



Project 33807: MYGEOSS

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MYGEOSS Lessons Learned v.1

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Table of Contents

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|--|---|
| Table of Contents | 2 |
| 1. Introduction and Scope..... | 3 |
| 2. The first MYGEOSS call for innovative apps..... | 3 |
| 3. The Lessons Learned | 4 |
| 4. The Recommendations..... | 7 |
| 5. MYGEOSS Response to Recommendations | 8 |
| 6. Conclusions | 9 |

1. Introduction and Scope

MYGEOSS¹ is a two-year project (2015-2016) by the European Commission to develop innovative Internet applications informing European citizens on the changes affecting their local environment. The project is part of the support that the European Commission gives to the efforts of the Group for Earth Observation (GEO²), which is a voluntary partnership of governments and organizations promoting the use of earth observations to inform decisions and actions globally.

GEO Member governments include 96 nations and the European Commission, and 87 Participating Organizations including international bodies with a mandate in Earth observations. GEO is creating a Global Earth Observation System of Systems (GEOSS) that links Earth observation resources worldwide across multiple application areas.

A key achievement of GEO has been to agree on a set of data sharing principles subscribed by the entire GEO community:

- There will be full and open exchange of data, metadata and products shared within GEOSS, recognizing relevant international instruments and national policies and legislation.
- All shared data, metadata and products will be made available with minimum time delay and at minimum cost.
- All shared data, metadata and products being free of charge or no more than cost of reproduction will be encouraged for research and education.

GEO has leveraged the voluntary nature of its partnership to implement these principles, and established a pool of documented datasets which its community has provided on a voluntary basis with full and open access, the GEOSS Data-CORE. This now includes more than 5 million data resources at different levels of detail: from large data series spanning the globe to individual measurement by a sensor in a specific area.

MYGEOSS is designed to increase awareness of the GEOSS Data-CORE, and other open environmental data, and promote their use for the benefits of society, particularly in Europe. Moreover, it aims to stimulate the demand for open environmental data by involving citizen science projects, citizen observatories, and the public at large via mobile applications based on EO products and services. To do so, the project envisages three open calls for innovative mobile or web-based application using openly available or crowd-generated data in different domains.

This report refers to the lessons learned from the first call for innovative apps.

2. The first MYGEOSS call for innovative apps.

The first call for innovative apps was launched on 18 March 2015. The call focused on developing applications of European relevance able to provide users with quantitative or qualitative information on the changing environment, e.g. change detection in climate, biodiversity, water bodies, coastal areas, built environment, green areas, forestry, agricultural land and crops, and atmospheric composition. The call included also other

¹ <http://digitalearthlab.jrc.ec.europa.eu/mygeoss/index.cfm>

² <http://earthobservations.org>

areas of application provided that they were addressing broad environmental or social themes across geographic scales. The call closed on April 30th and was a resounding success with 58 applications received from 13 countries: 63% of proposal from Small and Medium-Sized Enterprises (SMEs), 27% from Universities and research centres and 10% by individuals.

An international panel of experts evaluated the proposals received using as criteria: the relevance for use in Europe, the ease of use of the apps for non-expert users, the innovative characteristics of the proposed application, the contribution to environmental or social objectives including active citizen participation in data collection and analysis. It was mandatory that the data used for the proposed applications were available under the conditions of full and open access with no restrictions for reuse except attribution of the source. If data used was not part of the GEOSS Data-CORE, data from EU-funded projects, or other openly available or crowd-generated data that comply with the sharing and use conditions of the GEOSS Data-CORE, it was the responsibility of the participant to ensure that such data was in fact provided under the conditions of full and open access.

Nine applications were retained from the selection process and were awarded small contracts by the European Commission Joint Research Centre that is leading the project. The contract required three main deliverables:

1. A Data Management Plan to ensure that the data used or collected by the app is full and open access and that the GEOSS Data Management principles have been considered (data should be discoverable, accessible, usable, documented, preserved and curated as far as possible).
2. The first public release of the app with the related documentation and code (see <http://digitalearthlab.jrc.ec.europa.eu/mygeoss/results.cfm>).
3. A final report reflecting on the lessons learned during the development of the app including organisational, legal, and data-related issues, and recommendations for the European Commission helpful for MYGEOSS subsequent activities, and for future programmes aiming at the exploitation of GEOSS and other environmental open data.

The nine apps presented their results at the side event on Citizen GEOSS organised the European Commission during the GEO XII Plenary and Ministerial meeting in Mexico City on 10th November. The event included representatives from the private sector and the European Commission as well as other apps developed through the Interoperability Pilot programme of the Open Geospatial Consortium. The discussion at the end of the event was very fruitful and focused on particular on data access, data protection, IPR issues, and future commercial exploitation of the apps. The presentations made at the side event are available at http://digitalearthlab.jrc.ec.europa.eu/mygeoss/event_mx.cfm.

A selection of the apps was presented to Commissioner Moedas (RTD) on 12th November providing increased visibility to the project and its outputs.

3. The Lessons Learned

Table 1 clusters and summarises the key lessons learned by the 9 projects. The number in the right column indicates the number of projects expressing that topic. As shown, there is no clear pattern as each project has made its own reflection. This is consistent

the high degree of heterogeneity among the participants in levels of technical skills, size of organisations supporting them, and degree of maturity of the app itself (some had already a history of development behind them and came out as very polished and professional, others were fresh ideas brought to an initial testing phase but still needing further development).

Table 1: MYGEOSS Call 1, Lessons Learned

| Participating in MYGEOSS gave..... | Projects mentions |
|---|-------------------|
| Opportunity to develop/extend innovative ideas | 4 |
| Increased awareness of GEOSS and Open data | 2 |
| Increased awareness of data policy e.g. open data vs. proprietary | 2 |
| Increased awareness of data gaps in Europe particularly at urban/large scale | 2 |
| Improved data management | 1 |
| Improved documentation of data and apps | 1 |
| Open code gives opportunities to build community/improve apps | 1 |
| Increased visibility of the apps | 1 |
| Increased knowledge of different open source data libraries | 1 |
| Increased awareness of lack to machine-to-machine interfaces to exploit open data | 1 |
| Increased awareness of data management challenges with near-real-time data | 1 |
| Awareness of the need to focus on good design | 1 |
| Awareness of the need to focus on 1-2 core languages to start with | 1 |

An additional lesson was learned by the project's team in extracting some key datasets from the GEOSS Data-CORE that could be potentially useful to participants as a basis for their applications. This process yielded a number of useful insights that whilst specific to GEOSS and its Data-CORE are also applicable in a broad sense to all Open Data initiatives.

The key lesson is that opening data and removing barriers to its sharing is a necessary first step to enable access and use of the data but is not enough. Data resources need to be well signposted, easily accessible and well tagged. This generic good practice is not easy to apply to GEOSS where the scientific datasets are often very large and complex and it is not possible to adopt the Linked Data approach and 5-star rating of many open data initiatives, which largely deal with documents or relatively small datasets. Therefore GEOSS users have often to trek from the results of an initial query in the GEOSS web portal to the web site of data providers and then refine searches by spatial and temporal extent, identify which of the many variables they are interested in etc. before they can access the data. This suits the specialist user already familiar with the types of data and the approach to data delivery, but would require a significant degree of data preparation and pre-processing to satisfy the needs of non-specialist users. This is a limitation but also a potential opportunity for the private sector, including SMEs, to act as intermediaries and create information products more suitable to generic users.

MYGEOSS is contributing to raising awareness about the GEOSS Data-CORE and GEOSS in general among organizations and SMEs not previously aware of this opportunity. It is evident from the first call that none of the applicants were aware of the GEOSS Data-CORE or in many cases of GEOSS as such. The apps therefore used only in very few cases the data available in GEOSS. They will provide new data in the GEOSS Data-CORE as a result of the call, but the lessons learned during this process have also led to recommendations to the GEOSS Infrastructure Board, and the GEO Secretariat, about a new approach needed to link better the needs of scientific and policy users and the data available in GEOSS. This new approach has been accepted, at least in principle, and we hope it will be implemented starting from 2016 in the new phase of GEOSS 2016-25.

4. The Recommendations

Table 2 provides the list of recommendations given by the 9 projects. Here we can see a clear first group of 4 recommendations with considerable support: providing more information from the outset of the project, supporting the creation of a community among the developers of apps in the various calls to share experience, and advice on how to link the data created by the apps to GEOSS, as well as manuals and best practices to support the app development. All the other recommendations are mentioned only once. In some cases they will be followed up where possible (e.g. keep process simple, speed up contracts), while others are beyond the scope of the project (e.g. numbers 12 and 13). The next section indicates how the project is responding to these recommendations.

Table 2: MYGEOSS Call 1: Recommendations

| Ref. no. | Recommendation | Projects mentions |
|----------|--|-------------------|
| 1 | More information at the start of the project on aims, contractual issues, IPR and exploitation issues, open vs. proprietary data pitfalls/ Web based tutorial on licenses/how to handle legal issues | 5 |
| 2 | Link present and future applicants to develop a community and share solutions Discussion forum | 5 |
| 3 | Provide metadata editor and instructions on how to submit data and services created to GEOSS | 4 |
| 4 | Best practice manual for apps development/Libraries of open source tools to develop/share solutions | 3 |
| 5 | More market oriented training on business plans, and exploitation | 1 |
| 6 | Keep application process simple | 1 |
| 7 | Speed up contracts | 1 |
| 8 | Extend time to develop app | 1 |
| 9 | Common methodologies for data quality assessment | 1 |
| 10 | Require in future to publish observations using OGC profile of SWE when finalised | 1 |
| 11 | JRC to provide environment server to develop apps and preserve data after end of project | 1 |
| 12 | Tutorial on linked data | 1 |
| 13 | Improve GEOSS portal | 1 |

5. MYGEOSS Response to Recommendations

Table 3 indicates how the MYGEOSS project is responding to these recommendations so that the second call winners already benefit from the lessons learned and recommendations of the first group of applications. The MYGEOSS Second Call was opened on 15 September 2015 for 2 weeks and resulted in 42 applications from which 15 were selected for funding.

| Recommendation | Project Response |
|---|--|
| 1) More information at the start of the project on aims, contractual issues, IPR and exploitation issues, open vs. proprietary data pitfalls/ Web based tutorial on licenses/how to handle legal issues | For the winners of the second MYGEOSS call we organised 2 web conferences to ensure all 15 winners were given a clear picture of the project aims, methods, and expected outcomes. IPR, legal and contractual issues were all addressed to the satisfaction of the participants. We intend doing the same for the third call. |
| 2) Link present and future applicants to develop a community and share solutions Discussion forum | We will set up a MYGEOSS Forum to which all participants in the 3 calls can share experiences, knowledge, tools and tips. Expected to be launched in early 2016. |
| 3) Provide metadata editor and instructions on how to submit data and services created to GEOSS | JRC is developing catalogue for selected citizen science projects in which the data created by MYGEOSS apps will be documented and made discoverable and accessible. The catalogue will then be linked by JRC to the GEOSS Common Infrastructure so that the individual projects do not have to do it themselves. Expected release early 2016. |
| 4) Best practice manual for apps development/Libraries of open source tools to develop/share solutions | We will encourage the developers to add pointers in the MYGEOSS Forum (see above) to support the community. |
| 5) More market oriented training on business plans, and exploitation | Out of scope of MYGEOSS, which is a research project. Nevertheless we will provide increased opportunities through international events and through the publication of the open code to exploit the work done. |
| 6) Keep application process simple | We will try our best to do so. |
| 7) Speed up contracts | We are doing our best but it is beyond our immediate control |
| 8) Extend time to develop app | The length of the MYGEOSS project is 2 years and to have multiple calls with a process of learning from one to the next |

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| | constrains the opportunities. The goal is also to develop a first public release not necessarily a fully fledged app. |
| 9) Common methodologies for data quality assessment | Very specific to the app that mentioned it, but in general will try and support it. |
| 10) Require in future to publish observations using OGC profile of SWE when finalised | We are working with this profile at JRC and will promote it when released. |
| 11) JRC to provide environment server to develop apps and preserve data after end of project | We are developing the infrastructure to preserve the data together with the catalogue mentioned above. A server for development is more difficult given our cyber-security protections. |
| 12) Tutorial on linked data | Out of scope but we can provide a link to existing if needed. |
| 13) Improve GEOSS portal | We share the aim but out of scope of MYGEOSS. |

6. Conclusions

The key objectives of MYGEOSS are to raise awareness in Europe, and among SMEs in particular, about GEOSS, and to stimulate innovation based on the full and open access data available in the GEOSS Data-CORE, as well as other open access data available through other public sector initiatives. The mechanisms of open call for innovative ideas on a broad canvas of application domains related to the environment has proven very effective as the response has been strong, and the selected applicants have delivered their apps, and open code, in time. Some of the apps are very well developed as they build on some previous history, others are just initial prototypes but the publication of the open code provides an opportunity now for others to build on the initial investment made by the project and develop the apps further.

This report has presented the lessons learned by the participants, and their recommendations. It has also indicated how the project is now responding to these recommendations to strengthen its impact. Measures to build a MYGEOSS community of developers so that they can share their experiences during the lifetime of the project is a very important recommendation, which then will also help us to follow after the end of the project the evolution of the apps, and assess the long-term impact of the project.

As project team, we are satisfied that the overall approach taken to stimulate innovation has delivered. In particular we see that in addition to the app, it was very important to ask the participants to develop a data management plan and a final report reflective of their experience and focusing on recommendations on how to improve the process. The data management plan has proven valuable in raising awareness among the participants of good data management principles (as adopted by GEOSS), while the recommendations made, and the action that follow to take them on board, creates a spiral of iterative learning which yields useful insights into the process of data-driven innovation.