**Terms of Reference for the CEOS Land Surface Imaging Virtual Constellation**

Satellites that image the land surface have been in operation since 1979. There are now numerous land remote sensing satellites in operation across many space agencies, many of which are represented in CEOS. Data volumes are large but they are also highly adaptable, providing valuable information across many of the Group on Earth Observations societal benefit areas. This presents great opportunities to use these assets to serve many different domains. But it also presents great challenges, including in ensuring that the use of these assets is optimized to avoid important data gaps, in making it easy for users to interact with such vast amounts of data, and in supporting downstream users to enable them to seamlessly utilize the data generated from so many different systems.

**Purpose:**

The Land Surface Imaging Virtual Constellation’s (LSI-VC) exists to promote sustainable and systematic collection of satellite-derived land surface imaging observations, and to coordinate production and fundamental, non-domain specific, measurements derived from those observations to support a maximum number of downstream uses.

**Objective:**

The LSI-VC aims to optimize the use of existing assets, and coordinate development of new assets, to:

* facilitate maximum uptake of land surface imaging observations and the fundamental measurements derived therefrom across domains, supporting all those who develop products and systems for specific domains.
* promote program efficiency, increase resilience and redundancy in supply chains, and avoid unproductive overlap and duplication, in doing so.

Remit:

The remit of the LSI-VC is to facilitate coordinated and optimised land EO contributions from CEOS agencies to facilitate access to fundamental measurement products in support of confirmed/validated requirements linked to adopted CEOS priorities. These priorities are typically derived from key stakeholders, such as UN agencies/programs and GEO.

  Scope of space assets concerned:

All instruments that generate data that can characterize the land surface, and the organic and inorganic material on it, are in scope. This includes space-based remote sensors operating in the visible, infrared and microwave portions of the electromagnetic spectrum.

The LSI-VC will work with satellite operators with commercial or semi-commercial models, noting that it is better that an observational gap is filled by such data than not as data policies can change.

Activities:

The scope of activity includes:

* Assessing confirmed derived product requirements, identifying the fundamental measurement products that would be required from land surface imaging assets to meet them, and undertaking gap analyses.
* Coordination of mission development to ensure the overall set of space assets is optimized to support the overall package of validated derived product requirements.
* Coordination of acquisition planning to optimize asset use, and resolve conflicts between competing requirements, while promoting resilience and redundancy.
* Coordinating the retrieval, and reprocessing, of historical data to fill gaps in historical archives where required to support validated time series analysis.
* Coordination (along with the CEOS Working Group on Calibration and Validation (WGCV)) to promote implementation of consistent calibration and pre-processing approaches so that observation data are used to produce comparable fundamental measurement products for user benefit.
* Coordination in implementing and operating systems (such as those being developed by the CEOS Systems Engineering Office and the Working Group on Information Systems and Services) that lower the barriers to entry for the downstream user communities by enhancing access to these fundamental measurement products to enable production of derived products.

The scope excludes:

* Generation of domain-specific derived products.
* Engagement with domain-specific user communities.
* Specific coordination of ground stations or other ground infrastructure that is tightly coupled to a specific satellite system.

The CEOS Priority Actions are main drivers for the group with the current LSI-VC focus on:

• Improved coordination support of Space Agency terrestrial collection activities to support key GEO initiatives that CEOS has endorsed to include climate initiatives (WG Climate), disaster risk management (including recovery observatories) (WG Disasters), global agricultural monitoring (GEOGLAM) and global forest monitoring initiatives (GFOI), carbon, surface water;

* Coordinate the supply chain to the point where fundamental measurements (not “end user” ready products) to support well-defined land surface user requirements are routinely and sustainably produced.
* User requirements would be “fed in” from working groups as they are defined with user communities and stabilized.
* Includes mission development, acquisition coordination, dissemination of the data to users (including those developed under the auspices of WGISS), and may include the production of fundamental measurement-based data products.

• Investigating ways LSI can integrate or utilize outputs from CEOS Quality Assurance for Earth Observations (QA4EO) efforts.