

→ SENTINELS COLLABORATIVE GROUND SEGMENT WORKSHOP MAY 2015

Executive Summary

BACKGROUND

The Sentinel family of satellites is being developed to meet the operational needs of Europe's environment monitoring programme, Copernicus. The first in the fleet, Sentinel-1A, was launched in April 2014 and began its operational life in October 2014. Sentinel-2A is planned for launch on 23 June 2015.

Copernicus is the European Union's Earth Observation and Monitoring Programme, headed by the Commission. ESA coordinates the delivery of data from upwards of 30 satellites, comprising the Copernicus dedicated missions (Sentinels) and the Copernicus Contributing Missions. The COM is responsible for the overall initiative, setting requirements and managing the Copernicus services.

The Copernicus Space Component (CSC) – coordinated by ESA – includes the development and operations of the Sentinel satellites, as well as the distribution of the acquired Earth observation data. All Sentinel products managed by ESA is currently freely accessible online for the worldwide user community at sentinels.copernicus. eu and will soon be available on www.copernicus.eu

In addition to that, ESA facilitates cooperation activities with its Member States participating to the ESA GSC programme (including Canada) for direct and efficient access to Sentinel data. In the framework of the Sentinels Collaborative Ground Segment, potential activities of those countries are the set-up of a national mirror site, employment of own local receiving stations, development of innovative data processing tools and applications and complementary calibration/validation activities. In any ESA Member State, various initiatives and entities can be involved in the cooperation. Therefore a National Point of Contact bundles the flow of information between the national entities and ESA.

Under the lead of COM, ESA will implement a similar cooperation scheme also with those EU countries, which are not part of ESA, and with international partners.

WORKSHOP CONTEXT

The Sentinels Collaborative Ground Segment (CollGS) workshops provide a platform for information and discussion between ESA, the National Points of Contact, national entities involved in the cooperation and COM. The workshop succeeds the yearly meetings of the "GMES Operations Consultation Group", which started in 2010. In order to foster coordination among the CollGS initiatives, it was decided to organize the workshop twice a year from 2015 on.

The workshop objectives were to:

- Present the latest Copernicus Space Component (CSC) status (programmatic & technical)
- Update on the various Member States Sentinels Collaborative Ground Segment initiatives
- Promote the coherence between the CSC ground segment, and MS's collaborative initiatives
- Provide a forum for participants to harmonise their plans
- Address specific issues in plenary and bi-laterals

In particular the workshop focused on Member States initiatives addressing higher-level products & services.

The workshop took place on the 28th May 2015 and was hosted by the Italian Space Agency (ASI) at the "Centro di Geodesia Spaziale" in Matera, Italy. The workshop saw attendance by 41 national participants representing 17 countries. Further, European Commission and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) were also represented.

During the first part of the workshop, ESA presented the overall EO ground segment evolution strategy, whose definition is being pursued by ESA in close coordination with all involved stakeholders (e.g. Member States, Commission, Industry, users). COM presented the overall programmatic status of the Copernicus programme, including in particular the future coordination of ground segment activities in the frame of a dedicated Copernicus Ground Segment Task Force, which will meet for the first time on 7 July 2015.

ESA presented the latest status of the Copernicus Space Component, including the current programmatic set-up, the overall technical implementation status, the observation scenarios of Sentinel-1, Sentinel-2, Sentinel-3 and Sentinel-5P, and the status of the Sentinels and Copernicus Contributing missions' data access. There was a particular focus on the future development of the CSC ground segment and its consistency with the Sentinels CollGS initiatives by Member States.

The second part of the workshop was dedicated to presentations

from Member States regarding progress of the own CollGS initiatives. Ten presentations provided details on the various ongoing and planned national activities.

The third part of the workshop was dedicated to the presentation of CSC ground segment evolution towards an integrated approach. In this context two specific initiatives were presented: the 'Sentinel-1 European WW Persistent Scatterers (PS)' and the integration of the data hub relays and CollGS mirror sites.

The final round table provided the occasion to discuss the future evolution of the Sentinels Collaborative Ground Segment in coherence with the CSC ground segment development.

WORKSHOP HIGHLIGHTS

Participants emphasized the usefulness of the workshop, as the forum to coordinate the various CollGS initiatives. The main highlights of the workshop are summarized below.

The status of the recommendations from CollGS workshop December 2014 were reviewed. All actions have been implemented.

Both the Copernicus Space Component ground segment and the national Sentinel CollGS initiatives have demonstrated a significant development over the last months. Participants were positively impressed by the data provided by Sentinel-1A and by the enhancements of the data access infrastructure provided by the CSC ground segment. Many national activities, in particular Sentinel data mirror sites, generation of high-level products and services, and local acquisition stations have reached operational status or are close to it. Sentinel data is being used operationally by services from many different application fields.

ESA presented the Sentinels' mission status and observations scenarios, as well as the operations and evolution of the CSC Ground Segment. Data access operations of the open access hub have proven to satisfy requests of the worldwide user community. The ingestion of upcoming Sentinel-2 data and its dissemination will be a major challenge for the operations in 2015. As recommended at the previous CollGS workshop, the data retention capability of the rolling archive and access to historical Sentinel data have been enhanced The future evolution of the CSC GS is foreseen to include additional features, e.g. dedicated connection to the GEANT network, hosted processing capabilities, federated user management and research and support services.

CollGS agreements between ESA and seven of its Member States have been signed. Further signatures are planned for the coming weeks and months. A new chapter to the Technical Annex template covering the definition of collaboration ion the field of additional Sentinel data services and products will be proposed by ESA to the National Points of contact.

Sentinel data is distributed under a free and open data policy. COM is currently reviewing the licence document, which governs the usage and distribution rights for users, in close cooperation with ESA. A "Legal Notice" is intended to replace the current Terms and Conditions document. The Legal Notice will not limit the free and open access principle and access rights by ESA Member States will particularly be preserved.

COM presented the overall programmatic status of the Copernicus programme. A Task Force is being set-up by COM to encourage the coherence, complementarity, interoperability and cost-effectiveness of the CSC Ground Segment, national Sentinels Collaborative Ground Segments, and Copernicus Services. The Task Force will be comprised of representatives from COM, ESA, Eumetsat, EU Member states and Copernicus participating countries. A first meeting is tentatively planned for early July 2015, in the margins of the Copernicus Committee in Brussels.

The complementarity of the CSC GS and Sentinels CollGS frameworks enables the definition and implementation of large scale European proposals to maximise the exploitation of the Sentinel missions within the Copernicus programme. Two specific cases were presented to illustrate a potential approach for a Sentinels large scale initiatives allowing CSC GS and CollGS integrated contributions:

- The 'Sentinel-1 European WW Persistent Scatterers (PS)', with an overarching objective to prepare and maintain a European datasets and database of World Wide Persistent Scatters (PS) for public usage;
- The integration of the data hub relays and CollGS mirror sites, with an overarching objective to feature rolling archives (spanning 1 to 3 months worth of products) operated by collaborative centres and open to scientific / Other users

These two proposed initiatives could serve as use cases and pilot to support the Copernicus Ground Segment Task Force in the definition and consolidation of the process addressing the programmatic elements relevant to the Integrated Ground Segment (e.g. Governance, Data and information policy, IPR handling)

National representatives presented plans and implementation of CollGS initiatives. Services and projects are already using Sentinel-1 data operationally in the fields of e.g. sea ice monitoring, land use inventories sea wind analysis. Sentinel data mirror sites are being set-up to serve the national and wider user communities. Acquisition stations, listening-in to the Sentinel-1 data dumps to Core ground stations, aim at acquiring data in NRT and provide it to the selected services.

Many countries demonstrated significant progress from planning to implementation of their CollGS initiatives during the last months.

WORKSHOP RECOMMENDATIONS

- Workshop representatives from several Member States indicated that the need for Sentinel-2 L2A regional products tailored to National requirements should be considered in the frame of the on-going L2A feasibility study being coordinated by ESA and/or within their Collaborative ground segment activities.
- It should be possible to access Sentinel-3 Marine L2 products from the Collaborative data hub
- The management of configuration control and versioning of core and collaborative products should be consolidated and standardized
- Links to MS CollGS Portals should be added to the Sentinel Online Portal to further promote them
- The close connection between the CSC ground segment evolution and national Sentinels CollGS initiatives was underlined. In the future CSC ground segment evolution, Member states' investment in Sentinel data acquisition, storage

and dissemination needs to be considered. Several Member states are awaiting the CSC ground segment evolution before defining their strategy in CollGS initiatives.

- As concerns the Commission Copernicus Ground Segment Task Force, Participants recommended the following:
 - Workshop representatives from several Member States indicated that the contribution of Copernicus to GEO and COP-21 should be included in the Copernicus GS Task Force under the list of short term items
 - The evolution of the 'terrestrial network interconnectivity' between CSC GS and CollGS should be included in the Copernicus GS Task Force under the list of short term items
 - The process to be adopted to transition products and services provided by CollGS to become part of Copernicus should be included in the Copernicus GS Task Force under the list of short term items
 - The integration of MS mirror sites to enhance the reliability of the CSC GS data access should be considered as 'use case initiative' in the frame of the Copernicus Integrated GS
 - The Sentinel-1 global PS initiative should be considered as 'use case initiative' in the frame of the Copernicus Integrated GS
 - Services and Value Adding projects on national level, already using Sentinel data can contribute to a larger picture of use cases in the frame of the Copernicus Integrated GS and provide Sentinel data requirements

ESA will follow up these recommendations and report on the status of their implementation at the next Sentinel CollGS workshop, foreseen to take place in Brussels at the end of 2015

