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GISC
GMES in-situu coordination

PROJECT FINAL REPORT

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Name of the scientific representative of the project's co-ordinator, Title and Organisation:

Tony Blagoev, Project Officer GMES in-situ, European Environment Agency

Tel: +45 3336 7214

Fax: +45 3336 7199

E-mail: Stoyan.Blagoev@eea.europa.eu

Project website address: http://gisc.ew.eea.europa.eu/

4.1 Final publishable summary report

Executive summary

The GISC action was focused on bridging the gap between the research-led status and targeted operational GMES services (now Copernicus). The project activities stimulated participation by a wide range of organizations and networks both on European and national levels. The work focused on developing innovatory approaches to the coordination and governance of the in-situ data access, building on existing mechanisms, networks, stakeholders and national assets.

The GISC target to link data providers and GMES/Copernicus service providers was successfully completed through the main GISC outputs (in-situ data requirements, stakeholders list, initial framework for access to in-situ data and supporting documents). Practical aspects have been realised in five project quick wins (QW) to show in practice the in-situ coordinating role of EEA in signing agreements (EUMETNET and EuroGeographics), access to NRT AQ data collected and organised by EEA, re-use of the in-situ data provided in-kind by the EEA countries for the Gio Land service production, and support to EuroArgo operation in defining the project need of resources and support to identify funding possibilities.

The GISC project did not create any new centralised structure for processing or distributing in-situ data rather it based and proposed the future activities on the capacities of the existing information systems as well as instruments such as legislation and data flows to achieve the goals of sustainability and interoperability. In particular, the project engaged with other networks, national structures, GMES/Copernicus operators and FP7/GIO Regulation project consortia in order to develop shared understandings of the key required in-situ data flows and to produce the project deliverables.

Summary description of project context and objectives

Objectives

The goal of the GISC action was to stimulate open access to all necessary in-situ data for operational GMES/Copernicus core service provision by resolving the issues which are barriers for cost effective and sustainable data provision. Data for operational services are targeted to be available in terms of required quantity, quality, coverage, timeliness, accessibility, and intellectual property rights for all ground-based, air-borne, and ship/buoy-based measurements.

The high-level objective of GISC project was to act between data providers or networks of data providers to develop an adequate framework for access to GMES/Copernicus in-situ data. The outcome of the project is the preparatory work undertaken to develop and propose an initial framework for in-situ data access for four GMES/Copernicus services (Land, Marine, Atmosphere and Emergency management) following the in-situ data needs of the corresponding FP7 research projects and GIO Regulation (Geoland-2, MyOcean2, MACC, SAFER, and Gio Land).

The main objectives were:

1. Exploring and determining methods to enable networks to provide the required in-situ data for GMES/Copernicus core services.

2. Looking for ways to consolidate and prioritise the needs for in-situ data identified for GMES/Copernicus core services in consultation with stakeholders.

3. Exploring approaches to the integration of in-situ assets and networks into long-term sustainable frameworks for GMES/Copernicus services, including providing proofs of concept of operational in-situ architecture by devising solutions for a number of data sets as case studies (quick-wins) in cooperation with pre-operational FP7 projects, GIO Regulation funded projects, EC bodies, and institutions responsible for in-situ data provision.

Project context

The GISC project was fully successful in delivering all the products as defined in the DoW. The EEA role in coordination of the access to in-situ data is clearly recognised and supported by the Eionet countries, the GMES/Copernicus services, the European research infrastructures, organisations and networks providing in-situ data to the services. The GISC Website has provided operational services on GISC products, meetings and news.

The ultimate product was an initial framework for access to in-situ data based on the in-situ needs inventory, the stakeholders list and the supporting materials. Other key deliverables defined in the DoW (development of partnership, inventory of recommended solutions, review process and changes in the approaches based on analyses of implementation of the QWs) have been building stones of the final proposal for operational access to in-situ data.

Interactions with the GMES/Copernicus services, stakeholders, networks and countries allowed to finalise the work on QWs, enlarge cooperation, and finalise all the other GISC products and activities. The MFF did not develop enough to influence on the constraints in developing sustainable operational framework as its implementation. The existing research infrastructures and projects (like EuroArgo, FerryBoxes, IAGOS) were continued to lack enough operational funding as well as the future of the operational services was not fully clarified (expected to be covered by a new Copernicus Regulation).

GISC has enlarged the involvement of the Eionet network through GMES NFP Working Group, EuroGeographics (in support to the EMS to get access to national geospatial data), EUMETNET (assist in access to meteorological data), EuroGoos (access to marine data).

GISC has been in active support to the GMES/Copernicus unit for organizing and participating in the GMES/Copernicus UF meetings. Information on project development was also provided to the Copernicus unit as well as regular exchange of draft outputs to align the content. The possible scenarios for the future implementation of the initial framework were elaborated, presented and discussed with the Copernicus unit for decision.

GISC products were available from the GISC Web site: (http://gisc.ew.eea.europa.eu/gisc-project/deliverables).

GISC organized in April 2013 a large event called ‘Monitoring Matters’ meeting together Commission’s representatives, EEA, in-situ stakeholders, GMES/Copernicus services, networks and other organisations participating in the process to discuss and agree on the status and the way forward. Among the conclusions of the workshop, it was clearly stated by the participants that

‘the in-situ data landscape is hugely diverse and needs coordination. The diverse nature of in-situ (various data providers, different standards, scales, quality, coverage, decentralisation/centralisation, legal constraints and data policies) is a factor that requires management and coordination. It is not an option to do nothing; the in-situ component cannot be left on its own. It needs European engagement. The participants in the workshop recognised further the added value of the EEA having a role in in-situ coordination. In-situ coordination for Copernicus is needed to work alongside existing coordination mechanisms. Copernicus in-situ data coordination has an important cross-cutting facilitation role between the Copernicus components and the data provider networks. It improves the re-use of capacities and processes which already exist and can improve data access and the technical solutions behind it. It can also ensure adaptable in-situ interfaces not directly integrated into the services production environment, but made available as reusable elements.

Description of the main S&T results/foregrounds

The description of the main results is following the task order of the DoW – four work packages (WP).

The GMES has been renamed in December 2012 to Copernicus but still remains the European initiative for the establishment of a European capacity for Earth Observation. It aims at monitoring and forecasting the state of the environment on land, at sea and in the atmosphere. Moreover it supports emergency response activities in and outside Europe. To date, Copernicus builds on the research activities carried out under several framework programmes of the European Community and the Copernicus Space Component Programme of ESA (MEMO/12/966 of the European Commission on 11 December 2012).

The Copernicus programme comprises the following components:

- The service component ensuring access to information for the areas:
- Atmosphere monitoring;
- Climate change monitoring in support of adaptation and mitigation policies;
- Emergency management;
- Land monitoring;
- Marine environment monitoring;
- Security.

- The space component ensuring sustainable space borne observations for the services;

- The in-situ component ensuring observations through airborne, seaborne and ground-based installations for the services.

Whereas the space component of Copernicus is managed and developed by the European Space Agency (ESA), the Copernicus in-situ component is based on an observation infrastructure owned and operated by a large number of national and European stakeholders. In some cases these capacities are coordinated within the framework of European and international networks. The GISC project based its work on the existing structures for processing and distributing in-situ data. It acted between data providers and services to organise proper access to the in-situ data. The focus is on the essential data targeting to stimulate an open access in a cost effective and sustainable way. GMES in-situ data access coordination is entrusted to the EEA in close coordination with the European

Commission. The scope of the GISC project is limited to embracing in-situ data for the four services: Land, Marine, Atmosphere monitoring and Emergency management.

Work package 1

1.1 Contribute to the development of GMES governance arrangements or handling in-situ data through discussion with the Commission, Member Countries and relevant networks and stakeholders

One of the goals of the GISC project was to engage stakeholders and networks of stakeholders in cooperation, in order to ensure consultation process with relevant bodies and organisations, as well as to explore and determine methods to enable them to provide access to the required in-situ data for GMES/Copernicus services. GISC project based its work on wider geographical coverage than the EU27 involving all EEA 39 member and cooperating countries where appropriate through the Eionet network in providing environmental data to EEA. EEA acts as stakeholder of and provides full free and open operational access to the following data sets used by Copernicus services:

Natura 2000 data – land, emergency service
ECRINS database – land service
EUNIS database – land service
Airbase database – atmosphere service
NRT AQ Airbase database – atmosphere service
CORINE land cover data – land, emergency service

The EEA data policy (finalised by GISC project) provides full, free and open access to the data for non-commercial usage and it was agreed with the countries to provide this data through SEIS (Shared Environmental Information System). The EEA data policy model was used by GISC in the development of governance model as a target for an operational framework. INSPIRE, which has the same data access concept as SEIS, is considered a future tool for collection of Web access information for in-situ data. However, the full implementation of the directive is long way ahead. Already some information for data access, although minor part, could be obtained through INSPIRE portals developed by the countries, or through Web services described in the INSPIRE country reporting. Being a good source of access information to data, the implementation as of today does not allow to use INSPIRE for operational access. Within GISC full access information was collected and checked based on INSPIRE information and additional sources from the countries' questionnaires and access to the Web servers (geographical coverage EU27 + Norway and Switzerland) for the transport data sets (roads) and Hydrology data sets (rivers). The developed methodology shall be used in the follow up activities in cataloguing metadata for Web access to in-situ data needed by the Copernicus services.

GISC has produced on 6-th month basis "Report on Progress in negotiation and development of partnership".

The stakeholders concerned were international, European, regional (public or private) and national organisations that collect, hold, coordinate and provide the in-situ data needed for the GMES/Copernicus services to deliver their products.

The elements of developing partnership process were:

- Discussions with GMES/Copernicus precursor service projects, the research projects (MACC II and MyOcean2), GIO Emergency management and Land services, and the European Space Agency. The objective was to evaluate the GISC outputs and agree on roles and responsibilities for the operational phase of the GMES/Copernicus programme;

- Feedback and analyses of the information following the country visits to 17 of the EEA 39 countries (15 EU and two non-EU countries) (Norway, France, United Kingdom, Italy Czech Republic, Finland, Denmark, Portugal, Austria, Germany, the Netherlands, Spain, Poland, Luxembourg, Sweden, Switzerland and Belgium). The aim was to clarify the availability of in-situ data, and the role of the countries in the GMES/Copernicus programme.

- Dialogue with and commitments from different European networks and coordinating bodies and their members, by

  o signing partnership agreements with EuroGeoSurvey, EuroGeogrpahics and EuroGOOS;
  o coordinating the work of the Eionet NFPs GMES/Copernicus working group.

1.2 Facilitate the organisation of communities of practice involving stakeholders and develop an improved understanding of and engagement with their different categories, including a comprehensive catalogue of stakeholders and their interests

A continuing dialogue was established to assist project development and to get the needed feedback from the stakeholders and the services.

Other key element of this task was to prepare and organize meetings, and pursue follow-up action. Recommendations or solutions were brought to relevant ownership boards, government authorities, etc. and the corresponding agreements registered and communicated. Agreement with EUMETNET was not achieved. Research infrastructures like ICOS, IAGOS and EuroArgo were identified as potential for operational needs. Other organisations like ESA (space in-situ needs) and NIVA (operating FerryBoxes and quality assurance of marine data for the in-situ TAC) need support. We must note once again that sustainable future operation of the GMES in-situ research infrastructures depends on the proper finance. The countries are providing around 50% of the necessary funds for infrastructure and operation but more are needed to have full coverage and technical operation.

GISC supported the organisation of the meetings of the Copernicus User Forum and the Eionet NFP WG on GMES/Copernicus. The support ranged from preparation of documents to participation. The role of the Eionet and the other existing networks will need to be further developed in order to find the right coordinating roles to build up sustainable operational GMES in-situ governance structure.
The experience up to now shows that the existing networks are not yet prepared to play a coordination role in their theme for the GMES/Copernicus in-situ component neither can they play the role of a theme stakeholder for the GMES/Copernicus in-situ.

1.3 Maintain an on-line forum

The GISC on-line Web site with library, directory, discussion forum, news, meetings, deliverables, etc was maintained (http://gisc.ew.eea.europa.eu). GISC newsletter was issued regularly (http://gisc.ew.eea.europa.eu/news/newsletters).

1.4 Feedback to Commission and GMES Bureau

All deliverables were communicated and discussed with the GMES/Copernicus unit in detail. (http://gisc.ew.eea.europa.eu/gisc-project/deliverables).

Work package 2

2.1. Comprehensively catalogue the in-situ data needs of GMES core services

This is one of the major GISC deliverables which defines the GMES/Copernicus services' needs of the in-situ data to provide the service. It is result of a consultation process with stakeholders from the GMES Core Services, EEA's own summaries and knowledge of in-situ requirements, ETCs, and different FP6/ FP7 related project reports. This inventory helps to identify potential in-situ data providers and stakeholders who could contribute to a long term in-situ data provision and with whom a dialogue is needed. Hence, it was also the input to update and revise the initial stakeholder list developed and to produce the revised stakeholders list (deliverable 2.5). Furthermore, GMES/Copernicus service providers may benefit by identifying key players for the provision of in-situ data and analyse mutual needs of in-situ data to harmonise the access. This key deliverable also enables analyses and prioritisation of the in-situ needs in the light of their importance, criticality and contribution to GMES services. Linked with the estimate of the costs associated with a sustainable provision of operational in-situ data within GMES/Copernicus, it provides outcome beyond the GISC DoW in terms of setting up way forward for Copernicus funding 2014-2020 and post GISC activities towards sustainable operation.

The in-situ needs catalogue was periodically reviewed and updated in the course of the GISC project. The analyses and links of the in-situ requirements with the stakeholders allowed GISC to identify approaches for the provision of the initial framework for access to in-situ data. Furthermore, the in-situ requirements report was the source for analysis of in situ requirements to identify data gaps, synergies, overlaps, and critical constraints that need to be addressed when considering a long term operational in situ framework. Hence, it is a building stone of the initial framework for in situ data delivery and to recommendations on its governance in GMES/Copernicus.

The in-situ requirements catalogue covers the four GMES services as listed below:

Theme	**GMES Service**	**URL**
Land (continental & local)	GIO Land GMES Fast Track Service Precursor on Land Monitoring 2006-2009 (composed of Corine Land Cover 2006, degree of Soil sealing 2006 and Urban Atlas) Geoland2	http://www.eea.europa.eu/publications/COR0-landcover http://www.gmes-gseland.info/sport/service/imperviousAreas.php http://www.gmes-gseland.info/sport/service/urbanAtlas.php http://www.gmes-geoland.info/
Emergency response	SAFER	www.emergencyresponse.eu
Atmosphere	Monitoring Atmospheric Composition and Climate project – MACC	www.gmes-atmosphere.eu
Marine	MyOcean	www.myocean.eu

2.2. Cooperate with the implementation groups and networks, and other stakeholders, analyse data requirements in terms of specific spatial, temporal resolution, coverage, quality and multiple use, taking into account the needs of service providers and existing capacities

GISC was in active dialogue with networks, stakeholders, service providers and users to identify gaps, overlaps, critical constraints and issues (such as IPR obstacles and sustainability) that needed to be addressed. Estimating the costs of tackling these issues, as well as long-term cost assessments, as part of the Commission's assessments of GMES cost, was part of this process. The purpose of the valuation was as input to the GMES cost benefit analysis and to support budgetary planning of the Commission. The estimate of the costs is based upon an initial assessment of the known requirements for core services as communicated by pre-operational GMES service projects. Although the cost valuation was produced by GISC in the first year of operation, the valuation was updated in the second year following request by the GMES bureau. Cross-cutting data requirements common to several services received particular attention.

The overall annual costs of the in situ component are estimated for 410 Mio EUR (410,440,000 EUR). This has to be seen as the overall annual monetary value of the in situ component and it is not related to its financial needs. Moreover, according to the 2008 GMES Communication[1], the in-situ infrastructure is to a large degree developed and maintained by Member States and should remain their responsibility in line with the partnership approach for GMES/Copernicus. In that respect it can be stated that an effective Copernicus partnership will secure what we estimated to be almost 2.9 billion Euro worth of data in the period 2014 – 2020.

The overall costs are made up of the following components:

Cost type	**Amount (in 1000 EUR)**	**Share**
Setup costs	77,765	19%
Operation costs	269,020	66%
Data access costs	55,197	13%
Coordination costs	8,458	2%
Total	*410,440*	*100%*

Furthermore, these annual costs are shared by the four different GMES/Copernicus services in the following way:

Services	**Amount (in 1000 EUR)**	**Share**
Land	80,923	20%
Emergency Response	8,586	2%
Atmosphere	172,795	42%
Marine	148,136	36%
Total	*410,440*	*100%*

It can be noticed that the costs for the Atmosphere and Marine services exceed the costs of the other two services largely. This is mainly due to high infrastructure costs of the two services whereas for Land and Emergency Response rather "classic" GIS datasets and maps are considered.

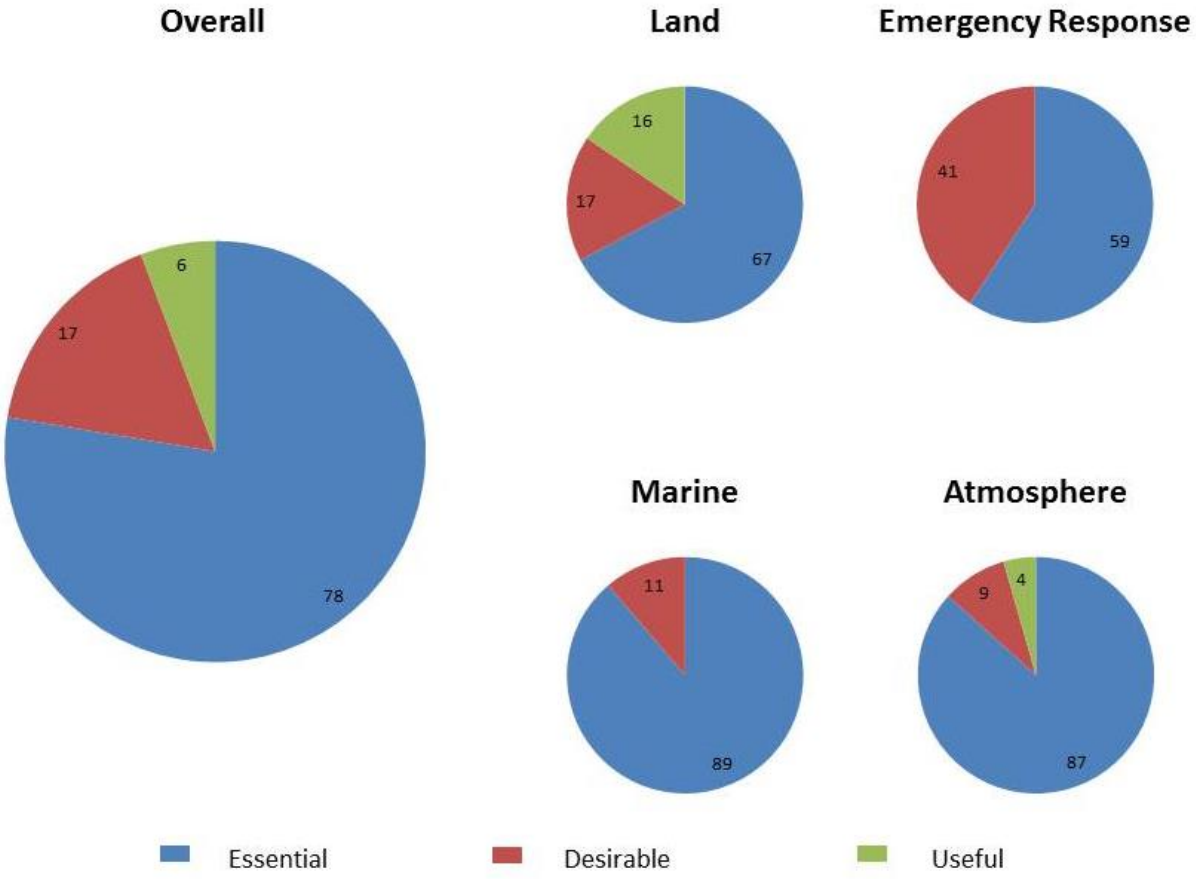
For the period from 2014 to 2020 the overall cost amounts to just under 2.9 Billion Euro.

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0748:FIN:en:PDF

In completing this activity GISC has analysed the in-situ data needs. More than 200 in situ requirements were collected from the GMES services for Atmosphere, Marine, Land and Emergency Management. The required data comprise marine, airborne and terrestrial sensor observations, GIS (raster & vector) datasets as well as alphanumerical database entries and on-the-spot visits in the field. The in situ data is assimilated into forecasting models, provides calibration and validation of space-based information, contributes to analysis or filling gaps not available from space sources, and provides essential reference data complementing space observations.

The in situ data is classified according to its criticality. Essential data is needed for the creation of the service products. Without availability the product specifications are not met. Thus it can be stated that all in situ requirements flagged as essential can be considered as priority datasets. However, among the essential in situ requirements, data exist which require special consideration to ensure access for the relevant GMES/Copernicus services. GISC proposed criteria to determine such priority in situ data sources which should receive special attention due to limitations and gaps in availability and access and due to their importance to GMES/Copernicus. In applying the criteria, the in situ requirements are identified for which it is most important to get support.

Of all in situ requirements 78% are classified as essential, 17% as desirable data and 6% cover useful data. The charts in the following figure give an overview about the number of requirements collected and graded according to their criticality factor:



GISC considers the in-situ data sets used by more than one service as a higher priority area to work on providing proper access. The following table shows a list of overlapping requirements between the different services:

Requirement	Land	EMS	Atmosphere	Marine
Administrative boundaries	V	V		
Buildings	V	V		
DEM (high res)	V	V		
DEM (low res)	V	V		
Forest maps	V	V		
Hydrographic elements	V	V		
Landuse maps	V	V		
Landcover	V	V	V	
Soil maps	V	V		
Transport networks	V	V		
Radiation	V		V	
Aerial photos/ orthophotos	V	V		
Meteorological observations	V	V	V	V

Timely and cost-efficient access to GMES/Copernicus in situ data will also depend on the successful implementation of the INSPIRE Directive. Potential links between in situ data required by GMES/Copernicus services and INSPIRE spatial data themes have been identified and examined.

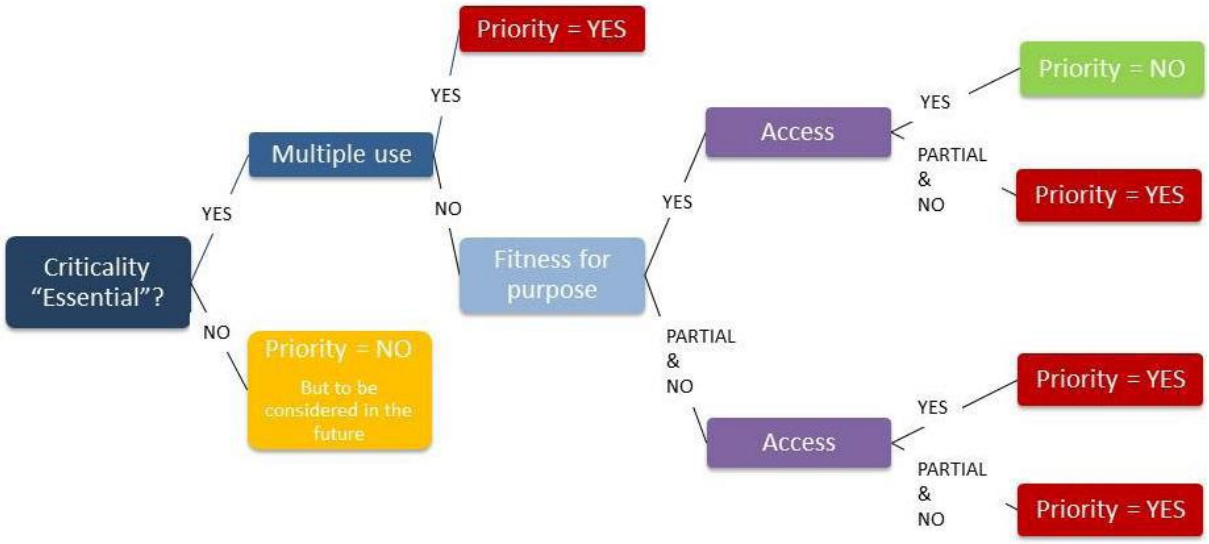
The results of the exercise are summed up in the following table:

GMES services	High match	No match	Cannot be assessed
Land	72%	6%	22%
Emergency Response	81%	7%	11%
Atmosphere	100%	0%	0%
Marine	50%	48%	2%
All GMES services	**73%**	**20%**	**7%**

2.3. Explore the use of criteria to define priorities where funding could be used to create added value

The aim of the GISC report on priorities was to develop an objective and robust method to determine priority in situ data which should receive special attention due to their importance to GMES. The in situ data need is classified according to its criticality. A minimum requirement is that today's status quo of the services is maintained. Future developments associated with evolving services have to be considered but have less priority now.

Basis for the development was the information available from the in situ requirement report. It lists in situ requirements in terms of attributes and characteristics, geographic coverage, timeliness, accuracy, and scales. Possible data providers were also identified. The decision tree allowed checking the meta-information of available data against the requirements following different stages. This allowed the stepwise investigation and identification of the priority datasets. The following figure shows the decision tree which was finally applied:



All requirements with multiple uses were selected to be priority. All other requirements underwent a further analysis on their fitness for purpose and their access conditions. The fitness for purpose test investigates if available in situ data fulfil the requirements in terms of availability, scales and timeliness. For all results a further accessibility check was conducted. The accessibility check investigates whether the in situ data is fully and open accessible or if access is limited. Following the different steps of the decision tree allowed the identification of priority in situ requirements.

GISC identified six main causes and decided to classify the list of priority data accordingly. Cost categories were added which were taken from the cost assessment report in 2011. Grouping the priorities into different classes and cost categories helped identifying actions to ensure access to the essential in situ data for the GMES services. Moreover, the given order of the priority classes can also be taken as a ranking about the efforts to solve the priority tasks. The report closes with a list of actions which we propose as solutions to improve the sustainable provision of prioritised in situ requirements.

Prioritisation tree is proposed for the GMES services for Land, Marine environment, Atmosphere monitoring and Emergency management. The analysis comprises issues like spatial and temporal resolution, geographic coverage, quality and multiple uses, taking into account the needs of service providers and existing capacities. Gaps, overlaps and critical constraints are investigated e.g. the need for long-term programme operation. The GISC product further explores the use of criteria to determine priority in situ data which should receive special attention due to their importance to GMES.

The fitness for purpose check investigated technical specifications of available data while the accessibility check analysed the availability and related conditions. Reasons for a limited fitness for purpose or limited accessibility can be various just as the complexity and efforts to overcome these limitations. After analysing them we found six recurring causes coming along with different difficulties to cope with. These causes build a good base to further classify the priority data. The classification will help to understand the needs and efforts to overcome the limitations of the data and thus the reasons for their prioritisation:

Priority classes: the colour code relates to the three main nodes of the decision tree – multiple use, fitness for purpose and accessibility.

1. As shown in the decision tree, essential data which is required by more than one service is a reason for prioritisation and should thus receive special attention.

2. The access to data might be limited due to specific licensing policies, or simply require arrangements and relationships to be put in place.

3. A third reason for prioritisation is that data might be fully available but not at the required quality or coverage.

4. There is a need for sustainability of all required in situ products and observations. Many datasets are created under national sovereignty. Many others are operated through research networks funded through national research funds, the EU framework programmes, research infrastructures, etc. The funding for long-term operation, as well as financing maintenance of the observation infrastructure, are needed and thus a reason for prioritisation.

5. Some datasets are only available through procurement from commercial sources. Therefore a commercial arrangement might be able to be put in place with lower cost for the GMES/Copernicus access.

6. Others which are not available or at limited quality or coverage require the complete setup of an observation infrastructure and its operation.

Besides the first issue of multiple data usage, reasons 2 - 6 require different efforts to solve them. To negotiate an agreement might be easier than setting up a new observation infrastructure. For that reason the order of the priority classes can also be taken as a weighting for solving priority issues which is also expressed in the changing arrow size in the above figure. However, the categories are not exclusive. Data can fall under several categories.

In addition to the above prioritisation classes the priorities can be further grouped into four cost categories as shown on the following picture:

1. Coordination costs
2. Data access costs
3. Operating costs
4. Set-up costs

These categories were applied in the cost assessment report 2011 and fit under the different costs categories. In principal the term cost has a monetary meaning. Even if the reasons for prioritisation and related activities will in most cases have financial implications (e.g. the need for coordination between two parties requires funding), the term "cost" should be primarily used as a synonym for some kind of "effort". This is also expressed by the order of the cost categories. In this context we assume that the coordination activities of an observation infrastructure are less cost intensive than its operation and set-up.

Coordination costs are costs incurred to coordinate between the GMES/Copernicus service provider and the in situ data providers. The coordination costs include the estimation of personnel costs in terms of effort and frequency required for coordinating the various data updates and coordination between various providers. A priority for coordination might evolve when data is provided through several providers at the same time (e.g. data from Member States).
Data access costs can be licence costs for an external commercial database which is required by the service provider or costs which incur specifically to make data fit for GMES/Copernicus purposes. Priorities falling under this category might have a relation to set-up costs.
Operating costs are those costs incurred in order to carry out all the necessary activities to collect, store and publish required data. Examples are maintenance costs for infrastructure, costs for processing raw data into validated data and for quality assurance, in addition to administrative costs.
Set-up costs are the initial costs incurred to collect, store and publish required data. These include investments for the development of infrastructure or the development of a database to store the data. Related R&D needs are also considered as set-up costs.

The report illustrates a method to determine criteria to select in situ requirements and related data for prioritization. It is based on knowledge acquired and research conducted in the course of the GISC project. The report includes full rating of all essential in-situ requirements of the four GMES services and concluding lists of priorities are recommendations of GISC to support and guarantee a sustainable provision of in situ data to GMES/Copernicus. The report provides an objective way to determine priority data which might change in the future due to evolving Copernicus services.

2.4. Identify organisations and networks as well as infrastructures critical for GMES in-situ data needs and explore their interest profile as a basis for initiating a dialogue on in-situ data exchange and building long term sustainable framework

Requirements for in-situ data for GMES/Copernicus are relevant for three communities. There are the requirements of the pilot core service providers using in-situ data as input as well as the community using core services either directly or for the development of downstream[2] services and

[2] Provision of in-situ data specific for DS services will be considered a secondary priority.

applications. Lastly there is the community of organisations and networks that are data providers for GMES/Copernicus in-situ data, both at an international and also national level. As part of this process, the stakeholders list was created and reviewed in consultation with the GMES bureau, GMES services, Eionet GMES NFP WG and the European Topic centres (ETCs). The list offers a global overview of stakeholders which have been identified as potential providers that could contribute to a long term in-situ data provision. The stakeholder's list accordingly represents a tool to identify with which stakeholders dialogue is needed.

The listing of the public and private entity stakeholders includes:

- Name of stakeholder
- Name of available in-situ product
- In-situ data set required
- Criticality of required in-situ data
- GMES product for which the in-situ data is needed
- Type of stakeholder
- Link to webpage of stakeholder

The list is a contribution to the forthcoming elaboration of the in-situ data implementation roadmap as proof of concept of an initial framework for accessing in-situ data. It forms an essential part of this framework together with the in-situ requirements and GISC proposed approaches to engage the stakeholders into long term sustainable operational in-situ governance.

Work package 3

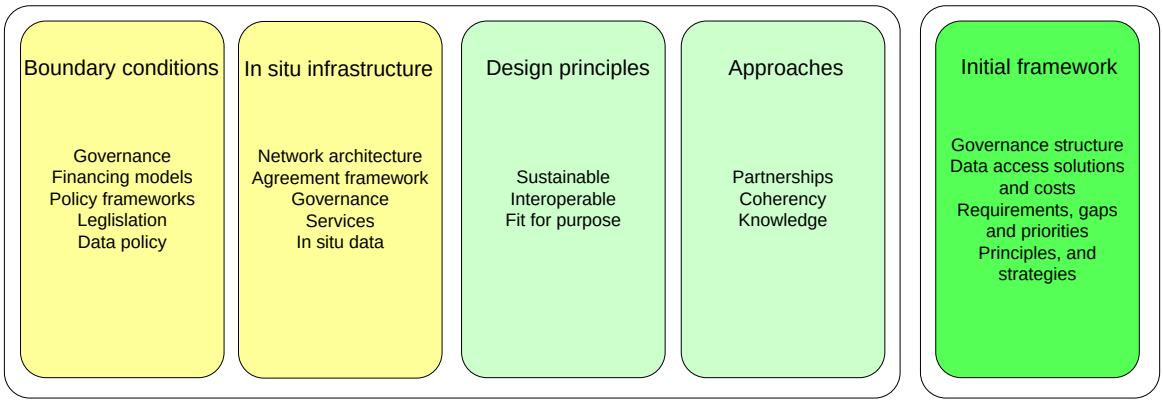
3.1 Identify and assess options to address issues identified in WP2 and to meet long-term sustainability

The overall objective was to analyse the infrastructure components (architecture, governance, services, agreements and data) and to develop and propose solutions and innovatory approaches that will support a phased implementation of a sustainable infrastructure for in situ data provision to GMES.

Within this activity GISC has explored and proposed approaches to provide the necessary basis and framework supporting the overall objectives and the implementation of the initial framework for access to in situ data in sustainable way to GMES services. The main achievements of this work are:

- A list of approaches and examples of approaches has been compiled and classified according to a set of proposed categories;
- Important boundary conditions have been identified and exemplified;
- Design principles have been defined to support the testing and validation of approaches;
- The interactions between the different elements of the initial framework have been illustrated.

To enable the GMES/Copernicus in situ component to manage this task it is necessary to consider five themes or focus areas namely: boundary conditions, in situ infrastructure, design principles, approaches, and the initial framework – see the following diagram.



The main goal was to identify, characterise, and validate a set of potential approaches that may be instrumental in providing in situ data access to GMES services in a sustainable way.

The final objective of GISC was to put in place an initial framework for the provision of in situ data access to GMES using a selection of appropriate approaches. The initial framework may be understood as a set of tools and methods necessary to construct an efficient and sustainable interface between the in situ data providers and GMES/Copernicus.

The in situ infrastructure is not able to provide data to GMES services in a sustainable and continuous fashion unless an efficient interface between GMES/Copernicus and the in situ infrastructure is established and maintained. The first formulation and implementation of this interface is called the initial framework and it is supposed to be created and managed by the GMES/Copernicus in situ component. The interface is building on a set of boundary conditions and uses tools and methods devised by GISC by use of selected approaches, e.g. governance and data access solutions, catalogue of in situ data requirements and gaps, and technical interfaces between data providers and GMES services.

The deliverable primarily focuses on describing and analysing approaches and their ability to support the implementation and functioning of the initial framework. In this context an approach may be understood as a *method, strategy, or an activity that supports the overall goal of establishing an initial framework.*

Potential GISC approaches to securing sustainable data provision include:

- Making use of existing public domain services;
- Securing data provision from existing international bodies or networks (Ex European bodies or international conventions) to which data are reported;
- Adapting data reporting under EU or national legislation or other policy frameworks (e.g. SEIS);
- Concluding bilateral or multilateral agreements with national or regional administrations;
- Procuring data through commercial arrangements where other solutions are not possible.

3.2 Propose solutions for in-situ data provision

The solutions are assessed on strengths and weaknesses (with underpinning information on cost and benefits), suitability and ability to address issues (e.g. gaps in infrastructure and architecture) identified in to create an inventory of recommended solutions. The proposal was reviewed in

consultation with countries, pilot projects, international organisations and networks and form the basis to devise architecture to be used to set up and develop initial framework for in-situ data access. The proposal includes four options:

Option A, Baseline	Option B	Option C	Option D
In this option, historic (pre-2014) investment in developing space infrastructure (by ESA Member States) is put to fruition by a comparatively small additional investment in completing development, launching and operating the already committed infrastructure. For the *in situ* component, the EU would contribute to co-ordination activities. The basic scenario does not exclude limited investment in smaller research projects financed under FP7, but no major EU investment in service evolution and renewal of existing space and *in situ* infrastructure would take place. Indicative annual budget (in situ): 10 M€.	Beyond putting past developments to fruition as in option A, recurrent duplicates of the Sentinel Missions are built, launched and operated. The EU would increase its investment in the *in situ* component under this option. As a result, the services provision could cover a longer period, but without guarantee of long term continuity of the full range of services. Indicative annual budget (in situ): 20 M€.	Option B extended, with upgrades and long-term availability of the full Sentinel space component guaranteed, (i.e. continuous replacement of Sentinel missions, but within a scope that remains fixed over time). The EU would continue to increase its investment in the *in situ* component. Indicative annual budget (in situ): 30 M€.	Option C expanded to fully guarantee data availability from Sentinel Missions and to provide enhanced support for the continuity of data from Contributing Missions. The EU would further increase its investment in the *in situ* component. Indicative annual budget (in situ): 50 M€.

The report proposes a data gateway, in-situ coordination and governance model for each one of the four GMES/Copernicus services.

3.3 Establish initial framework for provision of in-situ data using the sustainable approaches agreed with the countries, stakeholders and networks

The initial framework was delivered after deep involvement of the Copernicus unit.

The objective of the GISC project, according to its DoW, is to act between data providers and networks with the aim to develop an adequate system for access of the required in-situ data to the GMES/Copernicus services. As part of the preparatory work the Initial Framework proposes a set of approaches and solutions for the sustainable provision and access of in-situ data in support for building up an operational in-situ system. The Initial Framework serves as a logical framework that combines the project activities and deliverables, and links these to the recommendations presented.

The report provides a set of recommendations enabling the sustainable interface between in-situ providers and other components of the Copernicus programme. This report has been developed in consultation with the Commission in order to include current needs and related changes - outcome of

the meeting held 26 June 2013 with the Copernicus Unit of DG Enterprise, and subsequent consultations in August, September and October 2013.

The report also provides recommendations where the sustainability of data flow and organisation is at risk. The report is a final presentation that synthesises important elements and lessons of the GISC project, providing a status of the current provision of in-situ data for Copernicus services.

Chapter 3 of the report presents the overall conclusions, drawn from acquired results of GISC. At the same time it also makes clear that some challenges remain in order to successfully secure in-situ data provision. The chapter focus on the three central elements for the successful and sustainable in-situ provision, namely: providing decision basis, securing partnerships and ensuring data access. The GISC activities and accumulated knowledge related to these three central elements form the Initial Framework, which is presented at the end of the chapter.

Chapter 4 presents briefly the current situation, the GISC approach and the lessons learned for each of the services. Referring to the needs and challenges, the chapter also provides an overview of proposed recommendations for each service.

Chapter 5 addresses common recommendations.

The in-situ requirements and the stakeholder's list are part of the Initial Framework as well as the other GISC products such as supporting materials for data access agreements.

3.4 Create supporting material for each approach used for data exchange agreements and dealing with IPR where necessary

In the reporting period GISC finalised the supporting materials outputs. Based on key documents achieved in the life time of GISC project this deliverable compiles an initial set of agreements, MoUs, and letters of intent:

-Establishment of EEA data policy
-Partnership / agreements:
- Signed Agreements:
- Agreement EEA / EuroGeographics
- Agreement EEA / EuroGeoSurveys
- EEA / EuroGoos Agreement
- MACC Data Access Agreement
- NRT AQ data flows for EEA and GMES
- US Environmental Protection Agency (EPA) agreement on AIRNow Data Exchange Guidelines
- Access to data managed by NILU to the GMES
-Access to authoritative geospatial reference data for GMES Emergency Management Service
- Draft agreements:
- Country framework agreement
- Draft service level agreement
- Draft agreement between the EEA and the ESA on the use of Earth observation and in situ data for the provision of scientifically sound and independent information on the Environment
- Draft MoU between EEA and EMSA

Work package 4

4.1 Evaluate and select in-situ data delivery for service implementation in cooperation with the stakeholder frameworks and the pre-operational GMES services mainly MyOcean, GEOLAND, SAFER, MARISS, MACC, and related projects (e.g. EDMODNET) and in-situ data providers

GISC evaluated in-situ flows to select quick wins (QW) for service implementation. The QW are providing proof of concept for an operational in-situ governance of the respective architecture. The selection was performed in cooperation with the stakeholder frameworks and the pre-operational GMES services, as well as related projects and in-situ data providers. GISC discussed the selection of QW with GMES service providers, and obtained approval by the Project Board, and the GMES Bureau. The result takes into account GIO needs and varied approaches or organisational models as well as respecting the DoW.

Through various statements, the GISC project DoW sets out that the quick wins should:

- Demonstrate in-situ coordination role in practice.
- Facilitate supporting mechanisms to realise in-situ data services for pre-operational service implementation and initial operational services.
- Address different combinations of problems and processes to be solved in the facilitating process.
- Demonstrate re-use of existing capacities and networks, where appropriate, to ensure that the needed data infrastructures and procedures are available for operational GMES services to draw upon.
- Provide proof of concept for the whole project approach.

In order to select datasets as candidates for "case studies" that could prove to be QW for the whole project approach, the following selection criteria have been identified:

- Included in scope of GMES Initial Operations
- Criticality level
- Re-useable
- SMART
- Covered by Inspire directive (5) and / or aligned with SEIS principles (6)
- Aligned with GMES information objectives

The following table summarises the selected QW and their characteristics in relation to the selection criteria.

Quick Win / Selection criteria	**Included in scope of GMES Initial Operations**	**Criticality level**	**Re-useable**	**SMART**	**Covered by Inspire directive (5) and / or aligned with SEIS principles**
Surface air quality (near real-time measurements)	Yes (MACC)	Essential	Yes (Eionet Coordination structures, data access point, data providers, data for DS services, e-Reporting.	Yes	Aligned with SEIS principles. Aligned with Inspire (Annex III: (Atmospheric Conditions, Environmental Monitoring Facilities, Area mgt/restrict./reg. zones and reporting units, Human health and safety). Also e-Reporting for AQ dir.

Geospatial data (EMS only)	Yes (EMS response products)	Essential	Yes, (EG Coordination structure and data providers)	Yes	Covered by Inspire (mainly Annex I) for content.
Argo float measurement data	Yes (MyOcean)	Essential	Yes, re-useable[3] data, data providers, coordination structure and data access point	Yes	Aligned with SEIS principles (full and opened access to the data)
Selected GIO Land in-situ	Yes (EMS and GIO land)	Essential	Yes, re-useable coordination structure, data providers and data.	?	Covered by Inspire (Annex I: Admin. units, Transport networks, Hydrography, Geographical names; Annex II: Elevation, Ortho-imagery, Annex III: Land use)
European Meteorological Network - EUMETNET	Yes (MACC, EMS, MyOcean)	Essential	Yes, re-useable data, data providers, coordination structure and data access point	Yes	Covered by Inspire (Annex III: Meteorological geographical features)

The selected "case studies" will be further evaluated, which is the objective of Deliverable D 4.2 (Documentation about facilitating implementation of case studies), which aims at demonstrating the in-situ coordination role in practice through securing quick wins for data relevant to core services. In that way the quick wins will become part of the initial framework for access to in-situ data.

4.2 Secure data relevant to pilot services by resolving gaps and issues to remove obstacles to sustainable data provision for quick-wins

GISC facilitated the implementation of the case studies (QW) by documenting for the QW implementation so far and an evaluation of the implementation according to the evaluation criteria defined in the previous activity (availability, accessibility, fit for purpose...). The report also assesses how each QW can be used as a proof of concept for the GISC project approaches. GISC conducted also a review process with stakeholders. The review process assed the relative strengths and weaknesses of the approaches used in the QW and review the proof of concept of the GISC Initial Framework.

4.3 Review proof of concept

The in-situ landscape in Europe is vastly heterogeneous with respect to the existing legal frameworks, organisational settings, technical implementations and financial resources. Important data providers are numerous national institutions. Different data sharing and license policies exist in the countries ranging from full, free and open access to restricted licenses and license fees. Moreover, different technical solutions are implemented which make a standard access through web services impossible at this stage.

[3] Reusable for Climate Change

The GIO Pan-European Land service and the GIO Emergency Management Service require the similar reference data but with different scale. MSs have been asked to align the access procedures for Copernicus to avoid a duplication of efforts and resources. It is expected that the INSPIRE directive will help establishing the necessary infrastructure to make spatial information from MSs accessible and interoperable. Furthermore, INSPIRE provides the legal framework to report on and enabling the access to national reference geospatial data.

The examples of accessing air quality data through the EIONET, reference data through support of EuroGeographics and meteorological data through EUMETNET underline the importance of involving existing networks and intergovernmental organisations in the in-situ data provision. These networks have the relevant links to national member organisations and data nodes are often in place to access the data of their members centrally.

However, the case of EUMETNET illustrates that the willingness of data sharing is also dependent on the future Copernicus governance structure, its continuation in general and the future organisation of the Copernicus services and the in-situ component. The on-going discussions and negotiations about the proposal for the new Copernicus regulation will help clarifying these issues. However, it is obvious that such networks are interested in achieving a win-win solution and therefore demand clarity and a perspective.

Other important in-situ data sources are research projects and European Research Infrastructures. A major constraint for relying on these data providers is their unsustainability. Research projects have a limited duration. After a certain period of time, new funds have to be found to ensure continuation. This means that such data is rather unreliable for an operational Copernicus service. Moreover, long time series of observations are rather unlikely to be achieved. European Research Infrastructure Consortia (ERICs) are an attempt to improve this. EuroArgo is one ERIC example. While a number of MSs guarantee a share of the total budget, additional sources are needed.

The example of EuroArgo illustrates that the financial support for such projects does not necessarily has to come through the Copernicus programme. For that reason it is recommended to explore possibilities for cross-institutional funding not only for research projects but in-situ observations in general.

The QW activities in the frame of GISC show that the coordination of in-situ data access is beneficial to the services and data providers. Such coordination can improve access to in-situ data largely. As it is a long-lasting and laborious effort, an independent coordinating entity could support the in-situ activities of the technical coordinators of all Copernicus services. Not to forget the space component for which the availability of in-situ data for Cal/Val activities is essential.

The GISC QW explored ways to access required in-situ data from EEA countries, existing network organisations and EuroArgo ERIC, which are all essential in-situ data providers to the Copernicus services. This is in line with the proposal for a new Copernicus regulation according to which the in-situ data is considered as contributions of the MSs to Copernicus. The valid presumption of the (draft) Copernicus regulation in this regard is that MS owned data is at the heart of the network organisations' and the ERICs' operations.

However, other in-situ data providers should be explored. Volunteered geographic information (crowdsourcing) is an interesting trend in geospatial data collection. It should be investigated how reliable such data is in terms of availability, timeliness and fitness for purpose as input to Copernicus services.

Moreover, opportunities for public private partnerships should be examined. Already today the private industry is active in in-situ observations and related services. Private meteorological services are one example. Besides that, private stakeholders could be involved in the deployment, operations and maintenance of in-situ observing systems.

Several Copernicus services have a global coverage. For that reason it is necessary to address the in-situ subject and related challenges on the global agenda, e.g. through the GEO network.

The GISC's QW are merely five success stories which have to be continued and expanded to underpin sustainable and operational Copernicus services.

Potential impact and the main dissemination activities and exploitation of results

The proposed by GISC initial framework for access to in-situ data together with the produced stakeholders list, in-situ requirements and supporting documentation provide the basis for building up operational access to in-situ data for Copernicus services. The developed five QW are directly applicable in the respective areas for the operational use. These examples of success stories shall be extended to other in-situ data sets in the follow up activities in the in-situ component, involving also the space component needs of in-situ data.

The QW provided proof of concept for the GISC initial framework and EEA approach to in-situ coordination for GMES/Copernicus operational application. The QW became part of the initial framework.

The designed approaches and the established strategy to create agreements with stakeholders have wider impact than only GMES/Copernicus in-situ data. GISC finalised the EEA open data policy concept which is in the basis of the different agreements and is aimed to be extended to cover more data in the future as this activity is performed under the SEIS and INSPIRE concept and development.

The EEA data policy provides guidelines about EEA's handling of data. The policy ensures that data is handled in a consistent and transparent manner. EEA aspires to promote the sharing of environmental data. In agreeing to share, data providers need to have assurance that their data are properly handled, disseminated, used and acknowledged following similar principles and rules across countries and stakeholders.

The EEA MB adopted the EEA Data Policy in the meeting held on 20th March 2013. The EEA Data Policy has been published on the EEA website (http://www.eea.europa.eu/publications/eea-data-policy).

The need of the in-situ coordination is clear in the research projects and infrastructures. Common coordination is the preferred solution for organization of the access to the in-situ data rather than the individual approach by the individual services. It is considered more effective and less costly because of removing duplication in data re-use, harmonization of the access policies and following the service evolution in an uniform manner. The above findings were confirmed on the April's 2013 GISC event 'Monitoring matters'. Some of the key messages of the event are the following:
'

Member states' in-situ capacities make up the lion's share of the in-situ component**.** Participants challenged the European Commission's assumption that all the required in-situ capacities will be put at the disposal of Copernicus at no cost to the programme.

The in-situ data landscape is hugely diverse and needs coordination. The diverse nature of in-situ (various data providers, different standards, scales, quality, coverage, decentralisation/centralisation, legal constraints and data policies) is a factor that requires management and coordination. It is *not* an option to do nothing; the in-situ component cannot be left on its own. It needs European engagement. Participants recognised the added value of the EEA having a role in in-situ coordination.

Despite regulatory frameworks, intervention is required to meet the challenge of in-situ data availability**.** There is no straight forward mechanism to access national data despite legal frameworks such as the GMES Initial Operations Regulation and the INSPIRE Directive. Different strategies for overcoming the challenges vis-à-vis availability of in-situ data were discussed:
- A reinforced regulated approach mandating Member States to share data;
- Compensation of lost revenue to data providers; and
- Co-financing of in-situ infrastructures and their operations.

In-situ coordination for Copernicus is needed to work alongside existing coordination mechanisms. Copernicus in-situ data coordination has an important cross-cutting facilitation role between the Copernicus components and the data provider networks. It improves the re-use of capacities and processes which already exist and can improve data access and the technical solutions behind it. It can also ensure adaptable in-situ interfaces not directly integrated into the services production environment, but made available as reusable elements.

Sustainability of in-situ observations for Copernicus is crucial. Just because in-situ infrastructures exist does not mean that they are fit for purpose and can provide data in a continuous way. This concerns both national infrastructures and European research infrastructures. Long term strategies to secure sustainability must be developed and put in place, and this is partially a European matter.
'

The process could continue after the GISC end as general agreements, license agreements, and access agreements concerning the Copernicus services may be concluded based on the current work and products.

The address of the project public website and relevant contact details

The GISC project Web site was maintained at the Web address: http://gisc.ew.eea.europa.eu/ .
EEA maintains Web sites of projects up to three months after their end. Therefore, the GISC Web site is not updated after 31 October 2013 and will be not accessible anymore in 2014.

EE Web site is: http://www.eea.europa.eu/

EEA was the only beneficiary of the project.

4.2 Use and dissemination of foreground

GISC project activities were FP7 coordination and support action. There were no research and development activities. The outputs were for implementation into the practical coordination of the access to in-situ data for the Copernicus services.

Section A (public)

The GISC project was not a research and there were no scientific publications.

TEMPLATE A1: LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES										
NO.	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers[4] (if available)	Is/Will open access[5] provided to this publication?

[4] A permanent identifier should be a persistent link to the published version full text if open access or abstract if article is pay per view) or to the final manuscript accepted for publication (link to article in repository).

[5] Open Access is defined as free of charge access for anyone via Internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	Type of activities[6]	Main leader	Title	Date/Period	Place	Type of audience[7]	Size of audience	Countries addressed
1	*Conference*	EEA (GISC project)	Monitoring matters	10-11 April 2013	Copenhagen	*Stakeholders from more than 20 countries involved in the in-situ component of Copernicus (Provider and user communities, national authorities, international organisations, research projects, the European Commission and European coordinating bodies)*	Over 100	EU 27

[6] A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

[7] A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias, Other ('multiple choices' is possible).

Section B (Confidential[8] or public: confidential information to be marked clearly)
Part B1

There were no applications for patents, trademarks, registered designs, etc.

TEMPLATE B1: LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS, ETC.					
Type of IP Rights[9]:	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant (s) (as on the application)

[8] Note to be confused with the "EU CONFIDENTIAL" classification for some security research projects.

[9] A drop down list allows choosing the type of IP rights: Patents, Trademarks, Registered designs, Utility models, Others.

Part B2

There was no exploitable foreground created neither IPR measures.

Type of Exploitable Foreground[10]	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application[11]	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved

[19] A drop down list allows choosing the type of foreground: General advancement of knowledge, Commercial exploitation of R&D results, Exploitation of R&D results via standards, exploitation of results through EU policies, exploitation of results through (social) innovation.

[11] A drop down list allows choosing the type sector (NACE nomenclature) : http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

4.3 Report on societal implications

A General Information *(completed automatically when **Grant Agreement number** is entered.*	
Grant Agreement Number:	**249327**
Title of Project:	**GMES in-situ coordination**
Name and Title of Coordinator:	**Tony Blagoev, Project Officer GMES in-situ, EEA**

B Ethics	
1. Did your project undergo an Ethics Review (and/or Screening)? • If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final project reports? Special Reminder: the progress of compliance with the Ethics Review/Screening Requirements should be described in the Period/Final Project Reports under the Section 3.2.2 *'Work Progress and Achievements'*	***0Yes 1No***
2. Please indicate whether your project involved any of the following issues (tick box) :	***YES***
RESEARCH ON HUMANS	
• Did the project involve children?	0
• Did the project involve patients?	0
• Did the project involve persons not able to give consent?	0
• Did the project involve adult healthy volunteers?	0
• Did the project involve Human genetic material?	0
• Did the project involve Human biological samples?	0
• Did the project involve Human data collection?	0
RESEARCH ON HUMAN EMBRYO/FOETUS	
• Did the project involve Human Embryos?	0
• Did the project involve Human Foetal Tissue / Cells?	0
• Did the project involve Human Embryonic Stem Cells (hESCs)?	0
• Did the project on human Embryonic Stem Cells involve cells in culture?	0
• Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?	0
PRIVACY	
• Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?	0
• Did the project involve tracking the location or observation of people?	0
RESEARCH ON ANIMALS	
• Did the project involve research on animals?	0
• Were those animals transgenic small laboratory animals?	0
• Were those animals transgenic farm animals?	0
• Were those animals cloned farm animals?	0
• Were those animals non-human primates?	0
RESEARCH INVOLVING DEVELOPING COUNTRIES	
• Did the project involve the use of local resources (genetic, animal, plant etc)?	**0**
• Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	**0**
DUAL USE	

• Research having direct military use	0 Yes 1 No
• Research having the potential for terrorist abuse	0

C Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator	0	2
Work package leaders	3	3
Experienced researchers (i.e. PhD holders)	0	0
PhD Students	0	0
Other	5	1

4. How many additional researchers (in companies and universities) were recruited specifically for this project?	**0**
Of which, indicate the number of men:	0

D Gender Aspects

5.	**Did you carry out specific Gender Equality Actions under the project**?	○ 1	Yes No

6. Which of the following actions did you carry out and how effective were they?

		Not at all effective				Very effective
0	Design and implement an equal opportunity policy	○	○	○	○	○
0	Set targets to achieve a gender balance in the workforce	○	○	○	○	○
0	Organise conferences and workshops on gender	○	○	○	○	○
1	Actions to improve work-life balance	○	○	1	○	○
○	Other:					

7. Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?

○ Yes- please specify

1 No

E Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?

○ Yes- please specify

1 No

9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?

○ Yes- please specify

1 No

F Interdisciplinarity

10. Which disciplines (see list below) are involved in your project? – not applicable

○ Main discipline[12]:

○ Associated discipline[12]: ○ Associated discipline[12]:

G Engaging with Civil society and policy makers

11a	**Did your project engage with societal actors beyond the research community?** *(if 'No', go to Question 14)*	1 ○	Yes No

11b If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?

○ No

○ Yes- in determining what research should be performed

○ Yes - in implementing the research

1 Yes, in communicating /disseminating / using the results of the project

[12] Insert number from list below (Frascati Manual).

11c In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	○ ○	Yes No

12. Did you engage with government / public bodies or policy makers (including international organisations)

- ○ No
- ○ Yes- in framing the research agenda
- ○ Yes - in implementing the research agenda
- 1 Yes, in communicating /disseminating / using the results of the project

13a Will the project generate outputs (expertise or scientific advice) which could be used by policy makers?

- 1 Yes – as a **primary** objective (please indicate areas below- multiple answers possible)
- ○ Yes – as a **secondary** objective (please indicate areas below - multiple answer possible)
- ○ No

13b If Yes, in which fields? Environment

Agriculture		Energy		Human rights	
Audiovisual and Media		Enlargement		Information Society	
Budget		Enterprise		Institutional affairs	
Competition		Environment		Internal Market	
Consumers		External Relations		Justice, freedom and security	
Culture		External Trade		Public Health	
Customs		Fisheries and Maritime Affairs		Regional Policy	
Development Economic and Monetary Affairs		Food Safety		Research and Innovation	
		Foreign and Security Policy		Space	
Education, Training, Youth		Fraud		Taxation	
Employment and Social Affairs		Humanitarian aid		Transport	

13c If Yes, at which level?

- ○ Local / regional levels
- ○ National level
- 1 European level
- ○ International level

H Use and dissemination - not applicable

14. How many Articles were published/accepted for publication in peer-reviewed journals?	
To how many of these is open access[13] provided?	
How many of these are published in open access journals?	
How many of these are published in open repositories?	
To how many of these is open access not provided?	
Please check all applicable reasons for not providing open access:	
❑ publisher's licensing agreement would not permit publishing in a repository ❑ no suitable repository available ❑ no suitable open access journal available ❑ no funds available to publish in an open access journal ❑ lack of time and resources ❑ lack of information on open access ❑ other[14]: ……	

15. How many new patent applications ('priority filings') have been made? *("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).*		
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark	
	Registered design	
	Other	
17. How many spin-off companies were created / are planned as a direct result of the project?		
Indicate the approximate number of additional jobs in these companies:		

18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project:

❑ Increase in employment, or	❑ In small & medium-sized enterprises
❑ Safeguard employment, or	❑ In large companies
❑ Decrease in employment,	❑ None of the above / not relevant to the project
❑ Difficult to estimate / not possible to quantify	

19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (*FTE = one person working fulltime for a year*) jobs:	*Indicate figure:*

[13] Open Access is defined as free of charge access for anyone via Internet.
[14] For instance: classification for security project.

Difficult to estimate / not possible to quantify	❑

I Media and Communication to the general public

20. As part of the project, were any of the beneficiaries professionals in communication or media relations?

1 Yes ○ No

21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public?

○ Yes 1 No

22 Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?

❑	Press Release	❑	Coverage in specialist press
❑	Media briefing	❑	Coverage in general (non-specialist) press
❑	TV coverage / report	❑	Coverage in national press
❑	Radio coverage / report	❑	Coverage in international press
1	Brochures /posters / flyers	1	Website for the general public / internet
❑	DVD /Film /Multimedia	1	Event targeting general public (festival, conference, exhibition, science café)

23 In which languages are the information products for the general public produced?

❑	Language of the coordinator	1	English
❑	Other language(s)		

***Question F-10*:** Classification of Scientific Disciplines according to the Frascati Manual 2002 (Proposed Standard Practice for Surveys on Research and Experimental Development, OECD 2002):

FIELDS OF SCIENCE AND TECHNOLOGY

1. NATURAL SCIENCES

1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]

1.2 Physical sciences (astronomy and space sciences, physics and other allied subjects)

1.3 Chemical sciences (chemistry, other allied subjects)

1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)

1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2 ENGINEERING AND TECHNOLOGY

2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)

2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]

2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as

geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3. MEDICAL SCIENCES

3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immunohaematology, clinical chemistry, clinical microbiology, pathology)

3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)

3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4. AGRICULTURAL SCIENCES

4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)

4.2 Veterinary medicine

5. SOCIAL SCIENCES

5.1 Psychology

5.2 Economics

5.3 Educational sciences (education and training and other allied subjects)

5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary , methodological and historical S1T activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6. HUMANITIES

6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)

6.2 Languages and literature (ancient and modern)

6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S1T activities relating to the subjects in this group]