



EUROPEAN COMMISSION

7th Framework Programme for
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SPACEBEL SA	998945674
Istituto Superiore per la Protezione e la Ricerca Ambientale	997905349
CARDIFF UNIVERSITY	999979694
PML APPLICATIONS LTD	986292024
Tiwah UG (haftungsbeschraenkt)	951325270
Shoothill Limited	951489006
PSB Informatics s.r.l. - società a capitale ridotto	951508600



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A1: Content

Proposal Number

Proposal Acronym

Project Type

General Information

Proposal Title

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

Duration in months

Call (part) Identifier

Activity code(s) most
relevant to your topic

Abstract (max. 2000 chars)

OpenDataGEOSS exploits the European Open Data Strategy, the implementation of INSPIRE, and dynamic flows of data about the environment from citizens and sensors to support innovative applications, new forms of participative science, and more accountable and transparent policy. The key objectives of the project are: (i) to provide robust evidence that open data leads to open innovation and societal benefits, (ii) to develop innovative tools and applications for participatory environmental monitoring and assessment in the areas of fresh water and marine environments, urban sustainability, and biodiversity, (iii) to foster multi-disciplinary collaborative research by extending the capabilities of the Global Earth Observation System of Systems (GEOSS) Discovery and Access Broker and other components of the GEOSS Common Infrastructure so that scientists from different domains can exchange through interoperable services not only data but also semantic reasoning on events and processes, workflows, and models, (iv) to support the activities of the GEOSS Data Sharing Working Group by identifying the ethical and legal issues that arise in the project from the use of observations provided by citizens to increase our understanding of the Earth system, and deliver benefits to society. The integration of environmental and socio-economic data from INSPIRE and Open Data strategies, at both local and national levels, with data from citizens and sensors in the three thematic domains will show how the richness and diversity of European society are a major asset to support the Europe 2020 vision, deliver innovation and growth, and narrow the gap between citizens, policy, and science. OpenDataGEOSS is a key European contribution to GEOSS and its 2015 implementation target.

Free keywords

Open Data; INSPIRE; GEOSS; Open Innovation; Brokering approach; Citizen Science; Models Web; Data Democracy; Digital Participation; Network of Networks; Water; Urban Sustainability; Biodiversity



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a) Has this proposal (or a very similar one) been previously submitted to a call for proposals of the 7th EU RTD Framework Programme ? Yes No

b) Is this proposal (or a similar one) currently being submitted to another call under FP7 ? Yes No



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A2.1 Participant #1

BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES

If your organisation has already registered for FP7, enter your Participant Identity Code **999993662**

Legal Name **BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES**

Organisation short name **BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES**

Administrative data (legal address)

Street name **Quai Andre Citroen - Tour Mirabeau** Number **39-43**

Town **PARIS**

Postal Code / Cedex **75739**

Country **FR**

Internet homepage **www.brgm.fr**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #1

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Agnès**

First name(s)* **TELLEZ-ARENAS**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + Phone2 +

Fax + E-mail* **a.tellez-arenas@brgm.fr**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.2 Participant #2

JRC

If your organisation has already registered for FP7, enter your Participant Identity Code **999992304**

Legal Name **JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION**

Organisation short name **JRC**

Administrative data (legal address)

Street name **Rue de la Loi** Number **200**

Town **BRUSSELS**

Postal Code / Cedex **1049**

Country **BE**

Internet homepage **<http://www.jrc.ec.europa.eu>**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #2

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Craglia**

First name(s)* **Massimo**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + **39** Phone2 +

Fax + E-mail* **massimo.craglia@jrc.ec.europa.eu**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.3 Participant #3

CNR

If your organisation has already registered for FP7, enter your Participant Identity Code **999979500**Legal Name **CONSIGLIO NAZIONALE DELLE RICERCHE**Organisation short name **CNR**

Administrative data (legal address)

Street name **PIAZZALE ALDO MORO** Number **7**Town **ROMA**Postal Code / Cedex **00185**Country **IT**Internet homepage **www.cnr.it**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes NoPublic body Yes NoResearch organisation Yes NoHigher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #3

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Nativi**

First name(s)* **Stefano**

Title

Dr.

Male

Female

Position in the organisation **Coordinator of ESSI - LAB**

Department/Faculty/Institute/Laboratory name/... **Institute of Atmospheric Pollution Research**

Address

Same as legal address

Street name

c/o PIN Piazza Ciardi

Number

25

Town

Prato

Postal Code/Cedex

59100

Country

IT

Phone1* + **39**

3406428427

Phone2 +

39

0574602523

Fax +

39

0574602524

E-mail*

stefano.nativi@cnr.it

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.4 Participant #4

IIASA

If your organisation has already registered for FP7, enter your Participant Identity Code **999452596**

Legal Name **INTERNATIONALES INSTITUT FUER ANGEWANDTE SYSTEMANALYSE**

Organisation short name **IIASA**

Administrative data (legal address)

Street name **Schlossplatz** Number **1**

Town **LAXENBURG**

Postal Code / Cedex **2361**

Country **AT**

Internet homepage **www.iiasa.ac.at**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #4

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **McCallum**

First name(s)* **Ian**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + **43** Phone2 +

Fax + E-mail* **mccallum@iiasa.ac.at**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.5 Participant #5

NERC

If your organisation has already registered for FP7, enter your Participant Identity Code **999989200**

Legal Name **NATURAL ENVIRONMENT RESEARCH COUNCIL**

Organisation short name **NERC**

Administrative data (legal address)

Street name **Polaris House, North Star Avenue** Number

Town **SWINDON WILTSHIRE**

Postal Code / Cedex **SN2 1EU**

Country **UK**

Internet homepage **<http://www.nerc.ac.uk>**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #5

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Watkins**

First name(s)* **John**

Title

Mr.

Male

Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address

Same as legal address

Street name

Number

Town

Postal Code/Cedex

Country

Phone1* + **44** **01524595827**

Phone2 +

Fax +

E-mail*

jww@ceh.ac.uk

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.6 Participant #6

IEEE

If your organisation has already registered for FP7, enter your Participant Identity Code **998055505**

Legal Name **SECTION FRANCAISE DE L'INSTITUT DES INGENIEURS ELECTRICIENS ET ELECTRO**

Organisation short name **IEEE**

Administrative data (legal address)

Street name **RUE DE LA TOUR** Number **14**

Town **PARIS**

Postal Code / Cedex **75016**

Country **FR**

Internet homepage **www.ieee.org**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #6

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Garello**

First name(s)* **René**

Title

Prof.

Male

Female

Position in the organisation **President**

Department/Faculty/Institute/Laboratory name/... **IEEE Oceanic Engineering Society**

Address

Same as legal address

Street name

Rue de Keraveloc

Number

26

Town

Locmaria-Plouzané

Postal Code/Cedex

29280

Country

EC

Phone1*

+ 33

229001371

Phone2

+ 33

632518194

Fax

+ 33

229001098

E-mail*

r.garello@ieee.org

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.7 Participant #7

Fondazione CIMA

If your organisation has already registered for FP7, enter your Participant Identity Code **997710476**Legal Name **Centro Internazionale in Monitoraggio Ambientale - Fondazione CIMA**Organisation short name **Fondazione CIMA**

Administrative data (legal address)

Street name **Via A. Magliotto** Number **2**Town **Savona**Postal Code / Cedex **17100**Country **IT**Internet homepage **www.cimafoundation.org**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes NoPublic body Yes NoResearch organisation Yes NoHigher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #7

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Parodi**

First name(s)* **Antonio**

Title

Dr.

Male

Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

-

Address

Same as legal address

Street name

Via A. Magliotto

Number

2

Town

Savona

Postal Code/Cedex

17100

Country

IT

Phone1* +

Phone2 + 39

019230271

Fax +

39

01923027240

E-mail*

antonio.parodi@cimafoundation.org

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.8 Participant #8

CREAF

If your organisation has already registered for FP7, enter your Participant Identity Code **998880005**

Legal Name **CENTRO DE INVESTIGACION ECOLOGICA Y APLICACIONES FORESTALES**

Organisation short name **CREAF**

Administrative data (legal address)

Street name **UNIVERSITAT AUTONOMA DE BARCELONA** Number **Edifici C**

Town **BELLATERRA**

Postal Code / Cedex **08193**

Country **ES**

Internet homepage **<http://www.creaf.uab.es/>**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

73.1



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #8

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Masó**

First name(s)* **Joan**

Title

Dr.

Male

Female

Position in the organisation **Researcher**

Department/Faculty/Institute/Laboratory name/... **CREAF - Grumets**

Address

Same as legal address

Street name **UNIVERSITAT AUTONOMA DE BARCELONA**

Number **Edific**

Town **BELLATERRA**

Postal Code/Cedex **08193**

Country **ES**

Phone1* + **34** **935811771**

Phone2 + **34** **935811312**

Fax + **34** **935814151**

E-mail* **joan.maso@uab.es**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.9 Participant #9

UEDIN

If your organisation has already registered for FP7, enter your Participant Identity Code **999974941**

Legal Name **THE UNIVERSITY OF EDINBURGH**

Organisation short name **UEDIN**

Administrative data (legal address)

Street name **OLD COLLEGE, SOUTH BRIDGE** Number

Town **EDINBURGH**

Postal Code / Cedex **EH8 9YL**

Country **UK**

Internet homepage **www.ed.ac.uk**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #9

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Higgins**

First name(s)* **Chris**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + **44** Phone2 +

Fax + E-mail* **chris.higgins@ed.ac.uk**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.10 Participant #10

UNISIIf your organisation has already registered for FP7, enter your Participant Identity Code **999898020**Legal Name **UNIVERSITA' DEGLI STUDI DI SIENA**Organisation short name **UNISI**

Administrative data (legal address)

Street name **VIA BANCHI DI SOTTO** Number **55**Town **SIENA**Postal Code / Cedex **53100**Country **IT**Internet homepage **www.unisi.it**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes NoPublic body Yes NoResearch organisation Yes NoHigher or secondary education establishment Yes NoMain area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #10

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Capineri**

First name(s)* **Cristina**

Title

Prof.

Male

Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address

Same as legal address

Street name

Number

Town

Postal Code/Cedex

Country

Phone1* + 39

Phone2 +

Fax +

E-mail* **crisrina.capineri@unisi.it**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.11 Participant #11

WWU

If your organisation has already registered for FP7, enter your Participant Identity Code **999853691**

Legal Name **WESTFAELISCHE WILHELMS-UNIVERSITAET MUENSTER**

Organisation short name **WWU**

Administrative data (legal address)

Street name **SCHLOSSPLATZ** Number **2**

Town **MUENSTER**

Postal Code / Cedex **48149**

Country **DE**

Internet homepage **www.uni-muenster.de**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #11

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Pebesma**

First name(s)* **Edzer**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + **49** Phone2 +

Fax + E-mail* **edzer.pebesma@uni-muenster.de**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.12 Participant #12

UJIIf your organisation has already registered for FP7, enter your Participant Identity Code **999882985**Legal Name **UNIVERSITAT JAUME I DE CASTELLON**Organisation short name **UJI**

Administrative data (legal address)

Street name **AVENIDA VICENT SOS BAYNAT** Number **S/N**Town **CASTELLON DE LA PLANA**Postal Code / Cedex **12006**Country **ES**Internet homepage **www.uji.es**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes NoPublic body Yes NoResearch organisation Yes NoHigher or secondary education establishment Yes NoMain area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #12

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Huerta Guijarro**

First name(s)* **Joaquín**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + Phone2 +

Fax + E-mail* **huerta@uji.es**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.13 Participant #13

TUD

If your organisation has already registered for FP7, enter your Participant Identity Code **999897729**

Legal Name **TECHNISCHE UNIVERSITAET DRESDEN**

Organisation short name **TUD**

Administrative data (legal address)

Street name **HELMHOLTZSTRASSE** Number **10**

Town **DRESDEN**

Postal Code / Cedex **01069**

Country **DE**

Internet homepage

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #13

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Bernard**

First name(s)* **Lars**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + Phone2 +

Fax + E-mail* ***lars.bernard@tu-dresden.de***

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.14 Participant #14

THE UNIVERSITY OF SHEFFIELD

If your organisation has already registered for FP7, enter your Participant Identity Code **999976881**

Legal Name **THE UNIVERSITY OF SHEFFIELD**

Organisation short name **THE UNIVERSITY OF SHEFFIELD**

Administrative data (legal address)

Street name **FIRTH COURT WESTERN BANK** Number

Town **SHEFFIELD**

Postal Code / Cedex **S10 2TN**

Country **UK**

Internet homepage **www.shef.ac.uk**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #14

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Lafranchi**

First name(s)* **Vitaveska**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + Phone2 +

Fax + E-mail* **v.lanfranchi@sheffield.ac.uk**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.15 Participant #15

MU

If your organisation has already registered for FP7, enter your Participant Identity Code **999880657**Legal Name **Masarykova univerzita**Organisation short name **MU**

Administrative data (legal address)

Street name **Zerotinovo namesti** Number **9**Town **BRNO STRED**Postal Code / Cedex **60177**Country **CZ**Internet homepage **http://www.muni.cz**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes NoPublic body Yes NoResearch organisation Yes NoHigher or secondary education establishment Yes NoMain area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #15

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Řezník**

First name(s)* **Tomáš**

Title

Dr.

Male

Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address

Same as legal address

Street name

Number

Town

Postal Code/Cedex

Country

Phone1* + **420**

Phone2 +

Fax +

E-mail* **t.reznik@seznam.cz**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.16 Participant #16

INFORMATICA TRENTINA SPA

If your organisation has already registered for FP7, enter your Participant Identity Code **991479584**

Legal Name **INFORMATICA TRENTINA SPA**

Organisation short name **INFORMATICA TRENTINA SPA**

Administrative data (legal address)

Street name **Via G. Gilli** Number **2**

Town **Trento**

Postal Code / Cedex **38121**

Country **IT**

Internet homepage

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #16

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Shvaiko**

First name(s)* **Pavel**

Title

Dr.

Male

Female

Position in the organisation **Innovation Manager**

Department/Faculty/Institute/Laboratory name/... **Consulting & Innovation, TasLab**

Address

Same as legal address

Street name **Via G. Gilli**

Number **2**

Town **Trento**

Postal Code/Cedex **38121**

Country **IT**

Phone1* +

Phone2 + **39**

0461800605

Fax +

E-mail*

pavel.shvaiko@infotn.it

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.17 Participant #17

Geodan Software Development & Technology b.v.

If your organisation has already registered for FP7, enter your Participant Identity Code **991479972**

Legal Name **Geodan Software Development & Technology b.v.**

Organisation short name **Geodan Software Development & Technology b.v.**

Administrative data (legal address)

Street name **President Kennedylaan** Number **1**

Town **Amsterdam**

Postal Code / Cedex **1079MB**

Country **NL**

Internet homepage **<http://www.geodan.nl>**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

72



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #17

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Fruijtier**

First name(s)* **Steven**

Title

Mr.

Male

Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address

Same as legal address

Street name

Number

Town

Postal Code/Cedex

Country

Phone1* +

Phone2 +

Fax +

E-mail*

steven.fruijtier@geodan.nl

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.18 Participant #18

YD ACORES

If your organisation has already registered for FP7, enter your Participant Identity Code **952909765**

Legal Name **YDREAMS ACORES UNIPessoal LDA**

Organisation short name **YD ACORES**

Administrative data (legal address)

Street name **RUA DE SANTANA** Number **74**

Town **CAPELAS PONTA DELGADA**

Postal Code / Cedex **9545 132**

Country **PT**

Internet homepage

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

72



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #18

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Gouveia**

First name(s)* **Cristina**

Title

Ms

Male

Female

Position in the organisation Chief Operating Officer

Department/Faculty/Institute/Laboratory name/... NA

Address

Same as legal address

Street name Madan Parque - Sul Quinta da Torre

Number

Town Caparica

Postal Code/Cedex P2825-149

Country PT

Phone1* +

Phone2 +

Fax +

351

210314001

E-mail*

cristina.gouveia@yatlantic.com

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.19 Participant #19

52°North GmbH

If your organisation has already registered for FP7, enter your Participant Identity Code **997237407**

Legal Name **52°North Initiative for Geospatial Open Source Software GmbH**

Organisation short name **52°North GmbH**

Administrative data (legal address)

Street name **Martin-Luther-King-Weg** Number **24**

Town **Münster**

Postal Code / Cedex **48155**

Country **DE**

Internet homepage **<http://www.52north.org>**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

73.1



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #19

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Jirka**

First name(s)* **Simon**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + **49** Phone2 +

Fax + E-mail* **jirka@52north.org**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.20 Participant #20

BDigital

If your organisation has already registered for FP7, enter your Participant Identity Code **997457403**

Legal Name **FUNDACIO PRIVADA BARCELONA DIGITAL CENTRE TECNOLOGIC**

Organisation short name **BDigital**

Administrative data (legal address)

Street name **CARRER ROC BORONAT** Number **117, 5 PLANTA**

Town **Barcelona**

Postal Code / Cedex **08018**

Country **ES**

Internet homepage **www.bdigital.org**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #20

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Sanchez Moreno**

First name(s)* **Mària**

Title

Mrs

Male

Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address

Same as legal address

Street name

Number

Town

Postal Code/Cedex

Country

Phone1* + **34**

Phone2 +

Fax +

E-mail* **pmo@bdigital.org**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.21 Participant #21

SPACEBEL

If your organisation has already registered for FP7, enter your Participant Identity Code **998945674**

Legal Name **SPACEBEL SA**

Organisation short name **SPACEBEL**

Administrative data (legal address)

Street name **RUE DES CHASSEURS ARDENNAIS** Number **6**

Town **LIEGE ANGLEUR**

Postal Code / Cedex **4031**

Country **BE**

Internet homepage

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

72



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #21

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Ledent**

First name(s)* **Philippe**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + **32** Phone2 +

Fax + E-mail* **philippe.ledent@spacebel.be**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.22 Participant #22

ISPRA

If your organisation has already registered for FP7, enter your Participant Identity Code **997905349**Legal Name ***Istituto Superiore per la Protezione e la Ricerca Ambientale***Organisation short name ***ISPRA***

Administrative data (legal address)

Street name ***Via Vitaliano Brancati*** Number **48**Town ***Rome***Postal Code / Cedex ***00144***Country ***IT***Internet homepage ***http://www.isprambiente.it/site/it-IT/***

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes NoPublic body Yes NoResearch organisation Yes NoHigher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #22

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **BONORA**

First name(s)* **Nico**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + Phone2 +

Fax + E-mail* **nico.bonora@isprambiente.it**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.23 Participant #23

CARDIFF UNIVERSITY

If your organisation has already registered for FP7, enter your Participant Identity Code **999979694**

Legal Name **CARDIFF UNIVERSITY**

Organisation short name **CARDIFF UNIVERSITY**

Administrative data (legal address)

Street name **NEWPORT ROAD** Number **30-36**

Town **CARDIFF**

Postal Code / Cedex **CF24 0DE**

Country **UK**

Internet homepage **www.cardiff.ac.uk**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #23

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Hardisty**

First name(s)* **Alex**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + **44** Phone2 +

Fax + E-mail* **hardistyar@cardiff.ac.uk**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.24 Participant #24

PML APPLICATIONS LTD

If your organisation has already registered for FP7, enter your Participant Identity Code **986292024**

Legal Name **PML APPLICATIONS LTD**

Organisation short name **PML APPLICATIONS LTD**

Administrative data (legal address)

Street name **PROSPECT PLACE THE HOE** Number

Town **PLYMOUTH**

Postal Code / Cedex **PL1 3DH**

Country **UK**

Internet homepage

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

73.1



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #24

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Groom**

First name(s)* **Steve**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + Phone2 +

Fax + E-mail* **sbg@pml.ac.uk**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.25 Participant #25

Tiwah

If your organisation has already registered for FP7, enter your Participant Identity Code **951325270**Legal Name **Tiwah UG (haftungsbeschaenkt)**Organisation short name **Tiwah**

Administrative data (legal address)

Street name **Poststrasse** Number **10**Town **Rossbach/Wied**Postal Code / Cedex **53547**Country **DE**Internet homepage **www.tiwah.com**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes NoPublic body Yes NoResearch organisation Yes NoHigher or secondary education establishment Yes No

Main area of activity (NACE code)



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #25

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Plag**

First name(s)* **Hans-Peter**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + Phone2 +

Fax + E-mail* **hpplag@tiwah.com**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.26 Participant #26

Shoothill Limited

If your organisation has already registered for FP7, enter your Participant Identity Code **951489006**

Legal Name **Shoothill Limited**

Organisation short name **Shoothill Limited**

Administrative data (legal address)

Street name **Knights Court, Battlefield Enterprise Park** Number

Town **Shrewsbury**

Postal Code / Cedex **SY1 3GA**

Country **UK**

Internet homepage **www.shoothill.com**

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one or more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #26

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Francis**

First name(s)* **Darren**

Title

Male Female

Position in the organisation

Department/Faculty/Institute/Laboratory name/...

Address Same as legal address

Street name Number

Town Postal Code/Cedex

Country

Phone1* + **44** Phone2 +

Fax + E-mail* **darren.francis@shoothill.com**

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A2.27 Participant #27

PSB Informatics

If your organisation has already registered for FP7, enter your Participant Identity Code **951508600**

Legal Name **PSB Informatics s.r.l. - società a capitale ridotto**

Organisation short name **PSB Informatics**

Administrative data (legal address)

Street name **Borgo Pinti** Number **70**

Town **Firenze**

Postal Code / Cedex **50121**

Country **IT**

Internet homepage

Status of your organisation

Certain types of organisations benefit from special conditions under the FP7 participant rules. The Commission also collects data for statistical purposes.

The guidance notes will help you complete this section.

Please 'tick' the relevant box(es) if your organisation falls into one ore more of the following categories.

Non-profit organisation Yes No

Public body Yes No

Research organisation Yes No

Higher or secondary education establishment Yes No

Main area of activity (NACE code)

72



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1. Is your number of employees smaller than 250? (full time equivalent) Yes No
2. Is your annual turnover smaller than € 50 million? Yes No
3. Is your annual balance sheet total smaller than € 43 million? Yes No
4. Are you an autonomous legal entity? Yes No

You are NOT an SME if your answer to question 1 is "NO" and/or your answer to both questions 2 and 3 is "NO".

In all other cases, you might conform to the Commission's definition of an SME.

Please check the additional conditions given in the guidance notes to the forms.

Following this check, do you conform to the Commission's definition of an SME? Yes No

Dependencies with (an)other participant(s)

Are there dependencies between your organisation and (an)other participant(s) in this proposal? Yes No



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Contact point - Person in charge for participant #27

For the co-ordinator (Participant #1) this person is the one who the Commission will contact in the first instance.

Family name* **Santoro**

First name(s)* **Martina**

Title

Ms

Male

Female

Position in the organisation **Chief Executive Officer**

Department/Faculty/Institute/Laboratory name/... **Executive Office**

Address

Same as legal address

Street name **Borgo Pinti**

Number **70**

Town **Firenze**

Postal Code/Cedex **50121**

Country **IT**

Phone1* +

Phone2 +

Fax +

E-mail*

psbinformatics@legalmail.it

* Contact details can only be changed by the Proposal Coordinator via the "Step 4 – Manage Your Related Parties" screen.



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A3.1.1 Budget #1

BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Actual indirect costs

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	104 160 €		149 730 €	26 040 €	279 930 €
Subcontracting (in €)			20 000 €		20 000 €
Other direct costs (in €)	9 450 €		22 000 €	10 000 €	41 450 €
Indirect costs (in €)	111 338 €	0 €	168 295 €	35 319 €	314 952 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	224 948 €	0 €	360 025 €	71 359 €	656 332 €
Requested EC contribution (in €)	168 711 €	0 €	360 025 €	71 359 €	600 095 €
Total Receipts (in €)					



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A3.1.2 Budget #2

JRC

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	394 200 €			43 800 €	438 000 €
Subcontracting (in €)					
Other direct costs (in €)	9 450 €			20 000 €	29 450 €
Indirect costs (in €)	242 190 €			38 280 €	280 470 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	645 840 €			102 080 €	747 920 €
Requested EC contribution (in €)	484 380 €			102 080 €	586 460 €
Total Receipts (in €)					



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A3.1.3 Budget #3

CNR

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	203 500 €			33 300 €	236 800 €
Subcontracting (in €)					
Other direct costs (in €)	25 450 €			15 000 €	40 450 €
Indirect costs (in €)	160 036 €			33 762 €	193 798 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	388 986 €			82 062 €	471 048 €
Requested EC contribution (in €)	291 739 €			82 062 €	373 801 €
Total Receipts (in €)					



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A3.1.4 Budget #4

IIASA

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Actual indirect costs

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	192 000 €				192 000 €
Subcontracting (in €)	30 000 €				30 000 €
Other direct costs (in €)	11 450 €				11 450 €
Indirect costs (in €)	111 898 €				111 898 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	345 348 €				345 348 €
Requested EC contribution (in €)	259 011 €				259 011 €
Total Receipts (in €)					



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A3.1.5 Budget #5

NERC

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Actual indirect costs

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	246 050 €			6 650 €	252 700 €
Subcontracting (in €)					
Other direct costs (in €)	14 450 €				14 450 €
Indirect costs (in €)	289 155 €			7 382 €	296 537 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	549 655 €			14 032 €	563 687 €
Requested EC contribution (in €)	412 241 €			14 032 €	426 273 €
Total Receipts (in €)					



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A3.1.6 Budget #6

IEEE

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)					
Subcontracting (in €)				2 640 €	2 640 €
Other direct costs (in €)				143 050 €	143 050 €
Indirect costs (in €)				14 305 €	14 305 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)				159 995 €	159 995 €
Requested EC contribution (in €)				159 995 €	159 995 €
Total Receipts (in €)					



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A3.1.7 Budget #7

Fondazione CIMA

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	65 000 €				65 000 €
Subcontracting (in €)					
Other direct costs (in €)	10 450 €				10 450 €
Indirect costs (in €)	45 270 €				45 270 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	120 720 €				120 720 €
Requested EC contribution (in €)	90 540 €				90 540 €
Total Receipts (in €)					



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A3.1.8 Budget #8

CREAF

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	52 192 €			3 262 €	55 454 €
Subcontracting (in €)					
Other direct costs (in €)	8 450 €				8 450 €
Indirect costs (in €)	36 385 €			1 957 €	38 342 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	97 027 €			5 219 €	102 246 €
Requested EC contribution (in €)	72 770 €			5 219 €	77 989 €
Total Receipts (in €)					



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A3.1.9 Budget #9

UEDIN

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	121 027 €			7 166 €	128 193 €
Subcontracting (in €)					
Other direct costs (in €)	15 135 €				15 135 €
Indirect costs (in €)	93 273 €	0 €		4 909 €	98 182 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	229 435 €	0 €		12 075 €	241 510 €
Requested EC contribution (in €)	172 076 €	0 €	0 €	12 075 €	184 151 €
Total Receipts (in €)					



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A3.1.10 Budget #10

UNISI

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	68 850 €			4 050 €	72 900 €
Subcontracting (in €)					
Other direct costs (in €)	7 450 €				7 450 €
Indirect costs (in €)	45 780 €			2 430 €	48 210 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	122 080 €			6 480 €	128 560 €
Requested EC contribution (in €)	91 560 €			6 480 €	98 040 €
Total Receipts (in €)					



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A3.1.11 Budget #11

WWU

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	172 800 €				172 800 €
Subcontracting (in €)					
Other direct costs (in €)	17 450 €				17 450 €
Indirect costs (in €)	114 150 €				114 150 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	304 400 €				304 400 €
Requested EC contribution (in €)	228 300 €				228 300 €
Total Receipts (in €)					



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A3.1.12 Budget #12

UJI

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	117 600 €			19 600 €	137 200 €
Subcontracting (in €)					
Other direct costs (in €)	7 450 €				7 450 €
Indirect costs (in €)	75 030 €			11 760 €	86 790 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	200 080 €			31 360 €	231 440 €
Requested EC contribution (in €)	150 060 €			31 360 €	181 420 €
Total Receipts (in €)					



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A3.1.13 Budget #13

TUD

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	119 208 €				119 208 €
Subcontracting (in €)					
Other direct costs (in €)	7 450 €				7 450 €
Indirect costs (in €)	75 994 €				75 994 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	202 652 €				202 652 €
Requested EC contribution (in €)	151 989 €				151 989 €
Total Receipts (in €)					



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A3.1.14 Budget #14

THE UNIVERSITY OF SHEFFIELD

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	141 480 €				141 480 €
Subcontracting (in €)					
Other direct costs (in €)	11 950 €				11 950 €
Indirect costs (in €)	92 058 €				92 058 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	245 488 €				245 488 €
Requested EC contribution (in €)	184 116 €				184 116 €
Total Receipts (in €)					



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A3.1.15 Budget #15

MU

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	54 250 €			3 875 €	58 125 €
Subcontracting (in €)					
Other direct costs (in €)	8 450 €				8 450 €
Indirect costs (in €)	37 620 €			2 325 €	39 945 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	100 320 €			6 200 €	106 520 €
Requested EC contribution (in €)	75 240 €			6 200 €	81 440 €
Total Receipts (in €)					



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A3.1.16 Budget #16

INFORMATICA TRENTINA SPA

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	99 000 €				99 000 €
Subcontracting (in €)					
Other direct costs (in €)	21 450 €				21 450 €
Indirect costs (in €)	32 522 €				32 522 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	152 972 €				152 972 €
Requested EC contribution (in €)	76 486 €				76 486 €
Total Receipts (in €)					



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7th Framework Programme for
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A3.1.17 Budget #17

Geodan Software Development & Technology b.v.

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	308 000 €			28 000 €	336 000 €
Subcontracting (in €)					
Other direct costs (in €)	19 450 €				19 450 €
Indirect costs (in €)	196 470 €	0 €	0 €	16 800 €	213 270 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	523 920 €	0 €	0 €	44 800 €	568 720 €
Requested EC contribution (in €)	392 940 €			44 800 €	437 740 €
Total Receipts (in €)					



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A3.1.18 Budget #18

YD ACORES

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	101 250 €			3 750 €	105 000 €
Subcontracting (in €)	10 000 €				10 000 €
Other direct costs (in €)	26 450 €			1 000 €	27 450 €
Indirect costs (in €)	76 620 €			2 850 €	79 470 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	214 320 €			7 600 €	221 920 €
Requested EC contribution (in €)	160 740 €			7 600 €	168 340 €
Total Receipts (in €)					



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A3.1.19 Budget #19

52°North GmbH

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	148 400 €			10 600 €	159 000 €
Subcontracting (in €)					
Other direct costs (in €)	19 450 €				19 450 €
Indirect costs (in €)	100 710 €			6 360 €	107 070 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	268 560 €			16 960 €	285 520 €
Requested EC contribution (in €)	201 420 €			16 960 €	218 380 €
Total Receipts (in €)					



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A3.1.20 Budget #20

BDigital

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	63 750 €				63 750 €
Subcontracting (in €)					
Other direct costs (in €)	19 450 €				19 450 €
Indirect costs (in €)	49 920 €				49 920 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	133 120 €				133 120 €
Requested EC contribution (in €)	99 840 €				99 840 €
Total Receipts (in €)					



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A3.1.21 Budget #21

SPACEBEL

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Actual indirect costs

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	122 610 €			16 348 €	138 958 €
Subcontracting (in €)				30 000 €	30 000 €
Other direct costs (in €)	14 450 €				14 450 €
Indirect costs (in €)	82 016 €			9 809 €	91 825 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	219 076 €			56 157 €	275 233 €
Requested EC contribution (in €)	164 307 €			56 157 €	220 464 €
Total Receipts (in €)					



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A3.1.22 Budget #22

ISPRA

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	91 350 €			4 350 €	95 700 €
Subcontracting (in €)					
Other direct costs (in €)	19 450 €			7 000 €	26 450 €
Indirect costs (in €)	66 480 €			6 810 €	73 290 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	177 280 €			18 160 €	195 440 €
Requested EC contribution (in €)	132 960 €			18 160 €	151 120 €
Total Receipts (in €)					



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A3.1.23 Budget #23

CARDIFF UNIVERSITY

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	144 000 €				144 000 €
Subcontracting (in €)					
Other direct costs (in €)	17 450 €				17 450 €
Indirect costs (in €)	96 870 €				96 870 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	258 320 €				258 320 €
Requested EC contribution (in €)	193 740 €				193 740 €
Total Receipts (in €)					



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A3.1.24 Budget #24

PML APPLICATIONS LTD

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Actual indirect costs

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	239 200 €			10 400 €	249 600 €
Subcontracting (in €)					
Other direct costs (in €)	19 450 €				19 450 €
Indirect costs (in €)	297 448 €			11 960 €	309 408 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	556 098 €			22 360 €	578 458 €
Requested EC contribution (in €)	417 073 €			22 360 €	439 433 €
Total Receipts (in €)					



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A3.1.25 Budget #25

Tiwah

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	94 080 €			11 760 €	105 840 €
Subcontracting (in €)					
Other direct costs (in €)	14 450 €				14 450 €
Indirect costs (in €)	65 118 €			7 056 €	72 174 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	173 648 €			18 816 €	192 464 €
Requested EC contribution (in €)	130 236 €			18 816 €	149 052 €
Total Receipts (in €)					



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A3.1.26 Budget #26

Shoothill Limited

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	51 714 €			3 042 €	54 756 €
Subcontracting (in €)					
Other direct costs (in €)	7 450 €			2 200 €	9 650 €
Indirect costs (in €)	35 498 €			3 145 €	38 643 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	94 662 €			8 387 €	103 049 €
Requested EC contribution (in €)	70 996 €			8 387 €	79 383 €
Total Receipts (in €)					



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A3.1.27 Budget #27

PSB Informatics

In FP7, there are different methods for calculating indirect costs. The various options are explained in the guidance notes. Please be aware that not all options are available to all types of organisations.

Method

Specific flat rate 60%

My legal entity is established in an ICPC and I shall use the lump sum funding method
(If yes, please fill below the lump sum row only. If no, please do not use the lump sum row)

Yes No

Type of Activity

	RTD up to 50 or 75% *	Demonstration up to 50%	Management up to 100%	Other up to 100%	Total
Personnel costs (in €)	49 500 €			11 000 €	60 500 €
Subcontracting (in €)					
Other direct costs (in €)	4 450 €				4 450 €
Indirect costs (in €)	32 370 €			6 600 €	38 970 €
Lump sum, flat-rate or scale of unit (option only for ICPC) (in €)					
Total budget (in €)	86 320 €			17 600 €	103 920 €
Requested EC contribution (in €)	64 740 €			17 600 €	82 340 €
Total Receipts (in €)					



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A3.2: Budget

Estimated budget in EUR (whole of the project)

Nr.	Organisation Short Name	Organisation country	RTD	Demonstration	Management	Other	Total	Total receipts	Requested EU contributions
1	BUREAU DE RECHERCHES GEOLOGIQUES ET	FR	224 948	0	360 025	71 359	656 332		600 095
2	JRC	BE	645 840			102 080	747 920		586 460
3	CNR	IT	388 986			82 062	471 048		373 801
4	IIASA	AT	345 348				345 348		259 011
5	NERC	UK	549 655			14 032	563 687		426 273
6	IEEE	FR				159 995	159 995		159 995
7	Fondazione CIMA	IT	120 720				120 720		90 540
8	CREAF	ES	97 027			5 219	102 246		77 989
9	UEDIN	UK	229 435	0		12 075	241 510		184 151
10	UNISI	IT	122 080			6 480	128 560		98 040



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11	WWU	DE	304 400				304 400		228 300
12	UJI	ES	200 080			31 360	231 440		181 420
13	TUD	DE	202 652				202 652		151 989
14	THE UNIVERSITY OF SHEFFIELD	UK	245 488				245 488		184 116
15	MU	CZ	100 320			6 200	106 520		81 440
16	INFORMATICA TRENINA SPA	IT	152 972				152 972		76 486
17	Geodan Software Development & Technology b.v.	NL	523 920	0	0	44 800	568 720		437 740
18	YD ACORES	PT	214 320			7 600	221 920		168 340
19	52°North GmbH	DE	268 560			16 960	285 520		218 380
20	BDigital	ES	133 120				133 120		99 840
21	SPACEBEL	BE	219 076			56 157	275 233		220 464
22	ISPRA	IT	177 280			18 160	195 440		151 120
23	CARDIFF UNIVERSITY	UK	258 320				258 320		193 740



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24	PML APPLICATIONS LTD	UK	556 098			22 360	578 458		439 433
25	Tiwah	DE	173 648			18 816	192 464		149 052
26	Shoothill Limited	UK	94 662			8 387	103 049		79 383
27	PSB Informatics	IT	86 320			17 600	103 920		82 340
Total			6 635 275	0	360 025	701 702	7 697 002		5 999 938

Proposal full title	
Open Data: Linking Science, Citizens and GEOSS	
Proposal acronym	
OpenDataGEOSS	
Type of funding scheme	Collaborative project
Work programme topics addressed	ENV.2013.6.5-3
Name of the coordinating person	Agnès Tellez-Arenas

List of participants

Participant no.	Participant legal name	Country	Organization type
1 (coord.)	Bureau de Recherches Géologiques et Minières	France	Public body non profit organisation
2	European Commission Joint Research Centre	Italy	Public body research, organisation non profit
3	National research Council	Italy	Public body research, organisation non profit
4	International Institute for Applied System Analysis	Austria	Public body research, organisation non profit
5	Centre for Ecology and Hydrology	United Kingdom	Public body research, organisation non profit
6	The Institute of Electrical and Electronics Engineers, Incorporated	France	Public body research, organisation non profit
7	CIMA foundation	Italy	Public body research, organisation non profit
8	CREAF Public Research centre	Spain	Public body research, organisation non profit
9	University of Edinburgh	United Kingdom	University
10	University of Siena	Italy	University
11	University of Muenster	Germany	University
12	Universitat Jaume I de Castellon	Spain	University
13	Technische Universität Dresden	Germany	University
14	University of Sheffield	United Kingdom	University
15	Masaryk University	Czech Republic	University
16	Informatica Trentina	Italy	Enterprise
17	Geodan	Netherlands	SME
18	Ydreams Açores	Portugal	SME
19	52°North	Germany	SME
20	BDigital	Spain	Public body research, organisation non profit
21	SpaceBell	Belgium	SME
22	Istituto Superiore per la Protezione e Ricerca Ambientale	Italy	Public body research, organisation non profit
23	University of Cardiff	United Kingdom	University
24	PML Applications Ltd	United Kingdom	SME
25	TIWAH	Germany	SME
26	Shoothill	United Kingdom	SME
27	PSB Informatics	Italy	SME

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OpenDataGEOSS



1 Scientific and technical quality

1.1 Concept and objectives

“Your data is worth more if you give it away”, said EU Commissioner for the Digital Agenda Neelie Kroes when presenting the Open Data Strategy for Europe¹ to public administrators (EC, 2011). The EU public sector is ‘sitting on a goldmine’ of unrealised economic potential “expected to deliver a €40 billion boost to the EU’s economy each year”. To achieve this potential data must be accessible and open, i.e. free of restrictions on use and redistribution.

The EU Open Data strategy asserts that opening up access and reuse to public sector data offers major opportunities not only for innovation and growth but also for more informed science, greater public participation, and for addressing societal and environmental challenges. The strategy is part of the Digital Agenda, one of seven flagships supporting the Europe 2020 strategy to achieve growth based on research and innovation, a low carbon-economy, jobs and poverty reduction. Another flagship initiative of relevance for this project is the Innovation Union² which argues for better use of existing investment in research and research infrastructures, pursuing a broad concept of innovation that is “involving all actors and all regions in the innovation cycle: not only major companies but also SMEs in all sectors, including the public sector, the social economy and citizens themselves (‘social innovation’)”. These initiatives foster innovation and growth but also help addressing environmental issues and contribute to INSPIRE and to the Global Earth Observation System of Systems (GEOSS). Europe already plays a strong role in developing GEOSS and its platform for sharing data and information, the GEOSS Common Infrastructure (GCI). Through the Open Data strategy, Europe can further the development of GEOSS by expanding the GEOSS Data Collection of Open Resources for Everyone (GEOSS Data CORE), a distributed pool of documented datasets with full, open and unrestricted access at no more than the cost of reproduction and distribution, which is a centre-piece of GEOSS.³

Given the policy context highlighted above, the **key objectives of OpenDataGEOSS** are:

1. To provide robust evidence that open data leads to open innovation and societal benefits,
2. To develop innovative tools and applications for participatory environmental monitoring and assessment in the areas of fresh water and marine environments, urban sustainability, and biodiversity,
3. To foster multi-disciplinary collaborative research by extending the capabilities of the GEOSS Discovery and Access Broker and other components of the GCI so that scientists from different domains can exchange through interoperable services not only data but also semantic reasoning on events and processes, workflows, and models,
4. To support the activities of the GEOSS Data Sharing Working Group by identifying the ethical and legal issues that arise in the project from the use of observations provided by citizens to increase our understanding of the Earth system, and deliver benefits to society,
5. To create a long-term sustainable environment for project outcomes and opportunities for SMEs growth and impact through open data applications.

Key Concepts

Building on INSPIRE: INSPIRE, the infrastructure for Spatial Information in Europe, is a major development in Europe. The INSPIRE Directive (2007/2/EC) is the legal framework that requires EU Member States to document and make accessible spatial data and services in 34 themes relevant to environmental policy, according to agreed specifications. These specifications provide interoperability of services, and harmonise the contents and structure of the datasets falling under INSPIRE so that users can seamlessly integrate data across borders, and develop new applications. INSPIRE will increasingly become a major asset for environmental policy and research at the European and global levels. The

¹ [http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52010DC0245R\(01\):EN:NOT](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52010DC0245R(01):EN:NOT)

² http://ec.europa.eu/research/innovation-union/index_en.cfm

³ http://earthobservations.com/geoss_dsp.shtml

Joint Research Centre of the European Commission (EC-JRC) is the overall technical coordinator of INSPIRE. EC-JRC leads the development of the technical specifications, and operates the INSPIRE geoportal which provides access to the data and services maintained by the Member States. To date there are more than 270,000 datasets accessible through the geoportal. As the EC-JRC is also supporting the Member States in assessing the economic, social, and environmental impacts of INSPIRE, finding innovative uses of the data to create new services and jobs is an important area of research. OpenDataGEOSS will be a major contributor to this effort as detailed in this document.

Harnessing Open Data: Many organisations worldwide are developing Open Data strategies. These may be considered primarily as part of a policy evolution in e-government towards publishing data in ways that make public sector data more accessible and re-usable. OpenDataGEOSS will explore the combination of INSPIRE data with those published through Open Data strategies, noting that the latter have often a broader thematic scope than INSPIRE. From a technical point-of-view this combination means addressing data in multiple formats and structures published through web services (like in INSPIRE) or as Linked Data (data connected by structured relations <http://linkeddata.org/>). From a policy point of view, this effort may demonstrate to data providers the advantage of publishing their data free of restrictions (open) and linked (Linked Open Data).

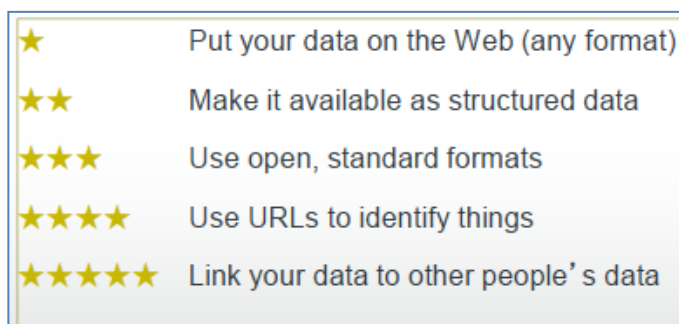


Figure 1: 5-star rating of Open Data

In relation to Figure 1, most INSPIRE data are already at 3-star level but discussions are taking place on making greater use of Unique Resource Identifiers in INSPIRE, and moving up the ladder towards (Open) Linked Data. OpenDataGEOSS will generate Resource Description Framework (RDF) vocabularies based on the data models developed in INSPIRE and build the essential bridge between INSPIRE and Linked Data.

The Observation Web and Science 2.0: Most of the data coming from INSPIRE and Open Data strategies are processed data based on administrative procedures, observations and measurements. By their nature they are updated at intervals that vary from a few days (or less) to many years. The emergence of cheap sensors connected to the Web has started to produce much more dynamic data flows that can be triggered on demand or on the occurrence of particular events. Another new stream of data derives from citizens providing quantitative and qualitative observations through social media and/or custom applications. The Observation Web captures the combination of sensor and citizen-based dynamic data flows. These offer major new opportunities for environmental monitoring, and for a more participative approach to evidence-building and scientific inquiry (Science 2.0). On the other hand, as we have experienced in a recent large-scale project using millions of Tweets to monitor forest fires (Craglia, et al., 2012) there are major challenges in harnessing and processing such heterogeneous data in terms of formats and quality. Moreover, the re-use of data provided by individuals for purposes other than those for which they were published raises issues of confidentiality and privacy that become all the more pressing with new technological and data access advancements. OpenDataGEOSS will harness these new forms of data, combining them with data coming from official sources in a set of focused applications to assess the opportunities arising for new forms of scientific inquiry and innovation, as well as the safeguards that are needed for an ethical re-use of information.

Standing on the Shoulders of Giants: the Project-of-Projects Approach: Europe is making a major contribution to the development of GEOSS through the Global Monitoring for Environment and Security (GMES) programme, INSPIRE, and research projects. In the FP7 programme alone more than € 20 million each year is invested in research projects supporting GEOSS. Each project addresses one or more facets of the System of Systems. As we approach the conclusion of the GEOSS 10-year implementation plan in 2015, we need to ensure that the benefits of EU investments are maximized. For this reason OpenDataGEOSS is designed to leverage the results of existing projects, and build a stronger European contribution to the achievement of the 2015 GEOSS implementation targets⁴.

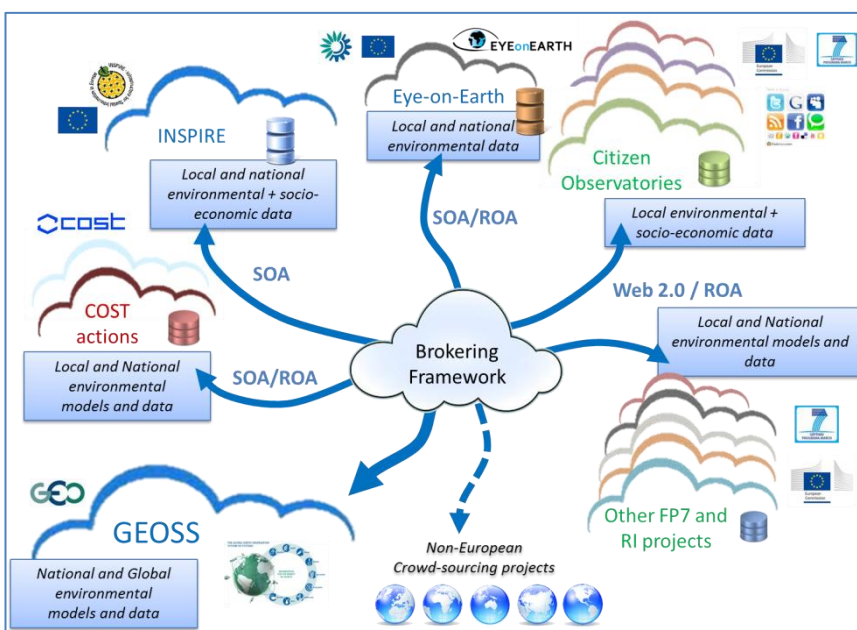
- From the official data perspective the project builds on 27 EU countries, Switzerland and Norway currently implementing INSPIRE, and the open data strategies of the official data providers in Austria, Italy, France, Germany, Czech Republic, and the UK who are partners of the project.

⁴ http://www.earthobservations.org/documents/geo_vi/12_GEOSS%20Strategic%20Targets%20Rev1.pdf

- From the citizens' data side, the project builds on the data and methodologies that will be published by five FP7 Citizen Observatories (COBWEB, Citclops, CITI-SENSE, OMNISCIENTIS, WeSenseIt) and two environmental actions (ENERGIC, and Mapping and the Citizen Sensor) of the European Cooperation on Science & Technology programme (COST www.cost.eu).
- From the research side, OpenDataGEOSS builds on many projects represented in the partnership. EuroGEOSS (www.eurogeooss.eu) and GEOWOW (www.geowow.eu) address multi-disciplinary interoperability across forestry, drought, biodiversity, weather, ocean ecosystems, and water runoff. GeoViQua (www.geoviqua.eu) and UncertWeb (www.uncertweb.org) address the analysis and visualisation of data quality and uncertainty. NETMAR (<http://netmar.nersc.no/>) develops a pilot European Marine Information System (EUMIS) integrating satellite, in-situ and model data from ocean and coastal areas. Similarly, MEDINA (<http://www.medinaproject.eu/>) provides marine ecosystem dynamics and indicators for North Africa, and EarthServer (<http://www.earthserver.eu/>) deals with Big Earth Data Analytics. EO2HEAVEN (<http://www.eo2heaven.org>) combines Earth observation, in-situ data and sensors to address environment and health issues, while the ENVIROFI project (<http://www.envirofi.eu>) extends these concepts as part of the Public-Private Partnership Programme on the "Internet of the Future" funded by DG CONNECT. In the USA, EarthCube is addressing the next generation cyberinfrastructure for science (<http://earthcube.ning.com>) and the applications of brokering for multi-disciplinary interoperability. The GEO User Requirement Registry (<http://www.scgcorp.com/urr/>) is another important contributor to the project, acting as a knowledge base to link data, models, requirements, and user feedback (Plag et al. 2010). It will be complemented by other related projects like BioVeL (www.biovel.eu) that allows researchers to build and re-use analyses expressed as workflows. BioVeL contributes to LifeWatch (<http://www.lifewatch.eu/>) and to the Common Operations of Environmental Research Infrastructures (ENVRI) (<http://envri.eu/>). **Building the networks between infrastructures addressing environmental policy (like INSPIRE), with ESFRI research infrastructures like LifeWatch and those represented by ENVRI, and reusing research to spur innovation is putting the Innovation Union into practice.**

The Brokering approach to the Network of Networks: OpenDataGEOSS has a clear and proven strategy to link all the different infrastructures, initiatives, and projects outlined above and create a Network-of-Networks: the brokering framework. This framework was developed by the project partners in the EuroGEOSS project, and then extended in GEOWOW, GeoViQua, and EarthCube. Essentially, it is middleware that connects multiple infrastructures and systems (each with its own community, standards, formats, and practices) and builds bridges to them without requiring additional work from these contributing systems (Nativi et al., 2012).

Figure 2: the OpenDataGEOSS Brokering Framework.



The brokering framework is the "glue" of the Network-of-Networks and makes it possible to discover, transform, and access data from heterogeneous networks (including social networks) or run models on the web through Composition-as-a-Service and workflow functionalities. This approach lowers entry barriers significantly for global and multi-disciplinary interoperability. This was demonstrated at the 2011 GEO Plenary when the inclusion of the brokering framework in the GCI made it possible to increase the number of information resources available in the GCI from a few hundreds to over 28 million in a few months. As a result of this success,

the EuroGEOSS Broker has become a key component of the GCI in 2012, and is now known as the GEO Discovery and Access Broker (DAB). More recently, key data systems, like the WMO Weather Information System, UNEP Live (www.uneplive.org), OneGeology (www.onegeology.org) and the EEA's

Eye on Earth network (<http://www.eyeonearth.org>) have been successfully brokered. OpenDataGEOSS builds therefore on this very solid foundation.

Scientific and Technical Objectives

The call identifies the following objectives:

1. Using open, readily accessible and freely available Earth Observation data and information, enable wide access to scientific data,
2. Allow researchers in different domains to collaborate on the same data sets,
3. Ensure seamless interoperability of data catalogues,
4. Engage in entirely new forms of scientific research and explore correlations between research results,
5. Using models, innovative environmental tools and information products, based on accepted standards, deliver benefits to researchers, European end-user agencies, the industrial sector, policy makers, and citizens, across environmental knowledge domains.

In the following paragraphs we describe the activities of OpenDataGEOSS to meet these objectives.

Interoperability of Systems and Sciences

OpenDataGEOSS will:

- Extend the brokering framework to combine data coming from Service Oriented Architectures (like INSPIRE and GEOSS), Resource Oriented Architectures (like Linked Data), and Event-based Architecture (Sensor Web). It will develop a methodology for the automatic generation of Resource Description Framework (RDF) vocabularies from the INSPIRE data models. This will be a major contribution to the integration of INSPIRE into e-government open data strategies. The project will also advance work on the GEOSS Service Factory, developed in EuroGEOSS, to facilitate the publication and semi-automatic documentation of data, models, and workflows through web services, and develop Web Open Application Programming Interfaces (APIs) for the brokering framework to enable re-use by external clients and applications (**Obj. 1 and 3**).
- Develop a collaborative environment for the semi-supervised matching of concepts across multiple thesauri and ontologies that are necessary to facilitate data tagging, indexing, and searching across very heterogeneous data sources, including for example vernacular geographical place names used by the public. This activity will be in close collaboration with projects on semantic assets and vocabularies in the Interoperability Solutions for Public Administration programme (<http://ec.europa.eu/isa/>) to align results with e-government activities (**Obj. 2**).
- Identify the ethical and legal issues that arise from the access and reuse of citizens-provided data and evaluate the mechanisms necessary to protect confidentiality, such as anonymising, aggregating, and clustering the data, and assessing quality including scoring, and cross-referencing. These activities extend work in previous projects (EuroGEOSS, GeoViQua, UncertWeb), and in the Citizen Observatories participating in the project (**Obj. 2**).
- Identify and test visualisation rules for Linked Data and services to enhance portrayal of spatial data defined in INSPIRE and contribute to achieve “visualization interoperability” (**Obj. 2**).
- Contribute to the Open GEOSS Model Web (Mazzetti et al. 2011), by developing a new brokering component/service to compile abstract scientific business processes provided by the three thematic domains through a dedicated activity to elicit and formalise business processes in each of the thematic case-studies which will then feed the GEO User Requirement Registry (URR). From these processes, the project will generate executable workflow fragments that can be reused by other scientists using different engines (e.g. JBoss, Taverna, etc.). This activity will build on: (a) the NETMAR and UncertWeb prototypes for models accessibility, (b) the activities on process and event reasoning from ENVISION, (c) the service-based geoprocessing and modelling tools sharing platform from EO2HEAVEN, (d) an innovative interaction with the GEO URR (**Obj. 4, 5**).
- Bring the project developments and outcomes to users to increase the impact of the project. This will be achieved through the project partners, and collaboration with the EEA. Wider international dissemination activities will be pursued through a network of international collaborations. Emphasis will be placed on expansion of SME opportunities in the network of collaborations (**Obj. 5**).

Thematic Applications in the areas of Freshwater and Marine Environments, Urban Sustainability, and Biodiversity.

The three thematic areas addressed by OpenDataGEOSS reflect key priorities of the EU following the Rio+20 United Nations Conference on Sustainable Development (<http://www.uncsd2012.org/>) and are situated at the intersection between two or more Citizen Observatories and COST actions in the project. In this way, we address major policy and scientific issues, and ensure that we develop appropriate mechanisms for the use of the data published by the observatories, their integration with official data, and their further input as European contributions to the GEOSS Data CORE. The applications described below use open data and models, and are enabled by the OpenDataGEOSS brokering framework to connect authoritative (i.e. INSPIRE, GMES, GEOSS) and non-authoritative (i.e. Citizen Observatories, COST) networks and digital infrastructures. The applications develop innovative environmental tools and information products, and involve the collaboration across disciplines required by **Objectives 4 and 5** of the call. The benefits derived will be measured through the activities identified in WP 6.

Water and Marine Environments

The increasing demand by citizens and environmental organisations for cleaner rivers, lakes, groundwater, coastal beaches and the sea, has led the European Commission (EC) to put water protection as one of its key priorities. The EC has adopted the Water Framework Directive (WFD) (2000/60/EC) as the central instrument for protecting freshwater and groundwater quality, and the Marine Strategy Framework Directive (2008/56/EC) for protecting marine environments. Utilizing the low-entry-barrier intermediation services offered by the OpenDataGEOSS brokering framework, the applications outlined below integrate non-authoritative and authoritative resources and observations to address critical challenges, such as the monitoring of biodiversity and water quality in aquatic systems, invasive species, and fluvial flooding. In particular in this thematic area, the following applications and scenarios are considered:

- Monitoring of whales in the Mediterranean through citizen scientists travelling on board of ferries who detect cetaceans and record information (such as sighting position, environmental condition). A mobile APP will be developed that provides information about marine mega-fauna that could be encountered during ferry trips and can be used to collect species sighting data.
- Advance the collaboration between hydro-meteorologists and citizen scientists to address fluvial flooding. Building on the DHRIMS (Distributed Research Infrastructure for Hydro-Meteorology, www.dhrims.eu) platform, this application will include ways to publish data so that they are more usable by the public to advance the current flood alerts procedures. The project will apply the lessons learnt from the application developed by Shoothill (<http://www.shoothill.com/floodmap>) and recently integrated in the official web site of the UK Environment Agency.
- Lake monitoring in the UK. The target audiences are the three UK environment agencies (EA, SEPA, NIEA) and water utilities who have a statutory requirement to ensure safe surface waters for public recreation and water supply for drinking and irrigation. This pilot will link existing automatic water quality monitoring stations run by CEH, with optical measurements from the UK GloboLakes project, crowd-sourced observations from Citclops (since these lakes have regular recreational users) and water quality measurement development based on aquatic devices (such as the Ziphius or SUBA by Ydreams-A).
- Improve the capabilities of the Italian information infrastructure on marine non-indigenous species by developing ad-hoc mobile applications for tablet and smart phone that help gather observations from fishing communities and material (photos and videos) produced by diving communities, and integrating these observations with data coming from existing environmental monitoring and scientific networks such as SinaNET (www.sinanet.apat.it) and GIIDA (<http://www.dta.cnr.it/content/view/2735/244/lang,en/>)

Sustainable Cities and Quality of Life Indicators

OpenDataGEOSS will address those aspects of sustainability that highlight livable cities and quality of life in urban environment. The background principle is “Beyond GDP” (<http://www.beyond-gdp.eu>), based on the concept that criteria applied to evaluate progress consist in both economic and social and environmental dimensions which include notions of inequality and equity⁵ (see also Agenda 21 “Promoting sustainable human settlements development⁶”). These documents reflect the need to find

⁵ <http://www.uncsd2012.org/content/documents/814UNCSD%20REPORT%20final%20revs.pdf>

⁶ <http://sustainabledevelopment.un.org/index.php?menu=222>

new indicators able to measure and assess the multiple facets of modern living. Building on the brokering framework capabilities for interconnecting diverse web-based networks and systems, these applications will compare indicators from official sources with new ones that include also the perceptions by citizens of their environment, quality of life, and service provision. The applications will harness user-generated information from in-situ campaigns coordinated by the ENERGIc COST action, and data published by the OMNISCIENTIS observatory. Both projects are partners of OpenDataGEOSS. Interoperability with the CITI-SENSE Citizen Observatory will also be tested (through the brokering framework) to re-use some of the data it publishes in nine European cities. In particular in this thematic area, the project will:

- Identify key dimensions of sustainability and quality of life in urban ecosystems that can be based on user generated data and Open Data. The major dimensions will include: environmental quality; cultural and recreational ecosystem services; quality of public services. Particular attention will be given to considering both the perceptions of local residents and those of public environmental authorities.
- Collect available open source data from authoritative sources (Eurostat, EEA, etc.) and user generated measurements and perceptions and develop indicators that can be used to measure the dimension of sustainability and quality of life identified above;
- Develop innovative applications enhanced with gaming techniques, to encourage users to provide content about their environment and their behaviour, and services that will adapt this information to be published and become ready-to-be-consumed by the GEOSS Common Infrastructure (GCI).
- Test the applications and indicators in five case-studies addressing the different dimensions identified above. Four case-studies take place in Europe (Italy and Belgium to start with) focussing on the quality of urban ecosystems, cultural change and sense of place in urban renewal, odour nuisance, and noisescapes. A fifth case-study tests these same indicators in the Gauteng City Region, South Africa, in cooperation with the Global Change and Sustainability Research Institute (GCSRI) of the University of the Witwatersrand, Johannesburg. The comparison between these different settings will provide evidence on the robustness of the indicators developed and the usability of the applications in different contexts.

Biodiversity and Ecosystems

The biodiversity and ecosystems applications build on the brokering services provided by OpenDataGEOSS and define an initial set of scenarios reusing and integrating in novel ways heterogeneous data sources from citizen observatories (e.g. Geo-Wiki, COBWEB, Non-native species networks and others), social networks (e.g. Twitter, Flickr) and official sources (e.g. LTER Europe and Austrian Open Data). These scenarios address critical challenges, such as the monitoring and assessment of official land use classification and data on fauna, flora and vegetation, forest dynamics, alien invasive species presence, and sensitive ecological sites. In this thematic area, the following scenarios and applications are envisaged:

- Development of a Game-based Geo-wiki to visualize land cover and other environmental datasets from the Austrian Environment Agency and from citizens. A game called photo-caching (a variant of geo-caching) will be designed to collect geo and orientation-tagged photos in areas of highest interest which can be used to validate the various thematic datasets.
- Monitoring the spread and impact of alien invasive species using the brokering framework to link data from the European Alien Species Information Network run by the JRC (<http://easin.jrc.ec.europa.eu>), with data from citizen data such as Irecord (<http://www.brc.ac.uk/irecord>) and the COBWEB Citizen Observatory, and the EEA's Nature Watch under development, to support the detection and reporting of non-native species and providing such data to inform policy decisions. This scenario demonstrates the feedback between publicly collected information, better-informed decision-making and motivation of citizen science.
- Two case-studies in Italy and Poland will validate official and citizen sources data from protected sites (e.g. Natura2000) deriving methods for assessing the reliability and consistency of heterogeneous data and enabling citizen involvement in annotation of official species occurrence and remote-sensed habitat data sets.

1.2 Progress beyond the state-of-the-art

The information landscape in Europe and other parts of the world has been changing rapidly in the last decade, and promises to continue to do so for the coming one. Technology, policy, and social attitudes are all playing a part. We focus here on the situation in Europe, but of course many of the issues raised apply beyond Europe.

1.2.1 Policy: Towards Open Data

Many of the current policy trends towards opening access to public sector information can be traced back to the early 1990s, and the Delors White Paper on Growth, Competitiveness, Employment (Delors, 1993) which recognized the upcoming challenges of globalisation, and the difficulty for Europe to compete with other parts of the world given its higher labour costs and fragmented markets. The paper argued for further integration of the European Single market, greater investment in trans-European networks and research, and more focus on the Information Society and emerging technologies. The development of the “Information Society” in Europe found a legal basis in the 1993 Maastricht Treaty that gave the European Union responsibility in matters of trans-European networks in the transport, energy, and telecommunications sectors. At a time of high structural unemployment, the European Commission saw the development of an information-based society as the key to new job opportunities in the medium term. This vision and the opportunity to exploit information technology to modernize government and provide better and cheaper services continued to receive high-level political support through the 1990s. Although more recently, access to information has become also an important component of the democracy and governance debate, it is important to recognize that the initial impetus was economic competitiveness. Twenty years later, we seem back to square one, with a large financial crisis, and a big push towards Open Data as the key to unlock the goldmine on which public administrations are sitting (EC, 2011). Although much has changed in Europe during these twenty years in terms of access to information and electronic services, extensive reviews of the scientific literature show little evidence to validate the assumptions that greater access to data, per se, leads to increased innovation, growth, and competitiveness. The majority of the studies belong to the category of ex-ante assessments on what could be the impact of Open Data on the society from different perspectives. For example, the MEPSIR (2006) estimated through an extensive questionnaire the Public Sector Information (PSI) re-use market for the 25 European Member States plus Norway at €27 billion, while Vickery (2011) borrowed methodologies from previous studies to estimate that the aggregate economic impacts of PSI would be in the order of €143 billion for 2008. On the other hand, Fioretti (2010) recognises some drawbacks of Open PSI, such as the apparent destruction of jobs in the Public Administration, which others argue could be substituted by more interesting jobs (see also Merrill, 2011). Another risk is to “empower the empowered” because the initial benefits are only for those that already have connectivity and familiarity with data handling. Dangers of open data might also have to do with the difficulty of many people to understand and correctly analyse the data that are made available.

Against this dearth of evidence on the economic and social benefits of increased access to PSI, OpenDataGEOSS will advance our knowledge in this field by analysing the benefits of Open Data on the innovation opportunities for SMEs, and assessing how the combination of official and citizen data can also provide social and environmental benefits. **Increasing access and moving from data to information are two of the many areas where OpenDataGEOSS will move Europe beyond the state of the art.**

1.2.2 Multi-disciplinary interoperability

The serious challenges in the global environment demand a renewed and more integrated effort to connect research activities and produce solutions together with stakeholders from government, business and civil society. The Earth System Visioning process for the next decade of Earth system research (ICSU 2010) and the science strategy development by the Belmont Forum (2011) highlight these issues and needs; UNEP (2012) identifies similar recommendations and envisions a new contract between science and society. If the science community is to find solutions to these challenges and inform decision makers with essential information, it will need to be more interdisciplinary, drawing on natural, economic and social sciences, work with stakeholders to answer research questions, and communicate and implement solutions more effectively.

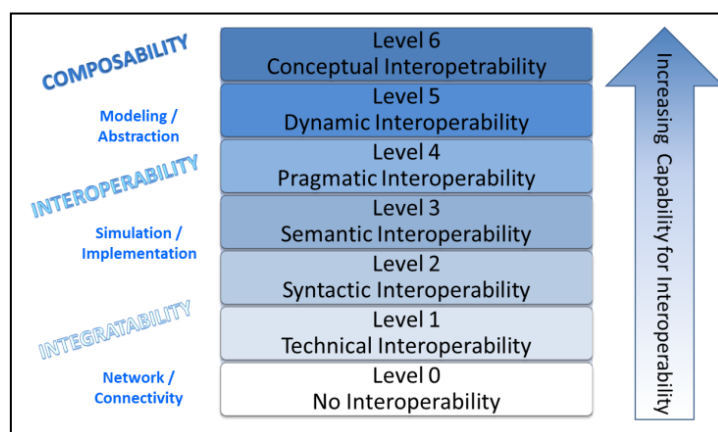
The rising tide of digital data globally available creates many opportunities for science to address these challenges, and indeed in recent years, we have seen an impressive development of e-infrastructures in

many disciplines like the WMO Information system (WIS)⁷, the Global Biodiversity Information Facility (GBIF)⁸, the Pan-European Infrastructure for Ocean & Marine Data Management (SeaDataNet)⁹, the US CUAHSI Hydrologic Information System (HIS)¹⁰, the IODE infrastructure for oceanographic data and information exchange¹¹, and a global geology information network, OneGeology¹². Others are under development under the EC research infrastructures programme, including: the European Plate Observing System (EPOS)¹³ and the GEO Biodiversity Observation Network (GEO BON)¹⁴, GMOS (Global Mercury Observation System)¹⁵, EISCAT (European Incoherent Scatter)¹⁶, EMSO the European Multidisciplinary Seafloor Observatory¹⁷, Euro-Argo: European contribution to the ARGO programme of buoys reporting sub-surface ocean properties¹⁸, ICOS: a research infrastructure to track carbon fluxes in Europe and adjacent regions¹⁹, and LifeWatch: the European infrastructure for biodiversity and ecosystem research²⁰. These environmental research e-infrastructure are clustering in the ENVRI project²¹.

These infrastructures serve their disciplinary communities well, but to meet the scientific and social challenges of the 21st century we need a new breed of data infrastructures that are based not only on the interoperability of systems but also the interoperability of multiple disciplines in the physical and social sciences, engineering and the humanities (ICSU, 2010).

Interoperability is not an on-off capability; there are various levels of interoperability. Different models already exist and are used successfully to determine the degree of interoperability implemented by a disciplinary infrastructure. One of them, the Levels of Conceptual Interoperability Model (LCIM) (Turnitsa, 2005) is shown in Figure 3.

Figure 3. Levels of conceptual interoperability



For instance, a Community exchanging files over the Web implements level-2 interoperability, utilizing “a common structure to exchange information”; while, level-3 introduces a common information exchange reference model to share data meaning. Several advanced disciplinary or domain infrastructures implement level-3 interoperability utilizing the recent instruments provided by Information Technology e.g. XML and Web service technologies, RDF and Linked Data technologies, etc. Communities are still working to attain level-4 (where the

use of data – or the context of its application – is unambiguously defined and shared), level-5 (the effect of the information exchange within the interoperable systems is unambiguously defined and shared), and level-6 (conceptual models are documented –in a neutral way- and hence aligned). Implementing the last three interoperation capabilities is a challenge which requires the agreement of the entire Community working within a given domain or discipline. Advanced technologies (such as the brokering approach introduced below) can move interoperability to a higher LCIM level and be a vehicle for enabling broader and sustainable interoperability and composability, especially in a multi-disciplinary approach.

⁷ http://www.wmo.int/pages/prog/www/WIS/overview_en.html

⁸ <http://www.gbif.org/>

⁹ <http://www.seadatanet.org/>

¹⁰ <http://his.cuahsi.org/>

¹¹ <http://www.iode.org/>

¹² <http://www.onegeology.org/>

¹³ <http://www.epos-eu.org/>

¹⁴ <http://www.earthobservations.org/geobon.shtml>

¹⁵ <http://www.gmos.eu/>

¹⁶ <http://www.eiscat.se/about>

¹⁷ <http://www.emso-eu.org/management/>

¹⁸ <http://www.euro-argo.eu>

¹⁹ <http://www.icos-infrastructure.eu/>

²⁰ <http://www.lifewatch.eu/>

²¹ www.envri.eu/

Strategy for achieving multi-disciplinary interoperability: Interoperability across different disciplines can be achieved by either:

1. interconnecting the existing (or under-development) disciplinary/domain infrastructures –this may be considered as an infrastructure of infrastructures or a “system of systems” approach; or
2. developing a new overall infrastructure that covers all the Earth Sciences disciplines.

The first approach applies the “separation of concerns” pattern (Reade, 1989), the main goal of which is separating a system into distinct features that overlap in responsibility as little as possible. This is achieved by ensuring that the disciplinary infrastructures within a system adhere to a single and unique purpose –i.e. the need to address disciplinary community requirements. An advantage of this approach is that disciplinary/domain communities are permitted substantial autonomy and are free to develop and improve their infrastructures while contributing, at the same time, to a cross-domains infrastructure.

The second approach applies the “federation architecture” pattern: interoperability is achieved by implementing a common information model, common principles and even a common technical architecture –they are the federation interoperability standards. The federated systems (i.e. the disciplinary infrastructures) maintain as much autonomy as possible, but they must also conform to the federal information model for information sharing with the result that there is an overlay of control of their interactions by means of an export schema and an import schema (Heimbigner and D. McLeod, 1985).

Each approach has its advantages and disadvantages but in very large and heterogeneous ecosystems of information infrastructures, the federated approach results to be more complex, lacking in flexibility, and difficult to sustain in view of the continuous evolution in standards, and practices in each of the federated systems. In view of these challenges, the EuroGEOSS project developed a Brokering approach, based on the following principles:

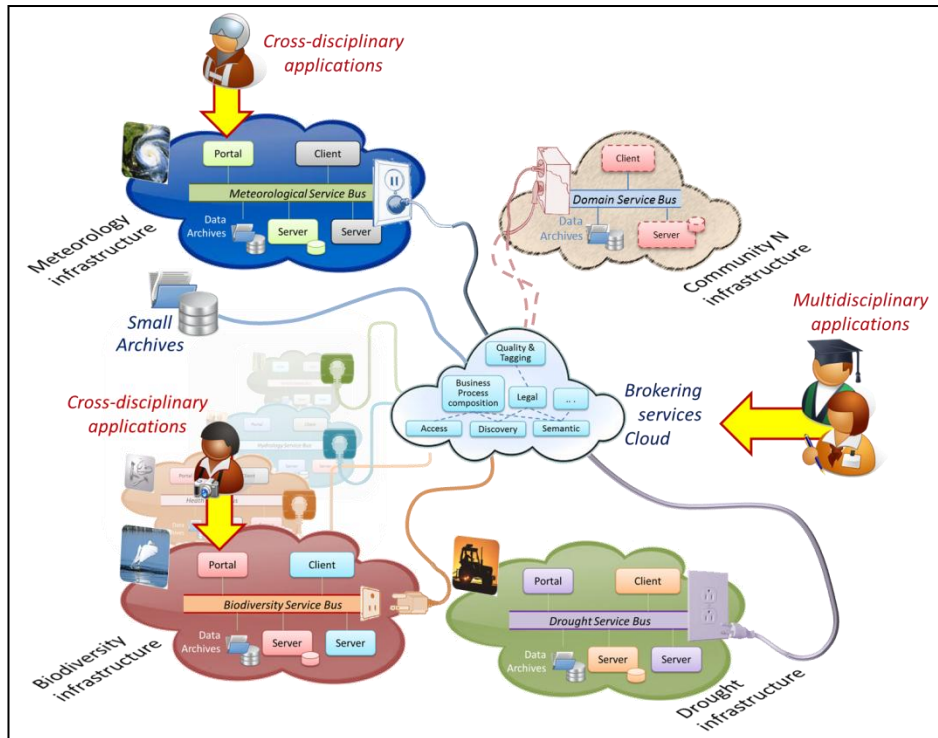
- a. **Autonomy:** keep the existing disciplinary infrastructures as autonomous as possible, not asking them to implement any "more general" service bus.
- b. **Subsidiarity:** supplement but not supplant disciplinary infrastructure mandates and governance arrangements by interconnecting and mediating their service buses.
- c. **Interconnection:** build incrementally on existing infrastructures and introduce distribution and mediation functionalities to interconnect the heterogeneous service buses characterizing any domain specific or other infrastructure.
- d. **Low entry barrier:** assure a low entry barrier for both users and resource providers of any disciplinary infrastructure.
- e. **Flexibility:** be flexible enough to accommodate existing and future information systems and information technologies that will augment the service bus implemented by any discipline.
- f. **Effectiveness:** Address the full range of information exchange needs (discovery, access, semantics, workflow, etc.).

In practice, the brokering approach introduces a middleware of components interacting with the different service buses of the disciplinary infrastructure. By “service bus” we mean the set of standards, protocols, interfaces, and agreements that enables communications among network-based systems. Whilst the federated approach, like INSPIRE, mandates the specification of a common service bus for each participating infrastructure so that interoperability is achieved, in the Brokering approach each infrastructure can maintain its own set of specifications, with the Brokering framework taking on the work of bridging across these different protocols, and interfaces (see Figure 4). Brokers realize the necessary mediation, adaptation, distribution, semantic mapping, and even quality checks required to address the complexity of a multi-disciplinary infrastructure built by interconnecting disciplinary infrastructures–i.e. their service buses (Nativi et al. 2012).

Brokers can do much more than just facilitate discovery and access of available resources: they may implement new capabilities for multidisciplinary Users and Data/Information Providers, such as:

- Advanced/semantic discovery;
- Resource tagging and clustering of results;
- Quality control;
- Data pre-processing and transformation (e.g. for data download on a common grid);
- Workflow management and model interconnection.

Figure 4: the Brokering approach



Several types of brokering services have been developed and tested. They include:

- The Discovery broker allows searching across multiple infrastructures adopting different protocols.
- The Access broker includes a set of transformations on the dataset identified during the Discovery, so that the user can select a subset by time and geography, change the coordinate reference system, and download or prepare the datasets for subsequent processing so that they are already on a common geographic and temporal framework.
- The Semantic Broker accesses a set of aligned vocabularies so that the user can navigate across the different concepts held in the vocabularies and select those more relevant to expand the search for relevant data or services
- The Quality Broker makes it possible to extend the quality descriptions of the data by providers and more crucially include user feedback on fitness for purpose.
- The Social Network Broker allows searching through a range of well known social networks using the OpenSearch protocol and retrieve relevant resources (Tweets, photographs, etc.)
- The Business Process Broker allows taking a high level description of a business process (e.g. in Business Process Modelling Notation) and feed it together with the data inputs identified through the discovery and access brokers on a number of different workflow engines to generate the desired output.

The discovery and access brokers are the most mature and, along with a limited version of the semantic broker, have already been deployed in the GEOSS Common Infrastructure (GCI), being called GEO DAB (GEO Discovery and Access Broker). **The OpenDataGEOSS Advanced Capability builds on and extends the GEO DAB.** The other brokers are at various stages of development and the major contribution of OpenDataGEOSS will be:

- To extend the present semantic broker with new methods for aligning new vocabularies and semantic assets,
- To develop further the social network broker for communications with citizen science and crowdsourcing mechanisms,
- To develop further the capabilities of the business process broker and include that in a wider Model Web framework so that it could make use of (i.e. broker) the capabilities offered by: (a) ontology and geo-processing repositories as well as (b) well-used workflow engines,
- To develop further the quality broker for addressing the quality challenges characterizing citizen science and crowdsourcing data.

1.2.3 Citizens as Producers of Information

Participatory approaches in research and governance are not new. There is long tradition of calling on volunteers to provide information relevant to science, as for example the Birdcount in the USA (<http://www.birdsource.org/gbbc/>) and Spring Watch in UK (<http://www.bbc.co.uk/nature/uk/>). What has made a significant difference recently is the diffusion of Internet-based and social networks as media to increase the participation of the public in reporting news, providing information on natural disasters, traffic, tourist information and so on. New technologies, e.g. Web 2.0 platforms, mobile internet and social networking access through smartphones, enable the public to contribute and participate on an unprecedented scale and have led to many and diverse initiatives using information by citizens (Elwood, Goodchild, and Sui 2011).

To understand the potential of this change it is worth noticing the amount of social information produced daily in the last years and now. In August 2006, geotagging facilities at Flickr started to operate; and by the year of 2007, more than 20 million geotagged photos had been uploaded to Flickr. In August 2011, Flickr announced its 6 billionth photo, with an increasing 20% year-over-year, over the last 5 years (<http://blog.flickr.net/en/2011/08/04/6000000000>). Similarly, Twitter was launched in 2006. The increase in number of message is impressive: In 2010, the average number of Tweets sent per day was 50 million (<http://blog.twitter.com/2011/03/numbers.html>), while in March 2012 it was 340 million (<http://blog.twitter.com/2012/03/twitter-turns-six.html>). Also in 2010, the geotagging feature of the tweets was added. Although the amount of geo-enabled messages is around 1 percent of all messages, this still means one million geotagged information messages per day.

The universe of Volunteered Geographic Information (VGI) (Goodchild, 2007) is not uniform and understanding the different components and perspectives is important to develop the strategies necessary to assess the quality of the VGI provided (see Coleman et al. 2009, p. 341). Simplistic notions that only experts actively providing VGI would be quality assured need to be re-assessed. In the first instance, one needs to be clear about who is an “expert” in what. Professional expertise has recognized standards to adhere to but in many instances local knowledge may be just as valuable (Goodchild, 2009). In other cases the cumulative knowledge of a community can achieve high quality results as in the case of Wikipedia or approaches in which volunteered contribute within a rigorous methodological framework as was the case for Seti@Home, or the Birdcount, or organised efforts such as OpenStreetMap. Research on the volunteers contributing to Wikipedia has been reported by Coleman et al. (2009) but a lot more research needs to be done in relation to VGI and its quality assessment. This is a concern also for the EC-funded Citizens Observatories.

Currently, the quality assessment of VGI is relying heavily on human volunteers, such as the Stand-By-Task-Force in times of crisis events. This approach has proven to work well on several occasions. However, the increase in VGI from all over the globe will lead to problems of sustaining and scaling these efforts, calling for an automated approach that lets volunteers handle the difficult cases only. Research at the JRC (Craglia et al. 2012) has developed such an automated workflow for mining, assessing, clustering and validating information from social networks in the case of forest fires in Europe. The workflow was able to extract some 22 million Tweets and photos from Flickr relevant to forest fires in France in 2011 and arrive to 11 spatio-temporal clusters that could be validated against official information from the European Forest Fires Information System (<http://forest.jrc.ec.europa.eu/effis/>). Much has been learned from this research, but the review of current literature shows that fundamental guidelines on the factors that influence successful and lasting participation are still missing, and many initiatives and projects are re-inventing the wheel every time. To a certain extent, this is to be expected for new and innovative approaches that are developed and applied in a decentralized context. It is now time to identify common variables of successful and failed projects. OpenDataGEOSS will build on the experiences of five Citizen Observatories, two participatory COST networks, and case-studies in the three thematic domains of the project to reflect critically on the collective lessons learned. The project offers an opportunity to develop a new model for participative science in which data from heterogeneous sources is integrated through workflows that cover the full cycle from semantic search of information resources, to discovery, quality assessment, transformation and access, aggregation, analysis, and publication of the derived results for new use. Crucially, the project develops interoperability across scientific domains and user-types (from expert to non-expert) by documenting not only data but also how the data are used for different purposes through workflows (translating data into information), which are then composed as services chains and made reusable. This full-circle information flow will advance substantially our knowledge and practice of Science 2.0 (Burgelman et al. 2010) and contribute to the expected outcome of the call.

1.2.4 Sensor Web Enablement and Citizens' Observations

The observations made by citizens through mobile phones or other devices are part of the broader category of geosensing. Geosensing can be defined as the process of measuring and transmitting environmental stimuli that can be geographically referenced. As such they include satellite-based sensors providing multi-spectral information about the Earth's surface (imagery, land cover, vegetation indices and so on), air-borne sensors for detailed imagery but also for laser scans of physical or man-made structures (LiDAR), and sensors near, on, or under, the Earth's surface measuring anything from physical characteristics (pressure, temperature, humidity) and phenomena (wind, rain, earthquakes) to the tracking of animals, vehicles, and people. Large-scale networks of sensors have been in existence for several decades. Examples include the network of the World Meteorological Organization and the Argos network of buoys measuring temperature and salinity of the world's oceans. What is novel is the web-enablement of these sensors and their networks so that individual sensors can be discovered, tasked, and accessed through web standards (sensor web), and that the networks can exchange information through interoperability arrangements. The new Sensor Web Enablement (SWE) version 2.0 suite has been recently released across all core SWE specifications (SOS, SPS, O&M, SWE Common, SensorML) (Bröring et al. 2012; Simonis and Echterhoff 2011; Cox 2011; Robin 2011; Botts 2007). Specifically, the advancement of the Sensor Model Language (SensorML) (Botts, unpublished) is the only remaining development standard prior to the full release of SWE2.0.

The combination of web-enabled physical sensor networks and networks of citizens reporting on their environment through both qualitative, and quantitative measurements, offers a new opportunity to develop "Digital Earth" meaning a more participative and dynamic framework to understand the relationship between the physical and social environment (Craglia et al. 2012; Goodchild et al. 2012). The research challenges to develop and use Digital Earth are several (Craglia et al., 2008) but OpenDataGEOSS will advance the state of the art by developing an advanced framework for the integration of both qualitative and quantitative data coming from multiple heterogeneous sources (official data, citizens, sensors), and will make a substantial contribution to sensor web research by developing specific applications profiles and data encodings applied to environmental and sensing observations from citizens. OpenDataGEOSS will also help transform massive observational data from Citizen Observatories into large networks of quality-assessed data sets, by developing an Open Data Network-of-Networks. This network-of-networks will combine the linked data paradigm (Granell et al. 2011) and Semantic Web technologies so as to cover the full cycle from semantic search of data resources, to discovery, quality assessment, transformation and access, aggregation, analysis, and publication of the derived results for new use.

1.2.5 Integrating INSPIRE with e-Government and citizen data

Over the coming years, a wealth of authoritative data will become available across Europe through INSPIRE. However, there is one key obstacle that prevents effective re-use and integration of this data with data from other sectors (e.g. e-Government) or contributed by citizens. While INSPIRE builds on the principles of Service Oriented Architectures (SOAs) and standards specific to the geospatial domain (e.g. GML), e-Government and citizen data mainly rely on the Linked Data approach and mainstream ICT standards (like RDF). OpenDataGEOSS will overcome this issue by developing a methodology to automatically generate Resource Description Framework (RDF) vocabularies based on the data models developed in the INSPIRE Data Specification process. This process will make it possible to make available INSPIRE data in accordance with the Linked Data approach without loss of information or context. This not only facilitates the integration with data from other sources already structured using a Linked Data approach, but also it makes it easier to re-use INSPIRE data models, whenever appropriate, also outside the geospatial field, thus contributing to cross-sector semantic interoperability.

Another issue preventing effective data re-use and integration is the different terminologies used, even in the same sector, to semantically annotate data and metadata. Due to this, it is not possible to exploit the flexibility and effectiveness of enhanced search and filtering mechanisms, based on semantic annotations, across different data sets. By building on work carried out in the EC ISA programme, INSPIRE, and GEOSS, the project will address this issue by establishing semantic and multilingual interoperability across disciplines and domains (e.g. environmental sciences, public policy, social media). In particular, the project will create the necessary links among related concepts in different semantic assets such as ontologies, thesauri, vocabularies, and code lists. Such links will then be used to make cross-sector data discoverable based on their semantic annotation and relationships. This will advance multi-disciplinary and multi-lingual interoperability.

1.2.6 Monitoring the Marine Environment

The status of Europe's coastal waters and changes in their composition are subject of concern. Not only is the absolute amount of nutrients input varying, but there are also changes in the ratio of nutrients leading to changes in species compositions and bloom timings. Water quality is a main concern of monitoring-agencies and the public, and it is subject of several European directives (e.g. Water Framework Directive, and Marine Strategy Framework Directive) and regional conventions²². The Marine Core Service (MCS)²³ is a major reaction of the European Community to this concern, underpinning the relevance of the marine environment for Europe. As an upstream service it provides relevant data on the status of our oceans and coastal waters to all interested research and management communities in Europe and beyond. The first downstream GMES services for water quality observations from space are FP7 projects AquaMar (<http://www.marcoast.eu/>) (closely linked to the ESA-GSE services project MarCoast), CoBIOS (<http://cobios.eu/>) and ASIMUTH (<http://www.asimuth.eu/>). With respect to citizens directly gathering data in the marine environment, a few initiatives exist, e.g. the TeamSurv project (<http://www.teamsurv.eu/>), where mariners can collect and contribute depth and position data from onboard sensors, which are then used to improve coastal charts. These data are relatively reliable and integration straightforward. On the other end of the technology and integration scale, there are many websites devoted to sharing information amongst communities of users, normally by commentary and photos with selected accompanying but non-integrated official data. For example, Magicseaweed (<http://magicseaweed.com/>) presents swell, wind and pressure forecasts alongside user comments and photos of surf to indicate the best places to go surfing. With the majority of these, the citizen and official data are simply presented alongside one another with no integration or combination and knowledge extraction. An alternative approach that avoids the data gathering difficulty is to use crowd-sourced analysis of official data to perform knowledge extraction by inviting visitors to help classify data or identify interesting features. The inconsistency of responses is partially filtered by using "the wisdom of the crowd" or, in other words, by ensuring multiple individuals attempt each analysis, and selecting only those where a clear majority view prevails. Simple, "gamified" interfaces are critical to making the work appealing and fun, and thus gaining a good response rate. An excellent example of this in the oceanographic domain is the Seafloor Explorer (<http://www.seafloorexplorer.org/>), where images of the sea bottom containing marine life can be classified into fish, scallops, sea stars, etc. with a simple web interface allowing accurate location and size estimates to be extracted. OpenDataGEOSS will build on these experiences and work and assess through the case-studies the opportunities for integrating data from multiple sources to improve the monitoring of marine research relevant variables.

1.2.7 Measuring and Assessing Urban Sustainability

Cities are the best environment for accessibility, service supply, occupation potential, but the worst in terms of environmental quality (pollution, congestion, criminality, etc.). Cities reveal one of the paradoxes of contemporary development processes: while density and public services significantly reduce per capita demand of natural resources, the increased affluence of city residents correlates with increased consumption. Therefore, the understanding of what is happening economically and socially in European cities matters tremendously for policy-makers to identify more sustainable models of development. Cities have been analysed for a long time to assess their weaknesses and strengths and identify appropriate interventions and policies. Urbanization is widespread in Europe: most people (80%) live in urban agglomerations and city density in Europe is the highest in world (average distance between cities of >10.000 inhab. is 16 km). In this context a new range of indicators are being developed such as ecological footprint, gross happiness index, index of sustainable welfare and more recently well-being as potential measures of sustainability. Nevertheless well-known sustainability aggregate indicators such as EPI (Environmental Performance Indicator by Yale University) and ESI (Environmental Sustainability Indicator) have been developed at national scale and thus are not adequate at the urban scale. Interesting applications of other indicators such as the ecological footprint have been developed by the Ecological Footprint Network only for some world cities (Wackernagel et al. 2006; Van Kamp et al. 2003; Portney, 2003; Flynn et al. 2002).

Sustainability in urban environments has been generally addressed with reference to externalities produced (pollution); resource management (waste, energy), land use management (compact versus dispersed cities); environmental accounting (material flows). More recently sustainability, which is a very

²² e.g., the Convention for the protection of the marine environment of the North-East Atlantic by the OSPAR Commission [<http://www.ospar.org/>].

²³ <http://www.gmes.info/pages-principales/library/implementation-groups/marine-core-service-mcs/>.

broad concept, includes aspect of equity, justice and well-being. Such multi-faceted approaches employ data and information from heterogeneous sources often lacking interoperability and deficient coordination due to monolithic and closed data infrastructures. Moreover, there is an emerging need to include bottom-up and qualitative dimensions in sustainable measures in order to record citizens' perception and evaluation of natural, cultural, recreational, and social environment. OpenDataGEOSS will identify innovative measures of urban sustainability that integrate both official and citizens-based data at the local scale, test these measures in real life settings, and develop an advanced interoperability framework for their reuse in other contexts, thus advancing research and practice in this field.

1.2.8 Biodiversity and Ecosystems

The involvement of citizens in the collection of biodiversity and ecosystem-related information has increased rapidly with use of Web sites and mobile applications to allow rapid upload of detailed data especially on species occurrence (e.g. non native arrivals), timing of biological spring or threat to habits (e.g. logging or illegal land use). The establishment of networks such as European Alien Species Information Network (EASIN) specifically use national recorder networks as their foundation and rely on linking to experts for validation and knowledge of potential impacts. Such linkage exists in European and regional networks. These contribute directly the governmental policy and environmental management though on issues such as spread on invasive alien species. For example, the Great Britain Non-native Species Secretariat provides a portal for identification and record of species through its Recording Invasive Species Counts (RISC) project²⁴. Specific recording communities are supported by infrastructures such as Indicia (<http://www.indicia.org.uk>) that help them to organise and collate crowd-source recording. There is a need to bring these infrastructures together with official sources of information such as broad scale remote sensed data (e.g. habitat mapping) or detailed long-term site monitoring data. Research is required to enable these two sources to be accessible and interoperable so they can augment each other. This requires the development of Web infrastructures and services to disseminate and integrate these data while providing detailed information of the quality, coverage and methods used in producing these diverse data. This necessitates the development of semantic representations of the characteristics and provenance of the data so that their unique strengths and weaknesses are taken into account when combining them to address different environmental issues. OpenDataGEOSS will establish this infrastructure and provide case-studies of how the diverse characteristics of official and crowd sources can augment each other when addressing key societal issues.

1.2.9 Summary

OpenDataGEOSS advances the state-of-the-art in a number of areas:

- It bridges across three main architectural patterns: Service Oriented Architecture, Resource Oriented Architecture, and Event-based Architecture. This is important to ensure that Europe's investment in implementing INSPIRE and related spatial data infrastructures can be extended to include the Linked Data paradigm being employed by many e-government and Open Data strategies, and be flexible enough to include sensor webs and social networks.
- It develops the connecting framework for an Open Data Network-of-Networks in a global, multi-disciplinary context, ensuring lower entry barriers for both users and resource providers.
- It develops a new model for participative science in which data from heterogeneous sources is integrated through workflows that cover the full cycle from semantic search of information resources, to discovery, quality assessment, transformation and access, aggregation, analysis, and publication of the derived results for new use. Crucially, the project develops interoperability across scientific domains and user-types (from expert to non-expert) by documenting not only data but also how the data are used for different purposes through workflows (translating data into information), which are then composed as services chains and made reusable. Whilst some progress in this direction has been made in recent projects like EuroGEOSS and UncertWeb, the extension to include administrative, sensor, and citizen-produced data is novel, as will be shown in the applications.
- It widens participation in environmental monitoring and develops new indicators that combine qualitative and quantitative information and reflect the perspectives of multiple stakeholders. In so

²⁴ <https://secure.fera.defra.gov.uk/nonnativespecies/home/index.cfm>.

doing, the project advances the state of the art and helps reduce the gap between citizens, science, and policy.

- It actively engages the public and other stakeholders in the development process so that the outcomes are sustainable with the maturing and completion of the project.

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1.3 S/T methodology and associated work plan

1.3.1 Overall Strategy

The innovative feature of OpenDataGEOSS is the combination of two strands of methodology. The first is characterised by an AGILE approach to design, develop, and assess the software components and services starting from user requirements and analysis. The second is based on Open Innovation. The concept of “Open Innovation” is a model of innovation in which organizations and companies draw on ideas, opinions and feedbacks that may lie outside their own boundaries from the very early stages of the development process. This complements the classical user requirement analysis, and offers opportunities for more creative thinking and interactions between technologists and users (government agencies, scientists, SMEs) who will be involved in the co-designing, co-development, and co-testing of an application or service. OpenDataGEOSS will adopt three techniques to facilitate Open Innovation from Open Data: (1) organizing brainstorming sessions involving “experts” in the three thematic areas, (2) through open calls on the Web (crowd participation), and open competitions, and (3) through the use of test-beds for collecting requirements and feedbacks from real end-user in real contexts. For this purpose we will rely on the experience of Living Laboratories, which are open innovation ecosystems with a strong focus on a specific network of end users. Two Living labs participate in the project in Italy and Belgium, and collaboration with the European Network of Living Labs (<http://www.openlivinglabs.eu/>) already established in a previous project (ENVIROFI) will be pursued further.

The project is articulated in eight work-packages, of which three are thematic (WP 3, 4, 5), three cross-thematic (WP 2, 6, and 7), and two for management (WP1) and scientific coordination (WP8). Figure 5 shows the relationships between the thematic and cross-thematic work-packages.

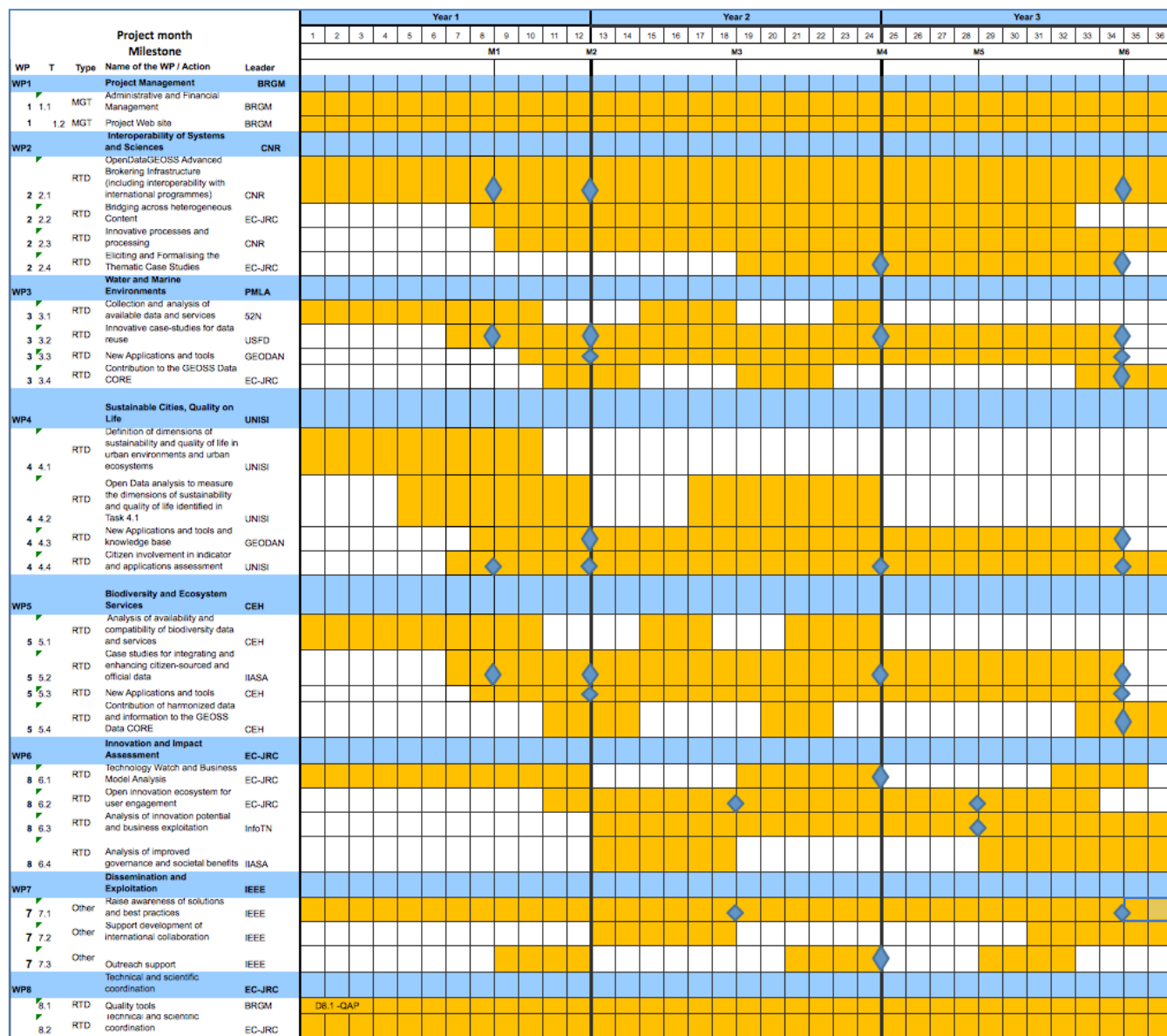
Figure 5: OpenDataGEOSS Project Structure



The interaction between the technical development of the infrastructure, including basic research on semantics, and ontology of processes (WP2), with the thematic case-studies is an important feature of the project. The case-studies provide the essential ground for testing the applications, developing new ideas, utilising existing libraries of workflows and models, and enriching them with new concepts, analytical processes and workflows. This cross-fertilization between applied and basic research is supported by a dedicated team of technical partners from WP2 participating in the development of the case-studies, ensuring the two-way flow of data, services, and formalised models. This bridging of expertise is absolutely crucial to develop a shared understanding, and truly support multi-disciplinary

work. By documenting the models, and what data is used to produce their outputs it is possible to make explicit the large body of tacit knowledge used by domain experts in their work. To elicit such knowledge, it is critical to have direct face-to-face interactions between the domain experts and those able to translate their framing of a problem, and analytical processes to solve it, into documented workflows and models. This interaction needs multiple iterations to understand fully and document such processes. OpenDataGEOSS builds on this process to ensure that basic and applied research go hand in hand and reinforce each other. The outcome is a major contribution in which workflows, models, and processing components are fully documented, and made reusable through the project’s infrastructure. In addition, two dedicated work-packages (WP 6 and 7) has been designed to generate innovative ideas about ways to adapt and reuse the applications and data developed in the project, and reflect critically on the lessons learned to support the further exploitation of the results by SMEs, and public administrations. The project will be of three years duration, from 2013, with three iterations of the OpenDataGEOSS operating capabilities, which will differ for the number of capacities interconnected (i.e. brokered) and the cross-disciplinary capabilities implemented. The results of the second iteration will coincide with the completion of the GEOSS 10-year implementation plan, and early project work will help lay the foundation for the subsequent stages of GEOSS.

1.3.2 Gantt Chart



1.3.3 Detailed Work Description

1.3.3.1 Work Package List

WP No	WP Title	Type of Activity	Lead Participant No	Lead Participant short name	Person month	Start	End
WP1	Project Management	MGT	1	BRGM	23	M1	M36
WP2	Interoperability of Systems and Sciences	RTD	3	CNR	217	M1	M36
WP3	Water and Marine Environments	RTD	24	PMLA	135	M1	M36
WP4	Sustainable Cities, Quality of Life	RTD	10	UNISI	91	M1	M36
WP5	Biodiversity and Ecosystem	RTD	5	CEH	96	M1	M36
WP6	Innovation and Impact Assessment	RTD	2	EC-JRC	92	M1	M36
WP7	Dissemination and Exploitation	OTH	6	IEEE	54	M1	M36
WP8	Scientific and Technical Management	RTD	2	EC-JRC	14	M1	M36
				TOTAL	722		

1.3.3.2 List of Deliverables

Del. No	Deliverable name	WP no.	Nature	Dissem. level	Delivery date
D1.1	Detailed project plan	1	R	RE	M2
D1.2	Periodic progress reports	1	R	RE	M6, M12, M24, M30
D1.3	Interim Progress and Management Report	1	R	RE/PU	M18
D1.4	Final Progress and Management Report	1	R	RE/PU	M36
D1.5	Project Web site	1	O	PU	M2-M36
D2.1.1	Requirements for the OpenDataGEOSS Operating Capability	2	R	PU	M8
D2.1.2	OpenDataGEOSS Advanced Brokering Infrastructure	2	O	PU	M14, M24, M34
D2.2.1	Methodology report on extending INSPIRE data models into RDF vocabularies	2	R	PU	M9, M21
D2.2.2	The OpenDataGEOSS semantic framework and assets	2	R	PU	M10, M20, M32
D2.2.3	Mechanisms to find, retrieve and aggregate social media resources	2	R	PU	M10, M20, M30
D2.2.4	Extension of GEOSS Service Factory to enable	2	R	PU	M12, M30

	collaboration				
D2.2.5	Mechanisms for enabling privacy, quality, IPR, and trust	2	R	PU	M20, M30
D2.3.1	Report on OpenDataGEOSS Model Web	2	R	PU	M14, M24, M34
D2.3.2	Geoprocessing App store	2	O	PU	M10, M20, M32
D2.3.3	Inference and simulation engine tool	2	O	PU	M10, M20, M32
D2.4	Thematic Use Cases formalization	2	R	PU	M12, M24, M32
D 3.1	Report on available data, systems, and services in the hydro-meteorology, fresh-water and marine domain areas.	3	R	PU	M12, M24,
D 3.2	Report of case-studies and lessons learned	3	R	PU	M18, M36
D 3.3.	Documentation of new Applications and tools	3	R	PU	M18, M36
D 3.4	New data sources made available and accessible through the GEOSS Data CORE	3	O	PU	M12, M24, M36
D 4.1	Report on criteria for the identification of measurements for sustainable smart cities and quality of life in urban ecosystems.	4	R	PU	M10
D 4.2	New data sources in the urban domain made available and accessible through the GEOSS Data CORE	4	O	PU	M12, M24
D 4.3	Documentation of new applications and tools	4	R	PU	M18
D 4.4a	Report and lessons learned from case-studies	4	O	PU	M18, M 36
D 4.4.b	Repository and web-based open source atlas of case-studies.	4	O	PU	M22, M36
D 5.1	Report on available data, systems, and services in the biodiversity field.	5	R	PU	M12, M24
D 5.2	Report of case-studies and lessons learned including new applications and data collection methods	5	R	PU	M18, M36
D 5.3.	Documentation of new Applications and tools	5	R	PU	M18, M36
D 5.4	New data sources made available and accessible through the GEOSS Data CORE.	5	O	PU	M12, M24
D 6.1	Report on technology and business models watch	6	R	PU	M12, M24, M 36

D 6.2	Report on lessons learned from open innovation strategies and stakeholder consultations	6	R	PU	M18, M 34
D 6.3	Report on analysis of innovation potential and model business plans for exploitation	6	R	PU	M27, M 36
D 6.4	Report on benefit assessment (including survey results, analysis of findings and recommendations for enhancing European Open data strategies.)	6	R	PU	M18, M 36
D7.1.1	First Open Data Festival with European focus	7	O	PU	M18
D7.1.2	Second Open Data Festival with International focus	7	O	PU	M33
D7.2	Report on global collaboration opportunities	7	R		M 36
D7.3.1-4	On line seminars (4)	7	O	PU	M12, M18, M24, M32
D 7.3.2	Project video	7	O	PU	M33
D 7.3.3	Newsletter				M9 M15, M21, M27, M 33
D8.1	Quality assurance plan	8	R	RE	M2
	All scientific reports produced by the WP leaders throughout the project and under WP8, will be integrated into the WP1 progress and Management reports (D1.2, D1.3, D1.4)	8	R	RE	M6, M12, M24, M30, M18, M36

1.3.3.3 List of milestones

Milestone Number	Milestone Name	WP involved	Expected Date	Means of Verification
M1	Identification of initial requirements for (implementing) the infrastructure, and setting up the case-studies including analysis of Open Data available	2, 3, 4, 5	M8	Report D 2.1.1 published, report of progress from thematic WPs
M2	Initial OpenDataGEOSS Operating Capability and Model Web, based on the advanced version of the enabling services and tools, prototype apps for case-studies	2, 3,4,5	M12	Initial Operating Capability validated by users, and initial operations of Geoprocessing Apps Store (D.2.3.2)
M3	First round of assessment and feedback from stakeholders and living labs + First Open Data Festival and project review	2,3,4, 5, 6,7	M18	D 6.2 published, D 7.1.1 held, Project Review
M4	Second round of development in infrastructure eliciting workflows, documenting models from case-studies and feeding into infrastructure + demonstrating advanced GEOSS components to Ministerial 2015	2,3,4, 5, 7	M24	Initial repository of case-studies (D 4.4b) running, Model Web extended, Demonstration at 2015 GEO Ministerial
M5	Second round of Feedback for stakeholders, assessment of potential and business models for reuse of apps, data, services, and models	3,4,5, 6	M27	D 6.3 published, Project meeting to assess outcomes
M6	Final release of advanced infrastructure, case-studies web Atlas, new data into GEOSS Data CORE, and GEOSS URR + Second Open Data Festival	2,3,4, 5,6,7	M34	Second Open data Festival held, Advance Brokering Infrastructure and Model Web validated by users
	End of Project		M36	

1.3.3.4 Work package descriptions

Work Package number	1	Start date or starting event:	Start: M1 – End M36											
Work Package title	Management													
Activity type	MGT													
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Participant short name	BRGM	EC-JRC	CNR	IIASA	CEH	IEEE	CIMA	CREAF	UEDIN	UNISI	WWU	UJI	TUD	USFD
Person-months per participant	23													
Participant number	15	16	17	18	19	20	21	22	23	24	25	26	27	
Participant short name	MUNI	INFOTN	GEODAN	YDREAMS-A	52N	BD	SPB	ISPRA	CU	PMLA	TIWAH	SHOOTHILL	PSB	
Person-months per participant														

Objectives

Administrative management:

- To set up and implement the management process for the project and the consortium, and thereafter ensure the project is led, coordinated and managed accordingly.
- To formulate and implement a quality plan and create related tools for use throughout the project.
- To review and assess the progress of OpenDataGEOSS activities towards the defined goals and objectives.
- To measure this progress as much as possible in a quantitative way and give feedback to the project partners so as to adapt and respond quickly as appropriate.
- To interface with the European Commission

Description of work

Task 1.1: Administrative and financial management (BRGM)

This task will initiate, set and implement the consortium contract, including the consortium agreement, the overall IP financial and administrative management processes and routines. The task lasts for the entire duration of the project and provides full control of all financial and administrative aspects of the project. Specific subtasks will focus on project coordination and activities of the Management Committee.

- All contacts with the European Commission, management of the project boards, WP leaders.

- Collection of the WP progress reporting (collecting WP activity information and compiling into IP summary reports with consolidated IP-level deviations) on a semi-annual basis, in addition, manages the interim and final progress report (including financial sections).
- Handling deliverables due by Work Package leaders, submitting them to the EC, IP internal communication, archiving. The final versions of the deliverables are due to IP coordinator 15 days in advance with respect to their deadlines.
- Setting up the Advisory Board structure and managing the relationship with the Members belonging to this body.
- Chairing and managing the Plenary Assembly, on a yearly basis.
- For more details on the management boards see Section 2.1 of this proposal.

Task 1.2: Project Web site (BRGM)

This task will set up the project web site and manage it throughout the project. The public part of the web site will be used for presenting the project results. A restricted partner area will be used for exchanging project internal information and documents and for collaboration between partners.

Deliverables

- D1.1 Detailed project plan (M2)
- D1.2 Periodic progress reports (M6, M12, M24, M30)
- D1.3 Interim Progress and Management Report (M18)
- D1.4 Final Progress and Management Report (M36)
- D1.5 Project Web site (M2-36)

Work Package number	2	Start date or starting event:				Start: M1 – End M36								
Work Package title	Interoperability of Systems and Sciences													
Activity type	RTD													
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Participant short name	BRGM	EC-JRC	CNR	IIASA	CEH	IEEE	CIMA	CREAF	UEDIN	UNISI	WWU	UJI	TUD	USFD
Person-months per participant	14	14	37					13	10		12	18	22	10
Participant number	15	16	17	18	19	20	21	22	23	24	25	26	27	
Participant short name	MJUNI	INFOTN	GEODAN	YDREAMS-A	52N	BD	SPB	ISPRA	CU	PMLA	TIWAH	SHOOTHILL	PSB	
Person-months per participant	3	6	9		9	3			12	9	8		8	

Objectives

The main objective of the WP is to develop an **Advanced Operating Capability (AOC)** linking public sector information made increasingly accessible through Open Data strategies, environmental data, and **research e-infrastructures** (INSPIRE, GEOSS, ESFRI, GMES, DRIHM), and **citizen observatories** (FP7 ENV.2012.6.5-1 projects, EEA Eye-On-Earth, COST networks). The AOC applies and extends the **GEOSS Brokering Architecture** to: (a) ensure a **seamless interoperability** among the data catalogues of researchers active in different domains, allowing them to collaborate on the same data sets; (b) provide **wide access** to existing **crowd-sourced** and **authoritative scientific** data sets; (c) enhance possibilities to share and exchange processing tools and models (d) finally, to engage researchers in **new forms of scientific research** to deliver benefits to European end-user agencies, academia, the industrial sector, policy makers, and citizens.

The WP addresses three main challenges, introducing a specific task for each of them:

- (1) Developing an advanced brokering (intermediation) infrastructure
- (2) Bridging across heterogeneous content
- (3) Extending the sharing and re-use of scientific workflows and processes.

The AOC will significantly contribute towards improving the visibility of information, informing citizens and business about policies, public spending and outcomes. The AOC services and tools aim to empower citizens and citizens' associations, enabling them to contribute to environmental governance processes. Finally, the AOC underpins the delivery of a wide range of innovative products and services – like those stemming from the GEOSS Model Web and the User Requirements Registry (URR).

Description of work

Task 2.1: OpenDataGEOSS Advanced Brokering Infrastructure (including interoperability with international programmes) (CNR, EC-JRC, UEDIN, TUD, PSB, BRGM, TIWAH, 52N, CIMA)

This task collects the Users and System Requirements, and advances the GEO Discovery and Access

Brokering framework (GEO DAB), which will underpin the thematic applications in WP 3, 4, and 5.

Activity a. User Requirements and link to the other WPs (leading partner EC-JRC)

This activity collects the **User and Systems Requirements for the OpenDataGEOSS Operating Capability**, considering the project thematic areas (WP 3, 4, and 5), paralleled with an Open Innovation approach in which several communities (INSPIRE practitioners, GEOSS communities of practice, DRIHM User Forum members, and social networks participating in the European Living Labs network) will participate in the co-design and co-evolution of this operating capability, as described in WP6. The requirements coming from these activities will be analysed in light of the many European and international activities that are shaping the technological and policy landscape underpinned by e-infrastructures. These include INSPIRE, the EC ISA programme, Open Data government strategies, and the ESFRI programme on research e-infrastructures in Europe, the development of cyber-infrastructures in the US (NSF EarthCube, DataOne), and global initiatives like GEOSS and the Research Data Alliance. The requirements, standards, practices, and solutions emerging from this fast-evolving landscape will shape the infrastructure developed in OpenDataGEOSS and ensure that this infrastructure remain open to innovation, and contributes to European leadership in a global setting

Activity b. GEOSS brokering framework extension (leading partner CNR)

This activity extends the operating capability of the GEOSS Brokering Framework (GEO DAB), developed by the FP7 EuroGEOSS and GEOWOW projects, on the basis of the User and System Requirements collected in the activity above. Through this advanced framework, the project will **interconnect the data and services provided by the citizen observatories, and the authoritative infrastructures, regardless of the system architecture implemented**, i.e. Service Oriented Architectures (like INSPIRE and GMES resources), Resource Oriented Architectures (like Linked Data, COST and EoE resources), Event Oriented architecture (like Sensor Web, the upcoming OGC Publish/Subscribe standard, and Future Internet resources). The tasks will lead to:

- Improved functionalities on data and service tagging, indexing, and ranking.
- Web Open APIs for the brokering framework to allow re-use by external clients and applications.
- Integration of the resulting data flows into the GEOSS Common Infrastructure, and the GEOSS Data CORE.
- An interoperability link to the GEOSS User Requirement Registry (URR) to support connections with GEOSS users and their feedbacks.
- Interoperability with research infrastructures in Europe (ENVRI, LifeWatch, BioVEL and DRIHM) and the US (NSF EarthCube, DataOne).

Task 2.2: Bridging across heterogeneous Content (EC-JRC, CREAM, UJI, INFOTN, CU, BDIGITAL, CNR, PMLA, UEDIN, BRGM, GEODAN, ISPRA, PSB, TIWAH, 52N, CEH)

This task addresses the key obstacles that prevent effective use and re-use of information in the public space from heterogeneous sources. In particular, the task builds the necessary bridges to integrate official data delivered through Service Oriented Architectures, like INSPIRE, with data delivered as Linked Data. Moreover, it advances mechanisms to find, retrieve and aggregate resources with different structures and meaning, with particular attention to semantic assets and information extracted from social media. Finally, it identifies the ethical and legal issues that arise from the access and re-use of citizens-contributed data.

Activity a. Bridging Service Oriented and Resource Oriented Architectures (leading partner EC-JRC)

This task develops a methodology to automatically generate Resource Description Framework (RDF) vocabularies based on the data models developed in the INSPIRE Data Specification process. This process, which will initially be deployed on the themes relevant to the OpenDataGEOSS project (Biodiversity, Water, and Urban Sustainability), makes it possible to make available INSPIRE data in accordance with the Linked Data approach without loss of information or context. This not only facilitates the integration with data from other sources already structured using a Linked Data approach, but also it makes it easier to re-use INSPIRE data models, whenever appropriate, also outside the geospatial field, thus contributing to cross-sector semantic interoperability.

Activity b. Expanding and Connecting Semantic Assets (leading partner EC-JRC)

This activity extends further semantic and multilingual interoperability across disciplines and domains (e.g. environmental sciences, public policy, social media). It builds on work carried out in the EC ISA

programme, INSPIRE, and GEOSS by creating the necessary links among related concepts in different semantic assets such as ontologies, thesauri, vocabularies, and code lists. The outcome of this activity will be a **collaborative matching framework to align semantic asset**, based on a set of software components previously developed in the FP7 EuroGEOSS, GENESIS, GEOWOW, NETMAR, and Tadoo projects. The framework considers:

- Versioning and provenance of semantic assets, trust management.
- The creation of an API environment to allow service reuse by external clients.

The frameworks will extend the list of aligned semantic assets used by GEO DAB, by adding new assets (e.g. EnvThes and other WP5 developments together with the vocabularies referred to in WP3). This important foundational work will be carried out in collaboration with international projects and initiatives in which OpenDataGEOSS partners are involved, e.g.: OneGeology-Europe, the INSPIRE Data Specifications, PanGeo and the IUGS-CGI Interoperability working group. A collaboration with related work carried in Australia by CSIRO in the framework of the Eye-on-Earth Global Network of Networks programme will ensure that OpenDataGEOSS delivers first class research and components to underpin multi-disciplinary science.

Activity c. Intelligent discovery, publication and exploring of heterogeneous information resources (leading partner UJI)

Social media data and information: This activity advances the tools for finding, retrieving and aggregating information published by social media platforms, and the Citizens Observatories participating in the project, and integrating it with official data from e-government, INSPIRE and GEOSS. The activity introduces innovative publication and visualisation processes and components to be integrated into the Brokering framework. This activity extends the GEOSS Service Factory developed during the EuroGEOSS project so that both scientists and citizens can easily publish their data, share resources and collaborate in addressing the same problem. Given the importance of visualisation to communicate between scientists, decision-makers and the public, this activity identifies also sets of visualisation rules for open data and services to achieve “visualisation interoperability” across heterogeneous data and systems. The platform will be tested in the case-studies in WP 3,4, and 5 and refined in a “learning-by-doing” process.

Activity d. Dealing with privacy, IPR, quality and trust (leading partner CREAM)

This activity addresses the **heterogeneity of quality descriptions, and the challenges of traceability, reproducibility**, and cross-referencing between content coming from observations and official data and information provided by citizens. The challenges addressed by this activity are both technical and social and the context within which they take place changes very rapidly with both technological, market, and social evolution. In the first place this activity will conduct a survey to capture stakeholders’ knowledge of and attitude to data reuse (activity in conjunction with Task 6.4). Then building on the OpenDataGEOSS Advanced Brokering Infrastructure, this activity develops mechanisms for anonymising, aggregating, clustering, cleaning, tagging, and quality scoring (including: uncertainty, lineage, and trustworthiness). Mechanisms for ensuring confidentiality and controlled access to information will also be considered building on the COBWEB project and the activities in the FI-WARE platform developed as part of the Future Internet Programme²⁵.

Main outcomes will include:

- Advances in ways to document and encode measures of data quality, reliability and trust based on user-supplied feedback, and consumer-supplied information, building on the work done by FP7 GeoViQua and GLUES projects.
- An ontology, and software mechanisms to record and assess the “quality” of data sources across the spectrum from trusted institutions to citizen scientists.
- A quality model to support quality-aware discovery services and related metrics.
- Assessment of the key legal issues (e.g. privacy and IPR, including legal interoperability) that may be seen, interpreted or used as hurdles to free and open re-use of observation data. This assessment will provide input to the work of the GEO Data Sharing Working Group.

Task 2.3: Innovative processes and processing (CNR, EC-JRC, CU, TUD, BDIGITAL, PMLA, WWU, PSB, TIWAH, 52N, CEH, UEDIN)

²⁵ http://catalogue.fi-ware.eu/enablers?chapter_tid=6

This task develops an innovative framework to compile and execute scientific workflows, contributing to the GEOSS Model Web activity.

The activity provides a key contribution to the innovative GEOSS action called “Model Web”. In fact, the “combination” of data and analytical models is essential to provide scientifically robust outcomes in a multi-disciplinary environment –a clear objective of GEOSS “Model Web” initiative.

Activity a. Scientific workflow framework (leading partner CNR)

The re-use of workflows and parts of workflow (fragments) is an important issue to advance collaborative multi-disciplinary science. To do so the project introduces a **new service to broker scientific workflow fragments** and re-compile them into new components that can run on well-used workflow frameworks (e.g. JBoss, Taverna, etc.). This technology makes use and/or extends some existing components and tools (the ontology developed in FP7 BioVeL for workflow functions, the FP7 UncertWeb Composition-as-a-Service (CaaS) tool, TavernaLite, a web based interface to TavernaServer).

This activity will lead to extend the OpenDataGEOSS operating capacity by **introducing a new brokering service for the discovery, retrieve and implementation (i.e. compilation) of high-level scientific workflows (and parts of workflow)**. This includes to:

- Re-use and extend the discovery and access brokering services of OpenDataGEOSS.
- Access the GCI URR (User Requirements Registry) to discover and retrieve the scientific high-level Workflow (i.e. URR:Applications) registered by the GEOSS SBAs.
- Access and use the geo-processing apps and knowledge repositories developed in activity b. and c. below.
- Re-use of well accepted workflow engines, such as: JBOSS and Taverna.

Activity b. Geoprocessing App stores (leading partner TUD)

This activity provides a **service platform for sharing service-based geoprocessing and modelling tools**. This will build on existing and well-accepted community driven workflow sharing platforms (e.g. MyExperiment platform for rating, annotation, tagging, etc.). This activity will consider similar developments carried out by the FP7 EU EO2HEAVEN, NETMAR and the on-going effort in the FP7 ENVRI project.

The web-based repository shall allow for the up- and downloading of geoprocessing algorithms, thus fostering the exchange of analysis tools between different communities. This platform will be enriched by mechanisms to test and rate the algorithms and to instantiate them in cloud environments.

Activity c. Process and event reasoning (leading partner WWU)

Observations and their combinations are used to infer new knowledge about on-going processes, or past and possible future events. The three domains of this project come with strong needs for such inferences, and previous European projects like ENVISION have established the ontological and data processing basics to support it. This activity applies these methods and extends them to cover a broader range of environmental processes and events.

The main goal of this activity is to develop a **service platform for changes detections and knowledge extraction from them**.

Task 2.4: Eliciting and Formalising Thematic Case-studies (EC-JRC, TUD, WWU, CNR, TIWAH)

This task will elicit and formalise the analytical processes developed in the thematic case-studies (WP 3, 4, 5). During the development of each case-study, a dedicated team acting as interface between users and IT experts, will elicit the processes, terminologies, and activities of the users, turn them into workflows, and then formalize them using standard notation languages (e.g. BPMN). The generated artifacts will enrich the vocabularies aligned in Task 2.2, and the ontology of processes developed in Activity 2.3.c, as well as the list of applications in the GEOSS URR. The engineering of these artifacts into applications and processing services will then extend the App Store in Task 2.3.b, and be available for running on the Model Web framework developed by task 2.3. In this way, the project will make a major contribution to the formalization of concepts and processes, as well as the grounding of ontologies in real-life instances. This spiral interaction between the case-studies, extraction, formalization, and deployment, will extend the scientific body of knowledge, be reused by the wider community, and leveraged by the SMEs to develop further applications (see WP6).

Deliverables

- D2.1.1 Requirements for the OpenDataGEOSS Operating Capability (M8)
- D2.1.2 OpenDataGEOSS Advanced Brokering Infrastructure (M14, 24, 34)
- D2.2.1 Methodology report on extending INSPIRE data models into RDF vocabularies (M 9, 21)
- D 2.2.2 The OpenDataGEOSS Semantic framework and assets (M10, 20, 32)
- D2.2.3 Mechanisms to find, retrieve and aggregate social media resources (M10, 20, 30)
- D2.2.4 Extension of GEOSS Service Factory to enable collaboration (M12, 30)
- D2.2.5 Mechanisms for enabling privacy, quality, IPR, and trust (M20, 30)
- D2.3.1 Report on the OpenDataGEOSS contribution to the GEOSS Model Web (M14, 24, 34)
- D2.3.2 Geoprocessing App stores (M10, 20, 32)
- D2.3.3 Inference and simulation engine tool (M10, 20, 32)
- D2.4 Thematic Use Cases formalization (M12, 24, 32)

Work Package number	3		Start date or starting event:			Start: M1 – End M36								
Work Package title	Water and Marine Environments													
Activity type	RTD													
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Participant short name	BRGM	EC-JRC	CNR	IIASA	CEH	IEEE	CIMA	CREAF	UEDIN	UNISI	WWU	UJI	TUD	USFD
Person-months per participant		2	4		5		10	1	1		4			10
Participant number	15	16	17	18	19	20	21	22	23	24	25	26	27	
Participant short name	MUNI	INFOTN	GEODAN	YDREAMS-A	52N	BD	SPB	ISPRA	CU	PMLA	TIWAH	SHOOTHILL	PSB	
Person-months per participant	4		4	21	7	13		9		30		10		

Objectives

The main objective of this WP is to demonstrate how the integration and novel use of official and citizens data can result in new forms of scientific enquiry, more accountable and transparent policy making, and more participative science in the fields of fresh water, ground water, water related hazards (e.g. floods, flash-floods and forest fire risks), and marine environments. The increasing competition for fresh water resources between industry agricultural and human consumption, and for the exploitation of marine environments between extractive industries, fisheries, transport, and tourism provide the social and policy context for this work package. In particular the WP will:

- Analyse existing European and international initiatives setting the boundary conditions for the thematic application,
- Identify innovative case-studies for data reuse for the water/marine theme
- Develop new applications and tools supporting the scenarios above.
- Contribute new data resources to the GEOSS Data CORE.

Description of work

Task 3.1: Collection and analysis of available data and services (52N, BDIGITAL, MUNI, EC-JRC, USFD, PMLA)

This task analyses the data, systems, and services available and accessible in the hydrology and marine domain area that can be accessed and used for new applications. Special focus will be placed on global, European and national initiatives providing open hydrological data such as those developed in the GEOWOW project, the German PEGELONLINE system, the Italian SINTAI system, the WISE system, and the Czech system DIBAVOD (<http://www.dibavod.cz/>), as well as new activities developing in the framework of the GEOSS Blue Planet initiative. This task will provide an inventory of relevant open data and GEOSS Data CORE sources that can be exploited by the global community, in addition to an overview of leading technologies, systems and interfaces used in this thematic area. The

identified resources will be made available through the OpenDataGEOSS Discovery and Access Broker (DAB).

Task 3.2: Innovative case-studies for data reuse (USFD, 52N, BDIGITAL, YDREAMS-A, TUD, PMLA, CEH, ISPRA, CIMA, MUNI, SHOOHILL, EC-JRC, WWU)

This task will select and develop a set of case-studies on Freshwater and Marine Monitoring to illustrate issues, potentialities and challenges of reusing and integrating heterogeneous data in novel ways. The scenarios will take into account the heterogeneity of data and stakeholders and the multiple ways in which they can interact. Data sources considered will range from informal social data such as information from citizens observatories or from social media platforms to formal official data at multiple scales (local, regional, national, European, global). We will identify and sample relevant stakeholders from within the case-studies such as citizens, communities, authorities, industries etc. We will situate the case-studies in the context of policies and initiatives such as the Water Framework Directive, the Marine Strategy Framework Directive (MSFD), Integrated Coastal Zone Management and the increasing competition for water fresh and saline resources. The following case-studies will be developed (lead partner in bracket):

- **Monitoring of Whales (CIMA):** The observation of ecosystem dynamics and especially the monitoring of cetacean as bio-indicators, is a research areas essential for finding effective tools for the conservation and management of the marine ecosystem. Indeed, the MFSD gives clear input about using top-predators as a proxy for effective tools for the conservation and management of the marine ecosystem. This use case will be based on citizen scientists travelling on board of ferries who are willing to detect and record cetaceans and associated information (such as sighting position, environmental condition). A mobile App. will be developed, as part of Task 3.3, to provide information about marine mega-fauna that could be encountered during ferry trips and that can be used to collect species sightings data. CIMA will develop a dedicated database, which will receive, store and provide all these different data coming from citizens. The database will be linked with other data sources such as GMES MyOcean2 data catalogues providing environmental data in the Mediterranean on ocean temperature and colour. During the test phase the reliability of the citizens' gathered data will be assessed by experienced marine mammal observers (MMOs) on ferries so that, at the end of each trip, quantitative and qualitative comparisons between citizens and MMOs data will be done. During the test phase the MMOs will offer short training sessions about the APP use for the crew and the interested tourists.
- **Hydro-meteorological personal weather station data in Europe (CIMA):** Personal Weather Stations (PWS) are becoming increasingly available and more densely distributed in many parts of the world. This trend makes PWS more and more useful to provide real-time observational data that can integrate and enrich the information supplied by official weather networks. This is of potentially great importance for populated localities subject to severe hydro-meteorological phenomena such as flash-floods and wild-land forest fires. This case-study builds on the DRIHM (Distributed Research Infrastructure for Hydro-Meteorology, www.drihm.eu, 2011-2015) project, and the advanced brokering framework developed in WP2 to facilitate the collaboration between hydro-meteorologists and ICT experts in the provision of end-to-end hydro-meteorological services (models, datasets and post-processing tools). Through the use of the Sensor Observation Service 2.0 profile for Hydrology and WaterML 2, users will be able to access sensor data and analyse them with the models and tools made available in the OpenDataGEOSS infrastructure (WP2).
- **Lake monitoring in the UK (PMLA):** this case-study will focus on lake water quality in the UK with a target audience of the three UK environment agencies (EA, SEPA, NIEA) and water utilities companies who have a statutory requirement to ensure safe surface waters for public recreation and water supply for drinking and irrigation under the EC water Framework Directive. The case-study will link: existing automatic water quality monitoring station run by CEH in UK lakes (until Dec 2014); high-quality "semi-official" optics data obtained within the UK GloboLakes project; and the ChloroGIN-Lakes web portal. Comparison of the high quality optics data will allow investigation and validation of the best sensors to add to aquatic devices (such as the Ziphius or SUBA by Ydreams-A) and also of the Citclops-methodology-based, crowd-sourced observations, hopefully reducing the uncertainty on such crowd-sourced data sources. If ESA Sentinel 2 MSI and Sentinel 3 OLCI are launched during the field-work phase of the project, then we will use these official GMES data sources; and we shall also validate the developmental

of (“semi-official”) GMES related products (such as lake optical properties).

- **Monitoring of non-indigenous marine species (NIS)** (ISPRA). A national case-study will be developed in Italy based on the integration of scientific dataset with crowd-sourced data taking advantage of existing infrastructures, built on INSPIRE, that already link environmental monitoring and scientific researchers (i.e. SinaNET and GIIDA). The main goal is to promote an “environmental monitoring 2.0” approach through the crowd feedback on, and data integration with, institutional dataset (e.g. GMES high resolution layers on imperviousness, grassland, forest and water; marine and coastal environment; etc.) that are available at national level and standardized at European scale. This case-study will improve the capabilities of the existing Italian NIS Information System that currently makes use of the observations coming from fishing communities. Through an ad-hoc mobile application for tablet and smart phone developed in Task 3.3, geo-referenced data information will be collected in a central database; the system will comprise a validation module for the marine scientists, to ensure the necessary data quality. The APP metadata schema for the description of NIS will be implemented and tested in collaboration with Task 5.2b. Also, it is intended to study the possibility to exploit material (photos and videos) produced by diving groups, communities and associations for NIS spotting. The audio/video material will be collected into a web site and, once filtered, it will flow into the system to support scientists and experts on NIS identification. The case-study will reinforce the role of citizens as actors able to influence the decision-making level and their engagement with environmental policies. This application platform will be enabled by the OpenDataGEOSS advanced operational capacity developed in WP2 and will provide full interoperability by adopting the most used international standards.

Task 3.3: New Applications and tools (GEODAN, YDREAMS-A, 52N, BDIGITAL, PMLA, SHOOTHILL)

This task will develop and deploy new applications and tools addressing the requirements and scenarios identified in 3.2 and reusing the data and services identified in 3.1 As an example, this task would include the development of an application to map **flooding across various countries** throughout Europe (where the data are available) and allow citizens to register a monitored location and receive alerts via email or social media channels, all free of charge. The application will build on the information provided by the case-study on personal meteorological weather stations and allow users to view flooding also in an historical context – using sliders to vary the timescales over which the flooding incidents have occurred. The application would be developed to operate on PC/MAC (using the most common OS/browsers combinations), on selected mobile devices (running iOS/Android/Windows 8) as well as touch tables running Microsoft PixelSense for use in collaborative/research environments.

The **lake monitoring** case-study requires several developments that together showcase the aims of OpenDataGEOSS - reusing components, integrating datasets from multiple sources, including novel use of crowd sourced data, and presenting it for multiple uses including policy, statutory monitoring, scientific and social/educational:

- 1) a targeted scientific portal tailored from the WP2 infrastructure to be specific for the lakes case, integrating and visualising different datasets. These include the specific datasets mentioned above (GloboLakes optics, CEH moorings, GMES Sentinel, crowd-sourced observations from CITCLOPS and YDreams-A aquatic devices) but also others identified as relevant and made available via the brokering framework, including social media. The primary scientific analysis presented is time series comparison of the datasets (using and contributing back to workflows from task 2.3c and components from 2.3b). Critically, the uncertainty of the various datasets, where known, will be incorporated and visualised. This allows monitoring/scientific users to make well-informed judgments about the quality of data inputs and prevailing conditions.
- 2) A minimal, mobile-friendly website aimed at the public, showing the crowd-sourced data alongside the official datasets, and weekly/monthly/annual trends (an App store in task 2.3b), alongside information about the lake and measurement program.
- 3) Tools for reducing uncertainty in citizen data (statistical amalgamation), for automatically identifying, extracting and correcting/calibrating water colour information from photos, and for integration/comparison with other data sources. These will be reused from or contributed back to the App store in task 2.3c.

Other applications will be developed during the course of the project will include the Whale App for mobiles developed by CIMA for the Whale Monitoring case-study in Task 3.2, the mobile App for

monitoring non-indigenous marine species, while the toy submarine (SUBA) developed by YDreams-A will be provided and tested with new sensors and communication devices for data collection and integration.

Task 3.4: Contribution to the GEOSS Data CORE (EC-JRC, 52N, PMLA, CEH)

This task extends the data resources identified in 3.1 with the new datasets derived through citizens' observations, and the new information products, models, and applications developed in this WP. All these information resources will be contributed to the GEOSS Data CORE, and the participants in this task will work with the data providers to make sure the resources are properly tagged and reusable in a global context. In this way, the project will start to extend the current pool of data resources available in GEOSS, which are primarily from remote sensing and official sources, with a wider range of data collected in situ by multiple sources both official and volunteered. This will be useful to start demonstrating the opportunities of GEOSS as a global endeavor to a much wider audience.

Deliverables

- D 3.1 Report on available data, systems, and services in the hydro-meteorology, fresh-water and marine domain areas. (M12, M24)
- D 3.2 Report of case-studies and lessons learned (M18, M 36)
- D 3.3 Documentation of new Applications and tools (M18, M36)
- D 3.4 New data sources made available and accessible through the GEOSS Data CORE. (M12, M24, M36)

Work Package number	4		Start date or starting event:			Start: M1 – End M36								
Work Package title	Sustainable Cities, Quality of Life													
Activity type	RTD													
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Participant short name	BRGM	EC-JRC	CNR	IIASA	CEH	IEEE	CIMA	CREAF	UEDIN	UNISI	WWU	UJI	TUD	USFD
Person-months per participant		8	4					1	2	15	4	6		
Participant number	15	16	17	18	19	20	21	22	23	24	25	26	27	
Participant short name	MUNI	INFOTN	GEODAN	YDREAMS-A	52N	BD	SPB	ISPRA	CU	PMLA	TIWAH	SHOOTHILL	PSB	
Person-months per participant	4		18		9		7	7			6			

Objectives

The overall objective of the WP is to demonstrate that integration and novel use of authoritative and citizens' data can result in new forms of scientific inquiry, more accountable and transparent policy making, and more participative science. This more participative approach will contribute to more sustainable and smart cities and improved quality of life. Sustainable and smart cities should encompass not only technological improvements but also the improvement of social and environmental capital in profiling the quality of life in cities. Web 2.0 applications and citizen science offer the opportunity to include qualitative measurements and perceptions of environmental quality. The WP will build on local intelligence capacity achieved through collective community intelligence. Thus the objectives of the WP will be:

- To define dimensions of sustainability and quality of life in urban environments and urban ecosystems;
- To develop new sets of indicators for the dimensions identified above, based on the integration of citizen's and authoritative data;
- To develop new applications and tools to support the creation of such indicators;
- To test the new indicators and applications in real-life settings and create a repository of case-studies to foster new applications, improve institutional management, encourage participation, and contribute to a better linkage between knowledge creation and usage.

The WP's outputs will contribute new data resources to the GEOSS Data CORE related to sustainability and ecosystems services. Moreover the WP outcomes will benefit from the results of the COST ENERGIC project, involving 19 countries, which will be available during the OpenDataGEOSS project.

Description of work

Task 4.1: Definition of dimensions of sustainability and quality of life in urban environments and urban ecosystems (UNISI, EC-JRC, ISPRA, TIWAH, 52N, MUNI)

Task 4.1 will consider firstly, the characteristics of sustainable communities (such as disaster risk, resilience, adaptive capabilities and sustainable livelihood) and use these characteristics to identify key dimensions of sustainability and quality of life in urban ecosystems that can be based on user generated data and open data. The major dimensions will include: environmental quality; cultural and recreational ecosystem services; quality of public services. The task will take into account existing experiences such as Italian statistical Institute's measures of well-being (<http://www.misuredelbenessere.it/index.php?id=32>), the Gross Happiness Index and historic-heritage, or sense of place, perspectives of urban environment. The local perspectives will complement those of public administrations such as ISPRA, the Italian National Institute for Environmental Protection and Research. Secondly, Task 4.1 will define the scale for data collecting based on spatial and functional urban areas (commuter and traffic flows in particular). The criteria will be developed by implementing authoritative sources such as ESPON categories, which include FUA (Functional Urban Areas) and LUZ (Large Urban Zone) in EU27 countries²⁶. Thirdly, Task 4.1 will verify whether both measurements and scales are applicable in urban contexts in developing countries. For this, TIWAH will use its relationship to the Global Change and Sustainability Research Institute (GCSRI) at the University of Witwatersrand, Johannesburg, South Africa, to provide this validation.

Task 4.2: Open Data analysis to measure the dimensions of sustainability and quality of life identified in Task 4.1 (UNISI, EC-JRC, SPB, MUNI, 52N, CNR, WWU, TIWAH, GEODAN, ISPRA)

This Task will collect available open source data from authoritative sources (Eurostat, EEA, etc.) and user generated measurements and perceptions (through sensor based applications from citizen observatories and COST projects). Data will be documented with metadata, quality assessments, time stamps, and transformation method (if aggregation is needed) to enable analytical applications and integration (link to Task 2.4). Data collection and analysis will be extended in time or in services (e.g. Geostatistics analysis service for odour nuisances by OMNISCIENTIS) in order to allow reuse of extended and new complementary data through GEOSS and also to provide adequate data for WP6. This task identifies those information resources that can be contributed to the GEOSS Data CORE and works with the data providers to make sure the resources are properly tagged and reusable in a global context. Data will be collected in the three categories identified in Task 4.1 (in brackets examples of applications, tools and project involved in task 4.2):

- Quality of environment: air pollution (i.e. data available from European and national organisations), noise pollution (NOISEtube), light pollution, odour nuisances (OMNISCIENTIS), soil sealing, water pollution;
- Quality of ecosystem services (in particular cultural, recreational, aesthetic, urban biodiversity, local memories) measured through perceptions (Geodan Testaccio case-study) validating with user-generated content, the top-down spatial assessment of ecosystem services in Europe²⁷.
- Quality of services: dirt/litter; public spaces; public transport; car traffic (52°North's EnviroCar project) infrastructures/streets (www.fixmystreet.org; <http://www.trashout.me>). This aspect is particularly relevant as it will provide institutions/local governments with evaluation from citizens and their perception of quality and also a measure of institution efficiency.

Task 4.3: New Applications and tools and knowledge base (GEODAN, UNISI, SPB, TIWAH, 52N, UJI)

This task will develop (UNISI) a tool to communicate the current state and trends of urban quality of life, cultural and recreational ecosystem services with particular reference to the evaluation of perceptions and sense of place. Measurements and indicators in this field are underdeveloped, as are the tools to support their analysis. Experiences from the COST Energetic project will implement the task (e.g. "Maps of babel" an on-going experiment by Accurat and <http://urban-sensing.eu/>) that is trying to create novel interpretations of how the city is lived, perceived and used by its citizens and temporary users through an analysis of different languages spoken in the city of Milan. This tool will support policy-makers' use of the "beyond GDP" approach in public and private sector decision-making and statistical analysis.

²⁶ (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/European_cities_-_spatial_dimension).

²⁷ <http://www.peer.eu/publications/a-spatial-assessment-of-ecosystem-services-in-europe-phase-2/>

Services will be developed to adapt this information to be published and ready-to-be-consumed in the GEOSS (based on the extended framework developed in tasks 2.4).

Other tools foreseen include: (1) A mobile/web application for low threshold data entry by citizens. This application will enable inhabitants and visitors of urban areas to contribute quantitative and qualitative data on sustainability and quality of life. The application will be easy to use, so as few people as possible will be excluded from using it. The application will be configurable for acquisition of data on various themes (2) A low threshold web mapping application that can be used to visualize data on quality of life and sustainability in urban areas. The application can make use of official data sources as well as data contributed by citizens. The application can be used in conjunction with the previous application, to provide visual feedback on data contribution. (3) An application that can be used to visualize urban areas in 2D or 3D and display data on and indicators of sustainability and quality of life, and to interact with those data. The application has access to all available data and models and can be used by decision makers, planners and interested citizens. The application can be used to visualize historical data as well as projections into the future. This application will be touch enabled, to allow usage on large display multi-user platforms in collaborative environments. Lesson from the gamification of application developed in WP 5 will be considered to increase uptake (collaboration with WP6).

TIWAH will lead the development of a virtual stakeholder table for urban deliberations. This table will provide to a wide range of stakeholders access to the knowledge generated in the project and at the same time facilitate urban governance deliberations with increased participation of socially and economically disadvantaged groups. A key element of the stakeholder table is the ability to improve the evidence base for deliberations, i.e., to provide data or improve data. The idea of the virtual stakeholder table is an outcome of the discussions at the 2nd GEOSS S&T Stakeholder Workshop held in Bonn, August 2012 (see http://www.geo-tasks.org/workshops/2012_Bonn). The advantage of the table is inherent capacity building in terms of knowledge usage by decision makers, and the facilitation of co-design and co-creation of knowledge. The table and other applications developed in this task will be tested by TIWAH also in less developed countries, where access to the Internet is an issue, but mobile phones are widely available.

Task 4.4: Citizen involvement in indicator and applications assessment (UNISI, ISPRA, GEODAN, 52N, TIWAH, SPB, WWU, EC-JRC, CNR)

This task will look into five case-studies based on different tools and applications to test and assess the results of previous tasks. The use case analysis will also be able to provide feedback, and so improve the information base and subsequent modelling. This task will be organised in 5 different case-studies (lead partner in bracket). The datasets collected in the case-studies will feed into the GEOSS Data CORE.

1. **Urban Ecosystems** (ISPRA) National case-study concerning the evaluation of the new indicators defined in task 4.2 through a comparison with the institutional data on quality of urban ecosystems. As ISPRA currently manages the database of the "National network of environmental quality in urban areas ", which includes main Italian cities (provincial capitals with populations greater than 100,000 inhabitants), this case-study will evaluate the new tool, built on the basis of user-generated data, through a comparison with the institutional data on quality of urban environment. The analysis will include a review of the interest of the regional agencies for environmental protection in the new indicator and about the new approach to crowd data.
2. **Rome Testaccio Neighbourhood** (GEODAN). This case-study integrates authoritative data and expert data about local archaeology and industrial heritage in order to measure, compare and increase perceptions of inhabitants and visitors to Testaccio neighbourhood, in Rome. The neighborhood, which used to be the main river harbour of Rome in ancient times, can be considered a brownfield and the combination of crowd-source data with the authoritative data will give new insights into the potential gentrification processes and the quality of life experienced by the inhabitants.
3. **Odour nuisance** (SPB) The case-study is located at Burgo Ardennes in the South of Belgium. The industrial activities on the site have started in 1964 with the exploitation of a manufacturing unit to produce pulp for paper fabrication. Odour is recognized as a strong or even severe nuisance. The case-study will integrate data from the OMNISCIENTIS Citizens observatory and official data to help all stakeholders in taking appropriate decisions for odour nuisance mitigation.
4. **Noisescapes** (UNISI): this case-study applies a participatory approach to noise pollution

monitoring. It will collect data on noise pollution in Siena and in the major cities of Tuscany (IT). Data collected by the Noisetube application, based on crowd-sourced information, will be compared with data collected by institutions, which control the metrics and parameters of noise pollution. Moreover they will be aggregated for analytical purposes to be integrated with socio-economic data (population density, infrastructure, dwellings, service distribution).

- 5. Gauteng City Region (GCR) in South Africa (TIWAH)** This urban area is a dynamic, rapidly growing attractor pulling in rural population both from South Africa and abroad. Like many other urban centres in the developing world, the GCR is characterized by extreme inequity with a pattern of very wealthy areas embedded in an economically disadvantaged background dotted with pockets of extreme poverty. Impacts on adjacent rural areas in form of human and natural resource depletion are severe and endangering food and water security. Participation of the different social layers and groups in urban governance is very unequal. The GCR therefore provides an excellent test-bed to check the validity of the sustainability and quality-of-life indicators under such conditions. The use case will consider to what extent the indicators developed in Task 4.1 can be applied to the GCR both in terms of conceptual adequateness and in terms of quantification based on available data. A particular focus will be on urban resilience. The GCSRI is conducting several large-scale projects on urban resilience and sustainability in the Gauteng City region. These projects focus on urban performance indicators and provide a test-bed for the indicators developed by Task 4.1, under less favorable conditions for data sharing and different conditions for crowd-sourcing.

Deliverables

- D 4.1 Report on criteria for the identification of measurements for sustainable smart cities and quality of life in urban ecosystems. (M10)
- D 4.2. New data sources in the urban domain made available and accessible through the GEOSS Data CORE. (M12, M24)
- D 4.3 Documentation of new applications and tools (M18)
- D 4.4a Report and lessons learned from case-studies (M18, M36)
- D 4.4b Repository and web-based open source atlas of case-studies (M22, M36)

Work Package number		5		Start date or starting event:				Start: M1 – End M36						
Work Package title		Biodiversity and Ecosystems												
Activity type		RTD												
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Participant short name	BRGM	EC-JRC	CNR	IIASA	CEH	IEEE	CIMA	CREAF	UEDIN	UNISI	WWU	UJI	TUD	USFD
Person-months per participant		2	4	12	30			1	5		4		2	
Participant number	15	16	17	18	19	20	21	22	23	24	25	26	27	
Participant short name	MUNI	INFOTN	GEODAN	YDREAMS-A	52N	BD	SPB	ISPRA	CU	PMLA	TIWAH	SHOOTHILL	PSB	
Person-months per participant	3		9				6	5	12	1				

Objectives

The overall objective of this task is to demonstrate how the integration and novel use of official and citizens data can result in new forms of scientific enquiry, more accountable and transparent policy making, and more participative science in the fields of biodiversity and ecosystem services.

More specifically, the objectives are:

- To assess the availability of open data that can be reused for new applications in the biodiversity field, and make them available through the OpenDataGEOSS Discovery and Access Broker.
- To identify requirements to link and integrate these data and information from different biodiversity and ecosystem user communities and demonstrate benefits through specific case-studies
- To develop new applications and representations of data to support these users and demonstrate reuse of OpenDataGEOSS data services.
- To contribute new data resources and services from the identified data sources to the GEOSS Data CORE

Description of work

Task 5.1: Analysis of availability and compatibility of biodiversity and ecosystems data and services (CEH, WWU, ISPRA, IIASA, GEODAN, SPB, MUNI)

This task will review the plethora of data and services related to biodiversity and ecosystem observation. The work will cover institutional data sources and citizen-based observatory networks that provide a wide range of data from earth observation, integrated environmental monitoring to particular species or environmental issue campaigns. Various sources of data and information from this analysis will be used in OpenDataGEOSS within the case-studies in Task 5.2.

The different aspects of the data and services available or potentially available will be described using the INSPIRE Environmental Facilities specifications testing and detailing in real-life the INSPIRE data models. The information gathered in this process will also be linked to standard vocabularies such as

GEMET and EUNIS but also more detailed vocabularies such as EnvThes (produced from EU FP7 Expeer) to ensure detailed, multilingual descriptions compatible with evolving Link Open Data standards. The standardized information will be collected using existing catalogues (e.g. LTER DIEMS - <http://data.lter-europe.net/deims/>) that will be INSPIRE and LOD enabled and will contribute to enriching the suite of vocabularies used in Task 2.2. All these information assets will be available through OpenDataGEOSS Discovery and Access Broker (WP2).

Task 5.2: Case-studies for integrating and enhancing citizen-sourced and official data (CEH IIASA, UEDIN, WWU, ISPRA, SPB, EC-JRC, WWU, CNR, GEODAN).

These case-studies will demonstrate how bringing these data together along with other complimentary information sources, such as expert ecological knowledge, enhances the value of all these data and increases their utility as a resource for environmental research, management and informing of citizens and professionals involved in data collection. They will demonstrate novel ways of reusing and integrating heterogeneous data sources from citizen observatories (e.g. Geo-Wiki, COBWEB and non-natives species recording networks), social networks (e.g. Twitter, Flickr), and official sources (e.g. LTER Europe and Austrian open data). The case-studies will demonstrate how combining these data can increase their individual value, provide increased resources for policy, societal, and scientific challenges, and increase citizen participation in finding solutions. The following case-studies will be undertaken to enhance access to information on:

a) Land Use Change (IIASA) Assessment of land cover and land use change is necessary for environmental monitoring at the national and global level. Austria has been developing land monitoring capabilities through participation in CORINE, the urban atlas, the acquisition of orthophotos and more recently through the LISA (Land Information System Austria) project. However, continuous change detection is currently not possible because of the high costs and the long time between high quality data acquisition. The OpenDataGEOSS project will provide a low cost/high frequency solution to this problem, which involves the integration of existing and new open data (e.g. Austrian Government open data, LUCAS sample points, social media, etc.) and GMES infrastructure with environmental in-situ data collection using crowdsourcing; the former will be discovered via the broker (WP2) (with additional data discovered in Task 5.1), while the latter will be facilitated through gaming, mobile devices and an online platform employing Geo-Wiki (geo-wiki.org) technology, to be developed in Task 5.3. Task 5.2 will ensure that all data requirements are fulfilled and tested, and that the initial design of new applications and tools is completed.

b) Non-native Species (CEH). This case-study will provide integrated access to data and information on non-native species using official and citizen sourced data on a range of species to demonstrate how combining these data can produce an enhance resource for evaluating the quality, provenance and utility of a wide range of data sources. The work will include data from institutional source such as the Long-Term Environmental Research (LTER) sites in UK and citizen-sourced data such as COBWEB (an FP7 funded Citizen Observatory) and the Non-Native Species Information Portal in the UK. This technology will be demonstrated in the field within the UNESCO designated Welsh Dyfi Biosphere Reserve area using the infrastructure built up during the COBWEB project. This application will demonstrate COBWEB and OpenDataGEOSS technology integrated and working together. The knowledge base used to validate, integrate and interpret these data will be sourced from existing non-native species expert networks (e.g. through DAISIE and EASIN). Link with the marine case-study in Task 3.2 will be established at the outset to compare approach and lessons learned.

c) Protected areas- There will be two case-studies related to protected areas:

C1: (ISPRA and CU) This case-study will demonstrate how the semantic mechanisms developed in WP2 (D2.2.2) can be used to select data sources based on an understanding of the expected quality characteristics of the results they wish to obtain from such data sources to effectively derive a set of "key-types" (discriminant or characteristics species, or a group of species). These key-types can be subsequently used, together with openly available knowledge on biodiversity (species and habitat) in Italy by non-expert personnel (private citizen, technical traders of protected areas, agencies, etc.) as guides in habitats interpretation according the main European classifications of habitats (EUNIS, Natura2000, etc.) for example, for conservation purposes. Applying automated BioVeL workflows and extensions to openRefine (<http://openfine.org>), the case-study will develop and demonstrate validation

rules for assessing reliability and consistency of these heterogeneous sources. Data sources (maps, databases, archives on fauna, flora and vegetation) will include: institutional national geodatabases such as the openly available “CARTA DELLA NATURA” archives from ISPRA (“Nature map of Italy”); data coming from the network of protected areas (national, regional, or Natura2000 sites); academic-scientific archives on flora and fauna scores; and citizen sourced data, coming from national or local associations of botanists and zoologist or private individuals registered in the NNB (National Network for Biodiversity).

C2: (SPB) This case-study, with the support of Aberystwyth University and Polish General Directorate for Environmental Protection, will develop a validation methods using official data and citizen observation at a UNESCO/LIFE/NATURA2000 site in Poland. The study combines 2 aspects: remote sensing methodology for identifying and monitoring natural habitats (based on FP7 MS MONINA and BIOSOS projects) with field inspection / validation thanks to the results citizen observation. The OpenDataGEOSS DAB will provide the necessary interoperability linkages with the FP7 BIOSOS and MS MONINA project data, platforms and results. This case-study will work closely to the other case-studies, and in particular with the one on Land Use Change above to assess the relative advantages and disadvantages of the approaches taken (e.g. gaming) in different thematic and geographical contexts. The collaboration with the general Directorate for Environmental Protection of Poland will be an important opportunity to extend the outcomes of the project to Central Europe.

Task 5.3: New Applications and tools (GEODAN, CEH, IIASA, CNR, WWU, MUNI,)

This task will develop and deploy new applications and tools addressing the requirements identified in 5.2 and reusing the data and services identified in 5.1

1. Working closely with the Austrian Environmental Agency, the OpenDataGEOSS project will integrate different areas of technology, i.e. gaming with a purpose, social networking and mobile devices, for in-situ data capture and acquisition of land change information. The fusion of these different technologies with space technology (Landsat and Sentinel 2) and other GMES products and available open data delivered via the broker (WP2), will be used to identify hotspots of change. These hotspots will then be documented by citizens on the ground (with mobile applications designed to provide geo-tagged audio, video and photos of e.g. soil sealing, illegal landfills, deforestation, and more) as well as online, using Google Earth and orthophotos. It is precisely these hotspots that will become the focal points of the games developed in this task. The goal is to develop a suite of social games or ‘games with a purpose’ to collect in-situ data on land cover change, thereby involving interested citizens in environmental data collection. A main output of the games will be the accurate location of land use change, which could potentially lead to improved land change monitoring by the Austrian government.
2. A Semantic Web application providing the ability to explore data and information on the occurrence and ecology of non native species from a range of Linked Open Data sources supplied through the OpenDataGEOSS infrastructure. This would provide a new way to present information from citizen networks and crowd-sourced data alongside official data and expert knowledge. Social networks (e.g. twitter, flickr etc.) could also be represented as linked data to increase the routes for participation into species, habitat and ecosystem recording. A knowledge-based approach will be used to analyse recording patterns and methods in different data sets. This will enable diverse data to be integrated while retaining information about their characteristics and quality through links to descriptive ontologies. Environmental observations sourced through mobile applications will also be linked with ontological tags to describe the provenance of these data. The novel representation of expert knowledge (e.g. DAISIE and EASIN) in Linked Open Data format will allow this to be augmented with information from across the Web and applied directly to the interpretation of diverse environmental data.

Task 5.4: Contribution of harmonized data and information to the GEOSS Data CORE (CEH, IIASA, EC-JRC)

CEH will manage the rollout of harmonizing data using the semantic techniques developed during Tasks 5.2 and 5.3. These techniques will be made available to wider networks identified in Task 5.1 collecting relevant biodiversity information to ensure their data can be combined without loss of vital information on types of recording, sampling and validation methods, and access to data provenance. This task will ensure that data identified as openly available, but currently not in the GEOSS Data CORE (GDC), will be made accessible through the OpenDataGEOSS infrastructure. These data will

include – 1) biodiversity data from long-term monitoring sites and citizen recorder networks especially relating to non native species; 2) potential spatial datasets available e.g. from the Austrian case-study, include protected areas (wetlands, parklands, peatlands), and land cover (CORINE, satellite images) over Austria; 3) habitat, flora and fauna data coming from Natura2000 sites and protected areas;

Deliverables

- D 5.1 Report on available data, systems, and services in the biodiversity field. (M 12, M 24)
- D 5.2 Report of case-studies and lessons learned including new applications and data collection methods (M18, M 36)
- D 5.3 Documentation of new Applications and tools (M 18, M 36)
- D 5.4 New data sources made available and accessible through the GEOSS Data CORE. (M 12, M 24)

Work Package number	6			Start date or starting event:			Start: M1 – End M36							
Work Package title				Open Innovation Ecosystems, Business Exploitation, and Impact Assessment										
Activity type				RTD										
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Participant short name	BRGM	EC-JRC	CNR	IIASA	CEH	IEEE	CIMA	CREAF	UEDIN	UNISI	WWU	UJI	TUD	USFD
Person-months per participant		24	4	12					3					10
Participant number	15	16	17	18	19	20	21	22	23	24	25	26	27	
Participant short name	MUNI	INFOTN	GEODAN	YDREAMS-A	52N	BD	SPB	ISPRA	CU	PMLA	TIWAH	SHOOTHILL	PSB	
Person-months per participant		9	4	6	3	1	2			4	2	7	1	

Objectives

The overall objective of this WP is to reflect on the lessons learned in the thematic case-studies developed in WP 3, 4, 5, and assess, in collaboration with the dissemination and outreach activities of WP7, the extent to which the new applications and tools developed offer opportunities for uptake and exploitation, and will have positive impacts on society, policy, and science. The specific objectives are:

- To analyse emerging technologies, markets and business model developments in this rapidly evolving field
- To stimulate the development and uptake of new applications and tools through an Open Innovation approach
- To analyse the innovation potential of the project and opportunities for business exploitation
- To assess the impacts for improved governance and societal benefits.

Description of work

Task 6.1: Technology Watch and Business Model Analysis (EC-JRC, INFOTN, 52N, YDREAMS-A TIWAH)

This task will undertake a thorough watch of the market from two complementary perspectives:

- Technology: Market analysis of existing and emerging tools, technology trends and applications related to the foundational pillars of the project and expected outcomes, such as Open Data, Linked Data, INSPIRE data and services, and citizens data as well as IT standards and specifications.
- Business models: The business model view represents the other side of the coin towards the take up of market applications and tools. Business models are bottom-line for exploiting

technologies and creative technologies require different and innovative business models. In Chesbrough's words, "a mediocre technology pursued within a great business model may be more valuable than a great technology exploited via a mediocre business model". As an example, YDREAMS-A intends to evaluate via market research and the stakeholder panels set up by the project whether the adding a label such as "OpenGeo" to different information products and applications could generate benefits for products that do not target the usual geographic community.

Outcomes of the technology and business models watch will serve as input to T6.3, and most importantly, lessons learned and results of the analysis process in T6.3 may come up with new technological niches and business models, which would be approached in T6.1

Task 6.2: Open innovation ecosystem for user engagement (EC-JRC, GEODAN, YDREAMS-A, 52N, INFOTN, BDIGITAL, PMLA, TIWAH)

This task will establish the context and mechanisms needed to engage and retain user communities in the application areas covered by the project so as to make them co-participants by means of open innovation strategies. As user communities vary in objectives and needs (e.g. SMEs, citizens, etc.), different engagement strategies are needed to promote innovative ideas for the re-use of citizen and public sector open data. Such strategies range from public meetings with domain specialists to the promotion of open competitions addressed to the broad community (organized in the context of WP7). An Open innovation ecosystem will then support such a creative process in conjunction with stakeholder and user communities of developing new usage ideas for the application areas covered by the project. The work in this task will be especially supported by the SMEs involved in the project with the aim to identify new applications that may become subject of future exploitation. Furthermore the domain specialists from the project's application areas will support this process by contributing experiences from practice, also focusing on "user-driven innovation" examples as methods to tap stakeholder and user's knowledge and develop new products and services (see for example. <http://www.nordicinnovation.org/Publications/user-driven-innovation-context-and-cases-in-the-nordic-region/>)

Building on the ENVIROFI project and linking up with the European Networks of Living Labs (ENoLL), and the European Institute of Technology ICT Labs will be strategic in this task and can be performed by the partners some of whom are signatories of a Memorandum of Understanding with the EIT ICT Labs. Collaborations and synergies with the ICT Labs focus areas on future media and content delivery, smart spaces, and digital cities of the future will be explored. In particular, the Province of Trento will act as test case to roll out some of the innovative ideas tested in the TasLab Living Lab located in that province.

Task 6.3: Analysis of innovation potential and business exploitation (INFOTN, IIASA, EC-JRC, 52N, YDREAMS-A, SPB, PMLA, GEODAN, SHOOTHILL, PSB)

This task will analyse the ideas for innovation that were collected from Task 6.2 together with the inputs on recent technologies from T6.1 and determine their potential for business exploitation. Based on this, and combined with the business model watching carried out in T6.1, a business and knowledge management plan will be developed to exploit the commercial potential of the key tools (e.g. through the establishment of an OpenGeo label), applications and data solutions that were developed during the project. In particular, gamification of volunteer geographic information is a new and rapidly expanding field where citizens and social networks play a large role. Gamification means the creation of a gaming environment to encourage players to collect useful information while having fun. These games can include official data, which the player validates, thus improving quality, and at the same time the playing the game provides the opportunity for creating new and previously unattainable datasets.

Within the task the potential for exploiting both the results of the project as well as the improved integration of multiple open data sources will be investigated in collaboration with WP7. The results of this project will be a set of business plans on how the results can be marketed by the SME partners beyond the duration of the project. The outreach activities of WP 7 will serve as a starting point for reaching potential customer groups. This will be a valuable activity for the partners planning to exploit the project results (i.e. the SMEs) to establish contacts with new customers for the services and tools resulting from the project.

Operationally, to support the achievement and measurement of innovation potential as well as of impact on the market, a group of the OpenDataGEOSS key **industrial stakeholders** will be identified. With this group, the key market-wise **benefits** to be pursued will be articulated. These, in turn, will be

substantiated by the **changes** that the project will bring through deliverables. Benefits and changes are the basis for exploitation plans as well as for measuring the respective results achievement with respect to the stakeholders.

Task 6.4: Analysis of improved governance and societal benefits (IIASA, EC-JRC, USFD, PMLA, TIWAH)

This task will utilise a set of user studies methodologies, such as surveys, focus groups, user and stakeholder feedback from the open innovation activities carried out in T6.2, to assess the improved governance and societal benefits that accrue from OpenDataGEOSS, building upon experience gained in the EuroGEOSS Project. The stakeholders identified in Task 6.2 with the help of the project partners in each of the respective disciplines will be surveyed at the onset of the Project and combined with the URR to identify the key benefit indicators in the respective use cases (i.e. in WPs 3,4,5). These are crucial in order to determine the OpenDataGEOSS baseline. A second round of surveys (done in collaboration with WP7 Task 7.2) will be completed at the end of the project to evaluate the results of the project, identify which aspects of the system enable improved governance and societal benefits and identify barriers to the uptake of Open Data. The GEOSS Science and Technology Service Suite (GSTSS) feedback utility will be used to crowd-source continuous user feedback during the project.

Additional assessment will be undertaken to measure the ability of stakeholders to perform tasks in a simulated pre and post OpenDataGEOSS world e.g. citizens, government agencies, and scientist would be provided with both data-rich and data-poor scenarios, and asked to perform tasks under these circumstances. Results would then be compared and recommendations made for enhancing European Open data strategies.

Deliverables

- D 6.1 Report on technology and business models watch (M12, M24, M36)
- D 6.2 Report on lessons learned from open innovation strategies and stakeholder consultations (M 18, M 34)
- D 6.3 Report on analysis of innovation potential and model business plans for exploitation (M 27, M 36)
- D 6.4 Report on benefit assessment (including survey results, analysis of findings and recommendations for enhancing European Open data strategies.) (M 18, M 36)

Work Package number	7		Start date or starting event:			Start: M1 – End M36								
Work Package title	Dissemination and Outreach													
Activity type	OTH													
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Participant short name	BRGM	EC-JRC	CNR	IIASA	CEH	IEEE	CIMA	CREAF	UEDIN	UNISI	WWU	UJI	TUD	USFD
Person-months per participant	4	6	9		1	9		1	1	1		4		
Participant number	15	16	17	18	19	20	21	22	23	24	25	26	27	
Participant short name	MUNI	INFOTN	GEODAN	YDREAMS-A	52N	BD	SPB	ISPRA	CU	PMLA	TIWAH	SHOOTHILL	PSB	
Person-months per participant	1		4	1	2		2	1		2	2	1	2	

Objectives

The objectives of this WP are:

- Raise awareness of solutions and best practices developed in the project among the European and International communities working in the project application areas.
- Support international collaboration in the project areas with the objectives of creating opportunities for expanding project developments into sustainable global opportunities.
- Support outreach to the broad technical community, to end-users and to citizens through traditional and social web-based resources. Information targeted to the technical community will address the tools and standards and other technical developments of the program.

Description of work

Task 7.1: Raise awareness of solutions and best practices (IEEE, BRGM, EC-JRC, CNR, PMLA, UNISI, CEH, UJI, CREAM, TIWAH)

Throughout the life of the project, the Work Package 7 (WP7) dissemination and outreach team, in close collaboration with the other Work Packages, will identify and harvest project solutions and best practices for:

1. Open Data technology innovations;
2. New applications of harmonized citizen observations and environmental Open Data, and
3. Cross-disciplinary solutions between the three thematic areas.

Regularly scheduled discussions and meetings between work packages will be conducted with project partners as they move toward identifying and demonstrating solutions and best practices. The strategy for communicating the outcomes of these meetings will be reviewed during coordination meetings within the Dissemination and Outreach team.

In order to demonstrate the new applications and use of both citizen observations and Open environmental Data, this task will organize two OpenData festivals. The OpenData Festivals will be organized in conjunction with major community events such as the INSPIRE conference, an eGovernment activity, an OpenKnowledge event, or in collaboration with the three Volunteer Geographic Information Days organised by COST ENERGIC project (WP4).

The first OpenData festival will take place approximately half way through the project and will focus on Open Data technology advancements. The second festival will be scheduled toward the end of the program and will highlight the cross-disciplinary aspects of the thematic areas. Both festivals will include a combination of presentations, and hands-on activities such as Hack-a-tons and demonstrations/competitions. The IEEE team has a broad experience with the organization of conferences, workshops, and hands-on events. For example, team members have organized over the last few years several IEEE Ocean conferences, two very successful EuroGEOSS conferences, two broad GEOSS Science and Technology Stakeholder Workshops, over 40 other GEOSS related workshops, and three Earthcube brokering hack-a-tons.

Building upon the festivals and other WP7 initiatives, WP6 will engage the community by: (1) organizing brainstorming sessions involving “experts” in the three thematic areas; (2) through open calls on the Web (crowd participation) and open competitions; and (3) through the use of test-beds for collecting requirements and feedbacks from real end-user in real contexts. For this purpose Living Laboratories will be used.

At a smaller scale, an outreach event will be organized in the use-case area in a developing country (Gauteng, South Africa). This event will provide useful feedback to increase usability of our awareness-raising approaches. Offering stakeholders and users a versatile feedback utility is another way to engage them in deliberations about solutions and best practices. The GSTSS feedback utility provides a starting point for this approach, which will be further developed during the project.

Peer reviewed publications in noted technical journals will be another avenue for raising awareness of technical developments. The project will publish its results, whenever possible, in open journals. In addition, lessons learned from the project will be integrated in the GEOSS best practices wiki (a contribution of the IEEE to GEOSS). Finally, recommendations to relevant international standards organizations (e.g. OGC, ISO, IEEE) will be made by each of the work packages as appropriate in order to encourage sustainable re-use of project results.

Task 7.2: Support development of international collaboration (IEEE, EC-JRC, CNR, PMLA, UNISI, CEH, GEODAN, YDREAMS-A, 52N, BD, SPB, SHOOHILL, PSB, TIWAH)

This task will focus on development of international collaborations with the objective of creating opportunities for expanding project applications and facilitating exploitation and sustainability. Working closely with the project partners, and particularly with the project SMEs, potential international collaborators will be identified. Together with project SMEs, business fora and trade organizations will be engaged within and outside of Europe for further contacts leading to identification of potential business and joint development opportunities. Additional target organizations will include European research infrastructures and collaboration projects (such as iCORDI and COOPEUS), international organizations (such as the Research Data Alliance, GEOSS, and UNEP), US agencies (such as NASA, and NSF Earthcube projects), other overseas organizations (such as CSIRO in Australia), and others. Together with project SMEs, business fora and trade organizations will be engaged within and outside of Europe for further contacts and identification of potential business opportunities. Examples of benefits from the project identified in WP6 will be brought to potential sponsors including the surveys and “before and after” analyses of WP6 Task 6.4. The business plans and exploitation models of Task 6.3 will guide the targeted interactions and identify outreach activities in this task.

A LinkedIn community will be established for addressing questions and discussion of project developments along with other outreach through web 2.0 services. The activities here will be coordinated with WP6 as well as WP 2-5. Relevant science and technology stakeholders are already engaged in the GEOSS Science and Technology Stakeholder Network, which will closely cooperate with the project. A compendium of capabilities will be created for the SMEs to facilitate exploitation of the project’s results.

Task 7.3: Outreach support (IEEE, BRGM, EC-JRC, CNR, PMLA, UNISI, CEH, ISPRA, UJI,

YDREAMS-A, 52N, TIWAH)

Reaching out to decision makers and to the general public requires effective use of audiovisual and web tools and directed communications. This task will use a variety of communication avenues including webinars, videos, newsletters, conference session organization and presentations, and web magazine articles.

In this task, four **on-line seminars** will be produced, covering respectively WP2-5 developments using web-based and telephonic meeting services. These one-hour seminars will provide a means to illustrate outcomes of each work package and support discussions of the project by the global community. The events will be widely publicized among the communities working in the project technical and application areas. Recordings of the seminars will be available on the project website, as was done previously for the EuroGEOSS project, and is currently done for the NSF Ocean Research Coordination Network (RCN) activity.

A **professional video** of project outcomes will be produced for outreach at major events and on YouTube or equivalent. This video will be approximately 6 minutes in duration, and will target both providers and users of Open Data.

- Data providers: This video will provide guidance for owners of data sets relevant to the project's usage areas, highlighting best practice examples on how to make their datasets accessible and usable by a very broad community
- Data consumers: This video will describe how the discovery mechanisms developed by the project as well as the data access through the brokering approach can be used by users (domain experts, general public) to answer their questions.

A **web based OpenDataGEOSS newsletter**, published every six months, will reach out to a wider community interested in OpenDataGEOSS best practices, results and events, particularly those applicable to the specific thematic areas, e.g. the national and European level experts and practitioners in the fields of data sharing, management, use and re-use for freshwater, marine environments, urban sustainability and biodiversity. The newsletter will target the following: Local, Regional, National EPAs and other Environmental, Water, Land and Sustainable Development Institutions, or National Services and Authorities, Professional Networks, Communication Managers of the partner institutions, National Reference Centers and National Focal Points of EIONET the Networks of the Heads of Environment Agencies, the Network of the Heads of European Nature Conservation Agencies, and others. The material will be based on brief contributions provided by project partners. A mailing list will be compiled and will be expanded as the project evolves. Under WP6 leadership, a series of public meetings with domain specialists will provide for broader inputs and collaboration. The results of these will be integrated into the outreach activities of WP7. Outreach will include **participation in international conferences** such as INSPIRE, eGovernment, BigData, relevant specialty meetings, major international science meetings such as EGU, and social networks events. It also includes facilitating engagement through the project partners (mostly electronically, and locally where practical) with communities organizing citizen data collection and usage in the spirit of Open Data. Project developments and results will be made available through **web magazines** including Earthzine and other web outreach (such as social media) to the general public. Inclusion of mobile technology as output channels will be considered in order to reach the broader public in areas with limited access to Internet.

Deliverables (brief description and month of delivery)

- D7.1.1 First OpenData Festival with European focus (M18)
- D7.1.2 Second OpenData Festival with International focus (M33)
- D7.2 Report on global collaboration opportunities (M36)
- D7.3.1-4 On line seminars (M12, 18, 24, 32)
- D7.3.2: Project video (M33)
- D7.3.3 Newsletter (M9, 15, 21, 27, 33)

Work Package number	8	Start date or starting event:	Start: M1 – End M36			
Work Package title	Scientific and Technical management					
Activity type	RTD					
Participant number	1	2	3	5	10	24
Participant short name	BRGM	EC-JRC	CNR	CEH	UNISI	PMLA
Person-months per participant	2	4	2	2	2	2

Objectives

- To co-ordinate and ensure the coherence of all the technical developments between Work Packages.
- To ensure the alignment of the OpenDataGEOSS architecture with respect to INSPIRE and GEOSS and the synergy with other relevant projects and initiatives.

Description of work

Task 8.1: Quality tools (BRGM)

The quality system adopted will be in accordance to the ISO – 9001 standard. A specific Quality Plan (QP) will be issued early in the project. The Quality Plan is applicable to all project's activities, and the strict compliance with it is mandatory for all partners. All subsequent changes will need the approval of the Steering Committee.

Task 8.2: Technical and scientific coordination (EC-JRC, BRGM, CNR, CEH, UNISI, PMLA)

In the OpenDataGEOSS project JRC will play the role of Technical and Scientific Coordinator and chair and manage the Technical and Scientific Committee described in section 2.1. These activities are:

- To ensure the coordination of technical and scientific exchanges between Work Packages.
- To assess all technical and scientific deliverables regarding their fitness for purpose to achieve the overall technical and scientific goals.
- To assure coherence of all technical and scientific developments.
- To observe INSPIRE/GMES/GEOSS/SEIS recommendations and relevant International standards and specifications, and to decide on changes or adaptations of technology employed in the project as a result of those recommendations.
- To chair the Technical and Scientific Committee, prepare the agenda, minutes and follow up on decisions.
- To manage the technical risks.
- To set up guidelines for the technical developments.
- To develop a validation plan

Deliverables

D8.1 Quality assurance plan (M2)

All scientific reports produced by the WP leaders throughout the project, will be integrated into the WP1 progress reports (D1.2, D1.3, D1.4).

1.3.3.5 Summary Effort table

N°	Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	TOTAL
01	BRGM	23	14					4	2	43
02	EC-JRC		14	2	8	2	24	6	4	60
03	CNR		37	4	4	4	4	9	2	64
04	IIASA					12	12			24
05	CEH			5		30		1	2	38
06	IEEE							9		9
07	CIMA			10						10
08	CREAF		13	1	1	1		1		17
09	UEDIN		10	1	2	5	3	1		22
10	UNISI				15			1	2	18
11	WWU		12	4	4	4				24
12	UJI		18		6			4		28
13	TUD		22			2				24
14	USFD		10	10			10			30
15	MUNI		3	4	4	3		1		15
16	INFOTN		6				9			15
17	GEODAN		9	4	18	9	4	4		48
18	YDREAMS-A			21			6	1		28
19	52N		9	7	9		3	2		30
20	BDIGITAL		3	13			1			17
21	SPACEBE				7	6	2	2		17
22	ISPRA			9	7	5		1		22
23	CU		12			12				24
24	PMLA		9	30		1	4	2	2	48
25	TIWAH		8		6		2	2		18
26	SHOOTHILL			10			7	1		18
27	PSB		8				1	2		11
	TOTAL	23	217	135	91	96	92	54	14	722

1.3.4 Significant risks and associated contingency plans

The analysis of the activities to be carried out in OpendataGEOSS allows the identification of some risks that could potentially jeopardise the achievement of project goals and related to both technical and managerial issues. Risk management will be pursued and enforced throughout the project duration by preparing a risk analysis dossier as described below. This file is intended to evolve along with the project and be updated at regular intervals (at least every six months). The activities will be carried out in accordance with state-of-the-art methodologies for risk identification and evaluation, and a method for risk control.

Each risk can be quantified as follows:

- Likelihood of occurrence, on the following scale:
 - 1) Very unlikely <10%
 - 2) Unlikely <10%,30%
 - 3) Possible <30%,50%
 - 4) Likely <50,70%
 - 5) Very likely >70%.
- Impact on the project (just because a given risk event occurs does not mean that it will necessarily prove detrimental to development):
 - 1) Low (<20%)
 - 2) Medium (20%, 40%)
 - 3) High (40%, 70%)
 - 4) Critical (>70%)

This formalized approach to risk assessment yields important benefits for project management in that it is possible to estimate the delay and/or additional expenses the risk event may incur and thus propose mitigation procedures aimed at limiting adverse impact of risk events on the project's development timeline.

Thus, for the purposes of risk assessment, each WP will be required to identify and describe the risks that may affect development within that WP and present it to the OpenDataGEOSS Project Coordinator in the form of tables, as described below. Upon reception of contributions from all WPs, the project management can then issue a risk analysis dossier, evaluating the overall risk to the project and undertaking appropriate mitigation strategies, if necessary. The risk events, their impact and the related total and estimated loss are represented in the following table:

A.	Risk event	<i>Description of the event – a brief statement of the risk</i>
B.	Likelihood	<i>Probability of the occurrence of the event</i>
C.	Impact	<i>Description of impact due to the occurrence of the risk event – the loss, that could result if the risk event occurred – and it's quantification</i>
D.	Total loss	<i>Maximum possible loss due to the risk event - a number that represents what would be lost if the risk event and its impact occurred. The total loss is expressed in either time, effort or money, such as the number of days lost due to rescheduling the class (time), the extra amount of person months needed to recover the event (effort) or the personal costs in lost billings (money).</i>
E.	Estimated loss	<i>Estimated loss, equal to $B * C * D$ – an overall measure of the risk – the average loss that can be expected as its result</i>
F.	Mitigation strategy	<i>Actions planned in order to avoid the risk event</i>
G.	Responsible person	<i>Person responsible for the mitigation strategy on the appropriate level</i>

The following table reports some of the major risks that can be identified for OpenDataGEOSS at proposal time, just in terms of their likelihood, impact and mitigation strategy.

All other fields needed to correctly manage the risks will be filled as soon as the project will start.

Managerial risks

Risk	Impact	Likelihood	Mitigation Strategy
Large number of partners	Inadequate communication; difficulties to manage; unclear responsibilities; insufficient participation; insufficient integration	low	To help avoid this possible risk clear consortium agreement and management structure, quality plan and procedures will be established. Clear description of responsibilities in working plans, Regular Consortium meetings and monthly conference calls of the Steering/Mgt Committee. Use of the project website for sharing project documents and information. Strategy designed for cross-WP coordination and spiral development. Many partners are known to each other from previous contracts and have experience of large project Consortium. This will mitigate risk.
SME partnership	Small size, low staffing, shortage of financial resources may create difficulties to face and meet project requirements	medium	Prepare and assess work scope, anticipate possible risks by steady budget elaboration. Ensure close contact and support, to be sure to immediately address problems, and a timely distribution of EC contribution allowance to avoid financial difficulties.
Deliverables not on time	Delay of correlated deliverables integration cannot start on time	medium	Clear working plan; strict management of milestones; definition of critical deliverables The list of major deliverables will be limited so that scientific work can be thoroughly performed. To ensure consistent results are delivered, the list of deliverables will be reassessed regularly and intermediate versions planned so that a final updated version can be produced at the end of the project.

Risk	Impact	Likelihood	Mitigation Strategy
Costs deviation	Deviations in the work plan and deviation in mission costs. Missions are obviously necessary to coordinate the project and for dissemination.	medium	Sound and ad-hoc budget prevision to anticipate this risk. Budget expenditure will be monitored on a regular basis by each partner. Spend and use of resources to be recorded in periodic EC reports. Management Committee to monitor significant over-spend and/or under-spend, and take remedial action if required. All deviations from work plan to be recorded in Periodic Reports and agreed by Management Committee.

Technical risks

Risk	Impact	Likelihood	Mitigation Strategy
Lack of coordination between cross-thematic Work Package and thematic Work Packages	Inability to communicate and find common ground among "Thematic areas" and "transverse activities" to produce expected outputs of the project. Failure in reaching expected output documents.	low	The Scientific and Technical coordination WP is set to steer and coordinate research and developments and has the role to maintain close contact and sufficient information level between Work Packages. Spiral engineering approach adopted for the project should reduce the impact of such an event, and ensure communication and coordination measures as defined in the Consortium Agreement. A dedicated team of partners has been set up to provide the necessary information flow between WP2 and WPs 3, 4, 5 to ensure smooth collaborative work.
Citizens Observatories do not deliver data in time	Potentially less data available for the case-studies	medium	The project does not overly rely on the Observatories as it will utilise open data from administrative sources and citizens observations directly obtained through the new apps developed in the project. The data from the Observatories is potentially useful but not critical.
Unexpected (or lack of) technical developments	Requirements cannot be met or can be exceeded or superseded	low	If barriers are technical, timely redefinition of requirements, and design of alternative solutions and deliverables in consultation with Management Committee and EC. If delays related to poor partner performance a formal warning to defaulting partner will be given. If not acted on, ultimate sanction would be expulsion from consortium in accordance with EC contract rules.

2. Implementation

2.1 Management Structure and Procedures

This section describes the governing bodies of the OpenDataGEOSS project, and the main roles of the various organisations within the project's management structure. It is important to note that all the partners have very significant experience of European research projects. They have also a strong track record of successfully completing the work in time and in budget, and at a very high standard both in terms of scientific output and policy-relevance as the EuroGEOSS project, in which several of the partners were involved, demonstrates. This Section presents also the Consortium plans for managing financial matters, risks, quality and other legal aspects. Management of the intellectual property rights (IPR) are described in section 3.2.

Management structure

The Management structure of OpenDataGEOSS aims at facilitating the co-operation between partners, flexibility to adapt to changing conditions and new developments while maintaining a close control of gradual achievements of the project objectives. The OpenDataGEOSS Management Structure is composed of: the Steering Committee, the Technical and Scientific Committee, the Advisory Board and the Plenary Assembly, as detailed hereafter.

The Steering Committee is chaired by the Project Coordinator and consists of the Work Package Leaders, the Technical and Scientific Manager and the Quality Manager. The Steering Committee will be in charge of all administrative and financial project issues including exploitation, and be responsible for:

- Monitoring of project progresses, achievements and costs.
- Solution of problems that have a potential impact on project strategies, resources and achievement of planned objectives, definition of the necessary contingency plans.
- Coordination of common exploitation and dissemination actions.
- Review the declaration of know-how and/or knowledge.
- Conflict resolution on issues that have an impact on strategies, medium-long term objectives, resources and the project roll-out strategies.
- Preparation of contract changes (budget, resources, plans, etc.).
- Detailed project monitoring procedures will be agreed at the first meeting of the Steering Committee.

The Steering Committee will meet physically at least every 6 months, and monthly by teleconference. Extraordinary meetings can be requested by any of the members of this Committee. The Consortium Agreement will detail description of the meeting procedures, voting scheme and resolution of conflicts.

The Technical and Scientific Committee is chaired by the Technical and Scientific Manager and consists of the Work Package leaders, the Project Coordinator, and the Quality Manager. The Technical and Scientific Committee will be in charge of all the technical and scientific issues of the project and will report to the Steering Committee about the potential problems, risks and proposed solutions dealing with technical and scientific aspects. The Technical and Scientific Committee will be responsible for the project roadmap, the coherence of the results, and the discussions about the results of all technical and scientific work packages with the project partners and the Steering Committee.

The Technical and Scientific Committee will meet at least at least every 6 months face to face and have regular monthly teleconferences. If needed, additional meetings can be requested by any of the members of this Committee. The Consortium Agreement will detail the meeting procedures, and resolution of conflicts.

The Advisory Board will play an essential role of guidance to put the activities of the project in the wider international context, and provide feedback on the requirements identified, the architecture, and the application areas (thematic and technical). The main activities of this Board are to peer review the

technical and scientific activities and provide recommendations. This Advisory Board has been formed to have a high level representation from key international organisations contributing to Open Data, Linked Data, GEOSS, and citizens science activities. The members of the Board also represent government, academia, and the private sector, thus providing multiple complementary inputs to help steer the activities of the project.

To date, the following organizations have agreed to be members of this Advisory Board:

- The European Environment Agency (Mr. Stefan Jensen, coordinating in-situ GMES activities, INSPIRE data sharing implementation, and citizens science including Eye-on-Earth)
- The US Federal Geographic Data Committee (Mr Ivan De Loatch, also co-chair of the GEOSS Infrastructure Implementation Board)
- Google Inc. (Mr. Ed Parsons, Chief Geospatial Technologists)
- The Commonwealth Scientific and Industrial Research Organisation of Australia (Mr. Rob Atkinson leading work on Linked Data and semantic interoperability)
- South African Environmental Observation Network (Dr. Wim Hugo, Chief Data and Information Officer)
- Kings College London (Prof. Denise Lievesley, Head of the School of Social Sciences, former Director of Statistics at UNESCO)

In order to accommodate the costs associated to the Advisory Board logistics, such as travel arrangements and allowances, the OpenDataGEOSS consortium has reserved a total amount of €12,000 of funding. This funding is currently allocated within the coordinator's budget under the Management activity and considered as "Other Cost" type of expenditure. This Advisory Board will be set up 3 months after the launch of the project.

The Plenary Assembly chaired by the Project Coordinator, is composed of the Technical and Scientific Manager, The Quality Manager and one authorized representative of each one of the OpenDataGEOSS partners. The Plenary Assembly will monitor and control the overall direction of the management of the project being carried out by the Steering Committee and be responsible for all decisions with an impact on the consortium as a whole. The Plenary Assembly will meet at least once a year, during the annual OpenDataGEOSS meeting and at the request of its chairman or at any other time when necessary at the request of one member of the Steering Committee.

Key OpenDataGEOSS Roles

OpenDataGEOSS has a large partnership and ambitious objectives. For this reason we have set up a strong management team able to ensure the smooth running of the project and the achievement of the expected impacts. Below are the details the roles and the partner responsible:

Project Coordinator (BRGM): BRGM has appointed a very experienced Project Coordinator, Dr. Agnes Tellez-Arenas, who has over 15 years of project management experience combined with technical expertise in the field of the project. Agnes is the project coordinator of the EO2HEAVEN project, which ends in 2013 and includes four of the partners of OpenDataGEOSS (BRGM, EC-JRC, TUD, 52N). BRGM has proven an excellent coordinator also of the EuroGEOSS project, in partnership with EC-JRC that acted as Scientific Manager. The core EuroGEOSS project partners (BRGM, EC-JRC, CNR, UJI, and IEE) are also leading partners in OpenDataGEOSS. Agnes will bring this collective experience to the project and will be in charge of the day-to-day management of the entire project, including:

- Administration and co-ordination of the project resources.
- Communication within the consortium (including deliverables, reviews, etc.).
- Setting up and management of the project Web site.
- Interface with the European Commission.
- Monitoring and control of the Work Plan.
- Arrangement of meetings and minutes-related activities.
- Issuing of periodical reports.
- Billing of efforts and budget.
- Leading the financial management activities.

Acting as interface between the consortium and the financial department of the coordinating partner in order to ensure that all payments are timely, that the accurate amounts were received by partners, and take any measures necessary to correct any possible contingency (except, if any, problems between the affected partner and its own bank).

Technical and Scientific Manager (EC-JRC): The Technical and Scientific Manager will work closely with the Project Coordinator and WP Leaders, and report to the former. EC-JRC has appointed Dr. Max Craglia to take this position. Max has over 20 years experience in international scientific project management starting with the European Science Foundation's GISDATA programme (1993-97) that involved over 300 researchers from 20 countries. He has since coordinated the MADAME, GENIE, EuroGEOSS, and GEOWOW European projects, and is a member of the INSPIRE Coordination Team. Max will be responsible for the technical development of the project. This includes the management of dependencies between various tasks, coordination of technical work, review and approval of technical reports and deliverables, and resolution of problems of a technical rather than an administrative nature. The Technical Manager duties will include:

- Monitoring the general technological and scientific community in those research areas tackled by OpenDataGEOSS to determine the state-of-the-art and industry evolution.
- Keeping abreast of industry technological trends.
- Monitoring of the progress of scientific research carried out in OpenDataGEOSS.
- Monitoring of the progress of technological developments carried out in OpenDataGEOSS.
- Liaison between OpenDataGEOSS and related projects, networks of excellence, standardisation bodies and in general with adjacent research communities including INSPIRE, GMES, and GEOSS.
- Work plan deviation identification and troubleshooting of technical and organizational contingencies.
- Support the decision making mechanism, proposing changes regarding technological and scientific implementation or adjusting the work plan ensuring the overall success of the project.

Quality Manager (BRGM): BRGM will appoint the Quality Manager who will be responsible for the quality procedures of OpenDataGEOSS in accordance to the ISO 9001 standard and to prepare the specific Quality Plan for the project. The Quality Manager reports to the Project Coordinator and the Management structure, and is in charge of installing and monitoring in-house quality procedures according to suitable standards. The Quality Manager is also responsible for setting the success indicators in all scopes, and measuring the evolution of the project according to the quality indicators and metrics. The Quality Manager will also report to the Management structure about any significant deviation to be corrected, since the Quality Manager will elaborate the Risk Identification and Management Plan, including Contingency Plans, for OpenDataGEOSS in collaboration with the Management structure (and other project members that the Board may consider appropriate). The Quality Manager interfaces to other partner's quality functions.

Partner Representative: Each partner will appoint a representative to be in charge of centralising interactions with other partners in the project and to represent its organisation as partner in the Plenary Assembly. This person would be responsible for the work carried out within their organisation.

Work Package leader: The Work Package leaders are key members of the Management Team as they provide the essential day-to-day dialogue between the individual partners working on specific tasks, the Scientific Manager, and the Project Coordinator. OpenDataGEOSS has a very strong team in this essential role:

Dr. Stefano Nativi (CNR) leads WP2

Dr. Steve Groom (PMLA) leads WP3

Dr. Cristina Capineri (UNISI) leads WP4

Mr. John Watkins (CEH) leads WP5

Dr. Max Craglia (EC-JRC) leads WP6

Mr. Jay Pearlman (IEEE) leads WP7

As the description of each partner in Section 2.2. shows all WP leaders have very strong scientific and management experience, and will provide the leadership needed to coordinate the activities of the project and ensure strong linkages to the many projects and e-infrastructures OpenDataGEOSS builds upon.

The activities for WP leader consist of:

- Coordinating the tasks and activities towards the WP objectives.
- Ensuring a smooth running and co-ordination with other Work Packages.
- Monitoring of the tasks progress with respect to task goals, milestones, and adequacy of results.
- Reporting to the Management structure of any possible deviations identified due to scheduling, unsuitability or risks affecting the quality of project results and/or objectives.
- Ensuring the conformance to the Quality Plan procedures.
- Checking the deliverables and submitting to the technical and scientific manager.
- Coordinating of task leaders.

Cooperation Procedures

The partners of OpenDataGEOSS consortium are committed to work as one in making this project a great success. Each partner will produce R&D the activities agreed, but we are all aware that the synergy developed within the consortium will provide an outcome of a greater value than the addition of each individual result.

As detailed within the section 1.3 all Work Packages are related with dependencies among them. This is also the case of tasks within each Work Package. The management structure discussed in the previous section ensures communication from a Work Package level to a higher, more strategic, point of view so that these dependencies can successfully be met and take place in an efficient communication manner.

The Project Coordinator will ensure that the consortium and key role players have the necessary tools and procedures to effectively communicate avoiding potential risks of lack of communication and/or over management.

Project Reporting and Quality Control

The consortium will provide regular management reports to the EC, and submit all the deliverables listed in Section 1.3.3.2. Besides the technical deliverables the consortium will generate managerial reports following the EC requirements as described in WP1. Based on this information the Project Coordinator will submit to the EU the managerial reports as specified in WP8 or otherwise requested by the EC during the negotiation phase and reflected in the contract.

Quality Assurance

The project will operate within certain administrative procedures, which will be defined at a very early stage covering management reporting, document standards, collaborative specification and development, review, configuration, change control and quality assurance. A common format will have to be agreed upon for the preparation of all documentation and the deliverables.

The activity reports, project publications and other deliverables will be submitted for review to the Management structure. The Quality Manager compiles and produces the final version of the reports taking into account corrections made by Board Members. Once finalised all deliverables will be publicly available, except for internal administrative reports.

Financial Management and Economic Liabilities

The guidelines for financial management and Economic Liabilities will be described in full detail in the Consortium Agreement. These guidelines will be in line with the model contract (contract body and annexes) provided by the European Commission at the Cordis website.

Management of the external funding (from the EC or other sources) and payments procedures of OpenDataGEOSS will be described in full detail in the Consortium Agreement. To ensure transparency,

periodic reports on the state of accounts shall be sent to the Steering Committee by the project coordinator.

Payments

Payments will be made directly from the project account, managed by the Coordinating Partner, to the official current account of each partner, in coherence with the data provided by the corresponding representative, according the following procedure:

1. Advance Payment: in agreement with EC rules, an advance payment will be distributed.
2. Financial Statements and audits: partners will prepare their own financial statements, and submit them to the Project Coordinator. These financial statements will be accompanied by audits according to EC regulation.
3. Financial data interface: the Project Coordinator must carry out the collection of current account details and other relevant financial information from all partners, and submit them to the coordinating partner's financial department.

Economic Liabilities

Following the directives of FP7, the consortium will not establish a collective financial responsibility fund, but it will rely on the participant Guarantee Fund which will be established by the EC for the FP7.

Risk Management

The identification of possible obstacles that could endanger the correct implementation of the project has to take place throughout the life of the project. For that purpose, the project will follow a policy that lists the risks identified throughout the work performed and proposes the appropriate counter-measures. This will be done under the responsibility of the Management structure.

2.2 Individual Participants

Participant name: Bureau de Recherches Géologiques et Minières – France Partner N°1
Description: BRGM is a French Public Institution responsible for mobilising the Earth Sciences in the sustainable management of georesources and the subsurface domain. BRGM's research and development programmes, funded by the Ministry of Research and Environment and the Ministry of Mines and Minerals, support innovation and work towards advancing the Earth Sciences in strategic areas on a national and international scale. Under the supervision of the Research Division, BRGM ensures the quality of the undergoing research projects. BRGM has an international competency in information systems, being part of drafting teams of the INSPIRE directive and in charge of the catalogue and search engine of the French Government's Geoportail. BRGM also manages projects on commercial bases for international funding agencies like European Commission or World Bank. BRGM is ISO 9001:2008 and ISO 14001:2004 certified for all of its activities.
Main tasks in the project: Project coordination :WP1 and contribution to WPs 2, 7, 8.
Relevant previous experience: Coordination or contribution to several EC research projects, such as GMES Terrafirma project, AEGOS (FP7), EuroGEOSS (FP7), E02Heaven (FP7), PANGEO (FP7), Genesis (FP7), OneGeology Europe (eContentPlus), RISK-BASE (FP6), LESSLOSS IP (FP6), ORCHESTRA IP (FP6), FOOTPRINT (FP6), RISKUE (FP5), SAFE (FP5), ANFAS (FP5), ISARD (Interreg), FLOODGEN (FP4), GEMITIS (FEDER, ECHO), GERIA (Interreg). BRGM is in charge of developing and hosting the portals of the OneGeology and OneGeology- Europe portals. To support these activities, BRGM has invested its own infrastructure providing powerful and reliable hosting facilities. BRGM is also deeply involved in standardisation activities such in OGC and GeoSciML (through IUGS/CGI working groups). BRGM coordinated the FP7 project EuroGEOSS and is actively involved, among others, in the interdisciplinary work package on forest, drought and biodiversity with a focus on interoperability aspects and the thematic domain of droughts.
Profiles of staff members: François Robida: Deputy Head of Information Systems and Technologies division, BRGM. Mining engineer and geostatistician, 33 years of experience in computer science applications to earth sciences (R&D, marketing of software in the areas of geology, mining). Currently co-ordinating IT R&D programs for BRGM. Member of the OGC Board of Directors, Chair of the EuroGeoSurveys Spatial Information working group, Chair of the IUGS/Commission for Geoscience Information, and member of ICT board of the EPOS initiative. Agnès Tellez-Arenas: PhD in Computer Science from the University of Orleans. Project leader in Information Systems and Technology since 1999. At BRGM she participated in the European project OneGeology-Europe as the work package leader for the geoportal and the services developments. She is also Work Package leader for the implementation of the portal and services in the Pangeo FP7 project and for the SW- Component Development and Integration work package in the EO2Heaven project and actively involved in the GeoSciML group of the Commission for the Management and Application of Geoscience Information (CGI) as co-chair of the test-bed working group. Jean-Jacques Serrano: PhD in Geology. Geoscience information expert, has direct experience in INSPIRE, as chair of the 'Network services' drafting team, and chair of the "Geology" and Mineral Resources" thematic working group. He was coordinator of the EuroGEOSS project, an FP7 developing interoperability between environmental domains (forest, biodiversity, and drought). He is a member of the IUGS/CGI Interoperability working group. Pierre Lagarde: Agricultural engineer, project leader in Information Systems and Technology with 15 years of project management experience in the environmental field. He manages and coordinates complex IT projects with different teams gathering end-users, IT architects, developers and testers. He has been promoting open service-oriented architecture, in particular in the context of the national water information system. He manages the BRGM research program on the development of new Web technologies for geosciences, in particular for open service-oriented architecture.

Participant name: Commission of the European Communities, Joint Research Centre- Partner 2

Description:

The Joint Research Centre is one of the Directorates General of the European Commission. Its mission is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. The Institute for Environment and Sustainability (IES) is one of the JRC Institutes, and provides scientific and technical support to EU policies for the protection of the global environment contributing to sustainable development. The Digital Earth and Reference Data Unit, co-ordinates the scientific and technical development of INSPIRE (the Infrastructure for Spatial Information in Europe), and supports its implementation within the Commission and the Member States. The Unit co-chairs the Infrastructure Implementation Board of GEO, and participates in the Data Sharing Working Group. It also Co-chairs the Legal Interoperability Working Group of the Research Data Alliance. It is therefore well placed to act as a bridge between the activities of GEO and those of the Member States, particularly in relation to environmental policy and the implementation of the INSPIRE directive.

Main tasks in the project: Scientific Coordinator and Lead WP 6. Major contributions to Wp2 and 4.

Relevant previous experience:

EC-JRC is the overall technical coordinator of the Infrastructure for Spatial Information in Europe (INSPIRE). As such it is responsible of leading the development of implementing rules and technical guidelines for metadata, the interoperability of spatial datasets and services, and the INSPIRE network services (discovery, view, download, transform and invoke), as well as developing the framework for helping Member States assess the impact of INSPIRE in terms of investment costs and benefits accrued. Supporting the Digital Agenda flagship initiative, the JRC is leading work on extending INSPIRE to support the delivery of e-government services and the creation of the Single Internal market for e-services. The competitive research activities of EC-JRC include participation and leadership in FP7 GEOWOW (GEOSS Interoperability for Weather, Ocean, and Water), EuroGEOSS (a European approach to GEOSS) and FP7 GIGAS (GEOSS , INSPIRE and GMES an Action in Support), and the smeSPIRE support action to assess the innovation impact of INSPIRE and greater access to public sector information on SMEs. EC-JRC contributes to the international standardisation efforts through the development of the INSPIRE technical specifications and its contributions to the work of CEN TC287, ISO TC211 and OGC.

Profiles of staff members:

Alessandro Annoni is the Head of the Digital Earth and Reference Data Unit. Alessandro is one of the initiators of the INSPIRE initiative in 2001. He has more than twenty years working experiences in Geo-Information and related technologies (GIS), remote sensing, image processing, system design and software development. He has been involved in several EC projects (ORCHESTRA, ETEMII, GINIE, GIPSIE, PANEL-GI, NATURE-GIS, SAFIR, GI&GIS). In 2006 he was elected co-chair of GEOSS Architecture and Data Committee, and in 2012 co-chair of the Infrastructure Implementation Board and since 2005 he is Member of the Executive Committee of the International Society for Digital Earth.

Massimo Craglia is a member of the INSPIRE Coordination Team, with responsibility in the field of metadata, and has been technical coordinator of the EuroGEOSS and GEOWOW FP7 Integrated Projects. Prior to joining the JRC in 2005, Massimo was a Senior Lecturer at the University of Sheffield, and participated in several European projects in the field of Geographic Information, and was the coordinator of the GISDATA scientific programme funded by the European Science Foundation.

Ioannis Kanellopoulos is Project manager for the institutional activities at the JRC (ENABLE Action) dealing with the implementation of INSPIRE in the EU as well as the development of the INSPIRE geoportal, an entry point to finding geographic information in Europe. His expertise concerns the research and development of advanced processing techniques for the analysis and interpretation of spatial data. He has published over 40 papers related to spatial data infrastructures, remote sensing, image processing and neural computation.

Catherine Doldirina is a lawyer specialized in Internet law and coordinates legal advice in the Unit in relation to INSPIRE, GMES, and GEO. She co-chairs the Legal Interoperability Working Group of the research Data Alliance and participate in the GEOSS Data Sharing Working Group

<p>Participant name: National Research Council of Italy – Institute of Atmospheric Pollution Research (CNR-IIA) Partner N° 3</p>
<p>Description: The National Research Council of Italy (CNR) is a public organization. Its duty 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 Institute of Atmospheric Pollution Research (CNR-IIA) is active in several research areas dealing with environmental pollution and pollutant cycles across different spatial scales, and the geospatial information and environmental knowledge-sharing. CNR-IIA participates in the OPENDATAGEOSS proposal with the Earth and Space Science Informatics Laboratory (ESSI-Lab) which was established in 2008 to facilitate the effective and seamless provision of multi-disciplinary Earth & Space resources to Information Society applications. ESSI-lab developed and maintains the GEO Discovery and Access Broker (GEO DAB). ESSI-Lab research focuses on the application of information science and technologies to manage, harmonize, and share Earth & Space Science resources and develop Spatial Information Infrastructures. These activities are also pursued as member of the OGC (Open Geospatial Consortium), IEEE ICEO, GEO SIF, as well as an affiliated organization to the US UCAR (University Corporation for Atmospheric Research).</p>
<p>Main tasks in the project: Coordination of WP2; contribution to WPs 3, 4, 5, and 7</p>
<p>Relevant previous experience: CNR-IIA ESSI-lab was coordinator or partner in a number of relevant EU-funded projects, including the FP7: EGIDA, EuroGEOSS, GEOWOW, GeoViQua, UncertWeb, EnviroFI, MEDINA, EarthServer, RECODE (Policy Recommendations for Open Access to Research Data in Europe), SAFER, G-Mosaic</p>
<p>Profiles of staff members: Stefano Nativi is member of the GEOSS Infrastructure Implementation Board (IIB) and previously served as co-chair of the GEO Science & Technology Committee (STC). He has been co-chair of the GEOSS Interoperability Process Pilot Project (IP3) and head of the SIF (Standards and Interoperability Forum) European Team. He was co-chair of GEO AIP-2 and AIP-3 for Climate Change & Biodiversity and Water: Drought. He is chair of the ESSI (Earth and Space Science Informatics) division of EGU (European Geosciences Union). He is member of the “Metadata” and “Data Definition: thematic” Drafting Teams of INSPIRE. He leads the Earth and the ESSI-lab of CNR-IIA and coordinates the CNR Inter-departmental project GIIDA (Integrated and Interoperable management of CNR environmental data). He was professor of “Systems for land management” for the University of Padova (specialization degree in Informatics). He was recently appointed Italian representative person for the Science Europe Working Group “Open Access to Data”. He is co-chair of the OGC Earth System Science (ESS) DWG. Paolo Mazzetti is researcher at CNR-IIA. He was professor of “Telematics” at the University of Florence for the degree in Information Engineering for seven years. He has more than ten years’ experience in design and development of infrastructures and services for geo-spatial data sharing in the context of national, European (FP7) and global initiatives. He participates in several standardization activities concerning catalog and data access services (OGC, DGIWG). He was a member of the 2011 GEOSS Evaluation Team. Lorenzo Bigagli, researcher at CNR, holds a M.Sc. degree in Software Engineering and a Ph.D. in Methods and Technologies for Environmental Monitoring. He held several professorships at the University of Florence. He was adjunct professor at the faculty of Informatics of the University of Padua.</p>

**Participant name: International Institute for Applied Systems Analysis (IIASA), Austria
Partner N°4**

Description:

The International Institute for Applied Systems Analysis (IIASA) is a non-governmental research organization based in Austria conducting inter-disciplinary research on the science policy interface on environmental, economic, technological and social issues in the context of global change. IIASA's Ecosystems Services & Management (ESM) Program will coordinate IIASA's role in OpenDataGEOSS. ESM research on Earth observations, in collaboration with GEO and national space agencies, aims to devise new approaches and technologies to collect, harmonize, and verify spatial information. New efforts are being explored in the areas of volunteer geography, opening up the vast potential of citizen science (e.g. through development of the Geo-Wiki). Furthermore, ESM has spent considerable efforts quantifying the benefits of earth observation and GEOSS, helping to form a community of practice.

Main tasks in the project:

IIASA's ESM Program will provide the crowdsourcing tool Geo-Wiki, building a new application which harnesses official Open Data in Austria, and enables the collection of citizen data through the development of a game and mobile applications. Furthermore, ESM will assess the impacts for improved governance and citizenship derived as a result of OpenDataGEOSS.

Relevant previous experience:

Since 2009, ESM has been involved with volunteered geographic information and crowd-sourcing to collect essential land cover information for the validation of satellite derived land cover products, developing Geo-Wiki.org. Geo-Wiki currently has more than 1400 participants registered. Additionally, ESM has been involved in several projects (e.g. GEOBENE, EuroGEOSS) where they were responsible for assessing the benefits of earth observation, GEOSS, data interoperability and SDIs.

Key personnel:

Dr Steffen Fritz is a senior expert in Geographic Information Systems (GIS), Remote Sensing, data interoperability land-use and land cover as well as policy related land-use modeling. Dr Fritz has coordinated and lead IIASA's participation in numerous research projects. Dr Steffen Fritz has been the initiator and co-ordinator of Geo-wiki.org, a global land cover validation tool based on Web 2.0 and crowd-sourcing, and participates in the GEO Data Sharing Working Group.

Mr Christoph Perger is the developer of the Geo-wiki client application with expertise in programming and managing IT projects.

Dr Linda See is an expert in artificial intelligence methods, spatial analysis and modeling, and GIS. Application areas include flood modeling and forecasting, and land cover validation.

Mr Ian McCallum has contributed to numerous research projects applying geo-spatial analysis to global environmental problems. He is an active member of the Geo-Wiki team, applying crowd-sourcing tools to improve global environmental datasets. Furthermore he has participated in research aiming to demonstrate the benefits we derive from Earth Observations.

Participant name: Centre for Ecology and Hydrology**Partner N°5****Description:**

The Centre for Ecology & Hydrology (CEH) is a public-sector research centre owned by the UK Natural Environment Research Council (NERC). CEH runs the Environmental Information Data Centre (EIDC) to coordinate long-term data curation and public access with informatics developments. EIDC currently provides a range of INSPIRE compliant Web services from its diverse data holding through the CEH information Gateway. Many of these result from decades of environmental monitoring. This makes CEH well placed to provide both expertise and data resources for the delivery of OpenDataGEOSS. CEH also support a range of official monitoring programmes and citizen sourced data through its Indicia and Irecord biological recording systems.

Main tasks in the project:

CEH will be a major contributor to OpenDataGEOSS through the coordination of the Biodiversity and Ecosystems work package (WP5), developing a case-study on combining non native species information from official and crowd sources, development of semantic techniques and contributing these developments to the Advanced Operating Capability of work package (WP2). CEH will also contribute to the Water and Marine Environments work package by providing data from a UK lakes monitoring network to be linked with other crowd sourced data.

Relevant previous experience:

CEH has been carrying out environmental monitoring in both terrestrial and freshwater science for many decades. CEH hosts the Biological Records Centre that supports biological recording communities since 1964 and is a corner stone of the UK National Biodiversity Network and the GBIF Portal and coordinates the DAISIE European invasive species inventory. CEH host the UK Environmental Change Network that has 57 sites in the UK and is part of the Long Term Environmental Research (LTER) network across Europe. CEH also host the EIDC that provides access to CEH's data through INSPIRE web services and has linked these to the EU INSPIRE GeoPortal. The EIDC develops new informatics techniques and through links to project such as FP7 BioVel and ExpeER, and the UK Environmental Virtual Observatory (EVO), is developing Linking Open Data vocabularies (e.g. EnvThes) and automated workflow for deployment within ESFRIs such as LifeWatch.

Key personnel:

Mr Gwyn Rees has been the director of the CEH Environmental Information Centre since 2009. He has a background in IT development and data management and hydrological science. His research has been in low flows and management of water resources. More recently he has lead the EIDC in development of INSPIRE services and informatics development through the EVO project.

Mr John Watkins has worked in the development of environmental data management and analysis techniques especially within long-term monitoring programmes within the UK. More recently he has been involved in development of informatics techniques such as the use of Linked Open Data vocabularies to annotate environmental data sources and use of Web services within automated workflow to enable an e-science approach for environmental research.

Mr Nicolas Bertrand has a background in IT support for bioinformatics research and carries out informatics research with the CEH EIDC. He is involved in serveral projects at a European and international level to promote interoperability between environmental research and monitoring data sets. He is work package leader for the FP7 I3 ExpeER project for information management and data access and has coordinated the use and development of the EnvThes environmental vocabulary and the DEIMS Ecological Information Management System within this and related iLTER projects.

Prof Stephen Maberly leads the long-term monitoring of lakes in Cumbria and also a project that uses automatic water monitoring station to produce high-frequency data on lake water quality. His is, or has been, a visiting professor in Denmark, China and London and has worked on numerous national and international projects. He has published over 90 papers and over 70 contract reports and is on the editorial board of several journals.

Participant name: The Institute of Electrical and Electronics Engineers, Incorporated, IEEE France Partner N°6

Description:

IEEE brings to OpenDataGEOSS its expertise in dissemination, its involvement with GEOSS and its work in interoperability, and standards. The IEEE France Section is an IEEE non-profit corporation registered in France in 1967. It has more than 3000 members with many links to both industry and universities. Globally, IEEE is the world's leading professional association for the advancement of technology with more than 400,000 members in over 162 countries; It produces more than 132 transactions, journals and magazines and more than 450 IEEE sponsored or co-sponsored conferences worldwide each year.

Main tasks in the project:

IEEE leads work package 7 on Dissemination and Outreach

Relevant previous experience:

IEEE has played an active role in GEO and GEOSS development in interoperability, leading the GEOSS infrastructure for standards and best practices and other relevant areas. IEEE has created a series of global GEOSS workshops with over 40 since July 2005. These were focused on outreach and dissemination for GEOSS. In addition, IEEE has developed web-based lectures and tutorials in Earth observation for capacity building and created a new peer review journal in applications of earth observation. For outreach to the general public, IEEE operates Earthzine (www.earthzine.org). IEEE led Outreach Work Packages for FP7 projects EuroGEOSS and EGIDA and is active in other projects through participation in advisory boards or through collaborations.

Key personnel:

Dr Jay Pearlman has a PhD from the University of Washington and is a Fellow of the IEEE. Dr Pearlman was an IEEE delegate to GEO, Co-Chair of the GEO Architecture and Data Committee and co-lead for the FP 7 EuroGEOSS workpackage on Outreach and Dissemination. He has also co-organized GEOSS workshops for user requirements and application areas. He has worked in government, industry and national research laboratories and has done collaborative R&D for most of his career. Dr. Pearlman has more than 75 publications and 11 patents. Dr. Pearlman is co-PI for the NSF Earthcube Brokering Concept Award, and PI for the NSF Ocean Research Coordination Network.

Prof Rene Garello earned his PhD degree in Signal Processing at the Institut National Polytechnique de Grenoble (INPG) in 1981. He is a Fellow of the IEEE and has organized a number of international conferences including OCEANS'98 (TC) and Conference Chair for Oceans'05. He is president of the IEEE Oceanic Engineering Society. Prof Garello has been active in GEO and participated in the 2005 Plenary, organized a GEOSS workshop in Corte in 2006 in addition to his participation with the IEEE Committee on Earth Observation. His professional work is in advanced information systems and communications in applications of ocean observing systems.

Ms. Francoise Pearlman has thirty years of experience in engineering and management including system of systems engineering, software/system integration and test. She has a Masters Degree in Aeronautical Engineering from the University of Washington, and a Masters in Business and Administration from the University of New Mexico. Since 2000 she has been the co-owner of a small consulting business (J&F Enterprises), currently working on outreach of the NSF Earthcube interoperability (brokering) and outreach. She is also a volunteer for IEEE, where she is a senior member, and has focused on a number of outreach and dissemination projects associated with GEOSS and socio-economic benefits assessments. These have included many workshops focusing on GEOSS architecture and applications

Participant name: CIMA Foundation
Partner 7

Description:

The Foundation, named Centro Internazionale In Monitoraggio Ambientale (International Centre On Environmental Monitoring), is a non-profit organization founded by the Italian Civil Protection Department, the University of Genova, the Liguria Region and the Province of Savona. CIMA works closely with many international and national operational and research institutions, as well as with universities, environmental research and assessment programs to define grand challenge problems in the hydro-meteorology and related Earth science disciplines.

CIMA is committed to promote the study, scientific research, technological development and higher education in engineering and environmental sciences in order to improve civil protection, public health and the preservation of aquatic and terrestrial ecosystems. The quality of CIMA services complies with the ISO9001:2008 certification.

Main tasks in the project:

Contribution to WP3 activities through the case-studies: Monitoring of Whales and Hydro-meteorological personal weather station data in Europe.

Relevant previous experience:

Coordinating Institution for three recent FP7 projects DRIHMS (Distributed Research Infrastructure for Hydro-Meteorology Study, www.drihms.eu, 2009-2011), DRIHM (Distributed Research Infrastructure for Hydro-Meteorology, www.drihm.eu, 2011-2015), and DRIHM2US (Distributed Research Infrastructure for Hydro-Meteorology to United States of America, www.drihm2us.eu, 2012-2014). It is the leader of the project ERDF Italy-France "Maritime" 2007-2013. PROTERINA-Due "The second step in the protection against natural risks: investments in the territory." The main object of the project is to provide "information" related to the prediction and prevention of natural hazards. Information as: - the ability to read the territory through an adequate monitoring network; knowledge and modeling of the processes which determine the hazard and risk in the area;- a capacity for dialogue and exchange between executive agencies and citizen, with particular reference to the planning and management of emergencies; There are two main lines of investment: 1) the strengthening of the observation networks in the regions of interest, 2) the improvement of the sharing of information (data and models) between institutional bodies and the territory (ordinary citizens or organized communities)

Key Staff

Antonio Parodi, PhD, is Project leader at CIMA Research Foundation. Master Degree in Environmental Engineering, University of Genoa, Italy (1998). Visiting Ph. D. at MIT - EAPS, (2002). Research interests related to the development of simplified models of dry and moist convection and to the study of the main sources of uncertainty in the high resolution numerical modelling of deep moist convective processes. He is author and co-author of 29 publications on international peer-reviewed journals. He is Project Director of the FP7 DRIHMS (Distributed Research Infrastructure for Hydro-Meteorology Study, www.drihms.eu, 2009-2011), DRIHM (Distributed Research Infrastructure for Hydro-Meteorology, www.drihm.eu, 2011-2015), and DRIHM2US (Distributed Research Infrastructure for Hydro-Meteorology to United States of America, www.drihm2us.eu, 2012-2014) projects: all together they focus on the application of new ICT (Information Communication Technologies) approaches (Grid computing, and High-Performance Computing) to the hydro-meteorology research.

Massimiliano Rosso, is Researcher at CIMA Research Foundation. He got Master Degree in Biology (University of Genoa, Italy) and PhD in environmental monitoring (university of Basilicata, Italy). Expert in marine mammals population dynamics, with special attention to beaked whales population ecology. Main research goal is to assess energy demand and conservation status of toothed whales populations in the Pelagos area. His research also addresses cetacean stocks, behavior and site fidelity using mark-recapture techniques, involving field work in the north-western Mediterranean Sea.

Participant name: Centre for Ecological Research and Forestry Applications (CREAF)**Partner 8****Description:**

The Centre for Ecological Research and Forestry Applications (CREAF) is a public research institution that was created in 1987 by the Generalitat (Autonomous Government) of Catalonia, the Autonomous University of Barcelona (UAB) the Institute of Catalan Studies (IEC) and The University of Barcelona (UB), to promote basic and applied research in terrestrial ecology. CREAM has made important contributions in terrestrial ecology and towards a sustainable management of the environment and also on Remote Sensing, GIS, and SDI technologies and technology transfer. International partnership is one of its strategic objectives A part from contributions in scientific papers publication in international academic journals CREAM develops and apply scientific methodologies in desktop and web technological tools such as the MiraMon software.

Main tasks in the project:

Contribute to WP2 and focus on lead Task 2.4 improving the encoding measures for quality, reliability and trust in heterogeneous data and service components, extending results in GeoViQua project to linked data and VGI and GCI integration. Contribute in elaborating robust methods for provenance information in workflows environments. In WP3 and WP5 identify user requirements and new data resources. In WP7 help in the dissemination of the project results.

Relevant previous experience:

CREAF is the coordinator of the FP7 GeoViQua project (2011-2014), which provides data quality indicators and search and visualization tools for the GEOSS common infrastructure. Improvement in documenting uncertainty, quality, trust and provenance. In EGIDA promote the reconciliation of the top-down versus bottom-up approaches for GEOSS in Spain. Active member in GEOSS tasks such as ID-03, DDQ subgroup and AIP4 and 5 and in OGC contributes to several standards such as WMTS 1.0, OWS Context 1.0, GMLJP2 2.0 and WCS 2.0 and participated 4 OGC interoperability experiments.

Profiles of staff members:

Dr. Joan Masó (PhD degree by the Universitat Autònoma de Barcelona in 2012) since 1995 he is a researcher at CREAM. Co-creator of the MiraMon compressed map and the MiraMon Map Reader idea in 1997; the first MiraMon technology for Internet distribution. He is a co-developer of the OGC WMS, WFS and WCS server and client MiraMon technology. He is co-developer of the MiraMon vector data model and metadata profile. He is an active member of the TC of the OGC since 2003 and the editor OGC 07-057r7 WMTS recently approved and Spanish representative for the current ISO19115 revision process. Coordinator of the FP7 GeoViQua project. Key role on the project: Extending result in GeoViQua project to linked data and VGI. Coordinate Task 2.4. Participate in GCI integration and dissemination.

Msc Anna Riverola (Degree in Biology and MSc in Remote Sensing and GIS) is currently a researcher at CREAM. In 2009 she joined the research group GRUMETS working as a remote sensing and GIS technician applied in agriculture, water resources, disaster data and data quality and services. She has participated in national and international research projects and research centers on marine and terrestrial conservation and dissemination activities. Key role on the project: Contribute to WP3 and WP5 identifying requirements from the user communities and proving new data resources to the GEOSS Data CORE. Coordinate the deliverables that CREAM leads.

Mr. Guillem Closa (Degrees in Geography, MSc in GIS) is a researcher at CREAM since 2012. He is participating in the GeoViQua FP7 project where he is developing his PhD in provenance visualization tools. Previously he has worked in Italy at the Environmental department of Iren AcquaGas (Genoa) developing cartography on water quality, deploying new methodologies for mapping water quality by using Open Source GIS, and working on the elaboration of a new Intranet Map service. There, he also took part in the FP7 project Prepared, enabling the change generating Floods hazard Maps. Key role on the project: Elaborate robust methods for dealing with provenance information in workflows environments

Participant name: University of Edinburgh (UEDIN)

Partner 09

Description:

The University of Edinburgh is one of the largest and most successful universities in the UK with an international reputation as a centre of academic excellence. Its international character is reflected in its student population, comprising of approximately 2,000 European students and 3,442 International students (out of a total of 24,500 students). It can also be found in its truly international staff and in its joint research and links with overseas universities, institutes, companies and governments.

Main tasks in the project:

Our primary role in OpenDataGEOSS will be to feed in results from the FP7-ENV-2012 funded Citizen Observatory Web (COBWEB) project (Grant Agreement No.308513). Participating in, and integrating COBWEB technology with, OpenDataGEOSS will assist in maximizing the impact of the European Commission contributions to GEOSS.

COBWEB is coordinated by Edinburgh University, specifically, by EDINA National Datacentre. EDINA is a Joint Information Services Committee (JISC) funded national datacentre which provides the UK tertiary education and research community networked access to a library of data, information and research resources. The EDINA geoservices team consists of approximately 20 personnel who support a range of online mapping and data delivery services. EDINA has also extended it's portfolio to hosting and project work, including involvement in EU funded projects.

Relevant previous experience:

The University is the leading research university in Scotland and is amongst the top ten in the UK. The University has a long and successful tradition in participating in European Framework Programmes. This success continued during the Sixth Framework Programme with collaboration in 180 projects, award value of approximately €74M, and currently in the Seventh Framework Programme the University participates in some 187 projects with an award value of €116M.

Profiles of staff members:

Chris Higgins is the Project Manager for COBWEB. He is Workgroup Leader, Product and Services Development and has been an employee at EDINA since 2000. Chris served as an elected member of the UK's Association for Geographic Information – Scotland for 6 years, and is the EDINA representative at OGC Technical Committee meetings (co-chair University Working Group). Chris was the Project Manager for the EDINA contributions to the FP6 funded MOTIIVE INSPIRE Data Harmonisation project and the eContentplus ESDIN project.

James Reid is Workgroup Leader, Business Development (joining 2001). James is the higher education representative on the UK Location Programme and Chairs the UK's Metadata Working Group with oversight of implementation of INSPIRE Discovery services. He is a member of the Geospatial Resources Working Group and is an Executive member of the Association for Geographic Information (Scotland) board. He has over 20 years experience of managing and delivering projects including the eContent funded EuroGeonames project.

Participant name: Università di Siena, Dip.Sienze politiche,sociali e cognitive and Ladest Lab.

Partner 10

Description:

The University of Siena is a very old Italian University, founded in 1240. The University of Siena, namely the Dispoc (Dipartimento di Scienze Politiche,Sociali e Cognitive) and the Ladest Lab. (Laboratorio Analisi Dati Economici Sociali e Territoriali) is a multidisciplinary institution. The area of geography will be involved in the project and it will benefit of the activities of Ladest Lab. which include working on volunteered geographic information (VGI), user-generated content (UGC), semantic analysis, photo-sharing, social networks dynamics and data mining. Other relevant research topics are: sustainable development, sustainability indicators, smart cities, transportation networks. In 2011 the University of Siena founded a sustainability network, Nesso (Network Siena Sostenibile) to foster fruitful exchanges with interested parties in order to define sustainable policies and operating solutions. It aims at promoting sustainability through its courses, research, training and consulting for businesses and institutions. The University of Siena is the leader of a 4 year ESF COST Action: ENERGIC (Chair prof. C.Capineri). It deals with harnessing geographic information from the crowd through software and methodologies.

Main tasks in the project :

University of Siena will coordinate WP4 on Sustainability and quality of life and will provide complementary contributions to the WPs.

Relevant previous experience:

The geography area and LADEST have recently developed the following research and applications:

1. TEA - Tourist Experience Application – It is a meta search engine which includes tourist and territorial information based on user generated information found in the web.
2. Flickr Search – It is a tool which harvests geo-localised photos from Flickr, one of the most used the photo-sharing site (every minute more than 2.000 pictures are uploaded!).
3. GeoTweet- It is a web application that allows harvesting, collecting and visualizing real time geo-localised tweets. Through GIS, analysis of real time phenomena, as well as, trends on different scales (urban, regional and global), can be carried out.

Other relevant projects: Research Project in collaboration with Dipartimento delle Politiche Territoriali e Ambientali, Regione Toscana, "Dalla sostenibilità all'eco-efficienza: la valutazione delle politiche ambientali in Toscana. (prot.4004RT/190453/124.01 del 4/7/2006) (2006-2007); Progetto "OVERSHOOT: IMPARARE & INSEGNARE LA SOSTENIBILITA" in collaboration with Provincia di Siena (2011-2012)

Profiles of staff members

Dr. Cristina Capineri is associate professor of geography at the University of Siena where she teaches economic and political geography and development geography. She was Associate Editor, *Rivista Geografica Italiana*, 1987-91 and is currently the Scientific Secretary of the Italian Society for Geographical Studies. She was the Coordinator of the transport research network *Nectar – Cluster 2 on "Networks"*, 1993-2000 (with prof. Piet Rietveld, Free University, Amsterdam), she is one of the founders of the GIS Vespucci Initiative, (2000 current) (www.vespucci.org), the NESSO network, University of Siena (2011 current). Cristina has been a Member of Transport Research Board, National Science Foundation (Usa) (2001-2006).

Participant name: WWU, Institute for Geoinformatics, University of Muenster**Partner 11****Description:**

The institute for geoinformatics (IFGI) of the university of Muenster is one of the leading institutes focusing on geoinformatics, the science of modeling spatio-temporal data computationally. Two research groups of the institute are involved in this project. The group of **Prof. Dr. Werner Kuhn** focuses on the design and use of ontologies, folksonomies, similarity measures, context models, and conceptual spaces. Its research goal is to create a theory of semantic reference systems that serves to ground symbols used in geospatial information and to translate data from one reference system to another. The group of **Prof. Dr. Edzer Pebesma** focuses on spatio-temporal statistical modelling of (mostly) environmental data and processes. Research interests include analysing heterogeneous data sources, optimizing monitoring networks and programs, integrating official and volunteered information, and quantifying and understanding uncertainty in model results. The institute has a long history of active participation in the OGC, through PhD research work as well as through two spin-off companies, 52North and con terra.

Main tasks in the project:

The main tasks of the institute for geoinformatics address WP2, WP4 and WP5. In WP2, we will contribute to task 2.4, focusing on process and event reasoning. This task will develop a formal approach how events, or environmental change, can be formalized and detected from data. In WP4 and WP5, the focus is on applying this formalism to concrete, heterogeneous data cases. Semantic annotations will be used to verify whether particular analyses (e.g. aggregations, interpolations) or visualizations are meaningful.

Relevant previous experience:

The group of Prof. Dr. Werner Kuhn has played an important role in the EU FP5 to FP7 projects ACE-GIS, SWING, and ENVISION. Prof. Dr. Edzer Pebesma coordinated the FP6 project INTAMAP, which developed an interoperable service for automated interpolation of environmental data, and was one of the key players in the FP7 project UncertWeb, which realized the uncertainty-enabled model web.

Profiles of staff members:

Prof. Dr. Werner Kuhn is professor in geoinformatics, author of over 100 scientific papers, and a founder of the Vespucci Institute for the Advancement of Geographic Information in Science.

Prof. Dr. Edzer Pebesma is professor in geoinformatics, author of over 100 scientific papers, and associate editor of Spatial Statistics.

**Participant name: UJI, Geotec Research Group, Universitat Jaume I of Castellón
Partner 12**

Description:

Geotec²⁸ is part of the Institute of New Imaging Technologies (INIT), a research centre of the University Jaume I of Castellón (UJI). INIT offers advanced services in 3D interactive visualization, geospatial Information processing and virtual reality among other disciplines. Geotec research focuses on integrated intelligent systems and spatial data infrastructures where main lines are: distributed processing, Web services, automatic metadata generation, retrieval of crowd-sourced information, sensor data integration and visualization and smart mobile applications.

Main tasks in the project:

UJI is involved mainly in WP2 and WP4, and more specifically leads tasks 2.2 and 2.4 and participates in task 4.3. In task 2.2 UJI will work on search and retrieval of information from social media, extending the work done in EuroGEOSS. In task 2.4 UJI will work mainly in the extension of the GEOSS the Service Factory GEOSS to publish data into the GEOSS framework using a web service approach. In task 4.3 UJI will develop gamified mobile geogames designed to crowdsource information about the environment from the players. UJI also participates in WP7 support the dissemination of the project activities and results in the social media.

Relevant previous experience:

The group is an active participant in international organizations and standardization processes in the Open Geospatial Consortium and also in consultation groups surrounding European initiatives such as INSPIRE and GMES. The group has experience in related EU projects focused on spatial web services, such as ACE-GIS (FP6) and AWARE (GMES) and EuroGEOSS (FP7) and CityBench (ESPON) as well as other national projects concerned Spatial Data Infrastructure. The UJI also hosts the Spain Coordination Office (SCO) of the United Nations Spatial Data Infrastructures (UNSDI).

Profiles of staff members:

Prof. Joaquín Huerta is an associate professor in the Department of Information Systems at UJI. He holds a Bachelor in Computer Science, a Master in Computer Science and a Master in CAD/CAM from Politechnical University of Valencia. He also holds a PhD in Computer Science from Jaume I University. His current research interests are Geospatial Technologies, Web and Mobile GIS, Internet technologies and 3D GIS. He is leading and has led several important research projects including EU projects as Citybench (ESPON) EUROGEOSS (FP7) and eSDI-NET+ (FP6) and a Spanish projects as "España Virtual" funded by Cenit Programme .

Prof. Michael Gould earned his PhD in geography (GIS) from the National Center for Geographic Information and Analysis (NCGIA), University at Buffalo. Dr. Gould currently holds the Esri global education manager position. Gould's research expertise includes creating Spatial Data Infrastructures (SDI), researching standards-based interoperability with the Open Geospatial Consortium, Inc. (OGC), and developing geospatial Web services.

Dr. Laura Díaz graduated in Computer Engineering and obtained her MSc in Intelligent Systems and the doctoral degree in Geospatial Science from Universitat Jaume I where she is currently a research associate. She has participated in R&D projects at the Institute of Robotics at the Universitat de València and in GIS companies. Her main research interests are in the field of Geospatial Information Infrastructures and user-generated content, for improving content integration and publication, distributed geoprocessing and service interoperability.

²⁸ <http://www.geotec.uji.es>

Participant name: Technische Universität Dresden, Professorship of Geoinformation Systems Partner 13

Description:

The Technische Universität Dresden (TUD) is one of eleven German universities that were identified as an “excellence university” and is the largest university in the federal state Saxony. The **Professorship of Geoinformation Systems**²⁹ (GIS) is part to the Department of Geosciences belonging to the Faculty of Environmental Sciences at TUD. The GIS team currently consists of more than ten research associates and post doc researchers from different disciplines (Geodesy, Geography, Geoinformatics, Informatics). Research and Education focuses on various topics within Geoinformation Science and here especially on Geoinformation Infrastructures and Services for Spatio-Temporal Modeling.

Main tasks in the project:

The TUD GIS team will mainly contribute to WP2 and specifically focus on research and developments to enhance distributed geoprocessing and geodata fusion.

Relevant previous experience:

The professorship has been recently involved in the FP7 EU projects HEREPLUS (Health Risk from Environmental Pollution Levels in Urban Systems) and GIGAS (GEOSS, INSPIRE and GMES an Action in Support), participates in the FP7 project EO2HEAVEN (Earth Observation and Environmental Modelling for the mitigation of Health Risks) and COBWEB. Moreover it coordinates the development of a Scientific GDI to support research on sustainable land management in the German funded project GLUES. The TUD GIS team is an active member of the OpenGeospatial Consortium, specifically contributing to the current revision of the OpenGIS Web Processing Service specification and is also involved in the GEOSS Architecture Implementation Pilot. Further the team is an associate partner of the 52°North Initiative for Geospatial Open Source Software and actively contributes to the developments of INSPIRE, the German GDI (GDI-DE) and the Saxonian GDI (GDI Initiative Sachsen).

Profiles of staff members:

Lars Bernard is associate Professor of GIS at TU Dresden and holds a Ph.D. in Geoinformatics. His research activities focus on design, development and application of component based GIS and component based spatio-temporal simulation systems as well as their linkage and the realization of GDI. Prof. Bernard acts as a German GDI expert within the INSPIRE drafting team on Network Services and is involved in a number of regional and national GDIs (e.g. GDI-DE, GDI Sachsen). He is elected member of the AGILE Council, Chair of Commission 5 Network Services European Spatial Data Research and serves numerous scientific boards. Dipl.-Geoinf.

Johannes Brauner is a research associate at the TU Dresden GIS Professorship and holds a Diploma in Geoinformatics from the Institute for Geoinformatics. He formerly worked in various research and development projects, participated in the EU-funded GIGAS project and currently works for the FP7 EO2HEAVEN project. Current research work focuses on distributed geoprocessing and crowd sourcing for environmental applications. Further he chairs the OGC/AGILE/EuroSDR Persistent Testbed for Research and Teaching in Europe.

²⁹ <http://tu-dresden.de/fgh/geo/gis>

**Participant name: University of Sheffield
Partner N°14**

Description:

The University of Sheffield (USFD) is a member of the Russell Group, the twenty institutions who receive two-thirds of universities' research grant and contract funding in the UK. It is the UK's sixth most highly rated research university. It was selected as University of The Year 2001 and 2011 by The Times Higher Education. They are participating with the **Organization, Information and Knowledge Group (OAK)** in the Department of Computer Science and the **Sociology Department**. The OAK group carries out research on Semantic Technologies with a particular focus on their application to Knowledge Management and the Future Web. Since 2005, current members of the group have published hundreds of papers, given 13 invited keynote speeches at international and national conferences and 12 tutorials at summer schools and international conferences. Research funds since 2005 exceed £4m from the European Commission, EPSRC, AHRC, JISC, industry and government. In 2007 they created a spin-out company, Knowledge Now Ltd., to commercialise some of their Knowledge Management Technologies. In 2012 another spin out company was created (The Flow) to provide telematics services. **The Department of Sociological Studies** is one of the top ten international social science research departments in the UK, with a long history of high profile contributions to theory, policy and practice. In the 2008 Research Assessment Exercise, 65% of its research outputs were rated as internationally excellent in terms of originality, significance and rigour.

Main tasks in the project:

USFD will be involved in WP2, WP3, WP4 and WP6. The main task of USFD in WP2 will be to provide a suitable set of data from the WeSenseIt Citizens Observatory. USFD will be responsible of Task 3.2 in WP3 and will cooperate Task4.2 in WP4, both aiming at designing case-studies and scenarios for data reuse. The case-studies will be complemented with an analysis of the government and societal benefits of shared data reuse in WP6

Relevant previous experience: The OAK Group at the University of Sheffield coordinates the EU project WeSenseIt, a 4 years research project started in October 2012 aiming at building a Citizens Observatory of Water through the integration of physical and social sensors. The OAK group has a strong experience in Information Extraction from social and classic media, Human Computer Interaction, Visual Analytics, Knowledge Management, Semantic Web Technologies.

The Department of Sociological Studies is unique in its interdisciplinary mix of Social Policy, Sociology, Social Anthropology and Social Work. This enables it to produce innovative theoretical, methodological and policy-oriented research that makes a real difference

Key personnel: **Dr. Vita Lanfranchi** is a Senior Research Fellow in the OAK Group. Her research field concerns Human Computer Interaction with a focus on supporting gathering and sharing of knowledge between individuals. She has an extensive experience in coordinating projects and designing, developing and evaluating systems with extensive users involvement. Vita has long experience in working and managing European projects for the University of Sheffield: among them: The European Integrated project X-Media, The European Integrated project WeSenseIt (on collective intelligence in emergencies), the TRIDS project on Tracking Real Time Intelligence in social media. She is currently managing Randms, a project on mining, gathering and visualising social media data for Emergency Response. Dr. Lanfranchi holds a PhD and a Doctorship from the University of Torino, Italy.

Dr. Bridgette Wessels is Director of the Centre of Interdisciplinary Research in Socio-digital Worlds (IRiS) and Senior Lecturer in Sociology. Her research focuses on the social innovation and use of digital technology including mobile and social media. She is on the University Strategy Group on open access and was expert for the European Parliament for social media and political participation in 2011. She has undertaken research in 7 EU and RCUK funded projects as well as 6 government funded projects. She has been expert for EU, the UK Office of Science and Technology, Department of Trade and Industry, Royal Society, and European Parliament. Some current projects: the ESRC & TSB Mainstreaming Telehealth (MALT) project; AHRC funded Newsbooks project on participation in digital search methodology; UK Cabinet Office Digital by Default Alpa funded project on mobile micro payments; EC funded RECODE project on open access to research data.

Participant name: Masaryk University (MUNI)**Partner N° 15****Description:**

Masaryk University (MUNI), located in Brno, is the second-largest public university in the Czech Republic and the leading tertiary education institution, established in 1919. MU research team of OpenDataGEOSS project includes Laboratory on Geoinformatics and Cartography (LGC) and Institute of Biostatistics and Analyses (IBA). Academic and research staff of MUNI have achieved significant successes internationally in many areas of informatics, such as GIS, concurrent and distributed computing, database systems, picture analysis and computer graphics, computer networks and distributed systems, machine learning, data mining and natural language processing. LGC aims at research, development and realization of projects in the field of cartographic visualization and modelling of contemporary trends in spatial information domain. IBA focuses on research, teaching and realization of projects in the field of environmental information systems, geographical data processing, human and ecological risk assessment.

Main tasks in the project:

MUNI will contribute on visualisation research (WP2), harmonisation of spatial data (WP3, WP4), development of applications/tools for volunteers (WP5) and dissemination of results (WP7).

Relevant previous experience:

LGC has participated in several international (FP7, eContentplus, bilateral, etc.) as well as national research projects like TaToo (2007 - 2013), Assessment and strategic development of INSPIRE compliant Geodata-Services for European Soil Data (GS Soil; 2009 - 2012), Dynamic geovisualization in crisis management (2004 - 2011), Flood monitoring and assessment of hazards based on remote sensing and GIS (2010 - 2011), Cartographic visualization of agricultural sensor based information (Agrisensor; 2009 - 2011), URBAX 2 (2002 - 2004), WirelessInfo (2002 - 2003), ABDS for the CEEC (1998 - 2000).

Key personnel:

Dr. Tomas Reznik PhD. is an Assist. Professor of Cartography, Geoinformatics and Remote Sensing at the Department of Geography as well as a postdoctoral researcher at the LGC. He also worked as a post-doctorate scientific/technical project officer at the Joint Research Centre (JRC) of the European Commission. His project-based experience lies in the topics related to geospatial Web services development, INSPIRE data specifications and conformance testing within INSPIRE. Dr. Tomáš Rezník is an author, or co-author, of more than 40 publications in the field of SDI, geoinformatics and cartography.

Prof. Milan Konecny is senior researcher and director of the LGC and professor of Department of Geography of Faculty of Science. He holds M.Sc. in Geography and Ph.D. in Geographical Science. Since 1992 he has been working in management, preparation, and realization of international and domestic research projects in spatial data infrastructure, GIS, cartographic visualisation, mobile technologies, sustainable development, crises management, open electronic atlases and development of Information/Knowledge-based societies. He was President of the International Cartographic Association (ICA), (2003 – 2007) and also he is deputy president of Int. Society on Digital Earth and European branch of Int. EuroAsian Academy up to now. He has authored more than 200 scientific publications and 6 books.

Prof. Jiri Hrebicek is senior researcher and director for science of IBA and professor of Faculty of Science. He holds a M.Sc. in mathematics and informatics and a Ph.D. in Applied and Numerical Mathematics. Since 1990 he has been working in the research of environmental informatics and modelling. In the last ten years he has specialised to eEnvironment and eGovernment services and eParticipation in environment protection, semantic web, ontology and modelling. He is a member of the Scientific committee of European Environment Agency, management board of International Environmental Modelling and Software Society (iEMSs), the secretary of WG 5.11 of International Federation of Information Processing (IFIP). He has authored more than 300 scientific publications. He wrote 16 books and one of them was translated to Portuguese, Chinese and Russian.

Participant name: Informatica Trentina S.p.A. (InfoTn) IT**Participant N°: 16****Description:**

Informatica Trentina SpA (<http://www.infotn.it>) is an enterprise of around 300 people, owned by public stakeholders, mainly the Autonomous Province of Trento (PAT), Italy. By statute, it is in charge of all the ICT needs of its stakeholders. Lately, it has been given also the role of Regional Catalyst for Innovation in ICT and, as such, it fosters innovation by creating the conditions for a successful integration of the innovation stakeholders in the territory. As part of this role, it has developed the notion of Trentino as a Lab (TasLab) and as part of its further integration into the European Network of the Living Labs (ENoLL) it has built a territorial agreement involving all the Trentino ICT research centers, the local government and a large network of local companies.

Main tasks in the project:

InfoTn, being a member of ENoLL, contributes to WP6 and specifically to the tasks related to open innovation (T.6.2) and exploitation (T.6.3). Strong past experience in the semantic integration field makes InfoTn relevant to contribute to WP2 on the ontology matching and integration themes (T.2.2).

Relevant previous experience:

InfoTn has been in charge of all the ICT needs of its stakeholders (the whole Trentino region) for more than 20 years. It has managed a significant number of user centered projects and it is a member of ENoLL through TasLab since the 2nd wave. "Environment" is one of the strategic areas for Informatica Trentina. For instance, it is involved in several European projects in this area, such as I-SCOPE and SUNSHINE CIPs or semantic geo-catalogue, which is a regional project, to name a few.

Key Personal:

Roberto Bona is a head of consulting & innovation area of InfoTn. He has an Engineering degree from the University of Genova (Italy). Senior executive with broad business experience at Accenture. Strong management skills, including extensive involvement in large, multi-location, multi-disciplinary international teams and contracts negotiation. Technical skills in application development, system and network management; deep knowledge of ICT service delivery, sourcing and off-shore strategies. Recognized for leadership in managing business units, negotiation and delivery of challenging results. A record of consistent and successful achievements in technology transformation programs to address crisis, reorganization, start up, adoption of new technologies, etc..

Pavel Shvaiko, PhD is an innovation and research project manager at TasLab, InfoTn. He has provided various consulting services, co-authored and co-edited a number of books, contributed to, and published in various international journals and conferences in the fields of Semantic Web, Artificial Intelligence, Information Systems, and GIScience. He coordinated/participated in a number of European, national, industrial projects (e.g., Vivi Fiemme, which provides a mobile platform for an enhanced tourist experience in the context of the World Nordic Ski championship of 2013). Specialties include: strategic consulting, innovation management, research and business development with topics involving semantic heterogeneity and GIS knowledge management.

Marco Combetto is an innovation and research project manager at TasLab, InfoTn. He has a Master degree in Computer Science from University of Turin (Italy). He worked as Senior Consultant and Project Manager for 6 years in Microsoft Italy - Consulting Services. Then he moved to Microsoft Research Cambridge, leading the University Relations activities for Italy, Swiss and Greece and later as Research Program Manager in the External Research Office until the 2006, when he left for a entrepreneurship activity. Since 2008 he has been working for InfoTn on the OpenData, eGovernment, eParticipation, Social Network thematic areas.

To facilitate the final user involvement (e.g., in T.6.2), the following person from PAT (see letter of support) is planned to be involved in the project.

Lorenzino Vaccari, PhD is a senior official at the Autonomous Province of Trento. Currently, he is the project manager of the "Open Data in Trentino" innovation project. He is also a senior researcher in the field of Interoperability of Spatial Data Infrastructures and previously he worked at the Joint Research Center of the European Commission as a scientific officer, undertaking research to support the development of the Global Earth Observation System of Systems (GEOSS) and of the European Spatial Data Infrastructure foreseen by the INSPIRE directive.

Participant name: Geodan
Partner 17

Description:

Since its foundation in 1985 Geodan is involved with all aspects of the Geographical Information Systems (GIS): data, databases, spatial infrastructures, modelling, analysis, interactive visualisation and education. Currently, Geodan employs approximately 120 highly educated and highly motivated Geo-ICT specialists.

Geodan develops software products for geo-information using standard GIS software (e.g. ESRI, MapInfo, Microsoft and Open Source tools), but also utilizes software developed in-house. Customers are found in the public sector and the private sector. Geodan offers internet services varying from simple geocoding services and maps to multidisciplinary geo-information services for e.g. inter-governmental applications and public safety. Geodan is producer and reseller of geographical data. As a broker in geodata, the company supplies global data products through a worldwide network of local specialist suppliers.

Main tasks in the project:

Data harmonization, application development, case-studies. Lead in the Testaccio case-study in WP4

Relevant previous experience:

Geodan has many years of experience in system integration and has participated in several projects concerned with pan-european integration and harmonization of geodata: EuroGeoNames, ESDIN, eWater, EuroGeoSouce. On a national level, it supports data suppliers and consumers with adopting INSPIRE. Advanced user interaction with open data is a main topic in the research department.

Profiles of staff members:

Steven Fruijtier (1970) graduated in Geology (MSc) with computer sciences as subsidiary subject. Currently he is the Research Director of Geodan Research, the research department of Geodan. Since 2000 he works at the company as software engineer, system architect and technical project manager. He has an extensive knowledge of GIS-ICT related subjects like computer science, GIS architectures, open standards, open source software, 3D visualisation, geometrical algorithms, sensor networks and metadata. This knowledge has been deployed in a wide range of subjects, ranging from disaster management to crossborder GDIs and from augmented reality to location based services leading to innovative and pragmatic solutions for GIS related problems. He has been involved in several EC projects.

Eduardo Dias (1978) graduated from the New University of Lisbon with a degree in Environmental Engineering (2001). He has worked as a location based services consultant at Geodan Mobile Solutions (2001-2004), satellite image specialist for the United Nations' Cartographic Section, Department of Peace Keeping Operations (2004-2005) and received his PhD degree in Spatial Economics at the Vrije Universiteit Amsterdam in 2007 on the topic of evaluating location based services. Since February 2007, Eduardo Dias is the Research Coordinator of Geodan Research, the R&D department of Geodan. He currently leads the EarthWatchers project (awarded the GMES Masters in 2011) where young people will monitor the rainforest in Borneo using remote sensing and crowd sourcing techniques.

Frans Knibbe (1969) graduated in Geology (MSc) at the Free University of Amsterdam. In 1995 he joined Geodan, at the same time completing the UNIGIS postgraduate GIS course. He is now a system architect at Geodan Research. He has been involved in many commercial projects as well as setting up internal systems and carrying out and leading research projects. He has been involved in several European projects targeted at different parts of the European infrastructure for spatial data, such as EuroGeoNames and ESDIN. His recent research lies in the field of Linked Data where he closely cooperates with the National Spatial Data Infrastructure executive committee in the Netherlands.

**Participant name: YDreams Açores
Partner 18**

Description:

YDreams Açores aims to become a world leading company in marine robotics by providing a new generation of tools for Ocean exploration. We seek to produce low-cost specialized instruments and autonomous robots, for different market segments: from leisure to business and scientific exploration. Our strategic vision is to develop proprietary technologies in areas such as aquatic vehicles, autonomous and swarm behaviors and low-power systems. In the long term, YD Açores will globally provide tools for deep ocean exploration but, our first products will be gadgets to increase the fun of families in places such as beaches, lakes and swimming pools. Ziphius, an aquatic drone controlled by smartphones is already a working prototype and is expecting to reach the market during 2013. YD Açores is a spin-out of YDreams, a company with vast experience in cutting-edge interactivity technologies including robotics. YDreams has developed projects for over 600 clients in 25 countries, for clients all over the world, including Coca Cola, Nike, Nokia, Adidas, Vodafone, Santander Bank, Bradesco Bank and Unilever.

Main tasks in the project:

YDreams Açores participates in WP 2 where it will contribute with the requirements for the framework. In this WP, YDreams Açores will also analyze and propose ways, including data aggregation and visualization, to deal with users privacy. In WP3 it will develop a prototype of an aquatic drone equipped to collect data for water monitoring. Also in WP3, YDreams Açores will develop an application for mobile devices that will use data available through the framework defined in WP2 to support the use of aquatic gadgets such as Ziphius or SUBA. As YDreams Açores has a strong interest in exploiting the project results, in WP6 it will perform a market analysis and propose the development of new products and new business models that explore the framework created in the project. In WP7 YDreams Açores will disseminate project results through innovative uses of the prototype developed in the project.

Relevant previous experience:

The company was founded in 2012, but since then it has participated in several R&D proposals. It has research collaborations established with the Department of Oceanography and Fisheries from the University of the Azores.

Profiles of staff members:

Cristina Gouveia has a PhD in Environmental Engineering from UNL, and a Master in Urbanism from M.I.T. Her research has focused on the use ICT to support public participation, particularly the use of VGI. She is Chief Operating Officer of YDreams Açores.

João Frazão has been working in man-machine interfaces, computer vision, parallel processing and autonomous agents. João has a large experience in the robotics field, and has developed agent based software architecture used in teams of robots. At YDreams Açores he is responsible for the design and development of the electronics both in the hardware and software components.

Francisco Ribeiro has a BSc in Graphic Design from ETIC. At YDreams he has been responsible for the graphic design of interactive applications such as the ones developed for the Braganza Science Center and Belmonte Interpretative Center. He has also experience in game design for mobile devices. At Ydreams Açores he is responsible for the design of mobile apps that control robotic vehicles.

Participant name: 52°North Initiative for Geospatial Open Source Software GmbH**Partner 19****Description:**

The open source software initiative 52°North, founded in 2004 by the Institute for Geoinformatics Münster and the con terra GmbH, is an SME and acts as an international network of partners from research, industry and public administration. Its mission is to foster the development of new concepts and technologies in Geoinformatics. Partners participate in so called R&D communities, focusing on common themes, in particular Sensor Web Enablement (SWE), Web-based Geoprocessing and Cloud Computing, Security of Geospatial Web Services, Semantics, Earth Observation, Geostatistics and Metadata. 52°North has a long and outstanding record in the Geo-IT domain and is actively contributing to the development of international standards, e.g. at W3C, ISO, OGC or INSPIRE. 52°North software is widely used in operational IT environments, research labs and education. All software developed within this collaborative development process is published under an open source license.

Main tasks in the project:

52°North will especially focus on WP 2 where Sensor Web concepts will be adapted to the requirements of serving open data. Furthermore, 52°North will support with its background knowledge the work packages on “Water and Marine Environments” (WP 3) and on “Sustainable Cities, Quality on Life” (WP 4). Finally, as 52°North has a strong interest in exploiting the project results, it will provide its experience and network of contacts to WP 6 (“Innovation and Impact Assessment”).

Relevant previous experience:

Besides a pro-active innovation strategy, which becomes manifest in European (FP7) research projects such as EO2HEAVEN, GEOWOW and GeoViQua and the company's involvement in OGC Testbeds, 52°North in particular provides services to operationalise Sensor Web technology in specific user contexts. Prominent examples are 52°North's cooperation with the European Environment Agency for enabling an interoperable exchange of air quality data across Europe and the development of SWE-based solutions to provide access to and visualization of near real-time sensor data for the Service Centre Information Technology of the German Federal Ministry of Transport, Building and Urban Development. Especially in the latter project, 52°North's technology is the foundation for the interoperable provision of open data sets.

Profiles of staff members:

Simon Jirka works as community leader for the Sensor Web group of the Open Source initiative 52°North. He holds a master degree in Geoinformatics and has finished his Ph.D thesis in 2012. His research activities focus on Sensor Web applications, the Sensor Web architecture and especially on sensor discovery mechanisms. In addition, he is also actively involved in the Sensor Web Enablement initiative of the Open Geospatial Consortium (OGC).

Dr. Arne Bröring works as a project manager and software engineer for the 52°North Initiative for Geospatial Open Source Software GmbH. He is one of the key designers of the Sensor Web Enablement framework at the Open Geospatial Consortium (OGC) and as such main editor of the Sensor Observation Service 2.0 standard.

Participant name: Fundació Privada Barcelona Digital Centre Tecnològic (BDIGITAL)**Partner N°20****Description:**

BDIGITAL is a technology centre devoted to research, development and innovation of new *information and communication technologies* (ICT) applications to the healthcare, security, mobility, energy, food and environment domains. BDIGITAL staff consists of 100 professionals with interdisciplinary and complementary backgrounds in different ICT fields. BDIGITAL is a non-profit private foundation governed by a board of trustees representing the government, companies and universities. Among current members are the Generalitat de Catalunya, Barcelona City Council, Fujitsu, Hewlett Packard, IBM, Microsoft, Universitat Politècnica de Catalunya, Universitat Pompeu Fabra, Universitat Rovira i Virgili. BDIGITAL has strong experience in participating at European-level, collaborative, research projects, with 20 projects ongoing (seven of which coordinated).

Main tasks in the project:

BDIGITAL provides linkage with the Citclops citizen observatory and focuses on retrieving, interpreting and using data concerning seawater colour, transparency and fluorescence from marine environments. Furthermore it provides research expertise in semantics, interoperability and application of artificial intelligence to new ICT tools. BDIGITAL's qualification for these roles derives from the experience of its personnel in R&D management and in the design, development and deployment of knowledge-based systems and in particular of decision support systems. BDIGITAL is mainly involved in WP3 and will provide contributions to WP2 and WP6.

Relevant previous experience:

BDIGITAL research experience includes the following main, recent projects: Citclops - Citizens' observatory for coast and ocean optical monitoring (FP7, 2012-2015, BDIGITAL is coordinator); IES - Irrigation expert simulator (LIFE+, 2012-2015, BDIGITAL is coordinator); WatERP - Water Enhanced Resource Planning (FP7, 2012-2015, BDIGITAL is coordinator); BackHome - Brain-neural computer interfaces on track to home (FP7, 2012-2015, BDIGITAL is coordinator); Synergy-COPD - Modelling and simulation environment for systems medicine (FP7, 2011-2014, BDIGITAL is coordinator).

Profiles of staff members:

Dr. Luigi Ceccaroni is a senior member of research staff at BDIGITAL. He obtained a BSc degree in Environmental Sciences, an MSc degree in Information-Technology Languages and Systems; and completed his PhD in Artificial Intelligence at the Technical University of Catalonia (UPC) in December 2001. His main research interests combine: ontologies; software agents; Web services; the semantic Web; personable, attentive personal-assistants; and application of artificial intelligence in environmental sciences. Currently, he coordinates the Citclops and Synergy-COPD European projects [<http://www.citclops.eu/>] [<http://www.synergy-copd.eu/>].

Gabriel Anzaldi is senior member of research staff and technical responsible in ICT Environment R&D Group at BDIGITAL. Gabriel is Electronic Engineer by IESE, Telecommunication Engineer, MSc in Telecommunications by Buenos Aires Technological Institute (ITBA), and Advanced Studies Diploma (DEA) by UPC. He has also participated in training and technology transfer activities in the United States. He has a large experience in the private sector in the field of industrial monitoring, telecontrol and networks deployments where he held different technical positions such as Project Manager, Researcher, Technical Director, R&D Director and CTO. Anzaldi, also played teaching activities in universities, developed corporate training, has contributed in two patents, 1 PCT and is author of more than 10 publications.

José Antonio Lorenzo is a senior research scientist who obtained a PhD in Physics from the University of the Basque Country. His thesis work was devoted to improvement of superconducting devices for their use in integrated circuits. He worked in the development of inertial sensors, tracking algorithms and computer systems for automatic data acquisition. Furthermore, he has good knowledge of several programming languages, such as C, C++, Java, Python and MATLAB. He is author of several articles in international peer-reviewed journals.

Participant name: SPACEBEL sa – Partner 21

Description: SPACEBEL (SPB) is a software engineering company that has grown in the space market to become a trusted developer of advanced IT solutions and a provider of related IT services. The company operates in the Space and Earth monitoring applications sectors, serving space agencies, government departments, major aerospace companies, European institutions as well as the commercial market. Our skills range from mission definition and analysis of Earth observation microsatellites, over the design, development, integration, validation of IT systems for the space industry to geospatial information systems. We deliver on board control and data handling software, simulation, control and mission centers as well as EO services provisioning infrastructures. So far, we have contributed to the success of more than 30 Space missions aimed at better understanding the Universe and the Earth. We also provide complete Earth Observation solutions based upon the Belgian PROBA micro-satellite platform, including user requirements and system definition. Such a solution gives governments the opportunity to independently manage their territorial information. Finally, we offer Earth observation services for forestry, water, industrial risks, atmosphere, mine exploitation and natural resources management and contribute to help decision makers world-wide in protecting and improving people's life sphere.

Main tasks in the project: SPB will contribute to WP4 and in particular to the reuse and extension in time and services of the data collected by citizens through OMNISCIENTIS project. In WP5, SPB will provide based on previous and on-going FP7 projects (MS-MONINA, BIOSOS and COBWEB) a use case on biodiversity showing great exploitation potential. SPB will contribute to WP6 for the analysis of the innovation potential and the business exploitation. This latter is linked with SPB participation in WP7 dissemination activities.

Relevant previous experience: SPB is the coordinator of OMNISCIENTIS project. He also plays a significant role in other EC projects like SANY, GENESIS, Interisk, BOSS4GMES, and regional projects like 3WSA for the Walloon region. Since 2001, SPB is also developing similar relevant activities for ESA. SPB combines the technological aspects inherent of OPENDATAGEOSS with the thematic geospatial issues and in particular those combining different sources of information whose those from citizens.

Profiles of staff members:

Philippe Ledent, MSc in applied geography. He has 15 years of experience in cartography, photogrammetry, GIS and remote sensing. He works on applied projects in domains such as high precision cartography, cadastral maps, land use / land cover, forestry, mobile mapping in Western and Eastern Europe and in Africa. He's combining a technical background with a business development and a marketing approach. He joined Spacebel in 2010 as Business Unit Manager.

Arnaud De Groof, graduated as an Agriculture Engineer in land use planning from the Gembloux Agricultural University, Belgium in 2001. He completed his post-graduate studies in Oceanology at the University of Liège, Belgium in 2003. He has seven years of experience in risk management and decision support systems specialising in issues with regards to the impact of climate change, floods, transport, air pollution in agglomerated regions of Europe and others. He joined SPB in 2007 as a GIS and Remote Sensing Engineer and has been involved in projects concerned with flood risks assessments in Senegal, and risks on aquaculture in Vietnam using remote sensing imagery.

Bernard Stevenot graduated as Civil Engineer (Physics) in 1969 and has developed his career in the ICT sector for Business, Process Control and Aerospace Systems. Since the creation of Spacebel in 1988 up to 2007, he has been the managing director of the Company. He has a special focus on the development of new opportunities in Geospatial Applications for Europe and for developing countries (South-East Asia and Africa) and contributed to several Research programmes (FP6-SANY, FP7-GENESIS, 3WSA). Using his long and in-depth experience of management, research & development, marketing and international business, he will provide guidance and expertise to the teams involved in the project.

**Participant name: ISPRA (Italian National Institute for Environmental Protection and Research)
Partner 22**

Description:

ISPRA is a national public body supervised by the Italy's Ministry for Environment (MATTM) and is responsible for research and activities related to protection of the environment. It supports regulatory activities of the Environment Ministry, including the fulfillment of environmental reporting requirements and the national implementation of EU directives and Regulations. ISPRA coordinates the National System of Environment Protection Agencies ensuring the exchange of information on environmental monitoring. It manages several monitoring and observation networks and the National Environmental Information Systems. ISPRA cooperates with key scientific institutions, nongovernmental and professional associations, also reaching out to citizen groups, thus contributing to improve environmental communication and participation, use and re-use of data across environmental sectors. It supports MATTM for the Implementation of the INSPIRE Directive and is National Focal Point for the EEA. It is a member of the Network of the Heads of European EPAs, of the GMES Committee and User Forum and of the GEO European High Level WG .It is partner in several GMES, INSPIRE, SEIS and GEOSS projects.

Main tasks in the project:

ISPRA will contribute to WP 2,WP3, WP4, WP5, and WP7 with the main tasks to provide use cases on marine, urban and biodiversity thematic areas and will also contribute to dissemination activities. ISPRA will lead the case-study on Monitoring non-indigenous species in Task 3.2.

Relevant previous experience:

ISPRA provides a nationwide cooperating network among the main environmental institutions. It coordinates the "National network of urban areas environmental quality" of more than 50 cities. It has been and still is active in several EC projects (GNU, EGIDA, PanGEO, GRAAL, HELM, SHIDIP, GNU, IASON. eENVplus). It has experience in cooperation with developing countries and acts as the Regional Activity Centre for Information and Communication of the UNEP/MAP.

Profiles of staff members:

Nico Bonora is researcher at ISPRA with experience in data management and sharing, information systems, coastal dynamic, field surveys and remote sensing. His current activities relate to the technical implementation of INSPIRE Directive, SW reuse and open source solution.

Luca Castriota is a researcher with experience in fish biology, ecology and biodiversity. He coordinated the building and updating of the national DB of marine non indigenous species (NIS). He is a member of NIS working group within the Marine Strategy Framework Directive (MSFD).

Carlo Cipolloni is PhD in Earth Science- He is INSPIRE National Contact Points and ISPRA project manager in the INSPIRE Test Data Specification Model. He is the Italian responsible in the frame of OneGeology-Global, OneGeology-Europe and IUGS-CGI.

Francesca Assenato is an Environmental engineer specialized in International Environmental Law. She worked with NGOs and civil society organizations. In ISPRA she deals with Urban Areas Sustainability Evaluation focusing on energy, mobility, logistics, urban green, soil sealing and climate change adaptation.

Silvia Brini has Degree in Chemistry. In ISPRA she conducts researches related to the Evaluation on urban environment. The most relevant competences deals with urban/metropolitan areas, environmental indicators and atmospheric pollution.

Patrizia Perzia Chemical, specialized in marine environmental monitoring and GIS analysis and data management. She covered GIS aspects of the marine NIS national DB. She is currently a researcher working on fishery data management within MSFD.

Lorenzo Ciccacese is researcher at ISPRA. His interests relate to relationships between climate change and biosphere and ecological restoration. He has been leader for several EU projects. He has been chair of IUFRO group 'Nursery Operations'. He is National Committee member of IPPC.

Giordana De Vendictis has a university degree in Law. She has experience on public procurement and negotiations. She attended the analysis of juridical issues concerning public tenders in developing Countries. She worked on EU project focusing on funding and dissemination opportunities.

Laura Casella is a researcher at ISPRA with a PhD in Ecology. She has experience in vegetation mapping and conservation planning and habitat assessment. She carries out activities of basic and applied research in ecology and biodiversity.

**Participant name: University of Cardiff
Partner 23**

Description:

The School of Computer Science and Informatics at Cardiff University (<http://www.cs.cf.ac.uk/>) undertakes internationally ranked research in distributed and scientific computing, informatics and visual computing. The School's multidisciplinary research continues to have a positive impact in areas as diverse as the environment, healthcare, and mobile communications. Through themes of geoinformatics and embedded informatics for biodiversity science, School staffs brings relevant knowledge and experience of distributed computing, information management and strategic information systems to bear on problems in environmental sciences, where we work closely with end-users. Expert researchers develop novel techniques for representing, manipulating and processing information to support knowledgeable decision-making. Funders of the School's work include: EC, UK Research Councils, and JISC.

Main tasks in the project

CU will provide contributions in WPs 2 and 5 and will ensure links with relevant projects / programmes that include BioVeL, LifeWatch and ENVRI.

Relevant previous experience

CU has a long-standing track record in e-Science and informatics relevant to the present proposal – this has included: building e-Science platforms for biodiversity research, addressing research problems in workflow system integration and usability across a number of projects such as BioVeL, BiodiversityWorld, GRAB, BioDA, ASMIMA, LifeWatch and Ark 2010. Work has also involved building distributed information systems addressing research problems in architectures for interoperability, quality control and standards for data and software in projects such as ENBI, EuroCat, SPICE, LITCHI, 4D4Life and i4Life. Other work focusing on e-Infrastructure has included EU and UK funded projects such as CONOISE, COVITE, GECM; PROVENANCE, PASOA, Triana, WoSE, Gridlab and GridOneD

Profiles of staff members:

Alex Hardisty is Director of Informatics Projects, a Chartered Information Systems Professional Fellow of the British Computer Society (BCS) and a Member of the Chartered Management Institute (CMI). Alex coordinates the FP7 BioVeL project and leads work packages in two other FP7 projects: a) Common Operations of Environmental Research Infrastructures (ENVRI); and b) Coordination of Research e-Infrastructures Activities Toward an International Virtual Environment for Biodiversity (CReACTIVE-B). In the ESFRI LifeWatch preparatory project, he has been responsible for planning the technical strategy to engineer e-Infrastructure for biodiversity research. From 2002 – 2009 he was manager of the Welsh e-Science Centre at Cardiff University. Prior to that Alex held industry positions in product management, consulting, software and systems engineering, and international standardization in real-time computing systems.

Alun Preece is Professor of Intelligent Systems and Director of Research in the School of Computer Science & Informatics. His research focusses on techniques for information provisioning and decision-support in complex environments. These require a fusion of aspects of: knowledge technologies: particularly ontologies, problem-solving, and information quality; agent technologies: particularly communication, resource identification, and coalition formation; and distributed computing technologies: particularly Web and Grid.

Omer Rana is Professor of Performance Engineering and formerly deputy director of the Welsh e-Science Centre. He has led work in the EU "Grid Provenance" project and the EPSRC "Provenance Aware Service Oriented Architecture" (PASOA) project, both of which investigated the development of a data model and architecture for recording provenance from scientific workflows. Omer is a member of the steering committee of the IEEE/ACM conference on "Grid, Cloud and Cluster Computing" and associate editor of ACM Transactions on Autonomous and Adaptive Systems.

Abraham Nieva (Research Associate) is presently researching an approach to componentization of workflows.

Participant name: Plymouth Marine Laboratories Applications Ltd (PMLA)**Partner N° 24****Description:**

PML Applications Ltd is a wholly owned trading subsidiary of the Plymouth Marine Laboratory created to work with customers across a number of industry sectors concerned with understanding, managing and protecting the marine environment. PMLA also offers consultancy, research and modelling services and Earth observing research, applications and products from satellite and airborne remote sensing systems.

Main tasks in the project:

PMLA will have a major role leading WP3 "Water and Marine Environments" together with involvement in WP2 in particular and WP7.

Relevant previous experience:

PML Applications aims to exploit and develop upon work done in PML Information and Communication Technologies projects including: FP7 NETMAR (Open service network for marine environmental data) that is deploying and semantically-enabling OGC web processing services for satellite, in situ and model data, with flexible service discovery, access and chaining facilities using Open Geospatial Consortium, OPeNDAP and W3C standards; and FP7 EarthServer which will further develop web-based visualisation including scaling to multi-terabyte data archives. PMLA is developing a web portal in the EC FP7 Operational Ecology (OpEc) project based on OGC standards.

Key personnel:

Steve Groom has 30 years' experience in satellite and aircraft remote sensing with special interest in the near-real time and operational water-quality monitoring. He has managed over 30 commissioned research projects as principal investigator funded by the UK Natural Environment Research Council (NERC), the European Commission (EC), European Space Agency (ESA) and Ministry of Defence. Steve is Head of Science for Earth Observation Science and Applications and Director of the NEODAAS-Plymouth that undertakes remote sensing data processing for UK environmental scientists. Steve is coordinator of the EC FP7 Europe Africa Marine EO Network (EAMNet). Steve is a principal investigator in the UK GloboLakes project that will investigate lake water quality from EO data (2012-2017). Steve also leads the team responsible for the ChloroGIN web portal (www.chlorogin.org). Steve has co-authored about 50 peer-reviewed papers.

Dr. Mike Grant is a Senior Scientist with a computing background and a long-term interest in large scale processing technologies, applied to EO data. He leads work on improving the accessibility, delivery and visualization of airborne and satellite data via several EC FP7 projects, guides technical developments in two UK services and the ESA ocean colour climate change initiative project. His current interests include the characterisation, distribution and use of uncertainty information in EO data, advanced web-based GIS, and technologies for very large-scale data processing.

Peter Walker: is a Computing Scientist. with >25 years' experience as a software developer including relational database systems with GIS enabled databases such as PostGIS. He is currently working on the EC FP7 NETMAR project with responsibility for web services and visualisation. His work for the Western Channel Observatory (WCO) has involved setting up ingestion routines to load data into a relational database and publishing the data through an OGC Web Feature Server. He is also working on visualisation tools which will allow the data to be accessed through the WCO web portal. He previously worked on the EC FP6 InterRisk project, developing web services using OGC WxS standards and building a web portal to access both these and other WxS compliant services.

**Participant name: TIWAH (UG) haftungsbeschränkt
Partner 25**

Description:

TIWAH is a young and still small research company focusing on the use of Earth observation, crowd-sourced information, and other data for sustainability research. TIWAH engages in the development of crowd-sourcing infrastructure. It developed the data model of the GEOSS User Requirement Registry (URR), guided the design of the web-based interface, and produced web-based tutorials including videos. TIWAH also developed the infrastructure for the GEOSS Science and Technology Service Suite (GSTSS), which includes tools for the organization and documentation of S&T Stakeholder meetings and an extensive feedback utility for Earth observation datasets and services. TIWAH is developing GIS and GeoDesign applications with a focus on urban sustainability indicators. TIWAH also leads a community white paper on the societal challenge of extreme geohazards (funded by the European Science Foundation).

Main tasks in the project:

TIWAH will support several WP Tasks with access to the URR and the GSTSS. The URR will be used to synthesize all user-related information and to analyse business process for the model web against the available user information. The GSTSS will be a major tool for the collection of stakeholder feedback in use cases as well as the overall project evaluation.

Relevant previous experience:

TIWAH has been leading the development of the URR and designed and implemented the GSTSS. TIWAH also has experience in working with stakeholder and user in the population of the URR in a wide range of disciplines ranging from air quality to integrated coastal zone management, infectious disease, and geohazards and disaster risk. TIWAH takes part in community-based assessments and leads a white paper on extreme geohazards.

Profiles of staff members:

Dr. Hans-Peter Plag is a CEO of TIWAH. He has a long record of participation in GEO as Committee member, Implementation Board member, task lead, and co-chair of the Coastal Zone and Geohazards Communities of Practice. He also co-chairs the GEOSS Science and Technology Stakeholder Network. He has more than 30 years' experience in research related to sea level rise, global and climate change, and sustainability. He has lead several large international collaborative research projects (including EU-funded projects) and several community-based assessment reports.

Shelley Jules-Plag also is a CEO of TIWAH. She has a diverse background in surveying, hydrography, GIS, and architecture, and she has long record of in-situ observations (hydrography and sea level), data analysis, and GIS application development. Over the last years, she has focused on GeoDesign application for urban resilience and the development of urban performance indicators.

**Participant name: Shoothill Limited
Partner N°26**

Description: Shoothill is a UK-based SME specialising in creating bespoke data visualisation and mapping solutions and bringing data to life through rich, interactive applications for a diverse range of blue chip clients in both the public and private sectors, including: The Environment Agency, the National Health Service (NHS), United Nations (UNHCR), British Telecom (BT), MSN, Warner Bros, Experian and NEXT Plc.

Using powerful visualisation technologies, Shoothill are able to transform complex statistical or geographic data into dynamic and accessible formats, from coloured heat maps to unique search systems. Our areas of specific expertise include: Mapping, data visualisation, heat-mapping, TimeMap technology, Silverlight development, 3D modelling, custom-built software, geo-coding API facilities, pivot dataset collections for intuitive searching and App development for mobile devices (including iPhone, iPad, Android, Windows Phone 7/8, Windows 8 [Surface and PC]).

Main tasks in the project: Shoothill will mainly have input into WP3 and WP6, with some additional activity in WP7.

Relevant previous experience: Shoothill have been developing software for many different types of applications for many years. Our development team have over 90 years' combined experience, including developers who have worked on some very large and complex defense projects and a project manager who has worked with NASA on the Space Shuttle and SpaceLab programs.

Our experience spans many areas, not least of which is data preparation and visualisation using specialised software development technologies. Shoothill is an award-winning company, recognised by its industry peers as a leading specialist developer and a preferred data visualisation partner with Microsoft, MSN and Microsoft Bing Maps.

Shoothill have many years' experience of software development using the Microsoft .Net suite of products, amongst other platforms and languages, and have extensive experience in cloud- hosted solutions using the Microsoft Windows Azure platform.

Profiles of staff members:

Erik Nodland - Chief Technical Officer: Erik is the Chief Technical Officer at Shoothill and has over 20 years' experience in the IT industry. Erik has been involved in many interesting and exciting projects which have included numerous complex mapping and data visualisation applications and large software, security, WAN and LAN switched solutions. As well as holding a B.Eng (Hons) in Electronic Engineering he has also been a Cisco qualified CCIE for the last 12 years and a Microsoft Certified Systems Engineer for the past 14 years.

Bonnie Huval – Project Manager: With a solid background of over 25 years' in project management, consultancy and high technology engineering, Bonnie has a robust approach and an in-depth knowledge of software development, design and testing. From her early testing days with NASA on the Space Shuttle and Spacelab programs, through many years' of high level international software consultancy roles, Bonnie brings a range and depth of experience across many sectors of industry and a wide range of software development projects. Bonnie is an AGILE and PRINCE2™ Practitioner and a published author of several computing and business related reference books.

Andrew Dray – Lead Architect: Andrew has more than 10 years' software development experience at a senior level. He has a MEng in Electrical and Electronic Engineering from Bristol University and also holds a number of Microsoft certifications. Throughout his time at Shoothill, Andrew has been involved in building GIS mapping, Cloud data storage and data processing and ESRI Arc GIS applications. Andrew has developed software for safety and compliance industry applications, mobile telecommunications and mobile video technologies.

In addition to the above key staff, the following development team members will play a significant role during the project: Lead Developer, 2x Map Developers, Senior Developer, Graphics Designer and a Software Development Test Engineer

**Participant name: PSB Informatics
Partner 27**

Description:

The PSB Informatics is a start-up SME funded in 2012 by researchers who have been working for many years in the Geospatial Informatics area. PSB Informatics is a software development company, with specific expertise in geo-spatial web applications and middleware solutions for mediation.

The core activities of PSB Informatics include:

- concept, design, realization, assistance and management of ICT systems;
- marketing, distribution and technical support of software and hardware products;
- training and education on IT.

Main tasks in the project:

The main task of PSB Informatics is to support the advanced brokering framework development in WP2. Besides, PSB Informatics will contribute to the GEOSS Model Web development.

Relevant previous experience:

The core staff of PSB has been involved in the development of the GEOSS Discovery and Access Broker. To extend this work in the project, PSB Informatics will engage additional developers who have gained experience in EC funded research and development activities.

Profiles of staff members:

Fabrizio Papeschi will lead PSB Informatics activities in this project. He developed a significant experience on geospatial information software development with the National Research Council of Italy. He has been developing the main components of the GEO DAB.

2.3 Consortium as a Whole

The Consortium has been built to respond effectively to the requirements of the call to share and exploit information from many varied sources including open public sector data portals, GMES, and GEOSS. In addition the call requires at least 30% of the budget to be assigned to SMEs to support innovation and growth in this leading sector of the European economy. With these considerations in mind, the Consortium brings together:

- Partners that contribute directly to access to public sector information in the environmental domain (EC-JRC, BRGM, CEH, ISPRA) or indirectly through formalised relationships at the outset of the project (e.g. IIASA with the Austrian Environmental Agency, TUD with the government of Saxony, INFOTN with the Province of Trento, SPB with the Polish General Directorate for Environmental Protection).
- Partners that provide access to scientific data and services such as the UK Environmental Change Network (CEH), French geological data (BRGM), the EDINA National Centre for the academic sector (UEDIN), the Italian database of environmental quality in urban areas (ISPRA).
- Partners with a strong connection with GMES projects (SPB, CNR, CEH, EC-JRC, MUNI, TUD, and PMLA). Collectively these partners have participated or are currently partners in more than 30 GMES projects including for example MyOcean2 on Ocean Monitoring (PMLA and ISPRA), GEOLAND2 on land use, land cover, spatial planning (SPB, CNR, EC-JRC), SAFER on emergency response and rapid mapping (CNR).
- Partners who are the project coordinators of Citizen Observatories funded with the FP7 2012 ENV call Citclops (BDigital), COBWEB (UEDIN), OMNISCIENTIS (SPB), WeSenseIt (USFD), and COST Networks on Citizens Science: ENERGIC (UNISI), and Mapping and the Citizen Sensor (IIASA). OpenDataGEOSS will provide the advanced infrastructure based on its brokering framework to ensure interoperability across these observatories and networks. This will support their sustainability and at the same time provide the basis for reusing the data they collected and also help the outreach activities of OpenDataGEOSS.
- Universities and research centre conducting leading-edge research on semantic interoperability and modelling, system of systems architectures, social networks, and the three chose thematic areas of Water and Marine, Urban Sustainability, and Biodiversity and ecosystems (CNR, EC-JRC, BRGM, IIASA, CEH, CIMA, CREAM, UEDIN, UNISI, WWU, UJI, TUD, USFD, MUNI, ISPRA, CU).
- SMEs, chosen for their leading-edge expertise in application development, combining in the Consortium experienced SMEs, with track record of innovation achievements, and more recent start-ups. So for example GEODAN has won several awards including the 2011 GMES Master Award for a crowdsourcing environmental monitoring application, earthwatchers³⁰, and the 2012 Oracle Eco-Enterprise Innovation Award³¹, while Shoothill has won the 2102 Guardian and Virgin Media Business Innovation Nation Award, and was a finalist in the 2013 IT Europa European IT & Software Excellence Awards and the 2013 GeoSpatial World Excellence Awards.
- Partners that provide linkage to European or global research e-infrastructures such as ENVRI, LifeWatch, and BioVel (CU), GEOSS (CNR, EC-JRC, IEEE, TIWAH), and the NSF EarthCube (CNR, IEEE, EC-JRC) among others.

The consortium is well balanced in terms of resources committed between public administrations (47%), academia (22%) and the private sector (31%) as shown in Figure 2.4.1 and the networks of projects, e-infrastructures, and other networks we can leverage in this project offer a real opportunity to build a critical mass of European contributions to the Open Data initiatives and GEOSS. To achieve this objective we have a relatively large partnership (27 members) that could be seen as a challenge. However, the management team has already successfully coordinated the EuroGEOSS project with 23 international partners, and having four more is unlikely to create difficulties that cannot be managed.

The key to success of OpenDataGEOSS in connecting successfully all these components is that the brokering approach we adopt does not seek to impose a single standard, protocol, or one size-fit-all solution. We acknowledge and respect the diversity of systems and solutions, and put in place the

³⁰ http://www.esa.int/Our_Activities/Observing_the_Earth/GMES/Winning_ideas_of_the_first_GMES_Masters_Competition

³¹ <http://www.geodan.com/organisation/news/latest-news/article/oracle-presents-eco-enterprise-innovation-award-to-geodan/>

middleware components that build the bridges across these infrastructures and projects. This approach has already been demonstrated successfully in the GEOSS context, it is time to deploy it in Europe for the benefit of European citizens, business, policies and science.

i) Sub-contracting:

It is planned that a few activities will be subcontracted by the following partners

01 BRGM: in WP1-Management - For partners reaching the 375,000€ requested contribution threshold audits certificates performed by external auditors have to be provided after the end of the project. It has been foreseen 20,000€ as a provision to cover this subcontracted task.

04 IIASA will sub-contract the Austrian Environment Agency (AEA) in Vienna, Austria for 30,000 Euros. The AEA will make available governmental datasets via their open data portal. Existing datasets will be enhanced to meet the requirements of the OpenDataGEOSS broker, and new datasets will be created according to required standards. The AEA will also assist in making governmental data available to the GEOSS Data CORE. The AEA is not allowed to participate in FP7 projects where matching funding is required. Hence, the sub-contract option was chosen to involve them in the project.

06 IEEE The subcontract for 2640€ is to ReadyTalk for support of the on-line project seminars. This is the cost for a total of four seminars. ReadyTalk provides a service for the on-line seminars of registration of participants, production of the seminar with their moderator and staff, recording of the webinar for further use by the project and preliminary editing of the recording. They also store the recording until it can be transferred to the project web site. ReadyTalk supported the EuroGEOSS webinars and webinars of other projects organized by IEEE. They are a recognized supplier to IEEE for these services.

18 YDREAMS-A (in RTD) The development of a new version of Ziphius or Suba to be more adequate to environment monitoring, implies to add new sensors to their current capabilities. The subcontracting amounting to 10,000€ is needed for the design and development of electronic boards, hardware plotting and industrial design of components.

21 SPACEBEL In WP7, SpaceBel is collaborating to Task 7.2 - "Support development of international collaboration". SPACEBEL will work on the exploitation and dissemination of the results of the project in order to ensure sustainability of the outcomes and further profitability for the companies involved based on the innovation and investments they have done. Concretely, SPACEBEL will focus on the exploitation of the outcomes of WP4, WP5 and WP6 the Odour Information System and process from OMNISCIENTIS in Belgium and abroad (targeted countries and regions will be France, Germany, Luxembourg, Poland and West Africa) the biodiversity monitoring and validation methods from the case-study in Poland. For this latter, SPACEBEL will be supported by WASAT sp. z.o.o., a polish SME (<http://www.wasat.eu>). They are a very active SME in Space and geo-Information. They are specialized among others in the protection of the environment. They are experienced with EU and in particular FP7 projects and will be helpful to sustain and support the contacts SPACEBEL has established with the General Directorate for the Protection of the Environment in Warsaw who is the beneficiary/ user for the case-study. Their role is to ensure the sustainability and exploitation of the outcomes and methods developed beyond the end of the project. The subcontracting has been chosen because WASAT will not participate to research nor development. They are considered as provider for their services. Furthermore their small role is not justifying their enrolment as partner.

2.4 Resources to be Committed

In order to achieve the challenging objectives of OpenDataGEOSS, the consortium is committing significant levels of access to science application and associated services, data, computer resources and manpower. The total manpower needed to implement the programme of work is 722 Person Months as detailed in Table 1.3e. Table 2.4.1 below shows the distribution of the effort across type of activity. As indicated Management (WP1) accounts for only 3% of the total effort while RTD activities account for 89%, and Dissemination for the remaining 8%. When considering the recourse split in functional terms Management and Scientific Coordination account for 5% of the total effort.

Part A (A3) provides an overview of the total cost to implement OpenDataGEOSS and the total requested funding. Total resources committed in the project are just over € 7.7 million, with a request contribution from the EC of just under € 6 millions. Figure 2.4.1 below indicates the distribution of the requested EC funding by organisational type, with 30% dedicated to SMEs.

Figure 2.4.1: Distribution of EC funding requested by organisational type

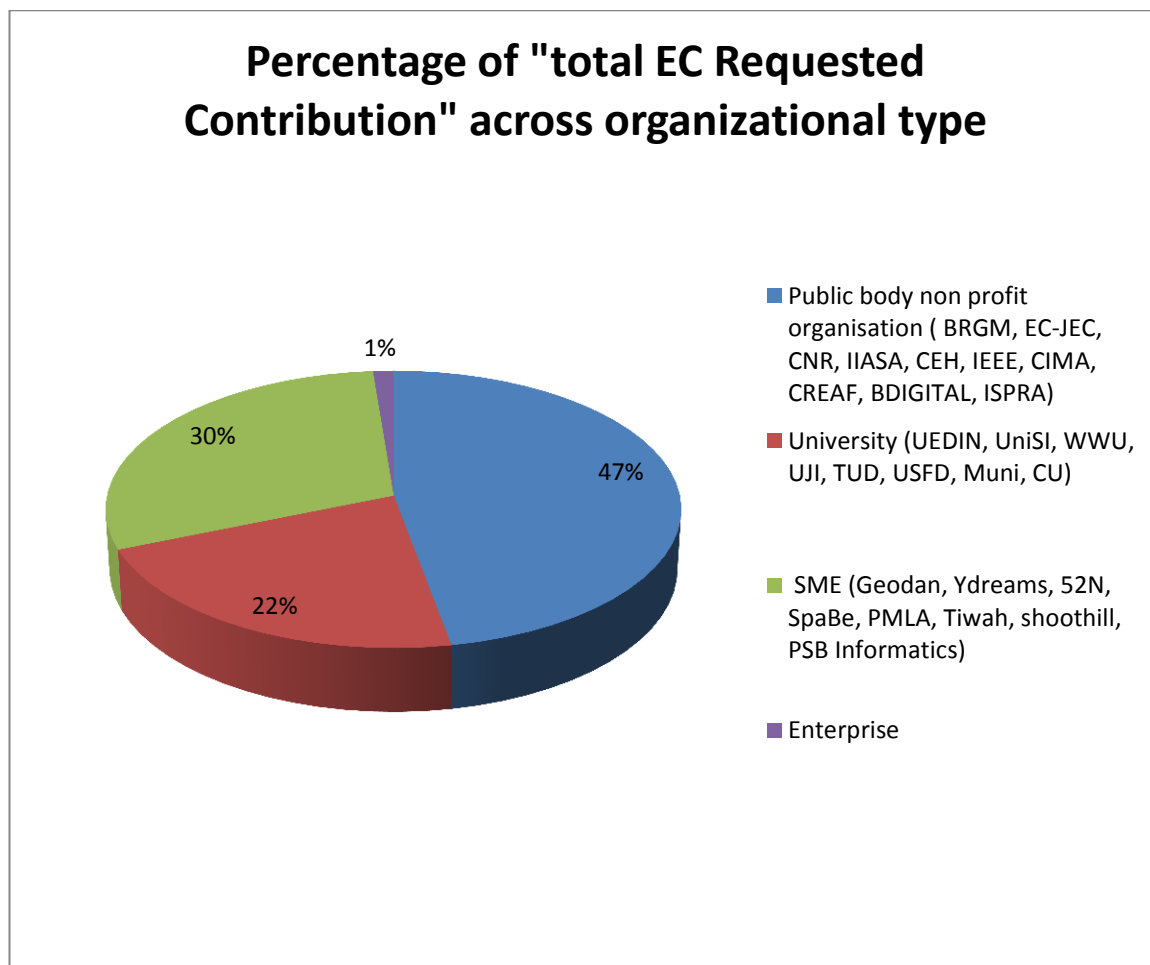


Table 2.4. 1: Summary of Efforts per Work Package

Partner n°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27		
Partner Short Name	BRGM	EC-JRC	CNR	IIASA	CEH	IEEE	CIMA	CREAF	UEDIN	UNISI	WWU	UJI	TUD	USFD	MUNI	INFOTN	GEODAN	YDREAMS-A	52N	BDIGITAL	SPACEBE	ISPRA	CU	PMLA	TIWAH	SHOOTHIL	PSB	TOTAL	
Management activities																											TOTAL		
WP1	23																												23
TOTAL	23																												23
RTD activities																											TOTAL		
WP2	14	14	37					13	10		12	18	22	10	3	6	9		9	3				12	9	8		8	217
WP3		2	4		5		10	1	1		4			10	4		4	21	7	13		9		30		10		135	
WP4		8	4					1	2	15	4	6			4		18		9		7	7			6			91	
WP5		2	4	12	30			1	5		4		2		3		9				6	5	12	1				96	
WP6		24	4	12					3					10		9	4	6	3	1	2			4	2	7	1	92	
WP8	2	4	2		2					2														2				14	
TOTAL	16	54	55	24	37		10	16	21	17	24	24	24	30	14	15	44	27	28	17	15	21	24	46	16	17	9	645	
Other activities																											TOTAL		
WP7	4	6	9		1	9		1	1	1		4			1		4	1	2	0	2	1		2	2	1	2	54	
TOTAL	4	6	9	0	1	9	0	1	1	1	0	4	0	0	1	0	4	1	2	0	2	1	0	2	2	1	2	54	

3. Impact

3.1 Expected impacts listed in the work programme

The key expected impacts of the Call ENV 2013.6.5-3 are: increased opportunities for innovation, growth, and jobs; better policy and increased efficiency of public administration, increased transparency and more informed public through open data; empowering citizens to contribute to environmental governance. These expected impacts will be achieved as follows:

Increased opportunities for innovation, growth, and jobs

OpenDataGEOSS will create a wider pool of open data from local to global levels by connecting through interoperability arrangements with five EU-funded Citizens Observatories (four of which are partners in the project), new sensing activities in the case-studies with new apps developed for the purpose, official data sources from public administrations at the European (INSPIRE and EEA), national (e.g. ISPRA, Italy; CEH, UK; Austrian Environment Agency, Czech Ministry of Interior), and regional levels (e.g. Saxony, Province of Trento), European research e-infrastructure (e.g. ENVRI, BioVel, LifeWatch) and global initiatives like GEOSS, with particular contributions towards extending the GEOSS Data CORE.

This wider pool of data will be exploited through an Open Innovation approach bringing together SMEs, public administrations, and academia all strongly represented in the project. As exploitation of results by SMEs is a key concern of the project, we have brought together leading innovators and developed an outreach framework, including Open Data festivals, to reach beyond the partnership. Section 3.2 outlines the approach that will be deployed by SMEs in the project.

Increased efficiency of public administration, increased transparency and more informed public

OpenDataGEOSS will demonstrate impacts at the local level. For example through Informatica Trentina (InfoTn), the ICT solutions provider for the Province of Trento, the project will promote the uptake of the advanced technologies we develop to deliver innovative public services for the Autonomous Province of Trento. As both the Environment and Open Data are strategic areas for InfoTn, the objective is to simplify (e.g., reduce time) service delivery to citizens, technicians, professionals, businesses and public offices. The existing “Trentino as Lab” living lab network will be exploited to boost the impact of such activities and provide: i) horizontal impacts: acquisition of best practices and methodologies for participatory environmental monitoring; ii) vertical impacts: demonstrating that applying the methodologies enabled by Open Data leads to measurable innovation, and impacts positively on policies, markets and citizens.

Documenting and disseminating the results of this and other local experiences will provide a framework for other public administrations to follow. The impact at the European level will be boosted further by the activities of the European Environment Agency (see letter of support below), and the EC-JRC. The latter, as technical coordinator of INSPIRE, is in the best position to channel the result of the project (e.g. extension towards Linked Data, and citizens data) into the evolution of INSPIRE and ensure that the reuse of INSPIRE data and the integration into e-government Open Data strategies takes place. To further these objectives, EC-JRC will feed the results of OpenDataGEOSS into the projects it leads as part of the EC Interoperability Solutions for Public Administrations programme. In this way they will be shared throughout the EU.

Empowering citizens to contribute to environmental governance

Developing an “Environmental Monitoring 2.0” collaborative framework between public administrations, citizens and SMEs is a core objective of the project and a key objective of the Italian National Institute for Environmental Protection and Research (ISPRA). All 13 thematic case-studies in this project will be documented and made reusable in an open-source web atlas (see D 4.4b) connecting data, applications, and models through the advanced brokering framework developed in the project. The comparative analysis of approaches, applications, and user feedback in the three thematic areas, as well as the analysis of applicability in a developing country (South Africa) will provide powerful lessons that the project will disseminate widely through workshops, web-seminars, and publications as detailed in WP 7.

The European Environment Agency will be an excellent vehicle to apply the lessons learned throughout Europe, and develop a new form of participative State of the Environment Report. At the global level, the

project will contribute to the evolution of GEOSS post 2015 in which the contribution of citizens into this global endeavour is expected to take an important role. The Global outreach of OpenDataGEOSS is not limited to GEOSS. Partners in the project (IEEE, CNR, and EC-JRC) are participating in the development of the National Science Foundation's EarthCube initiative, building a cyber-infrastructure for the geosciences (<http://www.nsf.gov/geo/earthcube/>). They are also participating in the preparation of a new collaborative research action of the IGFA/Belmont Forum on e-infrastructures and data management.

3.2 Dissemination and/ exploitation of project results, and management of IPR

Dissemination and exploitation of results are critical concerns of the project and the focus of two dedicated Work Packages (6 and 7). The issue of IPR will be addressed as a topic in WP 2 and 6 (e.g. OpenAPI will be mandatory to comply with the Social Media and Web2.0 trend), while the management of IPR in the consortium will be addressed by making explicit in the Consortium Agreement what is considered background knowledge brought by the partners and what foreground to share. In the spirit of Open Data all the outcomes of the project will be open access.

OpenDataGEOSS will disseminate project solutions and best practices to communities working in the project area, as well as reaching out to the broader technical community, to end-users and to citizen observer communities to familiarize them with results of the projects. In addition, the project will search for international collaborators with the objectives of creating opportunities for expanding project developments into sustainable global opportunities, with particular attention to the SMEs.

As the web has evolved and alternative mechanisms have appeared, the character of outreach has expanded. As we aim to reach citizens interested in observations and community data, dissemination and outreach for the proposed project will employ both "traditional" outreach approaches and mechanisms from the forefront of the social web. Thus participation with the technical community in conferences is one activity and the organization of Open Data festivals for the public is another. In fact, the outreach activities are fairly comprehensive with many more paths than just these two.

Dissemination to both the technical and non-technical communities working in the project areas will be performed via two Open Data Festivals. These events will demonstrate the new applications and use of harmonized citizen observations and Open environmental Data. The first Open Data festival will be European focused, and will take place in conjunction with a technology/innovation conference such as the INSPIRE conference, an e-government activity, a knowledge festival, or an AGILE event. The focus of the second Festival will have broader international reach and will add a citizen focus to the Festival. In addition to traditional presentations and other emerging formats such as IGNITE (<http://igniteshow.com/events/igniteagu-2011>), the audience will be invited to engage in hack-a-thon style or Maker Faire style hands-on experimentation and competitions. Examples of such events organized by the outreach and dissemination team include the EuroGEOSS conference (<http://www.eurogeoss.eu/conferences/Pages/2012.aspx>), the Earthcube Hack-a-Thons (<http://earthcube.ning.com/group/brokering>) and the maker faire discussions at the IEEE Global Humanitarian Technology Conference (<http://makerfaire.com>).

In prior projects, the EuroGEOSS conference resulted in collaboration with organizations such as EEA in Europe, and UNEP in Kenya regarding the Discovery and Access Broker (DAB). More recently, the National Snow and Ice Data Center and DataOne in the US worked with the DAB as part of the NSF EarthCube program, which is focused on infrastructure for interdisciplinary geoscience.

Peer reviewed publications in noted technical journals (preferably open journals) will be another avenue for raising awareness of technical developments. In addition, lessons learned from the project will be integrated in the GEOSS best practices wiki - a contribution of the IEEE to GEOSS. Recommendations to relevant international standards organizations (e.g. OGC, ISO, IEEE) will be made in order to encourage a sustainable re-use of project results.

The project will support development of international collaborations with the objective of creating opportunities for expanding project applications and facilitating exploitation and sustainability. The partners already have extensive international collaborations, and the Advisory Board members will play an important complementary role in supporting these linkages.

Outreach to the broader technical community, to end-users and to citizen observer communities is an important component of the project priorities and will employ web-based and in-person information exchange. There are conferences in Europe on citizen science which the project will participate in and

advocate uptake of the project developments. The Web Atlas of case-studies developed by the project in WP 4 will attract and engage the broader community. Other organizations such as “SciStarter” are creating such resources (<http://www.scistarter.com/finder>) and the OpenDataGEOSS project will collaborate, where possible, in adding to the existing lists and creating its own inventory.

Additional outreach activities will include: 1) production of a professional quality video; 2) production of four webinars with questions and answer sessions to illustrate innovations and technical progress of the project; 3) session organizations and presentations during international conferences; 4) publication of a bi-annual newsletter, and 5) publication of articles in web magazines. Examples of similar outreach activities performed over the last 3 years by members of the Dissemination and Outreach work package include: video: <http://www.youtube.com/watch?v=UORFs63xQzo>; webinars for EuroGEOSS <http://www.eurogeoss.eu/about/Pages/WP7.aspx>, and those from the NSF Ocean Observation Research Coordination Network under “Blue Marvel - Ocean Mysteries” at <http://rcn.iode.org>. Earthzine (<http://www.earthzine.org>) is an example of professional publications used by the Dissemination team. OpenDataGEOSS has created a broad and innovative outreach and dissemination initiative to capture the imagination of scientists, business leaders and scientists. The planned work is already comprehensive, but the project realizes that ideas and opportunities will evolve and new approaches will be engaged and adopted as the work progresses.

Exploitation of Results

The exploitation of project results comprises multiple tracks. EC-JRC, and public administrations like ISPRA will exploit the greater integration of INSPIRE with e-government Linked Data to improve the policy evidence-base, and reduce administrative burden, while the research partners in the project (e.g. universities, CEH, CNR) will focus on scientific exploitation and infrastructure which enables researchers in different domains to collaborate. Given the aims of this Call, particular attention is given in the project to the opportunities for commercial exploitation, and the measurement of impacts. Thus, for all the SMEs partners the involvement in the project is closely bound to their interests and perspectives to better satisfy the needs of (potential) customers, to generate new business models, to gain access to new customer groups, and to increase their visibility in the market. Examples of SME exploitation opportunities include:

For **52°North**, OpenDataGEOSS will be an important foundation for new business cases. As an innovation-oriented SME, 52°North relies on different activities for generating revenue. For exploiting the results of OpenDataGEOSS, two aspects are especially important. On the one hand, 52°North is offering consulting services helping local, national, and international agencies to find appropriate solutions for collecting, exchanging, and publishing observation data (including official open data sets and citizens’ observations) in an interoperable manner. On the other hand, software development that enables the interoperable exchange as well as processing of observation data is a core element of the 52°North business activities. Based on these considerations and the planned project results, 52°North expects from OpenDataGEOSS the following outcomes that will be exploited beyond the project:

- Experiences on the application of new concepts (i.e. linked data) and technologies in the field of open data (i.e. air quality, hydrological data); this will be an important factor for 52°North to increase its expertise on emerging technologies for the provision, exchange, analysis, processing, and visualisation of open data. This will be especially related to domains such as environment and hydrology. As a result, 52°North will be able to offer additional consulting services for customers wanting to publish open data, use open data, or provide services based on open data.
- New and enhanced software components, especially in the field of Sensor Web technology and web-based geo-processing; based on these results, 52°North will be able to offer its clients customised software components (server as well as client) to build systems for the provision, exchange, analysis, processing, and visualisation of (open) observation data.
- The OpenDataGEOSS project will help 52°North to continue its EnviroCar research activities in the context of open data. This will help 52°North to establish the EnviroCar technology as a new source for (open) traffic and environment data.

Complementary to this exploitation strategy, the results of OpenDataGEOSS will become part of 52°North’s innovation network. A core element of 52°North’s business model is the transfer of research results into practical application and commercial use. For this purpose, 52°North coordinates a partner network with players from research, industry, and application (e.g. public administration). 52°North will be able to feed the results of OpenDataGEOSS into this partner network and thus provide the involved stakeholders with new, up-to date research results on Open Data and Citizen Observatories.

Shoothill: A key area where we see further opportunities for exploitation will be in the extension of the Android App being developed as part of the case-study on monitoring of non-indigenous species in the Mediterranean. Initially, Shoothill could further develop the App as an iOS and/or Win8 application to reach a wider citizen audience. There are also some parallels that could be exploited with this App, or a derivative, in line with the changes to the Common Fisheries Policy (currently being discussed in Brussels) and Shoothill can see potential to develop the App in order to aid the local fishermen and scientists to help identify and catalogue the various types of fish being landed, once the discard regulations have been revised and the onus is shifted towards more regional fishing organisations. In WP3 Shoothill will also be involved in developing tools and applications in conjunction with Geodan and others, especially with a focus on enhancing the mapping and alerting capabilities of the tools and applications being developed. Of specific interest in terms of future exploitation of the outputs from this task will be the development of mapping applications and smartphone apps to complement our FloodAlerts application, especially in terms of its further development to ingest and surface data on, for example, forest fires or earthquakes across Europe. Once developed, these applications would then be made available to citizens across Europe (in multilingual format). Shoothill will also be involved in further activity, across both WP6 (Task 6.3) and WP7 (Task 7.2), including contribution to the development of business plans to increase exploitation of the project's outcomes and participation with the various events and activities being organised to extend the reach of the project to reach a wider audience of international organisations.

Plymouth Marine Laboratory Applications aims to develop improved innovative GMES “downstream” water quality monitoring services based on the EO data sets and integrated crowd-sourced data to be evaluated in the WP3 Lake water quality monitoring service. These will complement the existing services operated on harmful algal blooms based purely on EO data. PMLA is a developer of advanced web visualization services, and the brokering technologies explored in OpenDataGEOSS offer the opportunity to greatly enrich these services with other datasets from the GEOSS Data CORE and other sources. Similarly the geoprocessing App store promises a rich source of component software that can be reused in advanced web GIS developments. PMLA anticipates adding these additional services to ongoing and future projects, which will broaden the use of the data and the appeal of the visualization services. The use of crowd-sourced data is relatively novel in the water quality monitoring area, and experience and tools will be leveraged to further grow this area if proven useful. Clear opportunities exist for improving coastal zone (e.g. beach) and river monitoring.

Technologies such as drones and underwater vehicles (such as the **Ydreams-A** SUBA) for monitoring are also an area of considerable interest and likely to provide new business opportunities for broader scale, automated environmental monitoring.

In order to strengthen the exploitation of project results, a dedicated work package (WP 6) aims at increasing the exploitation potential of the project results. Work will be invested to refine business models, perform extensive market analyses, and promote the outcomes of OpenDataGEOSS. Consequently, it is ensured that the project partners, and especially the SMEs, receive an excellent basis for further exploiting Open Data together with the project results

Given the space restriction, the statements above are just some examples of the attention that the project as a whole will give to exploitation of results by SMEs. It is also worth pointing out that in addition to established SMEs, the project includes two brand new start-ups PSB and TIWAH that have been set up out of the development work their founding members have done in the development of GEOSS (to develop the GEOSS Discovery and Access Broker, and User Requirement Registry respectively). In terms of assessing the impact of GEOSS for innovation in Europe, it will be of great interest to measure how these start-ups exploit the opportunities provided by the project. The project will moreover provide important new evidence on the impact of INSPIRE on innovation and growth in SMEs and will complement the project currently led by EC-JRC dedicated to this effort (www.smeSpire.eu).



Mrs. Agnès Tellez-Arenas
BRGM – Bureau de Recherches Géologiques et Minières
Quai Andre Citroen – Tour Mirabeau 39-43
F – 75739 Paris
France

12 February 2013

Letter of support and advisory board for OpenDataGEOSS project

Dear Mrs. Agnès Tellez-Arenas,

With this letter, the European Environment Agency would like to express its highest level of interest and its readiness to support the 'Open Data: Linking Science, Citizens and GEOSS' (OpenDataGEOSS) project proposal, which is being submitted to the second stage of the EU's FP7 call FP7-ENV-2013-two-stage.

This proposal clearly complements the work of the EEA in respect to the implementation of the Shared Environmental Information System (SEIS), particularly in the areas of (i) the citizen-based Eye on Earth initiative – including, for example, NatureWatch that aims to fill knowledge gaps about invasive alien species – (ii) open and free exchange of information relating to the state and outlook of the environment in Europe – as implemented through the Shared European National State of the Environment (SENSE) process – and (iii) data and service sharing between INSPIRE, Copernicus and GEOSS.

We are especially interested in supporting OpenDataGEOSS to connect to data and services of operational EEA application domains – such as water, land use and biodiversity. For example, the proposed brokering framework could provide a technical solution for connecting the Eye on Earth platform to GEOSS, whereas the EEA semantics data service could provide useful resources to the project. Amongst other interesting applications, the pilot study on non-indigenous species in combination with the brokering approach to European Alien Species Information Network (run by the JRC) clearly aligns with the above mentioned NatureWatch, and the Game-based Geo-wiki would complement the land use related work of the EEA.

As part of our support, a representative from the EEA will actively participate in the Advisory Board of OpenDataGEOSS and in the user engagement activities.

Yours sincerely,

Sven Schade
Project Manager
Shared Environmental Information System

Kongens Nytorv 6
1050 Copenhagen K
Denmark

Tel: +45 3336 7100
Fax: +45 3336 7199

Email: eea@eea.europa.eu
Web: www.eea.europa.eu



PROVINCIA AUTONOMA DI TRENTO

Direzione Generale della Provincia
Incarico Dirigenziale in materia di innovazione
Via Giusti, 40 - 38122 Trento
Tel. 0461 499565 - Fax 0461 499262
e-mail: is.innovazione@provincia.tn.it

Dear Sir
Dr. Massimo Craglia
Digital Earth Unit
Institute for Environment and Sustainability
Joint Research Center
European Commission
Via E. Fermi, 2749
21027 ISPRA VA

Trento, 27 SET. 2012

Prot. n. 1041/12/ ~~544037~~ /6.6.3/93-12/MIB/ap
(da citare nella risposta)

Subject: Letter of Support for the project OpenDataGEOSS.

Dear Dr. Craglia,

I have received your email with the description of the OpenDataGEOSS project proposal on making environmental data accessible and reusable through INSPIRE and Open Data strategies which generates major benefits to European competitiveness and sustainable growth through innovative products and services, more accountable and transparent policies, and more participative science.

I believe that such effort is very timely and is highly needed to enable the Autonomous Province of Trento to achieve and improve its goals on the Open Data Government strategy which is central for the provincial 2012-2016 development plan ("Piano di Miglioramento della Pubblica Amministrazione per il periodo 2012-2016").

Regarding the Open Data Government policies, this year the Autonomous Province of Trento published, following the Open Government Data approach, 160 geographical datasets, which are now freely available from the provincial Geographic Web Portal. Additional provincial guidelines and datasets will be available within the end of this year.

I recognise that project outcomes will represent a key factor to support the provincial goals regarding the management of Open Data Government, to support the Environmental policies, and to improve the participation and use of the data of our administration by the public.

For these reason I, the undersigned, Dr. Isabella Bressan, hereby confirm the intention the Autonomous Province of Trento, to support and appreciate the expected outcomes of the OpenDataGEOSS Project, as useful and valuable to achieve the goals of the development plan of this administration and recognise the positive impact deriving from project activities.

With this Letter of Support we hereby confirm:

- That we are informed about the preparation of the OpenDataGEOSS project.
- That we will make full available to the project the resources we will publish following the Open Data approach.
- That we shall follow the project development.
- That we aim to participate in the project in the role of Supporting Institution, without financially contributing to it.

Your Sincerely,



IL DIRIGENTE

- dott.ssa Maria Isabella Bressan -

Maria Isabella Bressan



MINISTRY OF THE INTERIOR
OF THE CZECH REPUBLIC

Tomas Fasko
eGovernment Project Department
Director

Prague 1st October 2012

With this letter I would like to express the full support of the Ministry of the Interior of the Czech Republic for the project called "OpenDataGEOSS" in response to the call ENV.2013.6.5-3 Exploiting the European Open Data Strategy to mobilise the use of environmental data and information – FP7-ENV-2013-two-stage.

OpenDataGEOSS provides an excellent opportunity to build on the investment made in our country on the INSPIRE infrastructure and combine the data from INSPIRE with other data about the environment published through our Open Data Strategy, and observations and feedback provided by citizens. We believe that this combination will provide major opportunities to increase transparency, citizens' involvement, a more informed debate on key environmental issues, and innovation potential for our private sector, especially Small and Medium Enterprises. With this in mind, we look forward to collaborating with the project partners and benefit from the results of this project in our country.

Yours sincerely

Tomas Fasko

Letter of Intent

Project OpenDataGEOSS for the call ENV.2013.6.5-3 Exploiting the European Open Data Strategy to mobilise the use of environmental data and information



The Saxon State Spatial Data and Land Survey Corporation (GeoSN) is the central service provider of geo-information at the federal level. As such we are responsible for the construction and operation of central IT components. The authorities and municipalities in the federal State of Saxony use these key components to make their diverse geographical information available on the Internet. The central IT-components shall especially assist Saxon authorities and municipalities in

- meeting their obligations under Directive 2007/2/EC to establish a European Spatial Data Infrastructure (INSPIRE),
- creating efficient and modern management processes in the frame of eGovernment,
- opening their data holding for further usage in various applications by other administrations, research institutions, industry and citizens.

The public authorities and municipalities are required to provide their geospatial information under transparent terms and conditions and with according to well defined technical and content quality standards, so that operational applications in industry, research and government can rely on these services. Within the frame of eGovernment the Saxon state supports this process by building an operational IT infrastructure (Geodata Infrastructure Saxony). In this context we are aware that we are called upon to provide public geoinformation under the conditions of the "open data" initiative. Currently we are analysing to what extent creating added value on the basis of public geoinformation which is free of charge and license free can be combined with the obligation to achieve income under public-law. Within the frame of GDI Saxony various applications can be considered: implementation of environmental policies, research projects, citizen science, energy and water supply as well as risk alert and information systems.

From the proposed OpenDataGEOSS project we hope for the design and development of scenarios and prototypes under the terms of the "open data" initiative. We expect a major knowledge gain through the collaboration with TU Dresden, being able to weigh up the advantages and disadvantages and thus paving the path for future eGovernment and Open Data applications in Saxony.

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Hausanschrift:
Olbrichtplatz 3
01099 Dresden

Dienststätte Strehliener Str. 24
01059 Dresden

Telefon: +49 351 8283-0
Telefax: +49 351 8283-6110
Mail: poststelle@geosn.sachsen.de

www.landesvermessung.sachsen.de

Öffnungszeiten der

Verkaufsstelle:

Mo., Mi., Do. 09:00 – 15:00 Uhr
Di. 09:00 – 17:00 Uhr
Fr. 09:00 – 12:00 Uhr
Telefon: +49 351 8283-8400
Telefax: +49 351 8283-6130

Verkehrsanbindung:

Zu erreichen mit den Straßenbahnenlinien 7, 8 sowie Buslinie 64, Haltestelle Stauffenbergallee

We welcome the proposed OpenDataGEOSS project and intend to support it to the best of our ability and eagerly look forward to its results.

Dresden, 1st October 2012



Dr. Gunnar Katerbaum
Head of Department

4. Ethical Issues

Research on Human Embryo/Foetus		YES	Page
*	Does the proposed research involve human Embryos?		
*	Does the proposed research involve human Foetal Tissues/ Cells?		
*	Does the proposed research involve human Embryonic Stem Cells (hESCs)?		
*	Does the proposed research on human Embryonic Stem Cells involve cells in culture?		
*	Does the proposed research on Human Embryonic Stem Cells involve the derivation of cells from Embryos?		
I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL		X	

Research on Humans		YES	Page
*	Does the proposed research involve children?		
*	Does the proposed research involve patients?		
*	Does the proposed research involve persons not able to give consent?		
*	Does the proposed research involve adult healthy volunteers?		
	Does the proposed research involve Human genetic material?		
	Does the proposed research involve Human biological samples?		
	Does the proposed research involve Human data collection?		
I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL		X	

Privacy		YES	Page
	Does the proposed research involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?		
	Does the proposed research involve tracking the location or observation of people?		
I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL		X	

Research on Animals		YES	Page
	Does the proposed research involve research on animals?		
	Are those animals transgenic small laboratory animals?		
	Are those animals transgenic farm animals?		
	Are those animals non-human primates?		
	Are those animals cloned farm animals?		
I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL		X	

Research Involving ICP Countries		YES	Page
	Is the proposed research (or parts of it) going to take place in one or more of the ICP Countries?		
	Is any material used in the research (e.g. personal data, animal and/or human tissue samples, genetic material, live animals, etc): a) Collected in any of the ICP countries?		

	b) Exported to any other country (including ICPC and EU Member States)?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	

	Dual Use		
	Research having direct military use		
	Research having the potential for terrorist abuse		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	

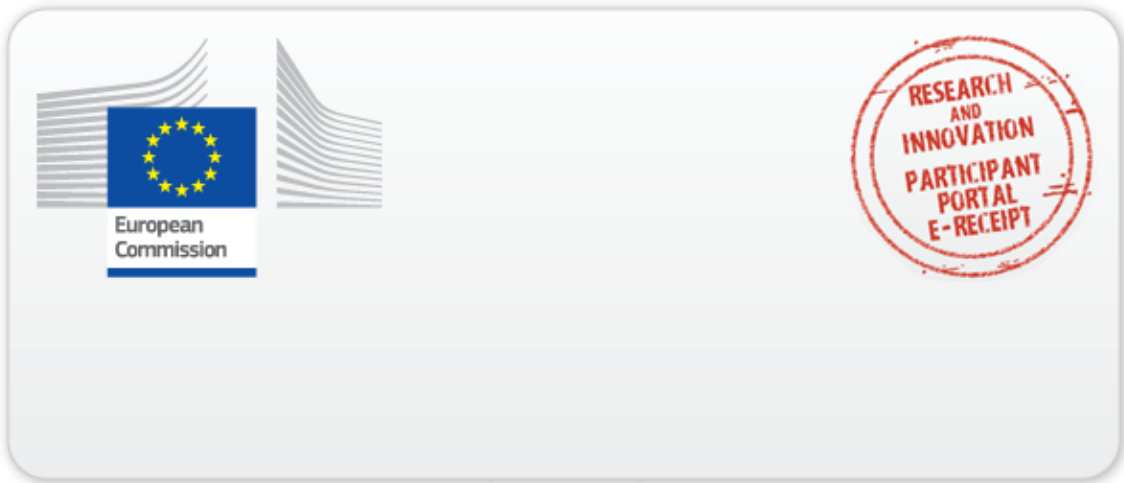
5 Consideration of Gender Aspects

The European Commission has already an instrument to deal with discrimination based on gender in the form of Article 141 (ex Article 119) of the EC Treaty and has adopted a whole series of measures to implement this article in practice. In previous years, the importance of the principle referred to equal economic treatment and wages was included in EC legislation under Article 119 of the EC Treaty. In subsequent years, this principle was extended to the case law of the European Court of Justice. Today, equal opportunities and equal treatment between men and women has been guaranteed by taking actions covering: the application of the principle of equal pay; the creation of equal conditions for men and women with respect to access to employment, vocational training and retirement; equal treatment of men and women in the area of the “de-jure” or “de-facto” social security systems, the reversal of the burden of proof in cases of discrimination; and positive discrimination to promote the underrepresented gender. Over the years, the European Parliament has supported and called for measures to improve the position of women. This work continues through the activities of the Women’s Committee. In more detail, a number of specific European and UN Policies have been adopted to promote gender.

The gender issues will be addressed within the OpenDataGEOSS consortium with two approaches:

- The companies and institutions which already have a gender policy established commit to contribute with communication on their gender policy to the OpenDataGEOSS outreach activity so that opportunities (training, employment) can be better known within the specific community.
- Within WPs, priority will be given to ensure that the final team will have an adequate presence of women with the right position and competencies.. Moreover, the partners commit to action so that the representation of the project towards externals will be well balanced between men and women to act as successful ante type to young women. BRGM has already led by example by appointing a woman as project coordinator

From a general point of view, the women representation in the project will roughly remain unchanged or will only marginally increase because key persons are tasked in general for the full duration of the project. The OpenDataGEOSS consortium is acutely aware of these issues and a detailed action plan will be developed and implemented, based on JRC example. JRC takes a proactive stance with regard to promoting equal opportunities and, in particular, gender equality in its working environment. The JRC-wide network on “Women and Science”, was set up in 2000, continued to monitor gender equality in the organisation. As a result of the activities of this initiative, gender parity has continued to improve with in the organisation.



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