

2016 Achievements and Way Forward

CEOS Land Surface Imaging Virtual Constellation (LSI-VC)

The CEOS Land Surface Imaging Virtual Constellation (LSI-VC) was renewed at the 2015 CEOS Plenary in Kyoto, Japan. Since then the team has made great progress on the tasks outlined in its Implementation Plan, and has supported the emerging and evolving needs of the CEOS Future Data Architectures *Ad Hoc* Team.

In just 12 months the LSI-VC has quickly found its feet – confirming agency leads and members, holding two very successful team meetings, and advancing in the following key areas that cross-cut many CEOS activities.

The LSI-VC is led by ESA (Bianca Hoersch), GA (Adam Lewis), and USGS (Jenn Lacey) and has over 20 members representing 12 agencies (CNES, CSA, CSIRO, DLR, EC, ESA, GA, ISRO, JAXA, NASA, NOAA, USGS).

CEOS Analysis-Ready Data for Land (CARD4L)

In 2016 LSI-VC took the lead of the CEOS Analysis-Ready Data (ARD) definition, which will underpin many CEOS activities including Data Cubes and other future data distribution architectures. The LSI-VC ARD definition document sets out the high-level attributes of CEOS Analysis-Ready Data for Land (CARD4L).

In 2017 LSI-VC will **coordinate oversight of the production of CARD4L for the CEOS Future Data Architectures pilots**, clarifying the geographic locations, applications, time periods and desired temporal frequency of observations and working with agencies to supply CARD4L compliant products. Attention also turns to a **Synthetic Aperture Radar (SAR) ARD product** as well as a **Specification Framework for CARD4L**. A team was assembled in late 2016 and a draft document has been initiated.

The application of SAR data for analysis remains a niche, with potential users often stating that the burden of data processing—requiring specialised knowledge—is a large obstacle. By defining and supplying a SAR ARD product, CEOS agencies can help users overcome some of these complications, giving them access to new and unique data sets that not only provide extra information but also avoid issues caused by cloud cover.

CARD4L Specification Frameworks are built around the idea of minimum- and aspirational-level specifications for general metadata, per pixel metadata, radiometric measurement corrections, and geolocational correction, and will ensure a level of consistency between the ARD being generated by different agencies, while allowing necessary flexibility.

Requirements Analysis and Thematic Acquisition Strategies (including the *CEOS Strategy for Carbon Observations from Space*)

At SIT-31 (April 2016) CEOS was asked to consider how to move forward in managing the multitude of thematic observation strategies that CEOS finds itself presented with—in relation to carbon, water, forests, agriculture, disasters—consistent with the capacity available within CEOS and agencies, whilst recognising the opportunities that they represent.

LSI-VC responded to this call, investigating approaches for gap analyses and requirements assessment, including the use of agency/country tools and CEOS information systems. LSI-VC

has identified that it can play a key role in bringing together requirements (from various communities of practice, using a common framework) and the necessary observing capabilities, and is taking steps to establish a standard **'CEOS Approach' to LSI requirements and capabilities analysis**.

While LSI-VC's work to date around the *CEOS Strategy for Carbon Observations from Space* has been mostly limited to initial scoping and understanding, it is expected that, in coordination with the CEOS lead for the implementation of the CEOS Carbon Strategy, carbon could be the initial test case for the 'CEOS Approach'. This work will be investigated further in 2017.

In search of further efficiencies and a unified approach to requirement analysis and data acquisition, CEOS agency representatives responsible for the work of the CEOS *ad hoc* Working Group on GEOGLAM, the CEOS Space Data Coordination Group for the Global Forest Observations Initiative (SDCG for GFOI), and LSI-VC are taking steps to better integrate and unify land surface imaging activities within the CEOS structure. Coordination began in 2016 with representatives of the SDCG for GFOI and the CEOS *ad hoc* Working Group on GEOGLAM joining LSI-VC-1 and LSI-VC-2 respectively. A formal joint meeting of all three groups is planned for late 2017. It is expected that the meeting will also help advance LSI-VC's work around the *CEOS Strategy for Carbon Observations from Space*.

Moderate Resolution Sensor Interoperability Framework

LSI-VC will lead the USGS 2017 CEOS Chair Priority on a Moderate Resolution Sensor Interoperability Framework. The framework will cover radiometry, geometry, data formats, and data access, with the aim of supporting the generation of interoperable products on an operational basis.

Management

In early 2017, the LSI-VC will revise its Implementation Plan to reflect the evolution of CEOS priorities.