DORIS_Net: enhancing the regional impact of COPERNICUS program by setting up the European Network of Regional Contact Offices

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Abstract
Despite successful technological developments, COPERNICUS, the European Earth Observation flagship program, has been showing a weak regional involvement with regards to the wide capacities and benefits it provides for the Environment and Security domains at public and private level. During the DORIS_Net project, a methodology was successfully implemented to raise regional awareness on COPERNICUS potential with the concept of a Regional Contact Offices (RCO) Network. This paper aims to describe the process of RCO's creation and certification. It also presents both benefits and challenges of management and sustainability faced by RCO in order to reach their operational goals. Finally, the paper explores the potential regional impact of RCO.
Keywords: GMES, COPERNICUS, DORIS_Net, Space Technologies, Regional Development, Regional Contact Offices.

Introduction
The Global Monitoring for Environment and Security initiative (COPERNICUS)
'Space' was explicitly identified in the Constitutional Treaty, recognizing that it represents a critical issue for the European Union (EU), for its society, its economy and its global role

in the world [Verheugen, 2005]. In 2005, the EU made the strategic choice of developing an independent European Earth Observation capacity called Global Monitoring for Environment and Security (formerly known as GMES and renamed as COPERNICUS) in order to deliver services in the environmental and security fields. COPERNICUS consists of the following three components: (I) Space Component - consists of a space observation infrastructure addressing service data needs with the missions of observing land, atmospheric and oceanographic parameters; (II) In-Situ Component - will rely on a large number of facilities, instruments and services owned and operated at national, regional and intergovernmental levels inside and outside the EU; (III) Service Component - the basis for Europe's autonomy in information provision world-wide. Since 2008, four preoperational COPERNICUS services have been launched: a land monitoring service, a marine environment monitoring service, an atmospheric monitoring service and an emergency response service. COPERNICUS is also at the heart of the EU contribution to the Global Earth Observation System of Systems (GEOSS) [European Commission, 2008, 2009]. Satellite-based services have significant potential to contribute to the development of the knowledge economy. Moreover, downstream services have better commercial and economic prospects in comparison to the upstream segment of the space sector [OECD, 2007]. Therefore, only a well-funded and strongly implemented COPERNICUS can serve the ambitious goal of Europe becoming one of the most dynamic knowledge-based societies in the world and allow Europe to be a leader in establishing the GEOSS [Aschbacher and Liebig, 2005]. To put matters into perspective, the European annual expenditure of €10 *per capita* on space investment is modest when set against the €11,175 spent each year on healthcare, the €1135 on education and €425 on defense [Jarritt et al., 2011]. The origin and sustainability of funding is a key issue for the future of the European Space Policy (ESP). The main difficulty in the space sector is that the rules of the commercial world often do not apply, and that most space projects need strong public backing. In this respect, it is crucial both to maintain a constant flow of funding (to ensure the continuity of operational services) and to keep costs under control (to avoid the political difficulties associated with cost overruns) [Venet, 2012]. Despite the ambitious goals of the ESP and the massive investments dedicated to its two flagship programs (COPERNICUS and GALILEO), satellite services' penetration of the market is very limited: demand is sluggish, there is little user pull for the development of such services [Matthieu, 2009]. Compared with the size of more traditional sectors such as chemicals, and the motor and nuclear industries, the space industry is relatively small; around 30000 employees and a consolidated turnover of €5.3 billion in 2007. It achieves nearly 40% of its turnover on the commercial markets (basically sales of telecommunications satellites and launches carried out by Arianespace), while fulfilling institutional needs constitutes the other major component of its turnover [Gaubert and Lebeau, 2009]. An unequivocal industrial policy for the space sector needs to be defined that reconciles the Union's political ambitions with the economic specificity of the space sector [Hansen and Wouters, 2012]. COPERNICUS products are being developed by partnerships of public and private sector actors where R&D know-how and expertise has been shared through collaborative projects. Industry has been investing alongside the public sector with the view to serve COPERNICUS users within Europe and to exploit COPERNICUS products and services in new markets [EARSC, 2011]. According to a PricewaterhouseCoopers study which does not fully capture all the areas of possible

benefit of COPERNICUS, the value of all the benefits from this program in 2006 was projected to be €102 billion. This is equivalent to a present value in January 2011 of €125 billion. Adding terminal values - which includes benefit stream beyond the core appraisal period of 25 years, the present value in January 2011 of all benefits equals €167 billion [PricewaterhouseCoopers, 2006]. Spacetec [2012] estimated that until 2030 Copernicus-based services will be able to create 20,000 jobs in the space sector and 63,000 jobs in the wider economy, with a potential turnover of €1.0 to €2.6 billion in the downstream sector. Nevertheless, for the full potential of COPERNICUS to be realized, some key enablers need to be addressed in the short term. Without these enablers, COPERNICUS may still develop and expand its role, but there are risks of higher costs, reduced take-up by public sector users and lower growth in the downstream sector. In this context, program financing and governance are identified as top priorities [Booz & Company, 2011; Giannopapa, 2011].

COPERNICUS and European regions
The European multilevel governance structure, the large number of actors involved (which continues to grow), the complexity and transversality of space itself and its long-term nature are the features which characterize the governance of space activities in Europe. The multitude of actors at different levels must get to know each other better in order to identify and benefit from synergies which are created by the interaction of the different levels of governance [Rieder et al., 2009]. The main objective of regional policy is to reduce economic, social and territorial discrepancies across the EU, particularly in countries or regions whose development is lagging behind [Giannopapa, 2012]. The role of European regions is crucial in the future deployment of the COPERNICUS program, especially for the downstream sector. Despite major economic, political and geographical differences between them, European regions can act together because they are relevant territories for expressing needs and for testing and developing tailored services facing specific needs and issues coming from territories. European regions will be major contributors to COPERNICUS, supporters of its implementation, and users of the program in order to implement their policies [The Graz Dialogue, 2006; Gil et al., 2012]. Local and regional authorities (LRA) can finance service development; they can potentially use, test and assess the innovative services and they are partners, clients, public-service providers to local or regional actors who are themselves potential final users [Secarat and Bruston, 2009]. The European regions, which have had the foresight to join forces, where necessary erasing borders between states in order to build infrastructures, or to maximize joint capabilities or tackle problems common to each of them, have constituted an association called the Network of European Regions Using Space Technologies (NEREUS) [Gaubert and Lebeau, 2009]. However, most regions are not yet able to profit from the benefits of satellite information and services because of difficulties with their operational implementation. The main cause is the lack of a mechanism enabling the coordinated transition of the services from the research and development phase to sustainable operational phase [EURISY, 2008]. For a full deployment of the latter, an open, continuous and free data access seems crucial. Continued networking of regions focusing on space-related technologies and services as part of their economic development and innovation efforts, will therefore be crucial to provide input and support the preparation and implementation of their smart specialization strategies and to support cooperation

for critical mass and better coherence at European level. In order to be able to reap the COPERNICUS benefits for European Regions, it is therefore crucial to ensure and promote the uptake of services by users because it is not enough to concentrate on merely funding the setting up of space systems and their infrastructures [CEON, 2012]. When looking at the European scale, it is probably fair to say that the overall awareness of COPERNICUS downstream opportunities is very low with respect to the potential benefits regions could draw from a wider participation. However, being aware of the potential of COPERNICUS, of the important role they can play and of the need for exchanging experiences, pioneering LRA intending to retrieve benefit from space technologies, including COPERNICUS, have now started to collaborate within structured networks; NEREUS being the most advanced example. Logically, the necessary next step is that LRA engage in a dialogue with service-industry and European decision-makers to maximize the benefits from these innovative tools which have significant impact on the economy, environment and the quality of life of the citizens. A prototype of such regional network was recently set up by the EU-funded DORIS_Net project [SRCTE, 2011].

DORIS_Net: the European Network of COPERNICUS Regional Contact Offices
DORIS_Net: making the regional link to COPERNICUS
Although its related services are well implemented at the international or national scale, at the regional scale COPERNICUS continues to be rather unknown and underexploited. At the regional level, stakeholders consisting of users, providers, policy makers but also citizens are often not aware about the potential benefits of the services COPERNICUS initiative can provide. European regions represent a large reservoir of potential COPERNICUS users and its related services can add value to already existing services in the various domains (i.e. land, maritime, atmosphere, emergency response and climate change), also being able to be customized to individual user needs, many of which are found at the regional level. The regional actors comprise of LRA who are in some cases users themselves but also key players in the COPERNICUS value chain responsible for the development of regional policies and regulations and for the regional implementation and enforcement of treaties, policies, laws, regulations and recommendations made at an international, European or national level. In this role, LRA are one of the main drivers for growth in the demand for regional COPERNICUS downstream services and have a great impact on meeting the objectives of the EU's socio-economic and innovative agendas (in particular *Lisbon Agenda*, *Regions for Economic Change*). The way forward is to encourage LRA to engage in a dialogue with the downstream service industry and European decision makers to maximize the benefits from innovative tools offered by COPERNICUS, which have significant impact on the economy, environment and the quality of life of the citizens. This is precisely the aim of DORIS_Net where the regional actors themselves have formed a consortium and taken the initiative to coordinate and stimulate COPERNICUS downstream services on a regional level [SRCTE, 2011].

DORIS_Net (Downstream Observatory organized by Regions active In Space - Network) is a Coordinated Action (CSA) project funded by the European Commission, under the 3rd FP7 Space Call. The project name DORIS_Net signals a fully user led approach for the establishment of a network linking European LRA, service providers and other COPERNICUS stakeholders at regional, national and European level. All partners in the

DORIS_Net project have been mandated by their regions who are all members of NEREUS and DORIS_Net is specified, designed and implemented by the Regions themselves. Six *Core Partners* (Bremen - Germany; Midi-Pyrenees/Aquitaine - France; Azores - Portugal; East Midlands - UK; Lombardy - Italy) and six *Fast Track Partners* (Basilicata - Italy; French Guyana and Bretagne - France, Castilla y Leon and Madrid - Spain; Baden-Wuerttemberg - Germany) make up the DORIS_Net consortium, which included also CHT (Capital High Tech), a consulting company specialized in the management of innovations with high technological contents based in France. In addition, DORIS_Net should expand to *Outreach Regions* which have been tutored in implementing the DORIS_Net methodology. This concept enabled the Network to expand allowing more and more European regions to be informed on the COPERNICUS service portfolio in a systematic and coordinated way. Furthermore, full support from NEREUS as well as the involvement of the major European networks AER (Assembly of European Regions), EARSC (European Association of Remote Sensing Companies), EURISY and the CoR (Committee of Regions) in the Advisory Board and dissemination activities have strengthened the impact of DORIS_ Net on the COPERNICUS downstream service sector. DORIS_Net dissemination and communication activities have been performed in conjunction with GRAAL - "GMES for Regions: Awareness and Access Link" (a CSA project also funded by the European Commission's 3rd FP7 Space Call), under the common flag "GMES4Regions".

Concept and functions of COPERNICUS Regional Contact Offices (RCO)

A COPERNICUS Regional Contact Office (RCO) acts as a focal point in its region, at the interface of industry (services providers), R&D actors, regional users and policy-makers. Hosted by one or more an independent entities and endorsed by its regional authority, it serves as regional centre of COPERNICUS expertise. The RCO facilitates an access by creating a public interface between the region and the stakeholders located in it, promoting information available under the COPERNICUS banner and making in this way the regional link. The RCO has the following main functions: (I) identifying potential users of COPERNICUS services; (II) raising awareness of the potential offered by COPERNICUS and Earth Observation services; (III) providing a service for regional actors to access data and information on COPERNICUS at global, national and European levels; (IV) knowing the COPERNICUS portfolio and observe new services, particularly at regional scale; (V) assisting users in the expression of their needs or in the search of services answering their needs; (VI) favoring dialogue between users and service providers; (VII) promoting new services developed by regional actors; (VIII) developing opportunities to produce new services in line with identified needs; (IX) supporting training in Earth Observation field [SRCTE, 2013a]. To encourage inter-regional cooperation between member regions, and to establish permanent communication, COPERNICUS RCO were connected by a web platform [DORIS_Net, 2013] through which they shared information (demand and capabilities, opportunities, events, training) and exchanged good practices. This platform includes a shared regional inventory to store and search information collected by RCO.

Certification Process for setting up a Regional Contact Office

In order to ensure that different RCO coming from various European regions can work together in a coordinated approach, DORIS_Net implemented a certification process,

through which regions interested in setting up a RCO and joining the network, can obtain the COPERNICUS RCO label. RCO can assume many forms and can organize themselves in different ways, as long as they respect the requirements, which rule the granting of the COPERNICUS RCO label. This certification process is organized in six steps [SRCTE, 2013b]:

I) Selection of the host organization: The first step is to select the host organization(s) that will become the future COPERNICUS RCO. It can be the Regional Authority (RA) itself or an organization operating in the region. If the host organization is not the RA, it should be an independent structure (no commercial company) to avoid confidentiality, legal and commercial conflicts and should receive an endorsement signed by the RA as proof of authorization to represent the Region within the activities related to COPERNICUS. The RCO can also be hosted by more than one organization in the same region, whenever it is assessed as a cost-effective solution by the RA. In this case the organizations have to agree on sharing RCO activities and duties, and to assure a well-identified interface towards the RCO network.

II) Self-evaluation - can an organization become a RCO? If the answer is positive to the following questions, the organization is likely to be able to become a RCO after following the standard evaluation process:
- Is /are the organization(s) an open and independent structure?
- Is / are the organization(s) endorsed by its RA?
- Does / do the organization(s) have expertise in COPERNICUS or Earth Observation?
- Does / do the organization(s) have excellent knowledge of the regional capacities with respect to COPERNICUS (services providers, users, research actors)?
- Does / do the organization(s) have the necessary means available regarding office space, infrastructure and funding?

III) Contact with the RCO network: after the self-evaluation step, the organization(s) can send its/ their expression of interest for applying for the RCO label to the DORIS_Net Network Coordination Board. A labeling committee will be set up to answer questions, verify eligibility and help with the process.

IV) Preparation of the application: after the preliminary approval, the organization will have to prepare its application. This will consist in gathering all the documentation needed to show how the candidate RCO complies with the requirements that must be met in order to be awarded the RCO label and which are grouped under seven headings: (a) General mission statement; (b) Host institution; (c) Staff and expertise; (d) Infrastructure; (e) Funding; (f) Regional activities and (g) Connection to the DORIS_Net platform.

V) Presentation to the labeling committee: once ready, the organization will present its application to the labeling committee. If the outcome is negative, candidate RCO should take corrective actions.

VI) Signature of the Memorandum of Understanding (MoU): the organization will be invited to sign a MoU that describes the spirit of cooperation among the regional partners entering the network. RCO granted with the RCO label commit to respect their obligations (Tab. 1) within this cooperation spirit (Tab. 2). DORIS_Net will then grant the organization with the official RCO label.

Table 1 - Commitments of Regional Contact Offices.

Item	Commitment
Financial	The RCO and its activities should be funded entirely by its own resources. RCO can be hosted by more than one organization in the same region, whenever it's cost-effective, and it presents a unique interface.
Staff and expertise	The RCO should put in place relevant staff to run the RCO (at least one person) with expertise in GMES issues and excellent knowledge of regional capacities (supply and demand).
Conducting regional activities on a regular basis in its region	The RCO should perform regional activities in its region (business breakfasts, users' forum, raising awareness events, etc.). The RCO should also compile and build up regional inventories (aiming at characterizing regional services and users' needs), whose content should be entered in the network inventory.
Networking and exchange of good practices	The RCO should share return on experience and good practices in running the RCO in order to enable an added value for all the members involved in the network.
Promotion and dissemination	The RCO should use the DORIS_Net and GMES4Regions brands in the dissemination activities.
RCO page creation and maintenance	The RCO will be responsible for creating and maintaining its RCO webpage and contents. The RCO adheres to the standards developed by DORIS_Net (IT, web interfaces, etc.) to ensure compatibility.
Management, IT and technical interfaces	The RCO should nominate at least one contact person, able to act as an interface to DORIS_Net in terms of IT, regional activities and management tasks.

Table 2 - Commitments of the Network of Regional Contact Offices.

Item	Commitment
Access to a dynamic network	The Network will share experience and knowledge accumulated by RCO, which is ensured via dedicated tools and networking activities.
Better visibility and promotion at the European level	The Network will help the new RCO - and thus its Region - to increase its visibility at the European level as part of the wider GMES4Regions initiative supported by the European Commission.
Access to the tools and contents developed by the network	The Network offers access in particular to a detailed shared inventory of existing providers and services on the one hand, and of users and their needs on the other hand, that is continuously fed by the members.
Cooperation opportunities	The Network ensures networking of its members and communicates on any new collaboration opportunities that could be of potential interest for the regional actors.
Provision of an easy-to-set up profile webpage	The Network offers a generic RCO web page 'starter kit', ready to be filled in with content, to present RCO mission, services and specificities. Support can be provided in setting this page up.

Current Regional Contact Offices and first operational results

Since July 2011, 7 RCO have been established in the following regions: Lombardy (Italy) hosted by CNR-IREA; Aquitaine - Midi Pyrénées (France) hosted by CETE Sud-Ouest; Azores (Portugal) hosted by SRCTE; Bremen (Germany) hosted by CEON; East Midlands

(UK) hosted by G-STEP; Basilicata (Italy) hosted by TeRN; and Brittany (France) hosted by Pôle Mer Bretagne [G-STEP, 2013]. Different geographical levels of RCO governance have been identified. Table 3 characterizes the governance nature of each existing RCO and summarizes its regional level events.

Table 3 - Characterization and first operational results of current RCO.

Regional Contact Office (Country)	Host Organization (Nature)	Local or Regional Authority	Regional events organized for fostering awareness on COPERNICUS during 2011 and 2012
Aquitaine / Midi-Pyrénées (France)	CETE Sud-Ouest (Public Department)	Aquitaine and Midi-Pyrénées Regional Councils	4 conferences, 6 workshops, 2 seminars, 2 training events, 1 showroom, 1 survey and several face-to-face meetings with SME and public bodies
Azores (Portugal)	SRCTE (Public Department)	Azores Regional Government	4 workshops; 1 press conference; several face-to–face meetings with SME and public bodies
Bremen (Germany)	CEON (Public-Private Consortium)	Free Hanseatic City of Bremen	5 conferences; 1 exhibition; 4 workshops
East Midlands (UK)	G-STEP (Public-Private Consortium)	Local Authorities in the East Midlands (no regional authorities in UK): City Councils of Derbyshire, Nottinghamshire, Lincolnshire, Leicestershire, Rutland and Northamptonshire	5 conferences; 5 workshops; several business breakfasts and face-to-face meetings with SME and public bodies
Basilicata (Italy)	TeRN (Public-Private Consortium)	Regional Cabinet of Basilicata	1 conference and several face-to-face meetings with SME and public bodies
Brittany (France)	Pôle Mer Bretagne (Public-Private Consortium)	Brittany Regional Council	1 conference and several face-to-face meetings with SME and public bodies
Lombardy (Italy)	CNR-IREA (R&D Centre)	Regional Cabinet of Lombardy	1 conference, 1 seminar and several face-to-face meetings with SME and public bodies

Despite differences on governance framework, it should be noticed that all LRA have activities and areas of interest for which COPERNICUS can be helpful. There are commonalities on areas of interest, such as spatial planning (at land, coastal and marine level), environmental management, agriculture, forestry, tourism, transportation, civil

protection and water resources. More than 50 specific needs in potential COPERNICUS downstream services were identified, collected and catalogued (short description; GMES4Regions taxonomy; EARSC taxonomy; EARSC user view; complete description; type of user who expressed this need; type of data to be exploited; geographical coverage; spatial resolution; time resolution) by RCO in DORIS_Net core regions. In order to help regional actors to express their needs, this work was accomplished through outreach activities focused on COPERNICUS benefits such as face-to-face meetings, surveys and technical events organization. Needs were collected from LRA but also from local and national actors. Table 4 shows the thematic distribution of needs for COPERNICUS downstream services expressed by DORIS_Net core regions according to GMES4Regions taxonomy [CETE, 2013a]. The domain for which the greatest number of applications needs was expressed was "sustainable development and nature protection", followed by "management of urban areas", "regional and local planning" and "agriculture, forestry and fisheries". Fewer requests were associated to "transport and tourism" and "health" thematic domains. Emergency-related applications needs are also relevant (not only regional but also national actors expressed these needs). "Management of urban areas" applications were the most common needs expressed by all regions. In terms of geographical coverage, all regions require a local coverage of COPERNICUS downstream services. It is the major request in most regions, except in Lombardy (Italy), where regional coverage is preferred. Regarding spatial resolution, high spatial resolution is required in most of the expressed needs (65%). Medium and very high spatial resolutions are also frequently required. Low resolution outputs do not interest interviewed people [CNR-IREA, 2013].

Table 4 - Thematic distribution of needs of COPERNICUS downstream services expressed by DORIS_Net core regions according to GMES4Regions taxonomy.

GMES4Regions taxonomy Category	Needs of COPERNICUS downstream services expressed by DORIS_Net core regions (%)
R1 – Management of urban areas	16.07
R2 – Sustainable development and nature protection	35.71
R3 – Regional and local planning	5.36
R4 – Agriculture. forestry and fisheries	14.29
R5 – Health	5.36
R6 – Emergencies	14.29
R7 – Infrastructure. Transport and Mobility	5.36
R8 –Tourism	3.57

RCO and COPERNICUS governance at European and National levels

The European Commission is the administrative and political body responsible for the COPERNICUS program. Within DG Enterprise, the COPERNICUS Bureau acts with the European Commission on the coordination of this wide flagship program. On the technical side, ESA is responsible for the implementation of data and infrastructure. In parallel, five core services are being developed in different issued domains: land, marine, atmosphere, emergency, security and climate change. In order to make the link with the EU members, a

COPERNICUS committee of delegates was created, composed of national COPERNICUS coordinators. COPERNICUS User Forums are also organized in the Member States. No regional entity is part of the COPERNICUS governance. More generally, no political support from the regions is expressed in COPERNICUS policies. Nevertheless, some regional entities are strongly involved in the development of COPERNICUS services. RCO have been acting in regions in order to raise regional actors' awareness on the benefits they can take from COPERNICUS. This individual regional structure (RCO) and this inter-regional network (European Platform of RCO) are therefore needed to identify, characterize and provide feedback on regional needs to the national and European levels of the current COPERNICUS governance. In order to reach its mission at political, communication, R&D and industry support domain levels, a strong and strategic coordination of the European Network of RCO is a key factor to ensure dynamic and concerted actions in regions, among regions, and at national and European levels.

Regarding the relationship with the European level of COPERNICUS governance, the RCO could assist the COPERNICUS Bureau in its actions towards users. RCO could provide the COPERNICUS Bureau annual reports on events organized, needs collected, feedback and especially needs for new products. This report should be coordinated by the European Network of RCO's coordinator. Regional activities could also be reported to the COPERNICUS Bureau. RCO could also provide articles and communications on regional uses to the COPERNICUS Bureau and to ESA. In parallel, RCO should also work closely with COPERNICUS providers of data in order to be informed of available products and their access. To improve liability of COPERNICUS products, a national referent for each core service could work in close relationship with the RCO so as to address RCO users' questions. This was experienced in Midi-Pyrénées for the "Land domain" issues and was very fruitful. This will improve RCO regional actions and, in parallel, data and service providers can collect feedbacks on their data access. Therefore, the integration of this coordination network of RCO into the European level of COPERNICUS governance can bring important political, operational and economic benefits for this EU flagship program.

The relationship of every RCO with the respective national level of COPERNICUS governance should benefit from an open collaboration and cooperation among regional and national coordinator. The RCO should also work closely with the COPERNICUS User Forum at the national level. Even if user forums are opened to regional actors, in most of the members states none of them are present in such forums as they are not fully aware of COPERNICUS benefits. The main users present in these forums are generally research experts. The national coordinator is in charge of collecting national needs but do not generally get regional needs. The consequences are double: regional users do not know COPERNICUS products and COPERNICUS program does not identify nor characterize regional needs in order to improve and adapt its services. Therefore, national contributions of each RCO should include: (I) participation to the program elaboration so as to attract more end-users; (II) dissemination of the announcement of the event in its regional network; (III) direct involvement in the organization of such event. More widely, representatives of RCO should be integrated in the User Forum Board. This request was expressed by the Finnish User Forum Manager during a DORIS_Net event. Advisory role can also be performed by RCO on feedbacks that National Committees have to provide to the COPERNICUS Bureau [CETE, 2013b].

Management and sustainability of RCO

In order to present the activities to be performed in both "launching phase" and "running phase", and also to assess the efforts and resources needed to carry out these activities, a study was prepared with the contribution of three operational RCO with different governance typologies who shared their return of experience in the setting up and running a RCO: Lombardy (CNR-IREA; Italy), East-Midlands (G-STEP; UK) and Aquitaine/Midi-Pyrénées (CETE; France). Beyond the distinction of the two development phases (launching/running), it seemed to be useful to work on the definition of these different development scenarios, each region having its own specificity (in terms of size; number of actors; number of areas of interest; geographical, social and economic contexts; priorities and ambitions; etc.). Depending on its regional context, a Region may consider one of the following scenarios labeled as "high" and "low" (Tab. 5). This study has allowed calculating two different templates of operating budget for launching and running a RCO in both scenarios. The calculation of the operating budget was done over 3 years (considering that the first year corresponds to the launching phase). Table 6 provides a summary of the cost estimations as calculated during the study [CETE, 2013b].

Table 5 - General description of "high" and "low" scenarios regarding RCO management.

High scenario	Low scenario
• Large region • and/or the number of regional actors is important • and/or the team has to be built from scratch	• Small region • and/or the number of regional actors is low • and/or the RCO can lean on a piggy back organization • and/or organization of very few events and work on a face to face meeting basis

Table 6 - Costs estimation for RCO development's "high" and "low" scenarios.

		Development Scenarios	
		High scenario	**Low scenario**
Phases	Launching Phase (Year 1)	72450 €	38950 €
	Running Phase (Year 2)	59900 €	32425 €
	Running Phase (Year 3)	59900 €	32425 €
	Total	192250 €	103800 €

A "RCO development plan" template was designed to support RCO. Although it is likely that every RCO have (or will have) different development plans to suit their own particular needs and availability of funding streams, they all have to search for funding at three different geographic levels in order to reach the financial sustainability needed to launch and run their activity: European (network-based RCO funding), National and Regional (individual RCO funding). The different funding streams and programs that could be mobilized at the European level by the RCO network have been identified: FP7 Cooperation (Space and Environment themes) – to be replaced by Horizon 2020 program, Competitiveness and Innovation Framework Program (CIP), and INTERREG IV-C. At national/regional levels, current operational RCO have engaged discussions with their regional authorities, and on a case by case basis with national/institutional bodies, for sustaining their RCO and therefore the network for the period 2013-2016. In general, regions might have specific funds that could be raised and used for RCO activities, on the following topics: (I) organization

and animation of innovation actors; (II) supporting specific sectors; (III) supporting the competitiveness of SME; (IV) supporting technology transfer. Some European Regions are currently undertaking the conception and development of its Regional Research and Innovation Strategies for Smart Specialization (RIS3), as recommended by the European Commission in the Communication "Regional Policy contributing to smart growth in Europe 2020". Therefore, each RCO should strongly participate and be involved in this regional procedure, in order to ensure that space technologies and COPERNICUS applications' clusters are assumed as a major strategic asset for the economic development of its region [SRCTE, 2013b].

Conclusions

COPERNICUS is the European Earth Observation program for the delivery of products and services to manage and protect the environment and natural resources, and ensure civil security. Despite successful technological developments, COPERNICUS has been showing a weak regional involvement with regards to the wide capacities and benefits it can provide for the Environment and Security domains at Public and private level (mostly regarding SME's involvement). During the DORIS_Net project, a methodology was successfully experienced to raise regional awareness on COPERNICUS potential with the concept of a Regional Contact Offices Network. To encourage inter-regional cooperation between member regions, and to establish permanent communication, COPERNICUS RCO were connected by a platform through which they shared information on demand and capabilities, opportunities, events in progress and exchange good practices. Every RCO is hosted by an independent entity (or more than one when it is cost-effective) and mandated by its regional authority, serving as regional centre of COPERNICUS expertise. RCO acts as a focal point in its region, at the interface of industry (COPERNICUS services providers), R&D actors, regional users and policy makers. RCO's success is based on person-to-person relationships and deep knowledge of the territory [SRCTE, 2013b]. Most relevant benefits on setting up RCO have been identified by the network members and stakeholders during DORIS_Net project, as shown in Table 7 [SRCTE, 2013a]. Despite being a regional entity, both European and national governance elements and levels can take benefit from RCO's actions in order to make the link between COPERNICUS and its region. At the European level, the RCO network provides more visibility and reliability to COPERNICUS products, by improving and fostering the use of satellite applications, by favoring environmental and economic regional development and by bringing needs and feedback on COPERNICUS products, which is mandatory to the success of this flagship program. At the national level, RCO strongly contribute to needs collection that are very difficult to get at the national level. RCO also involve regional actors in COPERNICUS User Forums. The interest and success of RCOs' actions has been recognized by many relevant stakeholders (LRA representatives, national advisors, GMES Bureau, ESA, DG REGIO, and the Committee of the Regions). The best indicator of DORIS_Net success is that RCO are in preparation in another 15 European regions (Baden-Wuerttemberg in Germany; Castilla y León and Madrid in Spain; Chania in Greece; Cork in Ireland; Észak-Alföldi/Debrecen in Hungary; French Guyana and Provence-Alpes-Côte d'Azur in France; Helsinki in Finland; Lazio and Veneto in Italy; Mazovia in Poland; Sofia in Bulgaria; Tartu in Estonia; Ventspils/Kurzeme in Latvia). Even if the network took roots in NEREUS, it is not restricted to its current members and is welcoming new regions. The transfer of the RCO model from one region to another has been successfully demonstrated with some DORIS_Net partners, being able to be launched

and run in every European region independently of its dimension, governance framework, geographic context and socio-economic features. The RCO model can not only be exported to other regions but also to other sectors, such as the GNSS sector for instance. Nevertheless, the current sustainability of the existing RCO network is threatened by the lack of political support and financial resources. RCO still need to make significant efforts to secure funding at European, national and regional level to ensure a sustainable continuation of their activities. DORIS_Net experience showed that it would be easier to secure funding from the regional authorities if there were political signals coming from the European level [CNR-IREA, 2013].

Table 7 – Benefits of setting up RCO for European regions

Benefits	Rationale
Improving coordination among actors	As an independent and mandated entity, the RCO will be recognized in the region as a neutral and trustworthy contact point to promote and support COPERNICUS capabilities. Acting as an interface and facilitator between universities, research centers, enterprises and regional authorities, it will improve the coordination of these various stakeholders. RCO can be hosted by more than one organization in the same region, whenever it is assessed as a cost-effective solution.
Improving regional users' knowledge	Being the regional centre of expertise, the RCO will raise awareness about the potentialities offered by COPERNICUS tools towards the users in the region. Besides, by developing and delivering tailored COPERNICUS training workshops and programs, the RCO will increase the level of knowledge of users and thus facilitate the adoption of COPERNICUS services which will in turn have positive impacts on the economy and the environment.
Answering regional users' needs	Potential regional users will benefit from the facilitated identification of services that can answer their specific needs.
Boosting regional competitiveness	By favoring dialogue between users and providers, the RCO will create favorable conditions for local enterprises to develop COPERNICUS services or to behave as distributors, which will significantly increase regional competitiveness. Besides, the network of RCO will create focal points for the regional providers that can be used as "entry points" to enter other regional markets. Last but not least, the regional stakeholders and SME will be able to gain a direct access to the information on COPERNICUS activities in other regions which can potentially boost their competitiveness.
Fostering collaboration and stimulating innovation	The RCO will facilitate close cooperation between local research actors and services developers which will have a positive impact on the exploitation of research work, the rate of innovation and growth of the COPERNICUS services industry within the region. The RCO will also improve opportunities for service providers to build up new partnerships for the development of innovative products on an inter-regional level.
Increasing the visibility of every region at the European level	Participating regions are represented by a common voice through the RCO network towards the COPERNICUS decision makers at the European level.
Accessing expertise at a European level	As all RCO will share information, exchange experiences and best practices, there is a constant gain of knowledge and capabilities for all people involved (a "win- win" situation).
Improving the quality of life of citizens	By raising the level of awareness at the regional level, the RCO will significantly contribute to the growth of the sector, which will ultimately benefit local citizens due the fact that COPERNICUS services are typically "public goods".

Acknowledgements

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