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Coordinating an Observation Network of Networks EnCompassing saTellite and IN-situ to fill the Gaps in European Observations

Deliverable D7.1

Plan for disseminating and communication of the project's results

Version 1

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1	04-06-2015	IS_CREAF	Final version

Table of Contents

1. Introduction

What is Dissemination and exploitation for ConnectinGEO?

The dissemination is focused on exploiting the results in the stakeholders community. Dissemination and exploitation measures address the full range of potential users and usages including research, commercial, investment, social, environmental, policy making, setting standards, skills and educational training. Its temporal extent encompasses the duration of the project and continues after the project.

What is Communication for ConnectinGEO?

Communication promotes the project and its findings to various audiences, including groups beyond the project's own community of stakeholders, allowing for public/societal engagement on issues related to the project. Its temporal extent encompasses the period of the grant.
The communication plan follows the structure recommended by the EC in the document:
http://ec.europa.eu/research/participants/data/ref/h2020/other/gm/h2020-guide-comm_en.pdf

2. Dissemination Plan

The Dissemination and communication Plan in ConnectinGEO is done both as outreach and in a collaborative feedback environment and will be based on a stakeholder analysis in order to reach anyone who has potential interest in the project or will be affected by its outcomes.

2.1.1. Stakeholder analysis

In the stakeholder analysis, stakeholders will be identified, listed, and assessed in terms of their potential interest in the project and importance for its success and further dissemination of the project an its results.

Main identified stakeholder communities are:

- With respect to the dissemination of the activities and findings of the project into the GEOSS CoPs and the GEO Implementation Boards:
    - Request the linking of the ConnectinGEO Observations Inventory in the GCI.
    - Actively participate in GEO governance structure to ensure a focus on the integration of the gap analysis methodology

  - Actively participate in GEO Implementation elements, GEO Work Plrogramme Symposiums and the GEO plenary and ministerial weeks
  - Participate in the Data Sharing Working Group, specifically in the Data Management Principles activities, and the Standards Interoperability Forum, that will start after the GEO XI Plenary.
  - Participate in the GEOSS Architecture Implementation Pilot (AIP) for the ENEON integration and industrial challenges.
  - Work with representatives of each of the SBAs.
  - Participate in the GEOSS Science and Technology Stakeholder Network (GSTSN) and the workshops organized by this network.

- With respect to the Earth Observation Networks:
  - Participate in conferences and symposiums and in regular meetings of European EO networks.
  - Organise dedicated dissemination events such as workshops about integration of EO networks
  - Participate in Networking of EO projects such as ENVRI plus.
  - Establish cooperation and agreements with relevant projects to foster knowledge of European EO networks capabilities and limitations.
  - Contribute to the ERA-PLANET ensuring that the activities done contribute to mitigate gaps in EO. Participate in the ERA-PLANET subprojects.

- With respect to the scientific community:
  - Organise dedicated dissemination events such as workshops and symposia (including the European Geosciences Union, EGU General Assembly, the ESA Living Planet Symposium, the annual GEO European Projects Workshop, etc). Of particular relevance are the GEOSS S&T Stakeholder workshops organized by the GSTSN.
  - Elaborate open access scientific literature in publications of recognized impact.
  - Provide the outcomes to relevant FP7-H2020 projects. Establish cooperation and agreements with relevant projects to foster knowledge of European EO networks capabilities and limitations.
  - Share observations catalogue analysis and results as reproducible research.

- With respect to the industry community and commercial sector:
  - Organise a dedicated dissemination workshop targeting SMEs and industries to share the ConnectinGEO methodology and results and create opportunities to build up new networks of stakeholders.
  - Transfer technical and organisational experiences across domains of business.

  - Attend to private business-focused exhibitions to demonstrate the possibilities of the data provided by the ENEON including cost/benefit analyses.
  - Organise a collection of best practices across European observation network communities and specifically describe these from a business opportunity perspective.

- With respect to the general public:
  - Co-organise dedicated dissemination event about Citizens Science.

GEOSS as a stakeholder

Efforts in the project will also contribute to increase and better engage GEOSS communities by applying already existing collaborative platforms, including, but not limited to, the former URR, now known as "Socio-Economic and Environmental Information Needs (SEE IN) Knowledge Base". One of the outcomes of the project will be to also detect gaps in the functionality of the GCI components for collaborative processes that can be addressed in follow up projects.

Integrate all the SBAs and GEOSS CoPs in the gap analysis and in the ENEON process.

SMEs as stakeholders

SME pilots will contribute to demonstrate the economic value of creating business opportunity while participating in the gap analysis study. These selected pilots are intended to continue working beyond the end of the project and be further developed by the respective SMEs. A business model that would allow SMEs to address some of the identified gaps by themselves will be sought. Results of pilots will be disseminated to other SMEs in using the EARSC capability (EO industry sector) and sources of finance will be studied and applied to allow continuation of the activities beyond the end of the project.

Funding agencies as stakeholders

Reports will be submitted to the relevant funding agencies that will receive a list of gaps and will participate in the process of exploring options to ensure that some of the priorities defined during the project can be covered afterwards.

2.1.2. Dissemination methods

2.1.2.1. Dissemination of the project results:

- **Publication of technical papers** in remote sensing, environmental, ICT and application domain related conferences and journals. We will specifically target the following journals: Int. J. Remote Sensing, Int. J. Spatial Data Infrastructures Research; Int. J. Geographical Information Science; Transactions in GIS; Int. J. Agricultural, Biological and Ecological Statistics; Int. J. Digital Earth and the following conferences: IGARSS, SPIE Remote Sensing; EGU; AGU; GI Science; GeoEnv, EarthZine, etc, although this is not an exhaustive list. The project has reserved some budget to ensure that most of the scientific publications are published with open access (also called 'gold' open access) and are immediately provided in open access mode by the scientific publisher.
  At the EGU 2015 General Assembly, the following works were presented:
  - *Towards the creation of a European Network of Earth Observation Networks within GEO. The ConnectinGEO project*. Joan Masó, Ivette Serral, Lionel Menard, Lucien Wald, Stefano Nativi, Hans-Peter Plag, Shelley Jules-Plag, Daniel Nüst, Simon Jirka, Jay Pearlman, and Martine De Maziere.
  - *Open Surface Solar Irradiance Observations - A Challenge*. Lionel Menard, Daniel Nüst, Simon Jirka, Joan Masó, Thierry Ranchin, and Lucien Wald.
  - *The GEOSS Science and Technology Stakeholder Network and Service Suite: Linking S&T Communities and GEOSS.* Hans-Peter Plag, and Shelley Jules-Plag.
- Involvement with the **relevant scientific and standards setting bodies**, which also have strong user involvement, such as QA4EO, OGC and ISO.
- **Engagement with user groups** through the Project Advisory Board, the Project Stakeholders Network, the ENEON, GEO CoPs, the GSTSN, and conferences / workshops.

2.1.2.2. Data dissemination

The project will collect and submit new information gathered by the project to the GCI, particularly information about observations involved in EO in both the remote sensing and in-situ sensors including but not limited to spatial and temporal coverage, means to access data, and data licenses. This information will be open-access and published following best practices for open data where possible. Thus the project will contribute to the EC Open Research Data Pilot. In fact, efforts to make data open, preserve, curate, and maintain it up to date will be considered in the gap analysis. On top of participant efforts, the ConnectinGEO Observations Inventory and collaborative platform will utilize current Open Source Software (OSS) and an open process that can be reproduced by any interested party.

To collect the data, relevant standards will be used, for example the Open Geospatial Consortium, OGC Sensor Web Enablement (SWE) suite of

standards. The project will also examine the contributions to the GCI standards registry and analyse any gaps in standards for describing observation data as well as accessing observation data as one aspect in the gap analysis process. The project will regularly participate in standards organizations meetings, particularly the ones dealing with sensor and observation standards, and present the findings at OGC Technical Committee and GEO Infrastructure Board meetings. The project will appoint a representative in the GEO Standards and Interoperability Forum (SIF).

The project will also collaborate with the GEO Data Sharing Working Group and the Data Management Principles new activities after the GEO XI Plenary and will disseminate the concept of the GEOSS Data CORE in the observation and measurement community.

3. Communication Plan

3.1. Communication activities

With the communication activities ConnectinGEO wants to raise public awareness about the use of environmental information to better understand the planet threats. Therefore, ConnectinGEO aims to address these complex communication needs by these general objectives:

- To make project information and results available to various audiences, including groups beyond the project's, by synthesizing the new scientific knowledge gained in the project and by using a non-technical language that could reach also general society.
- Overcome barriers to knowledge sharing between research, policy and SMEs in EO networks and environmental data acquisition, by a tailored publication strategy and communications that comprises face-to-face bidirectional exchange (workshops, seminars), target group specific dissemination material, awareness campaigns, and social media.
- Use appropriate communications channels to ensure communication with policy-makers, the media, society, SMEs and the stakeholders, by combining classical media approaches with modern social media techniques and participative web.

The coordinator has a communication office with demonstrated experience in communicating the activities of previous projects. It will collaborate with the project team in constant communication of the activities of the project as well as the conclusions. Communication will be done mainly in English but other local languages will also use facilities from the rest of the consortium. All the communication materials will include the European Union flag and will follow the

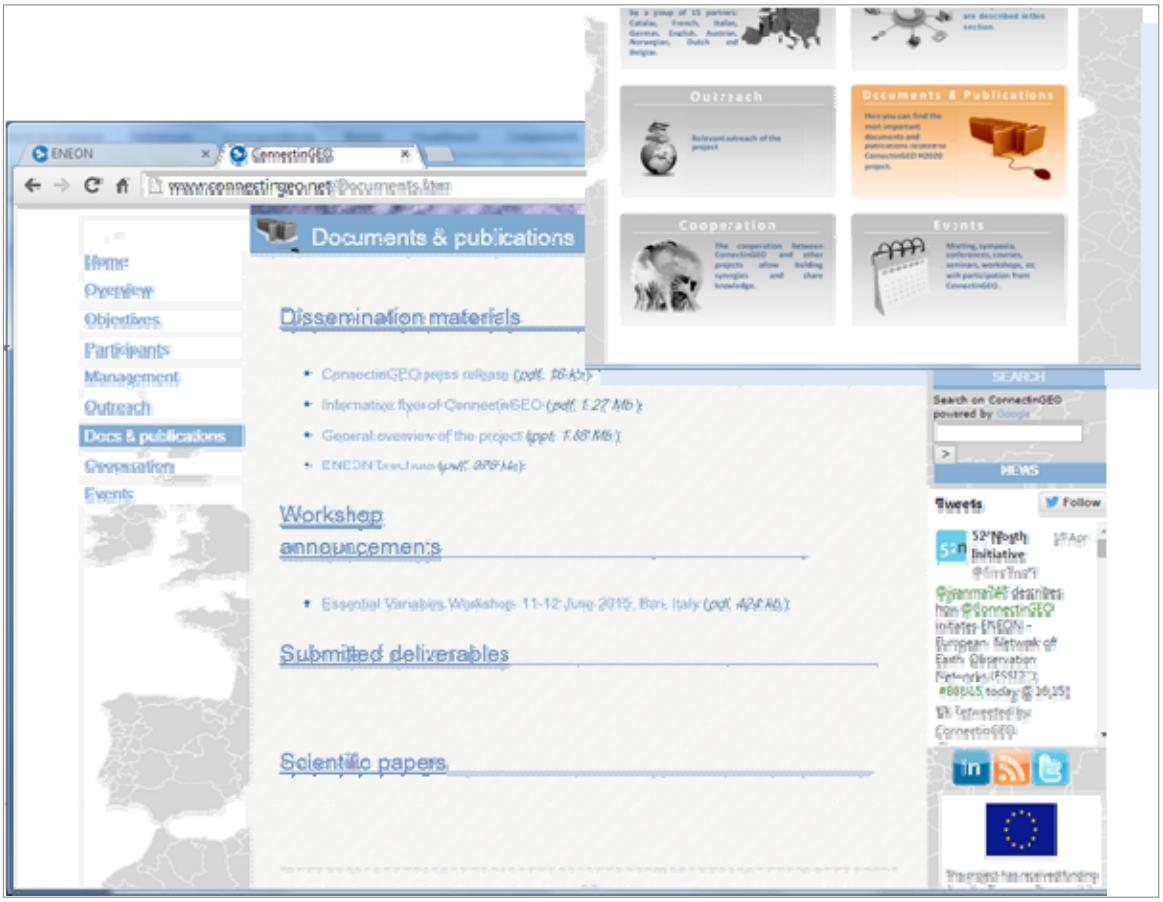
recommendations of the EU with regards to the acknowledgement of the EU funding received.

The communication measures for promoting the project and its findings are:

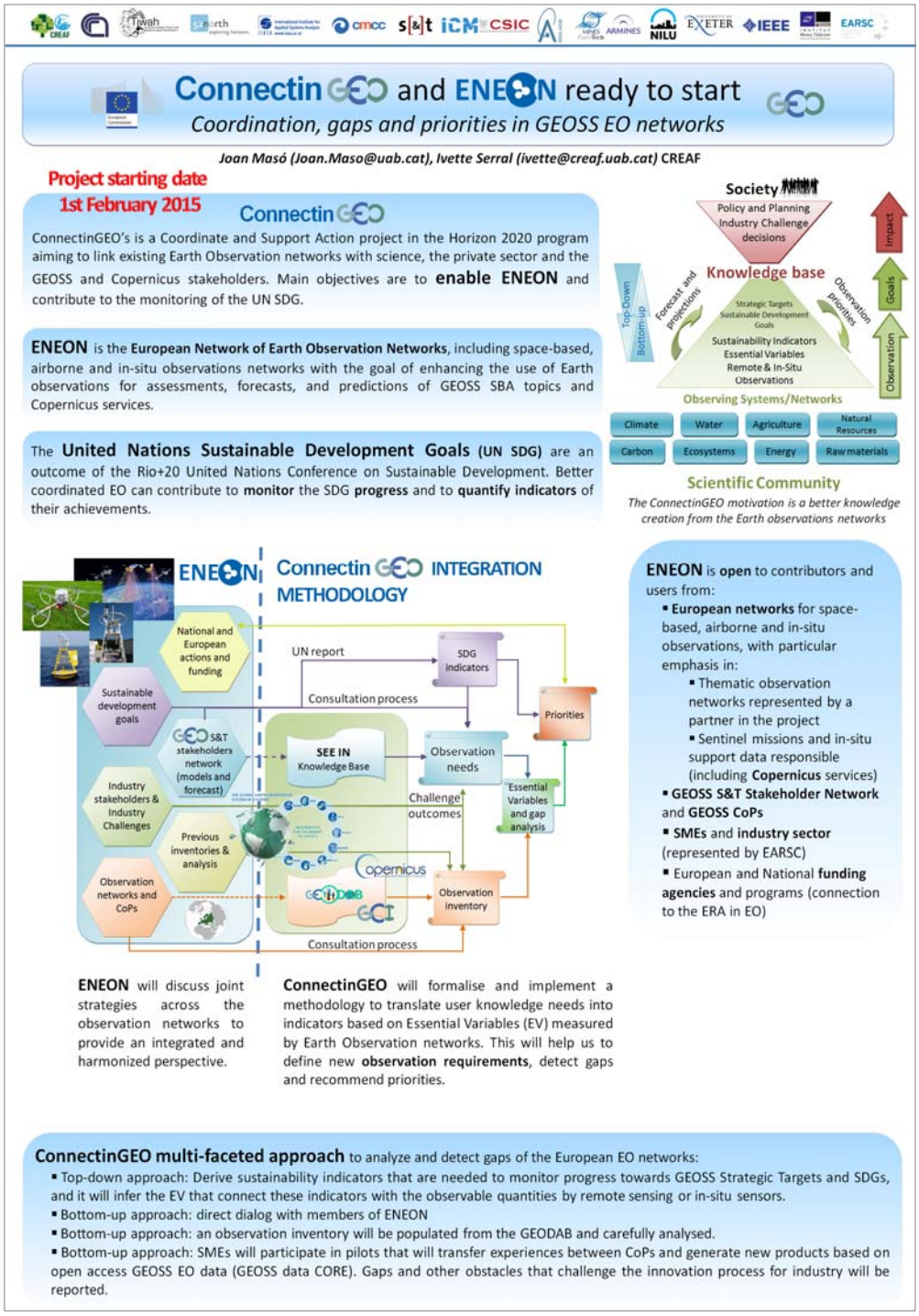
- **Project's corporate image and leitmotiv development**. A corporate design (logo, templates, and newsletter) developed to ensure that communication and outreach materials have a uniform and recognizable image. The ConnectinGEO logo uses "GEO" capitalization to reflect the project's relationship and contribution to GEO. ENEON's logo uses an icon similar to the GEOSS SBA representation with the aim to reflect the connection with GEOSS. All the project representations use, as well, the EU flag.

ConnectinGEO	ConnectinGEO logo
ENEON	ENEON logo
	ENEON simplified logo following the GEOSS SBA icon
	European Union's flag logo to be used in the project

- A **ConnectinGEO multimedia communication tool package**. ConnectinGEO will produce more formal appealing multimedia material to be used by the Consortium and the EC in various events. This tool package will include a periodical newsletter, brochures, leaflets, posters, a set of reusable illustrations and a few short stand-alone videos, all developed by an external designer under the communication office supervision. Additionally, ConnectinGEO will create merchandizing items to communicate the project logo and the EU image. This material will be a showcase of the project, so it will be downloadable from the project website and from widely visited media portals.



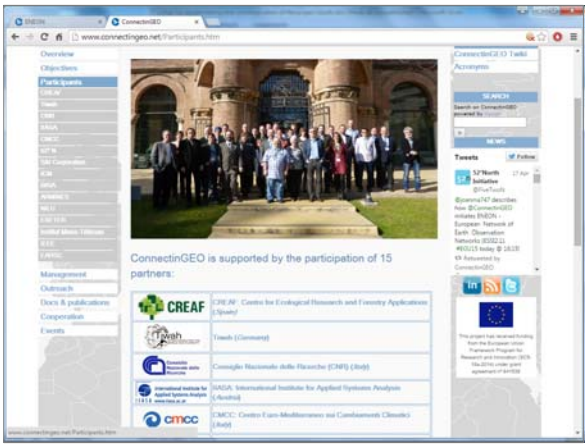
Communication materials in ConnectinGEO website



ConnectinGEO introductory poster

ENEON first brochure

- The **ConnectinGEO website**. The project has registered the domain ConnectinGEO.net (.net emphasizes the aim of catalyzing a network). www.ConnectinGEO.net uses this to host the project website. This website is managed by CREAF and is used as the key platform to explain and communicate the project objectives to the general public, provide specific news, information and links to the partners and provide access to all public deliverables. ConnectinGEO website links to other relevant websites, including GEOSS S&T Services Suite (maintained by the GEOSS S&T Stakeholder Network), the GEO website and the GEOSS Portal, the GEOSS S&T Services Suite website that contains the GEOSS S&T Portfolio, the SEE IN Knowledge Base, and the DAB.

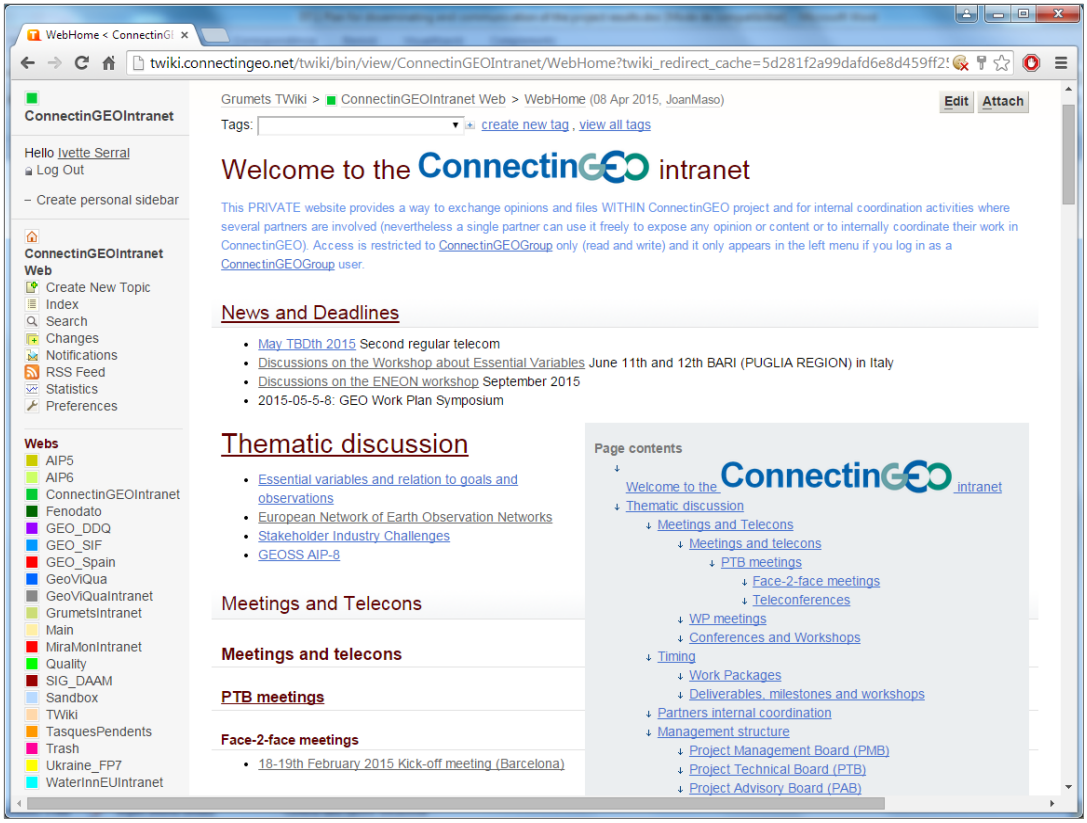


Some captions on ConnectinGEO website

- **ConnectinGEO social media accounts**. Social media accounts complement the website, and provide a forum for discussing the developments within the ConnectinGEO project allowing anyone to comment and discuss ConnectinGEO results, events, news, etc. A Twitter account has been created: @ConnectinGEO. A LinkedIn user creation will be considered as well. Dynamic gadgets have been used to embed the social media in the project website. Followers on the social media profiles and Klout index will be considered to assess its effectiveness.

ConnectinGEO Twitter account and embedded into the website

- A **ConnectinGEO Wiki** – A Wiki has been created to complement the website and to provide a private area within the partners. This private area is used for internal project communication, summarising discussions on the forum that have reached a conclusion. A public wiki will be considered to allow ConnectinGEO members to edit live content publicly visible and to be the basis for a collaborative community for EO networks that will live beyond the project. In contrast to a more static website, the wiki will be used for speedy discussion and interactive collaboration.



ConnectinGEO twiki page

- **External communications actions**. The consortium will take care of promoting the use and the uptake of the results via participation in the GEO plenary and in other relevant exhibitions, Earth Science thematic workshops (both European and international), and any other event deemed relevant according to project's achievements. The project will also contribute to newspapers and magazines, and will generate regular press releases to communicate the main activities and results of the project to the mass media. CREAF communication office will prepare different articles to release to the media with project results that can be of interest for the general public.
    - By this time of the project, EARSC has included information about the ENEON workshop at the May monthly report and created a dedicated page at the EARSC portal. They have also included the information at the EARSC website, EOcalendar and they will include a dedicated announcement at the July EOmag.

- A **ConnectinGEO citizen science conference**. ConnectinGEO plan to do a special workshop (WS4) for disseminate the EO network to people engage in citizen science networks: science researchers, project leaders, educators, technology specialists, evaluators, and others – representing some disciplines (including biodiversity, meteorology and ecology) – gathered to engage in dialogue and an exchange of ideas. Active EU-funded projects in the field of

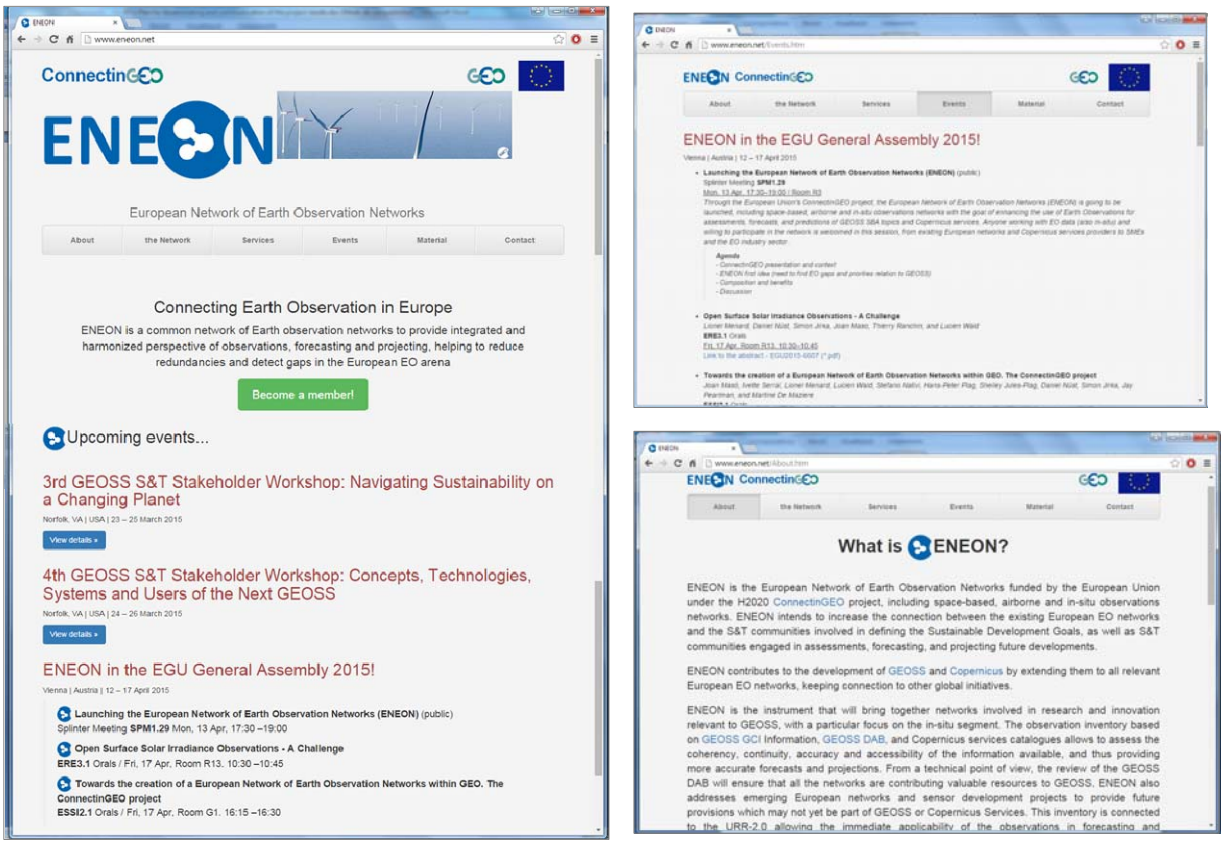
Citizens' Observatories for environmental monitoring will be particularly invited (e.g. CITI-SENSE, Citclops, COBWEB, OMNISCIENTIS, WeSenseIt).

- A **ConnectinGEO final book**. A book will be produced in order to present the project, its objectives, its actions and its results to a non-specialist audience, including political decision-makers, SME's and stakeholders. The whole consortium will be involved in the development of the book. The paper version can be distributed at community events and the electronic version will be accessible from the project website in formats suitable for common e-book readers. It will be a key tool that will help to draw attention to the work of the project and efforts performed.
- **ConnectinGEO conferences**. ConnectinGEO and ENEON will be explained and promoted yearly in the European Geosciences Union (EGU) inside the Earth and Space Sciences Informatics (ESSI) division, and will explore the possibility of a special issue of the Earth Science Informatics journal. EGU is an excellent conference for such an activity, attracting people from across the environmental sciences. The General Assembly meeting commonly gathers more than 15,000 scientists and engineers. This will be in addition to presentation of ConnectinGEO results at a range of other conferences, as outlined above. The first conference has been done in the EGU 2015 under a Splinter session formula and with the following aim:

Launching the European Network of Earth Observation Networks (ENEON) (public)
Splinter Meeting SPM1.29. Mon, 13 Apr, 17:30–19:00 / Room R3
Through the European Union's ConnectinGEO project, the European Network of Earth Observation Networks (ENEON) is going to be launched, including space-based, airborne and in-situ observations networks with the goal of enhancing the use of Earth Observations for assessments, forecasts, and predictions of GEOSS SBA topics and Copernicus services. Anyone working with EO data (also in-situ) and willing to participate in the network is welcomed in this session, from existing European networks and Copernicus services providers to SMEs and the EO industry sector.
Agenda:
- ConnectinGEO presentation and context
- ENEON first idea (need to find EO gaps and priorities relation to GEOSS)
- Composition and benefits
- Discussion

EGU 2015 Splinter session about ENEON

- **Collaboration with other activities**. ConnectinGEO will take care the promotion of the ConnectinGEO activities and achievements in general events such as GEOSS AIP activities. ConnectinGEO will participate in the AIP-8 activities (please find attached the proposal in the Annex1) and next ones, GEOSS Work Plan Symposia, GEO plenary meetings, GEOSS S&T Stakeholder Workshops and standards building and definition (ISO, OGC etc) and any other event deemed relevant according to project's objectives. ConnectinGEO will work with the Copernicus application groups to maintain visibility of project developments.
- **Industry communication actions**. Dissemination through EARSC, SMEs in the project and IEEE SMEs network will increase the visibility and impact of the project into the industrial domain and made them sustainable. The goal should be to define and/or extend the ConnectinGEO methodology to include consideration of industrial exploitation of the results. EARSC and IEEE communication tools (website, portal, and newsletter) will provide access to and liaison with the European EO services industry network, and will provide links to the companies through promotion of results, raising awareness of the actions etc.
- **ENEON website**. It is the key platform to explain and communicate the ENEON mission, vision and objectives to the general public, as well as to provide news, information and visibility of all ENEON members.



Some captions on ENEON website

- **ENEON Collaborative Portal**. It will provide many benefits for the ENEON, as well as the community surrounding the project. It will be a collaborative platform for the participants of the community that exists around the project's efforts, in particular, ENEON and PAB members. The main benefit is the ongoing sustainability of the community knowledge that comes from the project. This portal will allow the Earth observation networks to have a single entry point to maintain and evolve the knowledge of EV, indicators, gap analyses, etc., during and beyond the duration of the project. Another large benefit will be that this portal will allow the integration of educational modules, so that other scientists, students, etc., can learn from the work of the project and ongoing work after the project has ended. The development of this portal will be based upon well-known web-based products and associated best practices. When possible, existing portals will be analysed for reuse and customization.
- **Training in the ConnectinGEO methodology** will be an important factor in long term sustainability of project developments and it is also part of the plan.

Annexes

Annex 1. ConnectinGEO contribution for the Energy Societal Benefit Area in the GEOSS Architecture Implementation Pilot – Phase 8 (AIP-8)

ConnectinGEO

Lead by

Centre for Research on Ecology and Forestry Applications

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08193 Cerdanyola del Vallès

ConnectinGEO contribution for the Energy Societal Benefit Area in the GEOSS Architecture Implementation Pilot – Phase 8 (AIP-8)

Response Due Date: 27th February 2015

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ConnectinGEO response to the GEOSS AIP-8 CFP

1. Overview

The European Commission ConnectinGEO project funded under the Horizon 2020 framework program is a two years project (2015-2017) whose primary goal is to link existing coordinated Earth Observation networks with science and technology (S&T) communities, the industry sector and the GEOSS and Copernicus stakeholders. The aim is to facilitate a broader and more accessible knowledge base to support the needs of the GEO Societal Benefit Areas (SBAs) and their users.
ConnectinGEO has 4 major objectives:

1) Enable a European Network of Earth Observation Networks (ENEON) including space-based, airborne and in-situ observations networks.
2) Provide a methodology to convert the knowledge needs into a coherent observation and measurement compendium for ENEON strategy and development.
3) Apply the ConnectinGEO methodology to identify and assess the priority of gaps.
4) Open the results of the project and exploit them beyond the project end.

Within the phase 8 of the GEOSS Architecture Implementation Pilot a focus will be made through the development of a pilot for the Energy Societal Benefit Area to ensure viability in a real world scenario as describe below.

1.1. Real world scenario

Industrials and project developers of solar power plants (photovoltaic, solar concentrating technologies) have identified the surface solar irradiance (SSI) and its components as an crucial variable for their business development. Policy-makers need the SSI to set up energy policies at local to national levels. Such projects address:

- The solar resource prospective with solar maps integrated in GIS.
- The long-term solar resource assessment for a specific site with time series of SSI for technical sizing and yield report simulations.
- The monitoring of existing solar power plant for operation and maintenance.
- The multi-horizon forecast for energy storage, planning or participation to electricity spot market.

Different operational Earth Observation (EO) components provide estimations of the SSI:

- In-situ pyranometric sensors.

- Processing of meteorological satellites, such as HelioClim in the Copernicus Atmosphere Service, or Eumetsat-SAFs.
- Numerical weather models (NWM), such as ECMWF-IFS or ERA-INT.

Currently, all these components are used by companies and policy-makers in solar energy. However, they are used individually and not in conjunction. Emerging needs clearly show that a great benefit would be achieved by efficient means of joint exploitation.

2. Proposed Contributions

Providing an easy and open access to SSI information is therefore a key point. From the end-user point of view, information should be easy to find, easy to search, easy to access and consequently easy to use. From the data provider point of view in-situ measurements should be easy to register, easy to qualify and easy to process. To enable this virtuous circle such information should be integrated and made available by using existing and recognized open international standards. In that respect, ISO (International Organization for Standardization) and OGC (Open Geospatial Consortium) standards address the full spectrum of such virtuous circle ranging from the use of standard metadata to enable data integration, data search and discovery to the exploitation of SSI parameters using sensor Web standards.

To enable integration and access to SSI based information, an infrastructure should be deployed allowing on the one hand providers to share their sensor based resources and the other hand user to access them. As there are many data providers using many different sensor instruments there is a need for the infrastructure to tackle sensor integration and dissemination into a uniform, platform-independent and interoperable approach.

The OGC SWE (Sensor Web Enablement) architecture is particularly suited to tackle the full spectrum of SSI information dissemination. Indeed, it offers support to:

- Discover and locate sensor systems and measurements
- Discover sensor capabilities and information on the quality of the measurements
- Enable access to sensor parameters for direct or further processing

Beside the direct access to in-situ sensor information, SWE specification allows those assets to be coupled with any available SSI Earth observation resources (raster or vector data, maps). Being able to combine SSI in-situ measurement with additional EO data at the application level will provide value added information maximizing sensor based value and enabling decision-making.

The AIP-8 contribution will **extend the existing GEOSS Webservice-Energy SDI** (Spatial Data Infrastructure) to **provide the GEO Energy community with access to in-situ measurements**.

The platform that will be developed will allow to:

- **Visualize sensor locations on a map.**
- **Visualize measurements as time series plots and in tabular form.**
- **Display sensor metadata at different levels of detail.**
- **Download raw observation data for offline processing.**

In order for data providers to leverage their efforts of releasing SSI in-situ measurements, the Sensor Web infrastructure should enable a "search and discovery" mechanism of such measurements. This "search and discovery" mechanism will be provided by referencing all SSI in-situ measurement into an OGC compliant CSW (Catalog Service for the Web) catalog. This catalog should allow both human user-friendly searches through a Web based graphical user interface (GUI) as well as machine to machine distributed operations for back-office processes. This catalog is weekly harvested by the DAB (Discovery and Access Broker) and consequently its content is accessible via the GWP (Geo Web Portal).

2.1. Key application support

The description below indicates the possibilities that will be offered by the ConnectinGEO/Webservice-Energy in-situ platform:

- Name of the application: ConnectinGEO/Webservice-Energy in-situ platform.
- Sponsor: ConnectinGEO (Coordinating an Observation Network of Networks EnCompassing saTellite and IN-situ to fill the Gaps in European Observations) is funded under the European Union's Horizon 2020 framework program under the Grant Agreement number 641538.
- The SBA(s) supported by the app: Energy.
- Names and contact information of end-user(s) who will provide the requirements: ConnectinGEO project.
- Overview of App functionality:
    - Visualize sensor locations on a map.
    - Visualize measurements as time series plots and in tabular form.
    - Display sensor metadata at different levels of detail.
    - Download raw observation data for offline processing.
- Application Development Framework to be used: Webservice-Energy SDI including OGC CSW Catalog and OGC SOS 52°North Platform.
- Deployment: Browser-based.

- Discussion and list of data sources, standards based interface protocols (OGC), and gaps:

    - Gaps in data models: Design standardized data and metadata models suitable for in-situ SSI observations as profiles of OGC Sensor Web Enablement standards. Profiles for XML encodings are defined as Schematron rules. The data and metadata models will take into account spatiotemporal coverage, lineage, data quality, IPR, the existing terminology and units of measure.

    - ConnectinGEO/ Webservice-Energy Web services

        - OGC CSW
        - OGC SWE (SensorML, O&M, SOS)
        - Metadata Harvest via DAB

2.2. Supporting Technologies

N/A

2.3. Architecture and Interoperability Arrangement Development

N/A

3. Description of ConnectinGEO Team

Centre for Ecological Research and Forestry Applications (CREAF)

The Centre for Ecological Research and Forestry Applications (CREAF) is a public research center 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. CREAF has made important contributions in terrestrial ecology and towards a sustainable management of the environment and technology transfer. Only of the important lines of the center is the Geospatial Information and big data management tools such as the GIS&RS software MiraMon©. Its profile matches the tasks in the project for their experience in remote sensing, airborne and in-situ sensor data storage, manipulation and knowledge extraction. It has also deep involvement in GEO tasks and activities and in the geospatial standards specification. CREAF and the European commission co-organized the GEOSS European Project Workshop 7 in Barcelona.

Dr Joan Masó (male) (PhD in Geography, MSc in Physics, and a MSc in Electronic Engineering all in the UAB) Since 1995 he is a researcher at CREAF and GIS developer. Co-creator of the MiraMon compressed map and the MiraMon Map Reader idea in 1997; the first MiraMon technology for Internet

distribution. Teacher in a RS and GIS master in the UAB. Creator of Remote Sensing imagery visualization and download web data portals. Expert in JPEG2000 format. He is an active member of the TC of the Open Geospatial Consortium (OGC) since 2003 (editor OGC 07-057r7 WMTS standard and chair of the Iberian and Latin American Forum). Spanish representative in the ISO19115-1 and ISO 19157. He coordinated the GeoViQua FP7 project (research project about visualization of quality information in GEOSS) and participated in FP7 EGIDA (coordinate and support action on national applicability of GEOSS) and FP7 GEO-PICTURES (research project about a collaborative emergency response tool) as well as some other national and local projects related both with remote sensing and geospatial standards and applications. Earth and Space Science Informatics (ESSI) division president in the European Geosciences Union. Member (EGU) of the GEO Standards and Interoperability Forum, and ID-03 Science and Technology and EC-01 Global Ecosystems Monitoring GEO Tasks. GEO Spain users forum Chair.

Ivette Serral (female) is BSc in Environmental Sciences for the UAB and MSc in Remote Sensing and GIS for the UAB, with more than ten years of experience in GIS and RS research and European and national related projects management. At CREAF she is related to geospatial data standards projects, such as FP7 GeoViQua and FP7 EGIDA, to MiraMon GIS&RS software applications and development, and she is member of the Grumets research group.

MINES ParisTech

Ecole Nationale Supérieure des Mines de Paris (MINES ParisTech - www.mines-paristech.eu), founded in 1783, is one of the oldest French higher education institutions in engineering. The aim is for academic excellence with 286 research professors, 100 theses and 400 articles or books in key research fields published every year. The School is a leader in many areas, among which five major fields: 1/ Earth sciences and the environment, 2/ Energy and process engineering, 3/ Mechanical engineering and materials, 4/ Mathematics and systems and, 5/ Economics, management and society. With 15 research centres extending over five different fields, MINES ParisTech is the leading school in France for its volume of contractual research. Its major research themes are essentially based on problems raised by industry, including MITAL, EDF, TOTAL, RENAULT, PSA, SNECMA, GDF and SAINT-GOBAIN, as well as society as a whole. MINES ParisTech is also member of Paris Sciences et Lettres Research University (PSL - www.univ-psl.fr).

The Centre Observation, Impacts, Energie (OIE) is a joint laboratory of MINES ParisTech and ARMINES, with 16 persons studying the resources of renewable energies and the environmental impacts induced by the production and exploitation of energy. OIE is working on the assessment of the solar radiation available at ground for engineering purposes by the means of satellite imagery

since 1978 and in wind energy since 1998. It has created several databases containing solar radiation values and other geographical information parameters of interest in sun and wind energy (atmosphere optics, orography, ground albedo, land cover, air temperature and relative humidity). These databases are continuously updated with the continuous support of the European Space Agency (ESA) and EUMETSAT among others. An expertise has been gained in establishing World-Wide Web servers since 1993. These servers supply applications and databases relating to solar radiation, wind energy and industrial systems.

Mr Lionel Ménard (male) holds a Master degree (Ms. Eng.) in Information Systems Management from the University of Nice Sophia Antipolis. He has an in-depth knowledge of System Development Life- Cycle (SDLC), management of Information System and Spatial Data Infrastructure. He has been the team leader of the Energy contribution from phase 2 to 6 of the GEOSS Architecture Implementation Pilots (2006 – 2013). Since 1996, he has been involved in numerous European Commission funded projects playing key role in advocating, designing, prototyping, developing and monitoring cutting-edge information systems (EnerGEO 2009/2013 – ENDORSE 2011-2013 – MESoR 2007/2009 – SoDa 2000/2003).

Prof Thierry Ranchin (male) is the director of the Centre Observation, Impacts, Energy since 2013. He received his PhD degree in applied mathematics in 1993 and his "Habilitation à diriger les recherches" in 2005.. After a post-doctoral fellow in an aquaculture company in Tromso, Norway, he joined the Ecole des Mines de Paris in 1994. He was an invited scientist at the University of Jena, Germany in 1998. His current research interests are through the development of innovating methods: (1) sensor fusion of multisources data, (2) mapping of geophysical parameters for renewable energies, (3) offshore wind energy mapping, (4) renewable energies studies, (5) Geographical Information System and (6) mapping and study of urban areas. He has a patent about sensor fusion and more than 100 publications, communications in international symposia, or articles in journals with peer review committees. He is involved in GEOSS since 2005 as Tasks Leader in the societal benefit area ENERGY. He is the co-chair of the Energy Community of Practices since 2006. He was co-chair of the User Interface Committee of GEOSS between 2007 and 2012. Since 2012, he is Member of the Societal Benefits Implementation Board and of the Institutions and Development Implementation.

Prof Lucien Wald (male) is a Professor at the MINES ParisTech since 1991. He is specialized in geophysics (meteorology, solar radiation), remote sensing and image processing. He received several Awards for his research in information technologies and especially in data fusion in environment. He was the scientific coordinator of several EU-funded projects and the scientific responsible for ARMINES in the MACC / MACC-II projects.

52° North Initiative for Geospatial Open Source Software GmbH (52N)

The 52°North GmbH has been founded in 2006 as a German SME company limited by shares “Gesellschaft mit beschränkter Haftung – GmbH”). Shareholders with the indicated shares are University of Münster (Münster, Germany) – 26%, University of Twente (Twente, The Netherlands) – 26%, Environmental Systems Research Institute Inc. (Redlands, California, USA) – 24%, and con terra GmbH (Münster, Germany) – 24%. 52°North is a company (GmbH), but it acts as a n-opnrofit organi zation based on the shareholders agreement. Shareholders receive neither profit shares nor other payments from company funds.

52°North coordinates activities of multiple partners from research, industry, and public administration. Its mission is to foster the development of new concepts and technologies in Geoinformatics, in particular Sensor Web, Web-based Geoprocessing, Security of Geospatial Web Services, Semantics, Earth Observation, geostatistics, and Metadata. The company has a long and outstanding record in the Geo-IT domain and is significantly contributing to the development of international standards. For example, 52°North is involved in the OGC and in the advancement of the INSPIRE directive (e.g. contributing to the definition of a future INSPIRE Download Service for observation data based on the OGC SOS 2.0 standard).

A pro-active innovation strategy is a central element of 52°North’s activities. This becomes manifest in European (FP7) and national research projects as well as the company’s involvement in OGC Testbeds. This is complemented by professional services projects (consulting as well as software development) helping customers to integrate up to date technological developments into their operational infrastructures. 52°North focuses on the development of open source software in order to promote the use of the existing developments and to motivate external developers to contribute to the advancement of the 52°North software.

Software developed by 52°North is put under an OSI-approved open source license (primarily GPL version 2 or Apache Software License Version 2.0) and software projects are set up in a collaborative and open environment managed by 52°North.

52°North’s profile matches the tasks in the project with respect to the experience in development and application of standards, metadata modelling (including observation data), enabling communities with interoperable solutions for data sharing, information extraction from geospatial data, managing a collaborative research process, and developing open technology.

Dr. Simon Jirka (male) (PhD and diploma in geoinformatics) works as community leader for the Sensor Web group of the open source initiative 52°North. His

activities are focused on Sensor Web architectures and especially on sensor discovery mechanisms. Besides his contribution to several European projects such as GEOWOW and NeXOS he is also involved in the Sensor Web Enablement initiative as well as the hydrology related activities of the Open Geospatial Consortium (OGC). Through his daily work, comprising research activities as well as commercial consulting and software development projects, Simon Jirka has a broad range of experience in Sensor Web related topics and co-authored several OGC papers to increase the usability of standards for in-situ observations.

Daniel Nüst (male) (Dipl.-Geoinf – diploma in geoinformatics) works as a researcher at 52°North. He has worked in several research projects, such as GENESIS (FP7) and OSIRIS (FP6), at IfGI before joining 52°North as project manager for the FP7 project GeoViQua. In these projects he worked on a variety of topics including the Sensor Web, OGC SWE standards, data quality, observation data modelling, and real-time visualisation of sensor data. Daniel is also engaged in the Geostatistics, Sensor Web, as well as Geoprocessing communities as a software developer, is consultant in commercial projects, and pursues a PhD at the Gradschool for Geoinformatics, Münster.