EARSC Position Paper

on

Industry Access to Copernicus[1] Sentinel Data

The practical aspects of Copernicus Data Policy

The European Association of Remote Sensing Companies, EARSC represents the Earth Observation geo-information services companies in Europe. Today EARSC about 65 members coming from 20 countries in Europe and including nearly 50% of the total number of European EO service companies. Over 60% of these are small or medium sized enterprises. Our members include both commercial operators of EO satellites and downstream, value-adding companies. The sector plays a key role in providing value-added geo-spatial information to its customers in Europe and the world. In 2010, the revenue of EARSC members is estimated to be around €700m and giving work to around 2600 highly skilled employees. The industry is growing at around 10% per annum.

[1] Copernicus was formerly called GMES (Global Monitoring for Environment and Security)

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Introduction

Considerable discussion and exchange of views has taken place amongst stakeholders concerning the appropriate data policy for Copernicus Sentinel data[2] and in particular the introduction of a free and open policy. Representing the view of the EO services industry, EARSC has been supporting the view that the data should be free and has recently completed a study[3] looking at the impacts of such a policy. The study examines the consequences of a free and open data policy and makes a series of recommendations on steps that would help grow the EO services industry.

The industrial view supporting this policy is based on the perspective that the greatest benefit accruing from Copernicus will come from having free and open access to this new, public data. Industry expects to exploit the Copernicus Sentinel[4] data through developing new business with commercial (ie non-public) and export (ie non-EU) customers.

That being said, the industry also includes commercial data providers which expect a negative impact on revenues by virtue of free and open data policy unless adequate measures are taken. Private satellite operators - some with the support of Member States and the EU - have made large investments to build, launch and operate a number of satellite systems. Full and open access to Sentinel data will present a direct challenge for these data providers, where off-setting market growth may take considerable time to develop. Private satellite operators have played a fundamental role in the GMES pre-operational phase by complementing data available through ESA satellites. This role has demonstrated repeatedly that it is in the best interest of the EU to have a strong private satellite operators' industry sector. Hence a free and open data policy must be accompanied by measures which help the transition of the European commercial data providers' business models.

More recently, industry focus has turned to the practical aspects of a Free and Open data policy and how companies will be able to obtain imagery to be used for commercial business. It may be fine that the data is free but this is of no consequence if industry / companies are unable to access it. This has led to an exchange of information on the practicalities of the data access which gives rise to a number of concerns which are considered in this short paper.

Public Goals

Copernicus is a public programme for public use and the design and construction of the system is correctly focused on serving the European public sector needs. Notwithstanding, it also has an important goal to develop the European EO services industry. EU Regulation 911/2010 sets out the following objectives to be served by Copernicus data and information policy:

- Promoting the use and sharing of Copernicus information and data;

[2] By Sentinel data we refer to the data coming from the Sentinel satellites as processed by the Sentinel Core Ground Segment. For higher level products generated through the Copernicus Services we refer to Copernicus information
[3] About GMES and Data : Geese and Golden Eggs. Geoff Sawyer & Marc de Vries, December 2012.
[4] . The paper only considers access to data from the Sentinel satellites and not Contributing Missions that have their own specific data policies. Sentinel satellites are intended to address the current data gap in Europe and to complement the existing and future national commercial missions named Contributing missions; such policy of complementary should remain for the next generation.

- Strengthening Earth observation markets in Europe, in particular the downstream sector, with a view to enabling growth and job creation;

In addition, it will support other EU policies in developing competitiveness and with a particular focus on industrial growth.

If these goals are to be met, it is important that the needs of industry can be included together with those of the public sector. Whilst many of these needs will be the same or compatible, some will need facilities which differ. Whilst it is clear that the public needs will take priority, provided that industry ones can be met without conflict then these should be considered in order to maximise the industrial exploitation potential.

Gathering Requirements

ESA is designing the Copernicus Sentinel Core Ground Segment to meet requirements set out by the EC and Member States (MS). Consultations have been held during 2011 and 2012 where MS national representatives have been asked to provide their requirements. The responses are being used to define the first High Level Operations Plan (HLOP).

No formal engagement has been taken with the EO geo-information services industry[5] in this consultation. In some MS, companies have been consulted for their views but this has not been consistent and in most cases no industry input has been included. If the services industry is to exploit the Copernicus Sentinel data in a meaningful way then the views need to be incorporated in the design of the Sentinel data processing chains and in the planning of acquisitions as detailed in the HLOP as well as being consistent with the Copernicus Data and Information policy currently being prepared by the European Commission.

The first goal is to understand what the services industry needs are. We can then look to see how far these can be met with the system as it is being designed and constructed today. Finally we shall need to see how any gaps could be filled.

Industry Needs

At a recent workshop[6], companies outlined some of the requirements that they believe would enable them to do business:

- Imagery from anywhere on the earth's surface available in Europe.
- Imagery that is easily discoverable and easy to identify as covering a particular location on the ground. This implies that available imagery is geo-corrected (level 2/3).
- SAR imagery in coastal areas - which has consequences for the mode changing of the sensors.

[5] EARSC represents the EO geo-information services industry in Europe; which is sometimes referred to as the "downstream services industry". The EO geo-information services industry sells geo-information products in which some part of satellite data has been used for their generation. For simplicity we shall often shorten this to the "services industry".
[6] EARSC Data Policy working group met with ESA on 27th November 2012.

- Early knowledge (1 to 3 months ahead) of what imagery will be available and when[7].
- Assembly of imagery data together with in-situ data (metocean, atmospheric corrections, AIS, land measurements etc).
- A combination of SAR and optical imagery with observations taken within a short time of each other.
- Near-real time availability[8] (critical for many applications).
- Adequate bandwidth to allow data to be downloaded in a short time.
- Available as standard OGC compliant web-services.

These are only some of the requirements that were expressed during the recent workshop. This was also the first time that many industry representatives had information on how the Copernicus Sentinel core ground segment would operate. It is likely that more requirements could be identified through a more detailed consultation.

Who has Access?

Access to the data is expected to be granted according to the priorities:

- As a partner within a consortium offering (running) a Copernicus service. This will include some EO service companies namely those that are successful in bidding to supply the services. Many of the partners are public sector bodies.
- As a user of a Copernicus service. Users will be defined through the governance scheme where European public sector bodies will authorise the use of services. It is expected that this category of users will be other public bodies but it could be defined to include industry.
- Through national collaboration. Some Member States are setting up facilities to access data either through a collaborative ground segment (download station) or through mirror sites for data. Terms of access will presumably be defined by the Member State making the investment in facilities. The extent to which EO service companies have access will depend on national policy and would presumably favour companies from the MS concerned.

Further options are also being discussed regarding:

- Science users
- Partners to international projects
- Other authorised users

[7] For clarity, this should include specific planned acquisitions (including mode, beam, etc.), refreshed as often as required subject to any security restrictions.
[8] Near-real time deliver requirement will be in (tens of) minutes rather than hours.

There seems to be a lack of clarity regarding the formal access that can be granted to European EO service companies. Unless they are part of a Copernicus Service team or are recognised through a national facility there does not appear to be any particular arrangement through which the services industry can access data.

Two issues need to be resolved:

1. The capacity that will be available for downloading of data which should be adequate to accommodate EO service company's needs.

2. The legal entitlement to have access to and use the data which for the moment does not appear to be the case.

In line with earlier recommendations coming from the industry[9] a registration system and download control mechanism should be established that will ensure that European companies can legally benefit from the products and services developed for Copernicus.

Given the potential strong global interest to access data, the European services industry wish to benefit from a preferential system of access, with adequate bandwidth, that will ensure data-download or access via OGC compliant web-services is possible without bottlenecks or delays arising from demand coming from non-EU commercial or indeed non-EU public users.

What data will be available?

For industry to do business using the Copernicus Sentinel data, a number of needs must be met:

1. Acquisition of data.

Data / imagery will be acquired by the satellites according to a mission plan. This will detail not only the area of the ground to be imaged but also the mode of the instrument, the downloading of the data and in some cases, the products that will be produced on the ground. Clearly this will be driven first and foremost by the needs of the Copernicus services for public sector users.

Ideally, companies would like to be able to also place requests for products that they can use to meet commercial customer requirements or to influence the acquisitions requested by other users. Our understanding is that that order of priority for setting acquisitions into the mission plan will be:

a. Copernicus services
b. National requirements
c. Other users including international partners

In this case industry requests would be considered with the lowest priority, unless the company is a member of the team delivering Copernicus services, or if the company has access to the Member States priority through national arrangements. The latter will depend on the readiness of national

[9] EARSC Position paper on GMES Data and Information Policy, October 2011.

representatives to take on-board requests coming from industry which, as we noted earlier, depends greatly on the national disposition and organisation and which in some cases strongly favours public sector bodies.

The first requirement is that the required data is acquired. This means that either industry has the possibility to place observation requests or that they can exploit the data that is already being acquired for the public sector.

a) Acquisition requests: It is clearly recognised that priority for acquisitions will apply primarily to the SAR instrument on Sentinel 1 which will be programmed since Sentinel 2 will operate in a fixed observation mode. The priority for acquisition planning will be from the public sector with the Copernicus services having highest priority, then Member States requesting data and finally others.

b) Planned acquisitions: the acquisition plan will need to be published to allow companies to know what is planned and to offer products and services based upon the images and data that will be available.

How can industry influence the acquisition plan so as to be able to promise a client that a certain product will be delivered?

2. Which Products will be available?

Sentinel data products should be available in near-real time, when appropriate, with as short a delay as is practical before being accessible by the industry.

Processed products should be available from an archive together with the necessary meta-data to facilitate the search, selection and download of datasets.

The availability of information products needs to be examined in more detail. As a minimum, the products should be listed and discoverable through the core ground segment and easily searched, selected and downloaded from whichever servers or sources or designated. Capacity for download must be adequate although it is recognised that this is difficult to define with accuracy today.

A concern has been expressed about the availability of geo-referenced data which is currently only foreseen through a core service and not through the core ground segment. Current technology would allow all data to be geo-referenced as part of the core ground segment processing chain which would in turn avoid the need for this task to be performed multiple times as a part of each Copernicus service processing chain. Such an approach would help all users not just the industry.

Currently foreseen Capabilities

The Copernicus Core Ground Segment will provide:

- Systematic acquisition planning for pre-defined areas or globally depending on the instrument.
- Systematic generation of a list of defined, level 1 products.

- On-line distribution of data products including dedicated links to the Copernicus services.
- User registration and data access tools

These capabilities will reflect the application of the Copernicus Sentinel data policy.

It is understood that this covers only the level 1 products coming from the Core Ground Segment. A similar capability is needed for the higher level data and information products generated by the Copernicus Services or by other collaborators with the Sentinel operations.

Conclusions and Recommendations.

As a result of the first exchange with ESA, we have identified a number of areas where it would appear that the anticipated free and open data policy alone will not achieve the desired results due to some practical, conceptual or financial limitations on data access. Some of these may be fixed quite easily whilst others will need further consideration.

We recommend that:

- A formal consultation with services industry is initiated without delay. EARSC is ready to act with the public authorities to help this.
- The consultation is aimed at allowing European EO service companies to express what they believe would be their needs to access and use Copernicus Sentinel data in order to exploit it in new markets (commercial and export).
- Based on the requirements that are defined through the industry consultation, a programme must be established to ensure as far as possible that the Copernicus Core and collaborative Ground Segment is able to meet these needs.
- Based on our preliminary assessment the following steps should be taken:
  - Ensure that the acquisition plan is made available to industry as early as possible each time it is changed, up-dated or refreshed.
  - Provide means for industry to be able to influence acquisition plans and with as high a priority as is possible and with transparency on the conditions whereby decisions are taken.
  - Ensure that all European EO service companies have the an adequate legal and technical framework to download imagery as soon as possible after acquisition
  - Ensure that the products available are optimised to minimise the duplication of effort and to maximise the ease of access.
  - Ensure that all products (data and information) at all levels are easily discoverable and in the appropriate formats.

We consider that a Free and Open data policy should be implemented with the potential to offer a strong stimulus to the European EO geo-information services industry; it is in the interests of all parties to ensure that this is realised.