech.) degree from the Helsinki University of Technology, in 2006. He worked as a principal scientist in Nokia Corporation between 1999 and 2009 and holds 3 patents in mobile phone technology. He is a Senior Scientist at the FMI since 2009. His research interests are remote sensing methods and applications for cryosphere, microwaves, electromagnetics theory & computational modeling and EMC; Signal & Power Integrity. He managed the following projects: 1) EU FP7: SEN3APP Processing lines and operational services combining sentinel and in-situ data for terrestrial cryosphere and boreal forest, 2013-2016, 2) EU LIFE+ MONIMET (Climate change indicators and vulnerability of boreal zone applying innovative observation and modelling techniques), 2013–2017, and 3) COST Action ES1404: A European network for a harmonised monitoring of snow for the benefit of climate change scenarios, hydrology and numerical weather prediction, 2015–2018. He is the Chair of COPERNICUS Finnish User Forum and Copernicus Relay.

Mr. Mikko Strahlendorff (male) Development Manager with 19 years of experience in service development for national and EU programs. He is Finlands' delegate in the EU Copernicus Committee and a Member of the Group on Earth Observation Executive committee. He was an original developer of FMI weather web services and currently develops Sentinel mosaics for the national geospatial infrastructure PaikkaTietoAlusta.

Dr. Kari Luojus (male) is Head of Satellite Services and Research group at FMI Arctic Space Centre. Dr. Luojus received the M.Sc., Lic.Sc. (Tech.) and D.Sc. (Tech.) degrees from the Helsinki University of Technology (TKK), Espoo, Finland, in 2004, 2007 and 2009 respectively. From 2002 to 2008, he was a Research Associate and Research Scientist with the Laboratory of Space Technology at the Helsinki University of Technology (TKK). From 2008 to 2017 he was a Research Scientist and Senior Research Scientist with the Arctic Research at FMI. Since January 2018 he has been the head of the Satellite Services and Research group at the Arctic Space Centre of FMI. Dr. Luojus has participated several European Space Agency (ESA)-funded research projects (e.g. ESA GlobSnow; ESA SnowPEx; ESA SEOM S1-4SCI), national projects (e.g. Academy of Finland-funded ClimWater),

EC-projects (e.g. FP7 CryoLand and SEN3APP; Life+ Monimet and CLIPC). He worked as the project coordinator for the ESA DUE GlobSnow-1 and GlobSnow-2 projects between 2008 and 2014 which focused on constructing long term essential climate variables concerning terrestrial snow cover (SE and SWE). Dr. Luojus is currently leading the Cryosphere theme in the Copernicus Global Land Monitoring Service. Dr. Luojus acts as a steering group member of the WMO Global Cryosphere Watch (GCW) and as the co-chair of the WMO GCW Integrated Product Working Group and the GCW Snow Watch team. His research interests include the development of remote sensing techniques for cryospheric and hydrological applications and assessment and construction of long term records of terrestrial snow cover. He is the author and coauthor of more than 50 scientific publications concerning optical and microwave remote sensing of the cryosphere.

Dr. Hannakaisa Lindqvist (female) is the head of FMI Greenhouse Gases and Satellite Methods Group, Academy of Finland postdoctoral grantee, and a member of the Nasa OCO-2 Science Team. She has 10 years experience in atmospheric radiation research; expertise in light scattering, remote sensing and validation. Publication record: 20 peer-reviewed articles or book chapters (h-index 15).

Relevant products/ services/ publications

Eldering, A.,…, Hakkarainen, J., Tamminen, J., et al. (2017). The Orbiting Carbon Observatory-2 early science investigations of regional carbon dioxide fluxes, Science, 358, https://doi.org/10.1126/science.aam5745.

Hakkarainen, J., et al. (2016). Direct space-based observations of anthropogenic CO2 emission areas from OCO-2, Geophys. Res. Lett., 43.

Hassinen, S.,…, Tamminen, J., et al. (2016). Overview of the O3M SAF GOME-2 operational atmospheric composition and UV radiation data products and data availability, Atmos. Meas. Tech., 9, 383-407.

Pulliainen, J. et al. (2017). Early snowmelt significantly enhances boreal springtime carbon uptake. PNAS, 114: 11081-11086.

Rautiainen, K., et al. (2016). SMOS prototype algorithm for detecting autumn soil freezing. Remote Sensing of Environment, 180, 346-360, DOI: 10.1016/j.rse.2016.01.012

Takala, M., Luojus, K., Pulliainen, J., et al. (2011). Estimating northern hemisphere snow water equivalent for climate research through assimilation of space-borne radiometer data and ground-based measurements, Remote Sensing of Environment, 115:3517-3529.

Relevant projects or activities

FMI 01 – CryoLand: Copernicus Snow and Land Ice services: the project was coordinated by ENVEO, and developed and implemented near real time services for daily Pan-European Snow Extent maps from MODIS (ENVEO and SYKE), and SWE products for the PanEuropean domain (by FMI). The snow extent product was extenbd to the full-mission life time of MODIS (starting from 2000 onwards. The service on snow extent products is still operating (see www.cryoland.eu).

FMI 02 – SnowPEx: Satellite Snow products Intercomparison and Validation Exercise: ENVEO was PI of this international activity with the aim to bring the satellite snow community together and perform an international intercomparison and validation of global to continental snow extent and SWE products. Two international workshops on satellite snow product intercomparison with more than 40 participants each have been held in 2014 and 2015, hosted by NOAA, Washington DC, (ISSPI-1) and NSIDC, Boulder CO (ISSPI-2), respectively. Community agreed protocols and methods for intercomparison and validation of satellite snow extent and SWE products have been developed and are available for the public. More than 15 norther hemispheric to continental snow extent products from optical satellite data and 3 SWE products from passive microwave data participated in the intercomparison. Additional topics were the intercomparison of temporal trends of snow extent and SWE. SnowPEx was running under the umbrella of Global Cryosphere Watch of WMO.

FMI 03 – Copernicus Global Land Monitoring Service - Cryosphere: FMI is coordinating the Cryosphere theme of the overall service and is leading the Snow Water Equivalent generation from passive microwave data. ENVEO is leading the global snow extent generation from optical satellite data (MODIS, VIIRS, in near future Sentinel-3), SYKE is leading the European Lake ice production from optical satellite data (MODIS, in future

Sentinel-2 and Sentinel-3).

FMI 04 – ESA DUE GlobSnow (phase 1 and phase 2): FMI coordinated the project and led the Snow Water Equivalent development and production; SYKE developed the northern hemispheric Snow Extent and cloud masking algorithms from AATSR / ATSR-2 data, and contributed to the accuracy assessment and validation of the snow extent products; ENVEO contributed to the northern hemispheric snow extent production and lead the validation of the snow extent products.

FM 05 – EUMETSAT AC-SAF: FMI is leading the consortium that provides Atmospheric Composition Satellite Application Facility (AC-SAF) for the EUMTSAT. The service processes, distributes and archives NRT and off-line data products on air quality, ozone and UV-radiation from UV-VIS and TIR instruments in an operational manner.

FMI 06 – EUMETSAT HSAF: FMI is leading snow cluster of the EUMETSAT Satellite Application Facility on Support to Operational Hydrology and Water Management (H-SAF) project which started on 2005 as part of the EUMETSAT SAF Network.

Relevant infrastructure and equipment

The Sodankylä Satellite Calibration and Validation (CAL-VAL) Infrastructure is an essential part of the Arctic Space Centre of the Finnish Meteorological Institute. The Arctic Space Centre is Finland's primary infrastructure for the utilization, calibration and validation of data and products obtained from Earth Observation (EO) satellites (Arctic Space Centre is a unit of FMI's Space and Earth Observation Centre, FMI-SPACE, http://space.fmi.fi). The research infrastructure at Sodankylä is a globally unique system providing *in situ* and ground-based observations on the interaction between the Earth's surface, biosphere and the atmosphere. These observations are accompanied by reference instruments of various currently operational or planned EO satellite sensors of the European Space Agency (ESA), NASA, European Organization for exploitation of Meteorological Satellites (EUMETSAT), Canada, Italy, Japan and China. In particular, the Sodankylä site is an essential platform for ESA and NASA to develop products and the scientific end-use of data from such globally essential environment and climate monitoring satellites as selected Target site of NASA OCO2 (atmospheric CO_2 concentration), ESA TROPOMI/Sentinel 5 Precursor (atmospheric methane and CO, ozone and solar UV radiation as well as short-lived air pollutants), ESA SMOS (Soil Moisture and Ocean Salinity Mission and NASA SMAP mission (Soil Moisture – Active and Passive). Already by now Sodankylä accommodates the reference instruments of these satellites on a permanent basis providing vital information for the utilization of mission data and for the development and validation of satellite products on geo- and biophysical variables. The Sodankylä site has also acted as a test bed for recently proposed satellite missions, including the ESA Cold Regions Hydrology High Resolution Observatory (CoReH2O) and Radar Imager for Changing Cryosphere (RISC) mission candidates.

An exceptional feature in Sodankylä infrastructure is the integrated monitoring of boreal/sub-arctic environmental and climate processes from below the surface to upper limits of atmosphere and to space weather phenomena. FMI Sodankylä infrastructure serves as a primary station of numerous international research infrastructure networks, such as WMO Global Atmosphere Watch (GAW), WMO Global Cryosphere Watch (GCW), NASA/JPL TCCON (Total Carbon Column Observing Network), European Integrated Carbon Observation System (ICOS) and GCOS Reference Upper-Air Network (GRUAN). FMI Sodankylä facility is also a partner of the EU-funded International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT) and of the University of the Arctic. Further, in 2018 FMI and the University of Oulu established the Sodankylä Space Campus to utilize the infrastructure of the two institutes in Sodankylä for multidisciplinary research and educational purposes.

The key observations coordinated by FMI-SPACE in the Sodankylä site are listed in Table 1 and some examples of the current research infrastructure are depicted in Fig. 1, see also http://litdb.fmi.fi and http://nsdc.fmi.fi. The data from current Sodankylä measurement programs are used widely by different international research communities representing e.g. biology/ecosystem analysis/modelling, hydrology, greenhouse gas exchange research, meteorology including development of numerical weather prediction, climate change research, development of weather-related applications in intelligent traffic, atmospheric processes research (troposphere, stratosphere, mesosphere and ionosphere) and space weather research.

FMI-SPACE hosts the **Finnish National Satellite Data Centre** (**NSDC-**http://nsdc.fmi.fi) in Sodankylä, northern Finland (lon 27° E, lat 67° N). It consists of three satellite receiving systems, a server building and an operations room. NSDC provides satellite data reception, data processing and archiving services to Finnish and international partners. NSDC is a Copernicus Collaborative Ground Segment (CGS) consisting of Collaborative Acquisition Station (CAS) for local downlink of Sentinel-1 and Collaborative Archiving Centre (CAC) for mirroring, distributing and archiving data from Sentinel 1, 2, 3 and 5P. NSDC receives data from several different satellites operated by institutes and companies located worldwide. In addition to satellite reception service, NSDC infrastructure can be used to host processing lines and services to external partners as a cloud services.

All NSDC hardware and processes are monitored by 24/7 h surveillance located in FMI headquarters (HQ) in Helsinki. NSDC and HQ are linked with a duplicated 10 Gbps optical fibers to ensure a fast and safe connection.

The NSDC operations room acts as a single point of access from where all the systems can be remotely accessed and monitored. The operations room power supply is secured by UPS. The server room fulfils ESA security standards with doubled cooling system, argon-based fire extinguishing system and UPS and generator secured power supply.

NSDC's extensive in-situ measurement network with long time series of numerous geophysical and atmospheric variables, accompanied with observations with satellite instrument reference systems, enable the validation and calibration of satellite products and data. Most of the in-situ measurements are freely available from FMI databases.

Partner 6 : Barcelona Supercomputing Center – Centro Nacional de Supercomputación (BSC)

Organisation description

The Barcelona Supercomputing Center – Centro Nacional de Supercomputación (short named as BSC), created in 2005, is the leading supercomputing centre in Spain. It specialises in High-Performance Computing and its mission is twofold: to offer supercomputing facilities and services to Spanish and European scientists and to create knowledge and technology to be transferred to society. At the BSC, more than 500 people from 40 different countries perform and facilitate research into Computer Sciences, Life Sciences, Earth Sciences and Computational Applications in Science and Engineering. This multi-disciplinary approach and the combination of world-leading researchers and experts in HPC (High-Performing Computing) with state-of-the-art supercomputing resources make BSC unique. The BSC is one of the first eight Spanish 'Severo Ochoa Centre of Excellence" awarded by the Spanish Government, it is managing the Spanish Supercomputing Network, as well as one of the four hosting members of the European PRACE Research Infrastructure. The BSC hosts MareNostrum supercomputer, a Tier-0 PRACE system currently ranked as the #3 most powerful supercomputer in Europe (#13 in the world) with 13.7Pflop/s capacity. In addition, the BSC hosts other High-Performance Computing (HPC) resources, among which it is worth mentioning Minotauro, one of the most efficient supercomputers in the world (#35 in the last ranking of the top500 green list).

The Earth Sciences Department of the BSC (ES-BSC) was established with the objective of carrying out research in Earth system modelling and focuses its activity on emissions, air quality, mineral dust and global and regional climate modelling and prediction. ES-BSC is organized around four closely interacting groups (Atmospheric Composition, Climate Prediction, Computational Earth Sciences, and Earth System Services) comprising ~90 employees, including scientific, technical, and support staff. The department is an active member of the EC-Earth consortium, whose Earth System Model is widely used at ES-BSC for research and teaching purposes. During last 5 years (2014-2018), BSC-ES was granted 30 EU Horizon 2020 projects, 4 EU FP7 projects, 11 EU Copernicus contracts, 20 national projects, 4 projects funded by the European Space Agency, 1 project funded by the French Ministry of Sciences, 1 project funded by the Flanders Research Foundation, 1 project from ERA-NET, 3 from ERA4CS and ERC Consolidator Grant. During that same period, BSC-ES also participated in 21 RES and 4 PRACE projects. The BSC-ES international activity includes the coordination of the two World Meteorological Organisation (WMO) regional centres specialised in sand and dust warning and forecasting, as well as the participation in climate services initiatives like the Climate Services Partnership (CSP). Members of the BSC-ES participate in committees of the World Climate Research Programme (WCRP), such as the CLIVAR Scientific Steering Group or the Working Group on Seasonal to Interannual Prediction (WGSIP). The Atmospheric Composition group at ES-BSC aims at better understanding and predicting the spatiotemporal variations of atmospheric pollutants along with their effects on air quality, weather and climate and contributes to a variety of forecasting activities.

Capabilities matching proposal tasks

- BSC Earth Sciences Department has a long experience on data managing of a huge variety of observations of all over the world, both of European and other international networks, used to evaluate numerical models that are run in several HPC platforms.
- BSC Earth Sciences Department is also involved in several Copernicus contracts both in CAMS and C3S services.
- The deep knowledge of Copernicus ecosystem joint with the expertise on all the IT aspects related to observational data (e-infrastructure, advanced software tools and protocols etc.) and the involvement in international initiatives such as EUDAT (where ES-BSC had a user pilot and BSC is a service provider) put us in a good position to satisfy projects requirements and finalize proposal tasks successfully.

Main role in the project

BSC will lead **Task 2.4, Task 4.2** and contribute to **Task 1.2**, **Task 3.3, Task 5.2** and **Task 5.3**

Short CVs of Key Personnel

Dr. Carlos PEREZ GARCIA-PANDO (male) is AXA Professor, Ramon y Cajal Researcher and Head of the Atmospheric Composition Group at BSC. He holds an AXA Chair on Dust Storms at BSC. His research group is composed of ~20 people including senior researchers, postdocs, PhD students and technical support staff. His research focuses on understanding the physical and chemical processes controlling atmospheric aerosols, and evaluating their effects on climate, ocean biogeochemistry, air quality and health. His core area of expertise is atmospheric mineral dust. He is also a model developer with a large experience in supercomputers. Previously he has held research positions at the NOAA/National Centers for Environmental Prediction, the International Research Institute for Climate and Society, the NASA Goddard Institute for Space Studies and Columbia University. He has participated in ~30 international and national projects (in 7 of them as PI or co-PI). In the US, he has been PI and co-PI of competitive projects funded by the Department of Energy, NASA and NOAA. In 2017, he was awarded an ERC Consolidator Grant entitled FRAGMENT, which has started in October 2018. He was also awarded the Agustín de Betancourt y Molina prize for young researchers by the Spanish Royal Academy of Engineering. His work has resulted in ~60 peer-reviewed publications, 20 chapters in books, proceedings and reports, more than 150 contributions to conferences/workshops/seminars (26 as invited speaker) and the edition of a book of proceedings (Google Scholar; citations 3766; h-index 31).

Dr. Sara BASART (female) received her PhD degree in Engineering Environmental at Technical University of Catalonia (UPC) in 2012 while doing her research at different research centres (Centro de Investigacion Atmosferica de Izana, Spain, and Laboratoire des Sciences du Climat et de l'Environnement, France). Her main research background covers mineral dust modelling, air quality and aerosols. At present, Dr Basart is a researcher in the Barcelona Supercomputing Center (BSC). She is the scientist in charge of the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) Regional Center for Northern Africa, Middle East and Europe, and the Barcelona Dust Forecast Center (BDFC), hosted in BSC. She also participates in international projects like the International Cooperative on Aerosol Prediction (ICAP) initiative, H2020 (SOLWATT, ACTRIS and ACTRIS-2) and Copernicus (CAMS-50, CAMS-84, CAMS-95). She is Leader Project Investigator of the EU ERA4CS project DustClim. Recently, she was elected as a Chair of the COST Action InDust (CA16202). She has authored or co-authored more than 35 peer-reviewed publications in international journals and book chapters (Google Scholar: citations 1448; h-index: 19). Furthermore, she has participated in capacity building and transfer of knowledge activities associated with private contracts, European Commission and United Nations programmes.

MSc. Francesco BENINCASA (male) is software designer and developer. He holds a Master of Science in Software Engineering with a thesis on Optimization Algorithms ("Heuristic Algorithms for Bin Packing Problem"). He is GNU/Linux and Python language expert and author of various software applications, web and stand-alone, for web communities, for data managing, automatic shopping, network data upload/download, data processing, formatting and visualizing. After working in the private sector on web and databases development and automatic shop applications, he started his experience in supercomputing and data manipulation (SCS SuperComputing Solutions, a CINECA spin-off – Bologna, Italy) oriented to biomedical simulations, participating to several FP6 and FP7 European projects. Since 2010 he is at the Barcelona Supercomputing Center (BSC) working on air quality data management, processing and visualization. Currently is co-leader of the Data and Diagnostics Team inside the Earth Sciences Department. He is in charge of data processing and management and web development and maintenance of the WMO SDS-WAS NA-ME-E Regional Center (SDS) and the Barcelona Dust Forecast Center (BDFC), both projects operated by a consortium of BSC and AEMET (Spanish Meteorological Agency) under the umbrella of the World Meteorological Organization (WMO) with the goals to improve the understanding of sand and dust storms phenomena through air quality models comparison and evaluation (SDS) and to provide an operational daily dust forecast over the Mediterranean area (BDFC). Both previous projects are also involved in an EUDAT user pilot implementing storage and staging services. He is also co-chairman of the "weather, climate and air quality Interest Group" inside the Research Data Alliance (RDA).

Relevant products/ services/ publications

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Di Tomaso, E., N.A.J. Schutgens, O. Jorba, and C. Pérez García-Pando (2017). Assimilation of MODIS Dark Target and Deep Blue observations in the dust aerosol component of NMMB-MONARCH version 1.0. Geoscientific Model Development, 10, 1107-1129, doi:10.5194/gmd-10-1107-2017.

Relevant projects or activities

BSC 01 – CAMS_84: Global and regional a posteriori evaluation and quality assurance of the Copernicus Atmosphere Monitoring Service (Copernicus CAMS).

BSC 02 – WMO SDS-WAS Regional Center: The World Meteorological Organisation (WMO) Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) Regional Center for North Africa, the Middle East and Europe The SDS-WAS mission is to enhance the ability of countries to deliver timely and quality sand and dust storm forecasts, observations, information and knowledge to users through an international partnership of research and operational communities. The Centre's web portal became a place where visitors could find the latest dust-related observations and the most up-to-date experimental dust forecasts: http://sds-was.aemet.es.

BSC 03 – ACTRIS-PPP Aerosols, Clouds and Trace gases Preparatory Phase Project (GA-739530): is the pan-European RI that consolidates activities amongst European partners for observations of aerosols, clouds, and trace gases and for the understanding of the related atmospheric processes, to provide RI services to wide user groups.

BSC 04 – FRAGMENT (ERC-2017-COG-773051): FRontiers in dust minerAloGical coMposition and its Effects upoN climate. The goal of the project is to understand and constrain the global mineralogical composition of dust along with its effects upon climate.

BSC 05 – SOLWATT (H2020-LCE-2017-792103): Solving Water Issues for CSP Plants. The overall purpose of the project is to upscale, implement and demonstrate cost-effective technologies and strategies that bring about

a significant reduction of water of CSP plants while ensuring excellent performance of electrical power production.

Relevant infrastructure and equipment

BSC is a key element of and coordinates the Spanish Supercomputing Network, which is the main framework for granting competitive HPC time to Spanish research institutions. Furthermore, BSC is one of six hosting nodes in France, Germany, Italy and Spain that form the core of the Partnership for Advanced Computing in Europe (PRACE) network. PRACE provides competitive computing time on world-class supercomputers to researchers in the 25 European member countries. BSC operates MareNostrum, the most powerful supercomputer in Spain since its inception In March 2004.

The latest version, MareNostrum 4 (since July 2017) has a performance capacity of 13,7 Petaflop/s and is composed of two distinct parts. The general-purpose element, provided by Lenovo, has 48 racks with more than 3,400 nodes with next-generation Intel Xeon processors and a central memory of 390 Terabytes. Its peak power is over 11 Petaflop/s, i.e. it is able to perform more than 11,000 trillion operations per second, ten times more than MareNostrum 3 despite costing only a 30% increase in energy consumption. The second element of MareNostrum 4 is formed of clusters of three different technologies that will be added and updated as they become available. These are technologies currently being developed in the USA and Japan to accelerate the arrival of the new generation of pre-exascale supercomputers. MareNostrum 4 will have a disk storage capacity exceeding 10 Petabytes and will be connected to the Big Data infrastructures of BSC, which have a total capacity of 24.6 Petabytes. BSC has also other cutting-edge computing infrastructure based on latest available technology like FPGA boards, small clusters based on ARM SoCs, GPUs, etc.

Partner 7: European Association of Remote Sensing Companies (EARSC)

Organisation description

EARSC, the European Association of Remote Sensing Companies is a membership- based, not for profit European organisation which coordinates and promotes activities of European companies engaged in delivering Earth Observation geo-information services. EARSC's key goal is to help promote the industry and to help develop the market for EO services. EARSC is representing the European providers of geo-information services in its broadest sense creating a network between industry, decision makers and users and covering the full EO value chain from data acquisition through processing, fusion, analysis to final geo-information products & services.

EARSC currently has over 100 members and the network contains all the leading European suppliers of EO data and value-added products as well as many small and micro-enterprises. Formed in 1989, EARSC provides its members with information on current and prospective European programmes, legislative actions as well as news on the market for EO services, maintains facts about the industry (industry survey 2013, 2015 and 2017) and offers help for companies wishing to become ISO certified.

One of the objectives of EARSC is to support the European EO Services industry by opening up new market opportunities. In other words, to help develop the market for commercial EO-based products and services. This includes new commercial market sectors and new export possibilities linked to national needs in countries outside Europe. EARSC's strategy to improve export prospects for companies hinges around partnerships. The EO services sector has business applications in many domains and we seek partners which can help expand our reach (for example one key partnership is with the Oil and Gas sector through the International Oil and Gas Producers Association).

We undertake studies into the market and the impact of EO geo-information services. As well as the Comprehensive industry survey published every 2 years, we have conducted a study into the benefits of making Copernicus Sentinel data available on a free and open basis; "GMES and Data: Geese and Golden Eggs". More recently we have published a number of reports on the economic value of EO to European society; each of these follows an innovative, value-chain approach and provides new perspectives both on the high value being created through the use of EO, as well as new and important insights into the value-chains being constructed. More cases are currently being further analysed within the ESA Sentinel Economic Benefits Study which should provide valuable insights for PARSEC.

We also actively promote the products and services that make up our sector. In 2016, we published a position paper on "Creating a Marketplace for EO Services" in which we state that industry will come together to create a Marketplace Alliance which will oversee many different marketplaces. Within this project we have developed a digital marketplace for online services which facilitates the sales and market intelligence aspects of online sales in the EO sector, as well as making it easier for clients to find appropriate services.

Contributions of EARSC to:

National and international initiatives and networks: EARSC maintains connections with a number of other umbrella organisations at European and National levels. For example, EARSC works with Eurogi (as an observer member), Eurisy, Eurospace, NEREUS in Brussels and with National Associations where they exist. Where no national associations exist, EARSC acts on behalf of a national cluster of companies to help them with national policy, strategies and networking.

International initiatives and networks: EARSC has signed MoUs with Japan Space Systems (JSS), the African Association of Remote Sensing for the Environment (AARSE), the Australian Cooperative Research Centre for Spatial Information (CRCSI) and the trade association fostering international trade between Chile and Europe

(EuroChile). EARSC is also member of European and Latin American Business Services and Innovation Network (ELAN Network) in Latin America and globally it is participating organization of the Group on Earth Observation (GEO).

Capabilities matching proposal tasks

- **In-depth knowledge of the EO sector**: EARSC represents over 100 European companies engaged in activities linked to EO services from satellite operations, data supply, IT and software components and value-added GI services.
- It provides a **private sector perspective** to the promotion of EO services and has set up a Marketplace Alliance and online marketplace to help in this respect. This pro-active approach to market development is a fundamental precursor to a successful Research and Innovation forum.
- EARSC continuously **surveys** its members to provide stakeholders with up-to-date information on the activities carried out by the EO sector and an assessment of its effectiveness.

Main role in the project

EARSC will lead **Task 6.2** and contribute to **Task 2.3** and **Task 5.3**

Short CVs of Key Personnel

Geoff Sawyer (male), Secretary General:

- Secretary General of EARSC since 2011 and has driven the development of the Association into the widely known and well-regarded organisation it is today.
- Senior management positions in the space industry with Astrium / EADS / Airbus as well as numerous representative positions in the UK and Europe.
- Director of EARSC for 12 years during which he was chairman for 6 years from 1991 to 1997
- Served on many EU consultative bodies such as Spassec (for space and security) and the SecAG (Security Advisory Group) and in industry representative groups for example the chairman of the ASD security research committee.
- 3 years working for the European Commission where he was responsible for supporting space policy and the creation of the GMES initiative

Well known to many in the space and earth observation sectors and brings this deep wealth of experience and knowledge to support the ambitions of the geo-information industry that EARSC represents.

Natassa Antoniou (female), Project Officer – Market Development:

- Leads market development and internationalisation portfolio of EARSC
- Project manager of IDEEO
- Strong and relevant experience in the space sector
- Masters in both Urban Environmental Management and European Studies,
- Completed a Space Studies Programme at NASA, Cape Canaveral, USA.
- 8 years working experience in space policy and earth observation both in the public and private sector.
- She has been closely cooperating with several Inter-Governmental organizations, such as GEO, CEOS, UNSPIDER, the European Space Agency and the European Commission.

Since 2014, she has been focusing on raising awareness about benefits and applications of geospatial

technologies for governance, businesses and citizens.

Rory Donnelly (male), Business Manager:

- Represents European Earth Observation companies at EARSC where he oversees relations with Entrusted Entities and the promotion of European EO expertise within Europe and internationally.
- Background in commercial and R&D roles in Australia and Europe.
- Obtaining a PhD in atmospheric dispersion modelling while working concurrently as a consultant air quality scientist in Australia laid the groundwork for a career in the digital and satellite-data based sector.
- Technical experience at MeteoFrance, he rose to lead an R&D team of 15 scientists and engineers at a renewable energy consultancy in Belgium developing SCADA analysis algorithms and online services.
- Set up a team at Plymouth Marine Laboratory in the UK dedicated to commercialising research output through operational products and data visualisation in the remote sensing sector.

Since mid-2018 Rory leads liaisons with Copernicus Entrusted Entities and international market development.

Christopher Oligschlaeger (male), Analyst:

- Supports the EARSC secretariat in a number of projects project as an analyst
- Bachelor degree in European Studies from Maastricht University
- Double Master's degree in Governance and International Politics from Aston University Birmingham and Otto-Friedrich-University Bamberg.
- First work experience at the Institute for European Politics in Berlin and the OSCE's Conflict Prevention Centre in Vienna

Traineeship at Business Bridge Europe, developing a great interest in European space policy and concrete space applications through earth observation.

Marion Buvet (female), Communication Officer

- Supported the EARSC secretariat with communications activities, events, projects and networking with EU institutions since February 2018.
- Background in communications in different organisations, where she has demonstrated her ability to disseminate information efficiently.
- Holds a Bachelor's in law and a Master's degree in Political Science
- Policy analyst for former MEP Edith Herczog at Vision & Values

Guest speaker at UVSQ on the topic of European communication

Emmanuel Pajot (male), Senior Project Manager:

- Senior Project Manager at the EARSC
- PhD in Sciences (hons)
- MS in Business (hons)
- Remote sensing specialist with over 13 years of experience in field projects and research studies in the Oil & Gas sector
- From 2003 to 2008 worked for a Major O&G company for upstream worldwide projects. Then, working for a main EU contractor, he set up a team from scratch developing and providing high added value studies for

Major and International O&G companies.

In 2016 he decided to strengthen his skills in market analysis and strategic management and applied them to the pipeline inspection before joining the EARSC in 2017.

Monica Miguel Lago (female), Executive Secretary:

- Executive secretary and sector adviser for EARSC gained through 15 years of working experience in Earth Observation
- interacting with different stakeholders from most highly regarded technological related firms to organizations such as ESA, EU, GEO or UN Units
- Scientific background and proven ability and experience of conducting international programs
- she is leading a methodology for assessing the maturity of (G)EO activities at national level under an H2020 project
- Her experience in outreach projects, education and communication on the capabilities and limitations of Earth Observation makes a valuable asset for the project on sector skills strategy where she is leading and coordinating the preparatory work and road map.
- Responsible for relations with EARSC members, understanding the services portfolio evolution and contributing with community relations, specially groups with focus on Sustainable Development Goals.

Her engagement to consulting activities in the EO industry developed a strong belief that innovative EO can enable tremendous business growth and she is extremely pleased contributing on these exciting times for the sector.

Irene Doda (female):

- Joined EARSC as junior policy officer in November 2018 and works on implementing EARSC's policy strategy
- Monitors and analyzes relevant policy developments for the EO and geo-information sector at European level.
- Organizes and moderates working groups, workshops and events, giving the chance to members to positively interact with institutional stakeholders.
- Works on the Industry Survey, the biannual extensive market study undertaken by EARSC on the state and health of EO sector in Europe.
- Has a background in International Relations and global markets: she gained her master's degree in October 2018 with a dissertation on outer space political economy.
- Has previous work experience in marketing, communication and journalism.

Relevant products/ services/ publications

- **Sentinel Benefits Study** - Farm management support in Denmark (March 2018)
- **EARSC industry surveys** (August 2017)
- **EARSC Position Paper** – Creating a European marketplace for EO services (February 2016)
- **A Taxonomy for the EO Services Market**: enhancing the perception and performance of the EO service industry (August 2015)
- **EARSC views on European Geospatial services**: Developing the Private Sector Capability (May 2015)

Relevant projects or activities

- **EARSC01 – EuroGEOSS SHAPE (H2020):** EARSC leads the User Uptake WP and contributes heavily to Sustainability WP
- **EARSC02 – Sentinel Benefits Study (ESA):** leader of "Showcasing the benefits brought by the usage of Sentinels data to society, environment and economy" study
- **EARSC03 – MAOS (Marketplace Alliance of Earth Observation Services):** Leader of eoMALL (Establishing a European marketplace for EO services)
- **EARSC04 – Partner in GEO-CRADLE**
- **EARSC05 – EoVox4**

Relevant infrastructure and equipment

The **EARSC Portal** is a knowledge management tool and it is also used as a communication channel with members (www.earsc-portal.eu). The continued development of the EO Portal is becoming a key tool to engage and interact with other Communities as well as accessing information and news about the industry and EARSC.

The **OGEO-Portal** (www.ogeo-portal.eu) is a web tool for oil and gas and Earth Observation / Geo- Information professional communities to interact for which EARSC administers the Portal.

EOpages (www.eopages.eu) as a brokerage site for EO services. EOpages has also developed an API that allows other organisations to use the EARSC database on EO suppliers. It will provide the companies with a single location where they can maintain their contact details and capabilities but which can be extracted by other sites to be used in conjunction with their specific applications.

eoMALL aims to become the foremost web-site on which to find on-line EO -based services. The site facilitates the discovery of EO-based online services by customers as well as providing important market feedback to service providers. The site is administered by EARSC.

Partner 8: DRAXIS Environmental S.A., (DRAXIS)

Organisation description

Website: http://draxis.gr/

Founded in 2000 in Thessaloniki, DRAXIS is a dynamic company that focuses on developing real-life environmental and agricultural ICT solutions and providing specialised environmental and agricultural consultation services. Passionate about applying ICT, the company uses, combines and integrates remote sensing technologies, compound algorithms, GIS and other datasets to build multi-functional web-based platforms and mobile applications, decision-making tools, crowdsourcing platforms, workflow systems and other software solutions. The services provided target mainly the fields of e-government, air quality, weather forecasting, energy, waste management, sustainable agriculture and circular economy. All solutions are supported by an effective consultation framework, always aiming at enhancing efficiency in the use of natural resources, and at supporting successful integration of environmental aspects. Delivering excellence and sustainability is the key to each and every stage of DRAXIS end-to-end provided services.
Imaging the world and environment in a digital fabric, DRAXIS has implemented a number of relevant projects aiming in incorporating environmental and agricultural ICT both in private and public sector. Throughout these year DRAXIS has designed, developed and pilot tested a number of tools, such as:

- Environmental and agricultural decision support systems and web applications combining information from many resources and workflows and providing information and emergency alerting.
- Environmental and agricultural simulation models.
- Data hub systems that collect earth observation data offering them to other applications or the web via secure data bridges.
- Mobile application that push the appropriate information.
- Crowdsourcing platforms that exploit the power of the crowd and combine the crowdsourced data with additional datasets to accomplish unique goals and provide personalized alerts

These tools can be expanded and applied to different fields of the environmental and agricultural sector and create a whole new universe of opportunities for technological applications.
DRAXIS is empowered by its people. They are all competent professionals and experts in their respective fields, from various backgrounds, such as Physicists, Engineers, Geologists, Agriculturists, IT engineers, etc. But, even more importantly, everyone at DRAXIS is highly motivated and trained to tackle different challenges, and readily meet the incessant changes of today's increasingly demanding international market environment. Having an experienced diverse pool of professionals holding a PhD. or MSc. Degree, the company invests in research, so as to keep up with the latest scientific advances; this, coupled with its active involvement in European and national research projects, enables the company to provide top quality services and high technological standards.

DRAXIS outstanding services and exceptional environmental performance are 9001:2015 (Quality Management) and ISO 14001:2015 (Environmental management systems) certified.

Capabilities matching proposal tasks

- **DRAXIS** strives to create a path to a sustainable future through research, development and piloting services in all areas and in operational environment.
- **DRAXIS** is operating at an international level, and has experience in concurrently working in different multicultural environments and time zones.
- Its flexible and holistic approach gives **DRAXIS** the agility to provide full project life cycle ICT services; this helps its clients achieve substantial improvements in their everyday work and environmental performance.
- Starting with the identification of initial requirements, **DRAXIS** moves on to developing and implementing innovative applications continuously supporting their operation and adapting them to market and business ever-changing needs.

Main role in the project

DRAXIS will lead **WP5, Task 5.2** and **Task 6.3** and will contribute to **Task 1.2, Task 2.2, Task 2.4, Task 3.3, Task 4.2, Task 5.1, Task 5.3, Task 6.1** and **Task 6.2**

Short CVs of Key Personnel

Ms. Panagiota Syropoulou (female) is Physicist with MSc in Environmental Physics. From a scientific aspect, she is very active in the domains of air quality monitoring and management of environmental hazards. She is the coordinator of the citizen science project hackAIR (H2020-ICT10), which enables citizens and organisations to easily engage in generating and publishing information relevant to outdoor air pollution, raising collective awareness about the daily levels of human exposure to air pollution. Moreover, she is member of the ENVI4ALL team that has developed an innovative semi-empirical algorithm for the forecast of air pollution at a local level. Her working experience also includes the implementation and management of several European (FP7, H2020) and national projects, focusing on support of research, development and innovation. She is a core member of the coordination team of the STEP (H2020-Young), EXHAUSTION (H2020-LC-CLA-03) and BlueSky (H2020-EO1) projects, while she is the overall responsible for the management, dissemination and marketing of the commercial ENVI4ALL application.

Dr. (Ms.) Irene Zyrichidou (female) is Physicist with PhD in the field of Satellite Remote Sensing of atmospheric species. She has been working as an environmental Postdoc researcher in the Laboratory of Atmospheric Physics (LAP)-AUTH. She has more than 10 years of experience on research in Atmospheric Physics and Atmospheric Chemistry. She is highly qualified in satellite atmospheric observations diffusion, greatly experienced in the analysis, inter-comparison and validation of satellite observations of a wide range of atmospheric variables in order to attribute the sources of trace gases from space. She has scientific involvement in many European and National research projects related with atmospheric chemistry, air quality and climate and a proven publication track record. She has more than 30 publications in peer reviewed scientific journals and conference proceedings and more than 25 participations in international conferences. She is also an active reviewer in 7 scientific Journals. (h-index = 9, source: Scopus).

Mr. Gregory Mygdakos (male) is an experienced Business Manager, providing consultancy services to a number of EU and Non-EU based companies, in the fields of: innovation diffusion and adoption, organizational change, business needs and requirements, enterprise development plans and on market strategy development. Additionally, he has been involved in several National and European collaborative projects through bilateral agreements as well as through participation in European funded projects in developing new precision agriculture products and services based on Earth Observation Data. He holds an Honours Master's degree in Business Administration (MBA) on New Principles of Business Administration and Management and an MSc on Business Administration of Food and Agricultural Enterprises.

Ms. Maria Vogiatzi (female) is a dynamic Communication Manager. She has worked as a Communication Manager in various organisations and she has extensive experience in designing and implementing promotional activities and in the organisation of promotional events. Furthermore, she has excellent organisational skills and the ability to use social media channels effectively to deliver marketing content. She leads the development and implementation of a communication strategy to support engagement with partner and stakeholders. She holds an EMBA degree.

Mr. Christodoulos Keratidis (male) has strong experience in delivering new circular business models as well as designing new value propositions, from product to service orientation. Moreover, Christodoulos has expertise on leading environmental projects from the user requirements to solution delivery phase. He is a Chemical Engineer, holding an MSc in Environmental Engineering.

Relevant products/ services/ publications

Products/Services:

- **ENVI4ALL** (http://envi4all.com/) is a mobile application built on Future Internet technologies that provides

direct access to targeted, localised, and easy –to-understand information on air quality (current, forecast, and historical), making use of:

  - diverse sources of large datasets of open data on air quality;
  - crowdsourced information on the perception of users on the current air quality levels.

- **DRAXIS Digital Farming Services** are a suite of operational farm advisory services for tillage, irrigation, crop monitoring, yield estimation and pest management through easy-to-use and fully customizable ICT web-applications and APIs. DRAXIS Digital Farming Services combine datasets from various sources (satellites, weather stations, farmer-generated data) with advanced crop growth simulation models and machine learning algorithms.
- **Digital Waste Registry** (DWR - http://wrm.ypeka.gr/) is a digital service developed by DRAXIS with the collaboration of Federation of Recycling & Energy Recovery Industries and Enterprises and provided by the Ministry of Environment & Energy enabling online procedures for waste registration and submission of companies' Annual Waste report.
- **Digital Environmental Registry** (DER - http://eprm.ypeka.gr/) is a digital service providing an operational permitting tool for the Greek Ministry of Environment, Energy & Climate Change. DERs' main objective is to optimise the environmental permitting processes by transforming the current permitting status in a fully digital processing platform and workflow.

Publications:

Kosmidis E., Kourtidis K., Syropoulou P., ENVI4ALL: Personalised Air Quality Information Based on Open Environmental Data and User-Generated Information, Collective Online Platforms for Financial and Environmental Awareness, 2016.

Kourtidis K.A., Ziomas I., Zerefos C., Kosmidis E., Symeonidis P., Christophilopoulos E., Karathanasis S., Mploutsos A., Benzene, toluene, ozone, NO2 and SO2 measurements in an urban street canyon in Thessaloniki, Greece, Atmos. Envir., 2002.

Relevant projects or activities

DRAXIS 01 – hackAIR: Collective awareness platform for outdoor air pollution (http://hackair.eu/)", G.A. 688363, Funded by European Commission (H2020-ICT10). It is a citizen science project aiming at developing and pilot testing an open platform that will enable communities of citizens to easily set up air quality monitoring networks and engage their members in measuring and publishing outdoor air pollution levels, leveraging the power of online social networks, mobile and open hardware technologies, and engagement strategies. One of the hackAIR pilot partners is a grassroot organisation with more than 500,000 members. DRAXIS is the coordinator and the scientific leader of the project and is responsible for the overall platform development and integration. Furthermore, DRAXIS is responsible for the dissemination and communication of the scientific results.

DRAXIS 02 – Sympnia: Air quality monitoring and forecasting using satellite and low-cost sensors deriving data", G.A. T1EDK-05515, Funded by the Operational Programme Competitiveness, Entrepreneurship and Innovation 2014-2020-EPAnEK. Sympnia aims to develop an easy-to-use platform that provides targeted information to citizens about the current and forecast levels of air pollution. The collected information will be displayed in near real time in high spatial and temporal resolution, while simplified air quality indices will be provided to citizens along with personalized recommendations on how they can protect their health from air pollution. It is expected that the collected data will also enable the identification of air pollution trends that may lead to policy changes and, in longer term, to behavioural change. Sympnia is built upon an existing commercial system of DRAXIS, Envi4All, that provides credible services of air quality monitoring and forecasting. DRAXIS is overall responsible for the project and the development of the Sympnia platform.

DRAXIS 03 – EXHAUSTION: Exposure to heat and air pollution in Europe – cardiopulmonary impacts and benefits of mitigation and adaptation", G.A. 820655, Funded by European Commission (H2020-LC-CLA-03). EXHAUSTION will establish exposure projections for extreme heat and air pollution based on the most updated

and advanced climate modeling efforts. Furthermore, EXHAUSTION will develop innovative adaptation strategies informed by epidemiological evidence, and address major inequity issues by identifying how age, sex and indicators of socio-economic status predict probability for cardiopulmonary disease (CPD) caused by extreme heat and air pollution. EXHAUSTION will model socio-economic cost estimated for the response in CPD, and identify and validate possible adaptation strategies. DRAXIS is responsible for the development of a platform for raising awareness of citizens on episodes of extreme heat and/ or air pollution, available through a mobile and web interface.

DRAXIS 04 – AirQast: A commercial platform providing operational Air Quality services using EO data (http://airqast.com)", G.A. 776361, Funded by European Commission (H2020-EO1). The aim of BlueSky is to build a self-sustainable service platform providing air quality services based on Earth Observation data. These services will provide updated emissions inventories, advanced forecasting systems and decision-making tools to manage air quality events in order reduce their economic and societal impact. The BlueSky project envisions building a one-stop portal platform containing tools and functionalities that facilitate and simplify the access, visualisation and management of air quality data for commercial and policy purposes. DRAXIS is responsible for the market and business consolidation of the developed products and for the dissemination and exploitation activities of the project.

DRAXIS 05 – AfriCultuReS: Enhancing Food Security in AFRIcan AgriCULTUral Systems with the Support of REmote Sensing (http://www.africultures.eu/)", G.A. 774652, Funded by European Commission (H2020-SFS-43-2017). AfriCultuReS aims to design, implement and demonstrate an integrated agricultural monitoring and early warning system that will support decision making in the field of food security. AfriCultuReS will deliver a broad range of climatic, production, biophysical and economic information, for various regions in Africa. AfriCultuReS will apply geospatial science to sustainable agricultural development, natural resource management, biodiversity conservation, and poverty alleviation in Africa. DRAXIS is responsible for the development of an open source platform which supports early decision-making for the stakeholders of African food production and humanitarian aid. Moreover, DRAXIS has active role in the communication and dissemination of the project.

Relevant infrastructure and equipment

The offices of DRAXIS are located in a 400 m2 space in Thessaloniki. They are wholly independent from other beneficiaries and/or partner organisations in the consortium. Our key research facilities and infrastructure include: Dual CPU Server (2xCPU=28 cores), Intel Xeon E5-2697 V3, 14 cores, 2.6 GHz/3.6 GHz, 128 GB ram, 2.6 TB SSDs, 8 TB HDD.

Partner 9: Helmholtz Centre for Environmental Research (UFZ)

Organisation description

The Helmholtz Centre for Environmental Research - UFZ, Germany The Helmholtz Centre for Environmental Research - UFZ, Germany, was established in 1991 as the first and only centre in the Helmholtz Association of National Research Centres to be exclusively devoted to environmental re-search in a great variety of fields. It currently employs around 1100 people. Founded in response to the severe pollution prevailing in Central Germany, the UFZ has become a world-wide acknowledged centre of expertise in the remediation and re-naturation of contaminated landscapes, as well as the preservation of biodiversity and natural landscapes. UFZ is and was participating in 81 Projects funded within FP7 and Horizon 2020, 10 of them coordinated by UFZ. Additionally, UFZ was hosting 2 ERC grants, one Starting- and one Advanced Grant, and has coordinated 3 ITNs. Since 2014 the UFZ is leading the European Topic Centre on Inland, coastal and marine waters funded by the European Environment Agency (EEA).

Capabilities matching proposal tasks

- The UFZ is running the German LTER office. Research is conducted on seven own LTER sites and one LTERS-platform. These research infrastructures are embedded in the TERENO earth observation network of the Helmholtz-Association aiming to record the long-term ecological, social and economic impact of global change at the regional level.
- Consortium members from the UFZ have strong experience in conducting research on climate and land use change impacts on biodiversity and socio-ecological research as well as the related monitoring activities.

Main role in the project

UFZ will contribute to **Task 2.1, Task 2.2, Task 2.3, Task 3.1, Task 3.2, Task 3.3, Task 4.1,** and **Task 4.2**

Short CVs of Key Personnel

Dr. Michael Mirtl (male) (chair of LTER Europe) is ecologist and environmental engineer. Training in plant physiology, biometrics, micro-meteorology and soil science at the University of Vienna, University of Agricultural Sciences (BOKU) and Technical University of Vienna. PhD thesis on the influence of water regimes of flood-plain forests on tree photosynthesis. He is co-ordinator of the eLTER ESFRI initiative and led the successful proposal which led to the inclusion of eLTER into the ESFRI 2018 Roadmap. He is co-ordinator of the project eLTER (http://www.lter-europe.net/projects/eLTER, see projects), first chairman of LTER-Europe since 2007, and chair of ILTER (International Long Term Ecological Research) since 2015.

Further roles: Co-ordination of the Austrian contribution to the UNECE ICP on Integrated Monitoring of Air Pollution Effects on Ecosystems, which includes assessment of critical loads and dynamic modelling at long-term observation sites; concepts and management of about 50 research projects in the field of deposition chemistry, karst hydrology, soil chemistry, remote sensing, bioindicators and biodiversity monitoring. Design, logistics and QA/QS of Long-term Ecosystem Research & Monitoring Platforms. Leading expert in the development of MORIS, an object-relational IS for ecosystem research data. Specialized in analysis of ecosystem research data, development of ontologies and se-mantic mediation. Conceptual work on the integration of ecological and socio-economic research in LTSER since 2003, including scaling issues and ecosystem services. Leading role in the establishment of the Austrian LTER-Network (Chair of LTER-Austria since 2008) and the LTSER Platform “Eisenwurzen”.

Relevant products/ services/ publications

Mirtl, M., Orenstein, D., Wildenberg, M., Peterseil, J., Frenzel, M. (2013). Development of LTSER Platforms in LTER-Europe: Challenges and Experiences in Implementing Place-Based Long-Term Socio-ecological Research in Selected Regions. In: Singh, J.S., Haberl, H., Schmid, M., Mirtl, M. & Chertow, M. (eds.): Long term Socio-Ecological Research Studies in society nature interactions across temporal and spatial scales. Springer, Dordrecht.

Dirnböck T., Grandin U., Bernhardt-Römermann M., Beudert B., Canullo R., Forsius M., Grabner M.-T., Holmberg M., Kleemola S., Lundin L., Mirtl M., Neumann M., Pompei E., Salemaa M., Starlinger F., Staszewski T., Uziębło A.K. (2014): Forest floor vegetation response to nitrogen deposition in Europe. Global Change Biology 20, 429-440.

Vihervaara, P., D'Amato, D., Forsius, M., Angelstam, P., Baessler, C., Balvanera, P. Boldgiv, B., Bourgeron, P., Dick, J., Kanka, R., Klotz, S., Maass, M., Melecis, V., Petřík, P., Shibata, H., Tang, J., Thompson, J., Zacharias, S.. (2013) Using long-term ecosystem service and biodiversity data to study the impacts of and adaptation options in response to climate change: insights from the global ILTER sites network. Current Opinion in Environmental Sustainability 5(1), 53-66.

Zacharias, S., Bogena, H., Samaniego, L., Mauder, M., Fuß, R., Pütz, T., Frenzel, M., Schwank, M., Baessler, C., Butterbach-Bahl, K., Bens, O., Borg, E., Brauer, A., Dietrich, P., Hajnsek, I., Helle, G., Kiese, R., Kunstmann, H., Klotz, S., Munch, J.C., Papen, H., Priesack, E., Schmid, H.P., Steinbrecher, R., Rosenbaum, U., Teutsch, G., Vereecken, H. (2011) A network of terrestrial envi-ronmental observatories in Germany. Vadose Zone Journal 10 (3), 955-973.

Bwler, D.E., Haase, P., Kröncke, I., Tackenberg, O., Bauer, H.G., Brendel, C., Brooker, R.W., Ger-isch, M., Henle, K., Hickler, T., Hof, C., Klotz, S., Kühn, I., Matesanz, S., O'Hara, R., Russell, D., Schweiger, O., Valladares, F., Welk, E., Wiemers, M., Böhning-Gaese, K. 2015. A cross-taxon analysis of the impact of climate change on abundance trends in central Europe. Biological Conservation 187: 41-50. doi: 10.1016/j.biocon.2015.03.034

Relevant projects or activities

UFZ 01 – eLTER H2020 (European Long-Term Ecosystem and socio-ecological Research Infrastructure): advancing the European network of Long-Term Ecosystem Research sites and socio-ecological research platforms to provide highest quality services and to support knowledge based decision making at various levels. (2015-2019)

UFZ 02 – ECOPOTENTIAL (Improving future ecosystem benefits through Earth Observations): addresses the data-to-information-to-decision-making process for ecosystem services, using novel approaches of Earth System and Natural Sciences.

UFZ 03 – EnvEurope (Environmental quality and pressures assessment across Europe: the LTER network as an integrated and shared system for ecosystem monitoring), Life Environment Project, 2010-2013, aimed at gathering, storing and analysing environmental data applying a harmonized, cross-domain approach and including 67 LTER-Europe sites encompassing all major ecosystems.

UFZ 04 – ALTER-NET (A Long-Term Biodiversity, Ecosystem and Awareness Research Network), since 2004, FP4- and independent funding, members integrate their research capability to assess changes in biodiversity, analyse the effect of those changes on ecosystem services and inform the public and policy makers at a European scale.

UFZ 05 – OpenNESS (Operationalisation of Natural Capital and Ecosystem Services, FP7-funding): aims to translate the concepts of Natural Capital and Ecosystem Services into operational frameworks that provide tested, practical and tailored solutions for integrating ES into land, water and urban management and decision-making. (2012-2016)

Relevant infrastructure and equipment

TERENO Harz/Central German Lowland LTSER (EXPEER-DE-01)

In the framework of TERENO "terrestrial observatories" are set up in selected German regions for climate and landuse change studies. The Harz/Central German Lowland Observatory is one of these observatories that are

equipped with a combination of in situ measuring instruments and ground-based, airborne and satellite-borne remote sensing techniques. Additionally, a network of biodiversity observation plots is installed. With-in the Harz/Central German Lowland observatory the climate feedback experiment SoilCan using a lysimeter network will be realized. Soil monoliths with different vegetation are transplanted along the existing natural gradient in temperature and precipitation within the four TERENO observatories. Within the Harz/Central German Lowland observatory three main intensive test sites have been selected: Sauerbach, 27 ha, forest/agriculture, Schäferbach, 27 ha, agriculture, Selke Catchment, forest/agriculture. Instrumentation and surveys enable: Dense Soil Moisture Monitoring, Groundwater Monitoring, Runoff and Solute Monitoring, Eddy covariance tower (CO2, NO2, CH4, available end 2011), Geophysical Monitoring (ERT, GPR, EM), Airborne Monitoring using Hyperspectrum Imagery (flight campaigns), Soil Respiration Monitoring (available end 2011), Climate station, Deposi-tion station (available end 2011), Biodiversity Assessment, DTS-observation of groundwater-surface water interactions (Distributed Temperature Sensing, using fiberoptics and temperaturprobes), Vadose Zone Monitoring System (in-situ soil water budget observation), Rainscanner (small weather radar, available end 2011). At the GCEF in Bad Lauchstädt opportunities will be given to manipulate climate change and land environment, from which visiting scientists may benefit. This infrastructure is available since 2013.

Partner 10 : Environment Agency Austria (EAA)

Organisation description

The Environment Agency Austria (Umweltbundesamt GmbH, EAA – www.umweltbundesamt.at) was established in 1985 and is the environmental specialist institution of the Austrian Federal Government. It provides expertise on the condition of the environment and environmental changes as well as on measures to avoid or reduce environmental pollution. In 1998 the Agency became a limited liability company owned by the Federation, in order to allow a more flexible management. Currently, the agency employs some 450 people. The Environment Agency Austria undertakes environmental monitoring, assessment and evaluation for the Austrian Minister of the Environment, plays a key role in the implementation of federal environmental laws, EU directives and regulations, provides expert advice to federal and other institutions, designs and operates national environmental databases and is involved in multiple co-operations with national and international institutions. It plays an important role in the EIONET, in that it is the National Focal Point (NFP) for the EEA as well as a partner in several European Topic Centres and it is the National Reference Centre of the EEA in several areas.

Capabilities matching proposal tasks

- **Ecosystem Research & Monitoring**: The department deals with long term ecosystem monitoring (running the Austrian UNECE IM Site Zöbelboden), semantic data management, coordination of re-gional research activities and networking (currently chairing LTER Europe). Thus, the department provides the expertise in long term ecosystem monitoring, data management, and long term ecological networks. The Department has been involved in a large number of international research and coordination projects, several of which it has coordinated. Therefore, significant professional project management capacity was established and long-standing relationships were established within the eLTER community both on a technical/scientific level and on an organisational/managerial one.
- **ETC/ULS (Urban, Land and Soil systems)**: The EAA is leading the consortium of the ETC/ULS and supports the EEA regarding the three NRC Land cover, the NRC for Land use and spatial planning as well as partner NRC soil. The ETC is also supporting experts meeting and organising the IUME (Integrated Urban Monitoring of Europe) meetings. ETC/ULS is supporting the EEA in their responsibility on Pan European land monitoring and the EAA is implementing activities from user requirements until quality assessment and data distribution, where Urban Atlas is one European service. Beside accompanying the CLMS production process the ETC/ULS is developing and integrating new Copernicus based monitoring indicators into EEA workflows.

Main role in the project

EAA will lead **Task 3.2** and contribute to **Task 2.1, Task 2.2, Task 2.3, Task 3.1, Task 3.3, Task 4.1,** and **Task 4.2**

Short CVs of Key Personnel

Dr. Herbert Haubold (male) (Senior Project Manager and Expert) holds a PhD in Geological Sciences from The University of Texas at Austin and is a Certified Senior Project Manager (International Project Management Association Level B). Since 2002, he works for the Environment Agency Austria (EAA) as project Coordinator and also as an internal project management advisor and trainer. He currently is Project Manager of eLTER H2020 (see projects). Before, he was Coordinator of the FP6/FP7 projects GNU (GMES Network of Users) and HELM (Harmonised European Land Monitoring) and he participated in a range of other Earth Observation related European research projects and activities, including GeoLand and GSE Forest Monitoring (on land monitoring); BalkanGEOnet (capacity building); PROMOTE, MACC, obsAIRve (atmosphere monitoring). He currently represents Austria in the Copernicus User Forum and is a member of GEO/GEOSS Austria and the Austrian Interministerial Group for Space and he is the secretary of the association ILTER (International Long Term Ecosystem Research – www.ilter.network.

Andreas Littkopf (male) (ETC/ULS manager) holds a degree in agriculture (terrestrial ecology) from the

Humboldt University in Berlin (1986) and a degree in business management (2000). After working as head of the department in a local environmental agency, he acted as Pre-Accession Adviser and residential Twinning Adviser in Poland and Slovenia implementing environment related EU directives. Since 2007 he has led the European Topic Centre for Land Use and Spatial Information and from 2011-2012 the European Topic Centre for Spatial Information and Analysis. He also co-ordinated research activities of the University teams and was task manager in several FP7 projects like GNU, HELM, Envirogrid and MS Monina. In July 2012 he started working at the EAA Environment Agency Austria, where was responsible for project development with European and international financial institutions. Currently he is coordinating the ETC/ULS the European Topic Centre on Urban, Land and Soil systems, which is contributing to the activities of the European Environment Agency. Mr Littkopf has gained over the past decade considerable experience in working in international environments, project management and administration. Andreas and Herbert (see above) jointly are theme leaders for "Data management and data security" of the H2020 project CLEVER cities (see projects).

Dr. Johannes Peterseil (male) (Department Head) obtained his master and PhD in ecology at the University of Vienna with special focus on landscape ecology. He is head of the department Ecosystem Research & Monitoring at the Umweltbundesamt. He contributes to a number of European projects dealing with long term ecosystem observation and monitoring on European scale ((eLTER (H2020), ALTER-Net (FP6), EnvEurope (Life+), ExpeER (FP7)) and national scale (Austrian contribution to UNECE Integrated Monitoring), biodiversity monitoring at European scale (EBONE (FP7) and national scale (MOBI-e), data harmonisation (e.g. ENVRI (FP7), EUDAT (FP7) and EUDAT2000 (H2020)) and object oriented data management (MORIS, cooperation with South Korea). In 2004 he contributed to the Twinning Pro-ject SK03/IB/EN/01 Institutional and Capacity Building in the Environmental Sector. He is the lead of the Expert Panel on Information Management of LTER Europe and member of the Information Management group of ILTER. He has extended experience as Workpackage/task leader and short term expert.

Relevant products/ services/ publications

Gregor, M. et al.: Similarities and diversity of European cities – A typology tool to support urban sustainability. European Environment Agency Topic Centre on Urban, Land, and Soil Systems, Copenhagen, Denmark, 2018.

M. Mirtl, E. T. Borer, I. Djukic, M. Forsius, H. Haubold, W. Hugo d, J. Jourdan, D. Lindenmayer, W.H. McDowell, H. Muraoka, D.E. Orenstein, J.C. Pauw, J. Peterseil, H. Shibata, C. Wohner, X. Yu, P. Haase: Genesis, goals and achievements of Long-Term Ecological Research at the global scale: A critical review of ILTER and future directions. Science of the Total Environment 626 (2018) 1439–1462.

Dirnböck T., Grandin U., Bernhardt-Römermann M., Beudert B., Canullo R., Forsius M., Grabner M.-T., Holmberg M., Kleemola S., Lundin L., Mirtl M., Neumann M., Pompei E., Salemaa M., Starlinger F., Staszewski T., Uziębło A.K. (2014): Forest floor vegetation response to nitrogen deposition in Europe. Global Change Biology 20, 429-440.

Mirtl, M., Orenstein, D., Wildenberg, M., Peterseil, J., Frenzel, M. (2013). Development of LTSER Platforms in LTER-Europe: Challenges and Experiences in Implementing Place-Based Long-Term Socio-ecological Research in Selected Regions. In: Singh, J.S., Haberl, H., Schmid, M., Mirtl, M. & Chertow, M. (eds.): Long term Socio-Ecological Research Studies in society nature interactions across temporal and spatial scales. Springer, Dordrecht.

Ben-Asher, Z. (ed.): HELM – Harmonised European Land Monitoring: Findings and recommendations of the HELM project. ISBN 978-965-92202-0-5The HELM project, Tel Aviv, Israel, 2013.

Relevant projects or activities

EAA 01 – eLTER (European Long-Term Ecosystem and socio-ecological Research Infrastructure): further developing the European network of Long-Term Ecosystem Research sites and socio-ecological research platforms to provide highest quality services and to support knowledge based decision making at various levels, EAA coordinates (with UFZ). (2015-2019)

EAA 02 – Clever Cities (H2020 776604, since 2018): Co-designing Locally tailored Ecological solutions for Value added, socially inclusivE Regeneration in Cities, EAA role: Data management and data security, website

http://clevercities.eu

EAA 03 – HELM (Harmonised European Land Monitoring, FP7): interactive project involving the European public entities mandated for national land monitoring to work towards the integration of national LULC data bases into European ones, EAA coordinated

EAA 04 – ECOPOTENTIAL (Improving future ecosystem benefits through Earth Observations): addresses the data-to-information-to-decision-making process for ecosystem services, using novel approaches of Earth System and Natural Sciences.

EAA 05 – ENVRIplus, H2020: cluster of research infrastructures (RIs) for Environmental and Earth System sciences, built around ESFRI roadmap and associating leading e-infrastructures and Integrating Activities together with technical specialist partners.

Relevant infrastructure and equipment

Zöbelboden (LTER_EU_AT_003)

The Zöbelboden was established in 1992 as the only Integrated Monitoring station in Austria under the UN Convention on long-range transboundary air pollution (CLRTAP). In 2006 it became part of LTER Austria. The Zöbelboden covers a small forested catchment (90 ha) of a karstic mountain range (500 to 950 m above sea level) in the Kalkalpen national park. Monitoring and research is focussing on air pollution effects on forested catchments and its interaction with climate change. The Zöbelboden represents one of the best known karst catchments in Europe with long-term data series of the major components of its ecosystems. The Zöbelboden is managed by the Umweltbundesamt GmbH. All data and metadata from monitoring and research projects are stored in a semantically structured database.

Partner 11 : INTEGRATED CARBON OBSERVATION SYSTEM EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM – ICOS ERIC (ICOS)

Organisation description

The Integrated Carbon Observation System (ICOS) is a European Research Infrastructure. The mission of the ICOS is to enable research to understand the greenhouse gas (GHG) budgets and perturbations. ICOS provides high-precision, standardized long-term observations required to understand the present state and predict future behaviour of the global carbon cycle and GHG emissions. Technological developments and implementations, related to GHGs, will be promoted by linking research, education and innovation.

In order to provide this data, ICOS is a distributed research infrastructure. The backbones of ICOS are the national measurement stations such as ICOS atmosphere, ecosystem and ocean stations. Together they form national measurement networks. Each of the ICOS station has a responsible Principle Investigator (PI) and together PIs form a Monitoring Station Assembly (MSA). MSAs are established for atmospheric, ecosystem and ocean networks to monitor, develop and improve the scientific and technical basis (e.g. station networks) of ICOS RI. ICOS Central Facilities (CFs), such as Atmospheric Thematic Centre (ATC), Ecosystem Thematic Centre (ETC), Ocean Thematic Centre (OTC), Central Analytical Laboratories (CAL), Carbon Portal (CP) and Head Office (HO) are the European level ICOS RI Centres, which have the specific tasks in collecting and processing the data and samples received from the national measurement networks. The CP is the one stop shop for all ICOS data hosted at Lund University and Wageningen University. The CP is also providing data services and higher-level products. While HO and CP are part of ICOS ERIC, all other Central Facilities are nationally managed entities and part of ICOS Research Infrastructure. They are connected to ICOS ERIC via cooperation agreements.

ICOS ERIC legal entity is established “to coordinate the operations of ICOS RI, distribute information from ICOS RI to user communities and to establish integrated data and analysis from GHG observation systems. ICOS ERIC shall provide effective access to coherent and precise data to facilitate research into multi-scale analysis of GHG emissions, sinks and their driving processes by making available measurement protocols long-term data and data products.” The statutory seat of ICOS ERIC is in Helsinki, Finland.

ICOS ERIC as a long-term European Research Infrastructure has been developed over the last 10 years to be the observational backbone of a European GHG research, information and verification system and as such an important building block in a global information system. ICOS has established cooperation with global organisations such as WMO and GEO to further develop global research programs and provide valuable knowledge as well as technical support for the decarbonization processes following the COP 21 Paris Agreement.

ICOS ERIC has an established data infrastructure, which is already connected to EUDAT while ICOS is exploring further integration into the European Open Science Cloud. The data infrastructure which will also serve as an interface to COPERNICUS and GEOSS and the important knowledge on data management is an important asset of ICOS ERIC.

Capabilities matching proposal tasks

- Active participation in European RIs
- Coordinating and leading the communication of the ENVRI community
- Strong networking with WMO, Copernicus, GEO, GCOS, NOAA
- Operation of in situ monitoring stations and data quality assurance and control, using dedicated data processing techniques
- A fully operational and flexible FAIR data portal based on linked open data, focusing on correct data attribution, long term archiving by using a CDI/EOSC trusted repository and strong data identification using Handle PIDs and Datacite DOIs. Serving of elaborate data products and services and Virtual Research Environments for scientific collaboration.

Main role in the project

ICOS will contribute to **Task2.1, Task2.2, Task2.3, Task 2.4, Task 3.1, Task 3.2, Task 3.3, Task 4.1 and Task 4.2**

Short CVs of Key Personnel

Alex T. Vermeulen (male), Director of the ICOS Carbon Portal. He has a strong background in (micro)meteorology, air quality modelling, observation techniques and data acquisition and ecosystem science. He has authored or co-authored more than 60 peer-reviewed scientific publications (current H-index 24). He has been involved as PI or coordinator in international cooperation projects since 1994. He started as junior scientist on a project on ammonia deposition and acidification research at ECN (Energy Research Center of the Netherlands). Since 1990 he worked in climate research in the field of greenhouse gas emission and concentration measurements and transport modelling. He has been project leader since 1994 and has been assistant group leader (~20 people) from 2005-2012. Since June 2014 he is Director of the Carbon Portal, leading a group of 12 scientists and technicians at Lund and Wageningen University. As ECN project leader he participated in European projects like European Methane (FP4), AEROCARB, RECAB (FP5), CarboEurope-IP, IMECC, GEOMON, EuroHydros, GHG-Europe, and ACTRIS (FP7). He coordinated the CHIOTTO (FP5, RTD, 5 M€, 10 partners) and the InGOS (FP7, IA, 12 M€, 38 partners) project. Currently he is involved as PI and task leader in the H2020 projects EUDAT2020, ENVRIplus, SEACRIFOG, EOSC-Hub, ENVRIFAIR and RINGO. He is chair of the WMO GAW Greenhouse Gas Scientific Advisory Board and member of the IG3IS executive committee.

Dr. Ari Asmi (male) has extensive experience on atmospheric sciences, data science, research infrastructure development and collaboration, strategic planning and project management. He is currently Project Director of the ENVRI PLUS Cluster project, and the coordinator of RISCAPE international research infrastructure landscape project and WP leader in COOP+ H2020 infrastructure project on international RI collaboration. He is also involved several external projects and initiatives, such as a co-chair of several working groups of the Research Data Alliance, and a number of EU projects since FP5. He is the main author of the ENVRI Environmental Research Infrastructure Strategy document. He is currently also enrolled in MBA level management training programme EMMRI for Executive Masters in research infrastructure management. He is co-coordinator of the ENVRI-FAIR project and strongly involved in there in the policy development and connections to the international landscape.

Dr. Werner Leo Kutsch (male), Director General of ICOS-ERIC. He has a strong scientific background in ecosystem science. He has authored or co-authored more than 100 scientific publications (incl. peer-reviewed book chapters, actual H-Index (Google Scholar): 45). From 2004 to 2010 he contributed to the FP6 projects CarboEurope IP (cluster of observational sites and data integration for all agricultural sites) and CarboAfrica (member of the Steering Committee; work package leader). 2003-2007 he was chair of the ESF Program “The role of soils in the terrestrial carbon balance”. Since October 2009 he coordinated the national implementation of ICOS in Germany (ICOS-D) at the Thuenen Institute in Braunschweig, Germany. Since March 2014 he is Director General of ICOS RI and has successfully steered the procedure towards becoming an ERIC which was finalized at 23. November 2015 and an ESFRI Landmark in March 2016. Since January 2016 he is Director General of ICOS ERIC. In this position he is also managing the final internal integration of ICOS. In this work he focuses on legal work, internal financial management, and on optimizing the internal data workflow between the different observational programs of ICOS, on developing the Carbon Portal, and on deepening the cooperation with global observation programs and other RIs. Dr. Kutsch is the coordinator of the H2020 projects ENVRIplus and RINGO.

MSc Magdalena Brus (female), Project and Communications Manager. She is experienced in planning, management and implementation of several FP7 and Horizon 2020 projects, especially those facilitating the collaborative work of Environmental Research Infrastructures at the European level (ENVRI, ENVRIplus, Nordic ENVRI) and the international level (COOPEUS). Magdalena also worked with Joint Programming (JPI Climate), and projects funded on the global (iLEAPS, PEEX) as well as national (FCoE) levels. She leads the implementation of dissemination strategy of ENVRIplus and coordinates the multi-stakeholder engagement activities of the project and the cooperating environmental Research Infrastructures (Env RI) as such. She is responsible for the EnvRI community building, community engagement and promotion. She organizes the network of RI

communication managers, which brings together RI people responsible for the communications to improve their skills, to share their experiences, best practices and to plan the joint communication activities together. Magdalena also initiated the cooperation of communication managers of all other RI clusters (e.g. CORBEL, SINE2020, PARTHENOS, etc.) with the same purpose. Last but not least, Magdalena supports the ICOS RI communication activities and is therefore well aware of the challenges a single RI is facing in the efforts to increase its (international) visibility.

Relevant products/ services/ publications

Products/Services:

- ICOS atmosphere thematic centre is a Copernicus service provider for NRT greenhouse gas observations
- ICOS marine thematic centre is a central hub for the SOCAT and GLODAP global data products
- ICOS ecosystem thematic centre is the central hub for the FLUXNET global database for eddy covariance greenhouse gas flux observations
- At least 650 peer reviewed articles since 2012, with over 12000 citations

Publications:

Asmi, A.,et al. (2017). Community-Driven Efforts for Joint Development of Environmental Research Infrastructures. Chabbi A. & Loescher HW (Eds.). Terrestrial Ecosystem Research Infrastructures: Challenges and Opportunities, 534 pages. ISBN 9781498751315 - CAT# K27248

Bergamaschi, P. et al.: Inverse modelling of European CH4 emissions during 2006–2012 using different inverse models and reassessed atmospheric observations, Atmos. Chem. Phys., 18, 901-920, https://doi.org/10.5194/acp-18-901-2018, 2018.

Hellström, M. et al (2016). Near Real Time Data Processing In ICOS RI. Zenodo. http://doi.org/10.5281/zenodo.204817

Wingate, L. et al.: Interpreting canopy development and physiology using a European phenology camera network at flux sites, Biogeosciences, 12, 5995-6015, https://doi.org/10.5194/bg-12-5995-2015, 2015.

Relevant projects or activities

ICOS 01 – ICOS CP is partner in the **EEA Copernicus In Situ project** and coordinates the atmospheric composition part of this project.

ICOS 02 – ICOS is coordinating the **ENVRI-Plus project**, Grant agreement n° 654182 (2015-2019)

ICOS 03 – ICOS is co-coordinating the **ENVRI-FAIR project** (Grant agreement n° 824068 (2019-2022)) and leading important work packages

ICOS 04 – ICOS participates furthermore in the following H2020 projects: **EUROGEOSS, EOSC-Hub, SEACRIFOG** and coordinates the **RINGO** project.

ICOS 05 – ICOS CP is chair of the **WMO GAW Scientific Advisory group for the greenhouse gases**

ICOS 06 – ICOS CP is member of the executive committee of **WMO IG3IS**

ICOS 07 – ICOS is contributing **network of WMO GAW**

Relevant infrastructure and equipment

ICOS is an ESFRI Landmark European Research Infrastructure established as ERIC since November 2015. It is a multi-domain distributed observation network focused on determining the carbon balance of Europe with more than 130 stations in the domains atmosphere, marine and ecosystem. ICOS Carbon Portal delivers all high quality ICOS observational data and elaborated product free of charge using a CC4BY licence using a linked open data system focusing on strong data identification and high granularity, while performing full usage tracking following very closely the FAIR principles. ICOS involves 70 research institutes and universities from 12 member states of the EU. ICOS contributes globally to WMO GAW, WMO IG3IS, SOCAT, GLODAP, COPERNICUS, FLUXNET and the Global Carbon Project.

4.2 THIRD PARTIES INVOLVED IN THE PROJECT (INCLUDING USE OF THIRD PARTY RESOURCES)

Partner 2: The French National Centre for Scientific Research (CNRS)

Does the participant plan to subcontract certain tasks (please note that core tasks of the project should not be sub-contracted)	N
If yes, please describe and justify the tasks to be subcontracted	
Does the participant envisage that part of its work is performed by linked third parties[1]	Y

CNRS forms a Joint Research Units with the three Linked Third Parties UGA, LILLE, and UPEC.

University Grenoble Alpes (UGA)

UGA is located in the middle of the Rhône-Alpes region, 2nd French region in terms of research activities. It is a research-intensive university in an international and high tech environment with 45'000 full time students, of which 3'100 doctoral students which enhanced nearly 700 theses submitted each year. It comprises 3'000 lecturers and researchers and 2'500 administrative and technical staff, 80 laboratories organised in six core areas: Mathematics- Information sciences-Technologies-Communication; Chemistry-Life sciences-Health-Biotechnologies; Particle physics-astrophysicsgeosciences-Environment-Ecology; Material sciences-Nanosciences-Engineering; Law - Political sciences-Economy-Sociology-Management; Arts-Humanities-Social sciences. The University Grenoble Alpes is a partner of major international and national research centres are located in the Grenoble area as ESRF, ILL, EMBL, CEA. UGA has a long-standing experience in European framework programmes (FP) with participation more than 100 projects under the FP6 and FP7.

Role in the project
UGA will be involved in WP2, 3, 4, 5, 6

Principal personnel involved

Dr. Paolo Laj (male) is a senior scientist at Université-Grenoble-Alpes (Physicien). He is the acting co-coordinator of ACTRIS-2 and ENVRIplus, and has been involved in a number of EU projects since FP4 (ACCENT, EUCAARI, CIME, ACE2, EUSAAR, PEGASOS, ACTRIS, ACTRIS-2, ACTRIS PPP, ENVRIPLUS, ENVRI FAIR). He is author or co-author more than 120 research articles in the field of aerosols and clouds and their interactions. He is a member of WMO expert group on aerosols. Paolo Laj is participating in the European Environment Agency's lead project for coordination of the In-Situ component of the Copernicus Programme Services. He also actively contributed to the establishment of the GEO foundational task on in-situ observations. As a member of BEERI, he will be one of the NEURONE partners ensuring the connection with ENVRI and EOSC.

Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N
If yes, please describe the third party and their contributions	
Does the participant envisage that part of the work is performed by International Partners[2] (Article 14a of the General Model Grant Agreement)?	Y
Institut des Géosciences de l'Environnement (IGE) - UMR5001 is a Joint Research Unit set up by CNRS and universities. Professor Paolo Laj, employed by Université Grenoble Alpes (UGA) being involved in the project, UGA is a Linked-Third Party to CNRS and to be added in Article 14 of the ECGA.	

[1] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action. (Article 14 of the Model Grant Agreement).

[2] 'International Partner' is any legal entity established in a non-associated third country which is not eligible for funding under Article 10 of the Rules for Participation Regulation No 1290/2013.

5 ETHICS AND SECURITY

5.1 ETHICS

The NEURONE Consortium has not entered any ethics issues in the ethical issue table in the administrative proposal forms and does not have any specific ethic requirements to highlight. Before filling in this information a self-assessment of ethics took place using H2020 Guidance - How to complete your ethics self-assessment: V5.2 - 12.07.20161.
The consortium went through all types of ethics and relevant checklists, where any ethical issue raised. It may happen that during the project implementation and innovative research, ethical issue(s) may occur. For any such case, the NEURONE consortium will ensure the compliance of the performed activities with the basic ethical principles that represent the shared values upon which the EU is founded and that are laid down in the European Charter of Fundamental Human Rights2:

- Respect for human dignity
- Respect for autonomy, based on people decisional capacity
- Right to the physical and mental integrity of the person
- Protection of individual privacy and protection of personal data

5.2 SECURITY[3]

Please indicate if your project will involve:

- activities or results raising security issues: NO
- 'EU-classified information' as background or results: NO

[3] See article 37 of the Model Grant Agreement. For more information on the classification of Information, please refer to the Horizon 2020 guidance: https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/secur/h2020-hi-guide-classif_en.pdf.

6 ANNEXES

ANNEX I – LETTERS OF SUPPORT

Advisory Board

Letter of Support for the "NEURONE" project

The undersigned:	Angelika Dehn	Date: 27.02.2019
Position:	Earth Observation Ground Segment Department	
Name of the Organization:	European Space Agecny (ESA) / ESRIN	
Address:	Largo Galileo Galilei 1, CP 64, 00044, Frascati, Italy	

Dear Project Coordinator,

I am writing on behalf of the European Space Agency (ESA), in order to express our support for the activities proposed to be carried out under the auspices of the NEURONE project.

Acknowledging the importance of the in-situ observing systems for the Copernicus Space Component data and information validation and quality enhancement, ESA welcomes the establishment of the NEURONE coordination network for identifying and mapping the status of the in-situ component and propose a roadmap for its efficient use in the CalVal activities of the Agency.

In order for the above to be implemented and established, ESA aims to support the NEURONE activities by facilitating the mapping of current and future requirements of the Space Component for in-situ observations. We specifically aim to respond to NEURONE interviews for providing specific needs and requirements. Moreover, I agree to participate in the NEURONE's Advisory Board and to represent ESA in 3 NEURONE workshops that will be implemented in the next 3 years.

In this role we hereby declare that should the NEURONE project be chosen for funding we will support the relevant activities.

Yours sincerely,

Angelika Dehn

Digitally signed by Angelika Dehn
DN: o=European Space Agency, c=FR, cn=Angelika Dehn, email=angelika.dehn@esa.int
Date: 2019.02.27 18:46:08 +01'00'

Angelika Dehn

EUMETSAT

EUMETSAT - Postfach 10 05 55 - 64205 Darmstadt

To whom it may concern

Your reference Votre référence	Your letter dated Votre lettre du	Our reference Notre référence	Darmstadt
		EUM/RSP/LET/19/1060205	11 March 2019

Subject: Letter of Support for the "NEURONE" Project

The undersigned:	Dr. Bojan R. Bojkov
Position:	Head of the Remote Sensing and Products Division
Name of the Organization:	European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
Address:	Eumetsat Allee 2, D-64295 Darmstadt, Germany

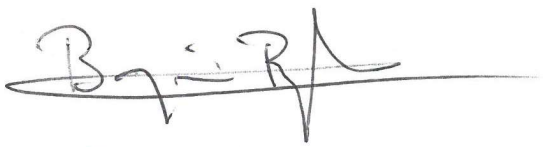
Dear Project Coordinator,

I am writing on behalf of the EUMETSAT to express our support for the activities proposed to be carried out under the auspices of the NEURONE project. Acknowledging the importance of the in-situ observing systems for the Copernicus Space Component data and information validation and quality enhancement, EUMETSAT welcomes the establishment of the NEURONE coordination network for identifying and mapping the in-situ component and propose a roadmap for its efficient use in future EUMETSAT Cal/Val activities.

In order for the above to be implemented and established, EUMETSAT aims to support the NEURONE activities by facilitating the mapping of current and future requirements of the Space Component for in-situ observations. We specifically aim to respond to NEURONE interviews for providing specific needs and requirements. Moreover, EUMETSAT agrees to participate in the NEURONE's Advisory Board and to participate in NEURONE workshops that will be implemented over the course of the next 3 years.

In this role we hereby declare that should the NEURONE project be chosen for funding EUMETSAT will support the relevant activities.

Yours sincerely,



Dr. Bojan R. Bojkov
Head of Remote Sensing and Products Division

Headquarter Address:
EUMETSAT
Eumetsat-Allee 1
64295 Darmstadt
Germany

Mailing Address:
EUMETSAT
Postfach 10 05 55
64205 Darmstadt

Tel: +49 (0)6151 807 7
Fax: +49 (0)6151 807 555
Web: www.eumetsat.int

Letter of Support for the "NEURONE" project

The undersigned:	Eric Petermann	Date: 26.02.2019
Position:	Executive Director of the EUMETNET Secretariat	
Name of the Organization:	European Meteorological Services Network (EIG EUMETNET)	
Address:	c/o l'Institut Royal Météorologique de Belgique Avenue Circulaire 3 – B-1180 Brussels – Belgium	

Dear Project Coordinator,

I am writing on behalf of the EIG EUMETNET, in order to express our support for the activities proposed to be carried out under the auspices of the NEURONE project.

Acknowledging the importance of the in-situ observing systems for the Copernicus Space Component data and information validation and quality enhancement, EUMETNET welcomes the establishment of the NEURONE coordination network for identifying and mapping the status of the in-situ component and propose a roadmap for its efficient use in the CalVal activities of the Agency.

In order for the above to be implemented and established, EUMETNET aims to support the NEURONE activities by providing consulting based on the Network's high expertise and knowhow on the coordination of different in-situ components. I personally agree to participate in the NEURONE's Advisory Board and to represent EUMETNET in NEURONE workshops that will be implemented in the next 3 years.

In this role we hereby declare that should the NEURONE project be chosen for funding we will support the relevant activities.

Yours sincerely,

Eric Petermann
Executive Director

To:

Vassilis Amiridis
Research Director, National Observatory of Athens, IAASARS
I. Metaxa & Vas. Pavlou St., Penteli, GR-15236, GREECE

Letter of Support to NEURONE
H2020 LC-SPACE-05-EO-2019

Dear Vassilis

EOSC-hub is the H2020 EINFRA-12 flagship EC project contributing to the European Open Science Cloud implementation. It mobilises providers from the EGI Federation, EUDAT CDI, INDIGO- DataCloud and major research e-infrastructures offering services, software and data for advanced data-driven research and innovation. Access to these services are provided by the integration and management system of the European Open Science Cloud, acting as a single entry point for all stakeholders. The EOSC-hub service catalogue is open to new contributing communities and business organisations.

On behalf of the EOSC-hub Project Consortium, Per Öster - EOSC-hub Project Director – and myself – the Project Coordinator – are pleased to offer our wholehearted support for the NEURONE project proposal, and we offer the EOSC-hub collaboration leveraging the following EOSC-hub activities of:

- the "EO pillar" programme aiming at integrating DIAS providers and EGI federated cloud providers to offer Copernicus data as a service to researchers,
- the GEOSS programme aiming at providing an open cloud infrastructure offering data analytics.

EOSC-hub will collaborate with the NEURONE activities on needs for Copernicus data access and analysis, and distributed data processing solutions, and the Project Director and Project Coordinator Per Öster and Tiziana Ferrari are available to contribute to the Copernicus Consultation Board.

We strongly believe the collaboration of the two projects will be of great benefit to the technical and operational advancement of the European Open Science Cloud initiative and the Copernicus programme.

05 March 2019
Yours sincerely,

Dr. Tiziana Ferrari
EOSC-hub Project Coordinator

Letter of Support for the "NEURONE" project

The undersigned:	Simon Machin	Date: 05.03.2019
Position:	Observations Domain Manager (Met Office/EUMETNET)	
Name of the Organization:	Met Office	
Address:	Met Office FitzRoy Road, Exeter. EX1 3PB. UK	

Dear Project Coordinator,

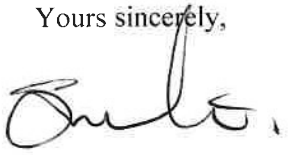
I am writing in my position of Observations Domain Manager for the EUMETNET led Lot 1 "FOUNDATIONS" Consortium, supported through my role in the Observations Partnerships Team at the Met Office. I wish to express my support for the activities proposed to be carried out under the auspices of the NEURONE project.

Acknowledging the importance of the in-situ observing systems for the Copernicus Space Component data and information validation and quality enhancement, I welcome the establishment of the NEURONE coordination network for identifying and mapping the status of the in-situ component and propose a roadmap for its efficient use in the CalVal activities of the Agency.

In order for the above to be implemented and established, I personally agree to participate in the NEURONE's Advisory Board and to represent the interests of the the Lot 1 "FOUNDATIONS" Consortium in supporting the EEA led Coordination of the Copernicus In-Situ Component in NEURONE workshops when possible over the next 3 years.

In this role I hereby declare that should the NEURONE project be chosen for funding I will support the relevant activities.

Yours sincerely,



Simon Machin

ANNEX II – LETTERS OF SUPPORT

Copernicus Consultation Board

Dr. Vincent-Henri Peuch
Deputy Director Copernicus Services
Head of the Copernicus Atmosphere Monitoring Service (CAMS)
European Centre for Medium-Range Weather Forecasts
Tel +44 118 949 9102 Fax +44 118 986 9450

11 March 2019

Reference: Letter of Support for the NEURONE H2020 proposal

Dear Dr. Amiridis,

I am writing in my capacity as Head of the Copernicus Atmosphere Monitoring Service (CAMS) at the European Centre for Medium-Range Weather Forecasts (ECMWF) to express my support for the activities that are proposed to be carried out in the context of the NEURONE H2020 proposal.

Acknowledging the pivotal importance of in-situ observations for data assimilation and validation in CAMS and the role already played by the European Environment Agency (EEA), CAMS welcomes the establishment of the NEURONE coordination network for further identifying and mapping the in-situ component requirements and proposing evolutions for its efficient use in the Copernicus context.

In order for the above to be implemented and established, CAMS aims to support the NEURONE activities that are related to in situ atmospheric composition observations. Specifically, the CAMS team at ECMWF and our contractors will facilitate the mapping of current and future CAMS requirements for in-situ observations. We strongly suggest starting by building on top of the existing coordination activities led by the EEA and of the activities that we have already engaged in CAMS with a number of international networks and research infrastructures (NDACC, GAW, EMEP, ACTRIS, EAN, EEA, ICOS, IAGOS). Should the NEURONE project be selected for funding, I can confirm that personnel from our CAMS team will specifically devote time to respond to NEURONE interviews for describing our incremental needs and requirements and helping the project to achieve its objectives.

In closing, I formulate my best wishes of success for the NEURONE proposal. Yours sincerely,

Dr. Vincent-Henri Peuch, Head of CAMS

ECMWF Shinfield Park, Reading RG2 9AX, UK
Tel: +44 (0) 118 949 9000 | Fax: +44 (0) 118 986 9450 |Email: first.initial.surname@ecmwf.int
atmosphere.copernicus.eu | copernicus.eu | ecmwf.int

Date 11/03/2019

Vassilis Amiridis
Research Director
National Observatory of Athens, IAASARS
I. Metaxa & Vas. Pavlou St., Penteli, GR-15236, GREECE

To whom it may concern,

with this letter, I, Jean-Noël Thépaut, Head of the Copernicus Climate Change Service at ECMWF, express my support to the NEURONE proposal, to be submitted at the European Commission H2020 programme, in response to the call LC-SPACE-05-EO-2019.

With the information provided to me about this proposal, and acknowledging the importance of the in-situ observing systems for Copernicus data and information validation and quality enhancement, C3S welcomes the establishment of the NEURONE project to further already existing coordination network efforts for identifying and mapping the status of the in-situ component and proposing a roadmap for its efficient use in Copernicus.
I would like to emphasize the importance for this project to liaise with the European Environment Agency (EEA), in charge of the Copernicus In Situ Component to map the in situ data landscape, compare what is available against requirements to identify gaps, support the provision of cross-cutting data and manage partnerships with data providers to improve access and use conditions. I understand this project will build upon what is already commissionned by EEA as part of their current Delegation Agreement and contribute to the evolution and strengthening of such activities.
Should the project be funded, C3S will be happy to support the mapping of current and future C3S requirements for in-situ observations, under the umbrella of the EEA leadership. C3S staff will devote some time, on a best effort basis, to respond to NEURONE interviews for providing the C3S specific needs and requirements. In this role we hereby declare that should the NEURONE project be chosen for funding we will support the above.

Yours sincerely,

Dr. Jean-Noël Thépaut
Head, Copernicus Climate Change Service
E-mail: jean-noel.thepaut@ecmwf.int

ECMWF Shinfield Park, Reading RG2 9AX, UK
Tel: +44 (0) 118 949 9000 | Fax: +44 (0) 118 986 9450 |Email: first.initial.surname@ecmwf.int
climate.copernicus.eu | copernicus.eu | ecmwf.int

European Environment Agency
European Topic Centre on Urban,
Land and Soil Systems

Letter of Support for the "NEURONE" project

The undersigned:	Andreas Littkopf
Date:	11.03.2019
Position:	ETC/ULS Manager
Name of the Organization:	Envrionement Agency Austria
Address:	Spittelauer Lände 5; 1090 Wien

Dear Project Coordinator,

I am writing on behalf of the European Topic Centre on Urban, Land and Soil Systems (ETC/ULS) in order to express our support for the activities which are proposed to be carried out under the auspices of the NEURONE project.

Acknowledging the importance of the in-situ observing systems for Copernicus data and information validation and quality enhancement, ETC/ULS welcomes the establishment of the NEURONE coordination network for identifying and mapping the status of the in-situ component and propose a roadmap for its efficient use in Copernicus.

In order for the above to be implemented and established, we are glad to be part of the NEURONE activities and will specifically contribute related to the Copernicus Land Monitoring Service (CLMS). Specifically, ETC/ULS will facilitate the mapping of current and future CLMS requirements for in-situ observations. Among other activities in the framework of the project, we will devote time to support the provision of CLMS specific needs and requirements.

Yours sincerely,

Andreas Littkopf

Letter of Support for the "NEURONE" project

The undersigned:	Charalampos (Haris) Kontoes Date: 30.02.2019
Position:	Research Director, Head of Center of Excellence BEYOND/NOA
Name of the Organization:	National Observatory of Athens
Address:	Metaxa & Vasileos Pavlou Str, GR 15236, Athens, Greece

Dear Project Coordinator,

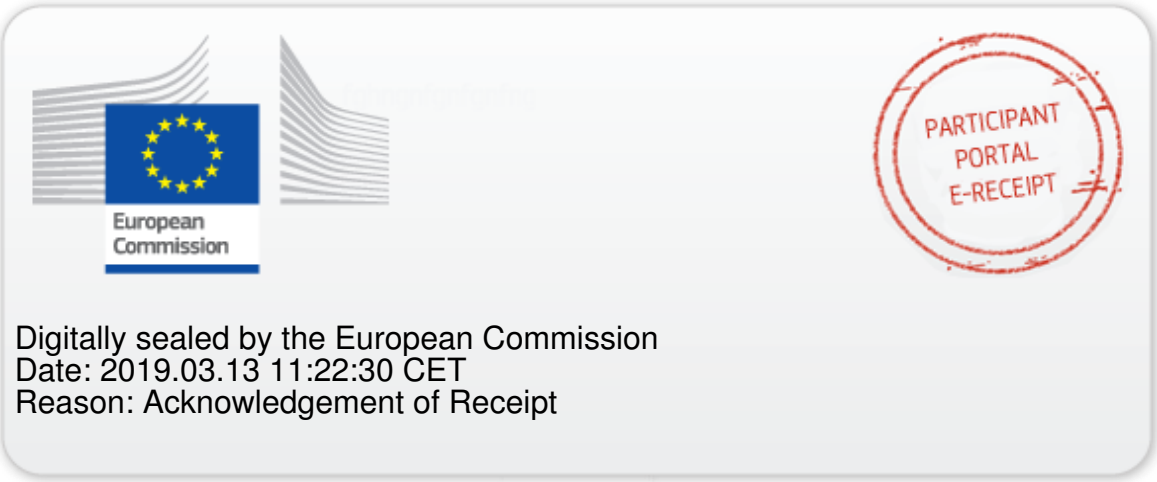
I am writing on behalf of the Center of Excellence BEYOND of the National Observatory of Athens, in order to express the organization's support for the activities which are proposed to be carried out under the auspices of the NEURONE project.

Acknowledging the importance of the in-situ observing systems for Copernicus data and information validation and quality enhancement, BEYOND/NOA welcomes the establishment of the NEURONE coordination network for identifying and mapping the status of the in-situ component and propose a roadmap for its efficient use in Copernicus.

In order for the above to be implemented and established, BEYOND/NOA aims to support the NEURONE activities that are related with the Copernicus Emergency Mapping Service (EMS). Specifically, BEYOND/NOA will facilitate the mapping of current and future EMS requirements for in-situ observations. The BEYOND/NOA personnel will devote their time to respond to NEURONE interviews for providing the EMS specific needs and requirements. In this role we hereby declare that should the NEURONE project be chosen for funding we will support the relevant activities.

Yours sincerely,

Charalampos (Haris) Kontoes



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