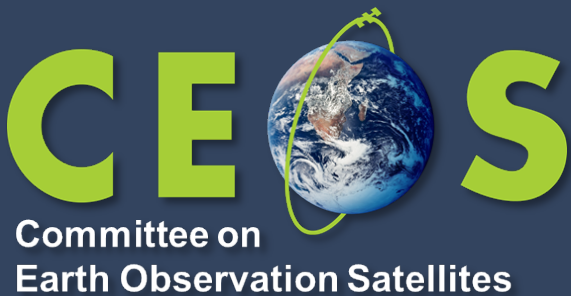


WG Disasters 20 (presential & virtual) 2023

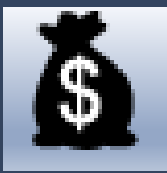
*New Space Task Team
Results and Next Steps*



Helene de Boissezon ,
CNES, WGD Chair
Laura Frulla, CONAE, WGD
Vice -Chair

Agenda Item: 12

WG Dis -20 2023, USGS
5th - 9th September 2023



CEOS New Space Task Team



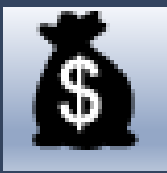
The topic of New Space was introduced in CEOS by the 2022-2023 CEOS Strategic Implementation Team (SIT) Chair as one of the SIT's strategic priorities. A New Space Task Team was endorsed at the 2022 CEOS Plenary for one-year to explore collaboration opportunities in New Space that bring mutual benefit to all parties, including the identification of concrete initiatives that will drive the agenda forwards.

The New Space Task Team is led by the CEOS SIT Chair with membership open to representatives of all CEOS Agencies and all CEOS entities. The CEOS Working Groups, Virtual Constellations and *ad hoc and Task Teams* play a key role in the definition and implementation of CEOS activities that aim to foster the partnership between CEOS Members and the New Space sector to provide more accurate and tailored information, and to propose innovative targeted services to users.

This is an example of a CEOS task-specific effort with a defined term of one-year.

CEOS New Space Task Team Lead

 *Antonio Ciccolella*



CEOS New Space Task Team



- ❖ CEOS New Space Task Team established for one-year

- ❖ **Aim:** Explore collaboration opportunities in New Space that bring mutual benefit to all parties, in delivering public benefit, including the identification of concrete actions

- ❖ Two key deliverables:
 1. Organise the **New Space sessions** at the main 2023 CEOS events (SIT meeting, SIT Technical Workshop and the CEOS Plenary)
 2. Produce a **White Paper** to be endorsed at CEOS Plenary that include a list of key findings & recommendations on the actions that should be undertaken by CEOS entities (working groups, VCs, ad hoc teams) to foster the development of the New Space sector in a neutral manner.

↪ CEOS Plenary/2022 -> New Space Task Team was established for a period of one year



write a white paper to be presented during the CEOS Plenary/2023

↪ Contents: experiences of the Agencies that give a frame of a set of recommendations for action for the current activities undertaken by the CEOS entities (Working Groups, Virtual Constellations, ad hoc Teams)

What is New Space



There is no definition of "New Space"

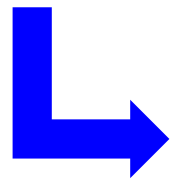
↓
appearance of a space industry financed by the private sector

↓
for the construction of the satellites are used:

- ✓ commercial technologies available in the market (COTS)
- ✓ miniaturized technologies that are rapidly developed

→ great proliferation of smaller satellites and in some cases they form large constellations

- the **technology**
- the specific approach of the company in relation to the **business model**

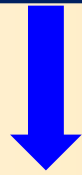


- ✓ services
- ✓ prices
- ✓ incremental implementation
- ✓ certain reliability
- ✓ quick response to the market

Interaction Between Public/Private actors - Potential role of CEOs



Public institutions are the financiers of R&D and industrial incentives



establish a link between basic research in EO and economic resources

public needs

As it was reported by the experience of CEOs members, the functions of public institutions for the EO industry, can be summarized as follows:

- ✓ as a regulatory entity
- ✓ as a legitimating entity
- ✓ as a resource provider
- ✓ as a user/customer
- ✓ as an investor

The history of **innovation** shows that the market and the socio-economic implications of new technologies do not follow a predetermined pattern and can vary between countries due to different patterns of national technological specialization such as:

- ✓ corporate structure
- ✓ governance
- ✓ intellectual property rights
- ✓ labour regulations
- ✓ competition policy



critical influences
on innovation and
its adoption

Opportunities for New Space



- ✓ It can **complement** with the provision of other type of data
- ✓ It can **provide additional and complementary** services tailored to the end user
- ✓ It can free up public resources where the collection, distribution of data, or provision of services is commercially viable
- ✓ The investors in New Space are looking for a **return**
- ✓ New Space companies seek to understand the specific **user needs** to respond with **appropriate quality**
- ✓ Commercial value depends on many factors and responds to operational needs, not always can support science

Thematic Area Observation Gap Opportunities



- ✓ Agriculture, Forestry & Other Land Use
- ✓ Sustainable Development Goals
- ✓ Precipitation
- ✓ Atmospheric Composition
- ✓ Climate
- ✓ Disasters ←
- ✓ Capacity Development
- ✓ Land Surface Imaging
- ✓ Ocean Surface Wind Vector
- ✓ Sea-surface Temperature

- The phases involved in disaster management **require high revisit, accessible data, fast availability, spatial resolutions ranging from low to very high** depending on the type of disaster, etc.
- Old Space satellites are reliable, have rapid communication, observation and positioning tools, have a specific architecture with very high technological impact and high reliability.
- New Space satellites are produced in series, with simplification of testing and revision processes, using COTS components

- New Space produces constellations that offer very regular revisits (daily or higher) at any point on the Earth, with metric or sub-metric spatial resolution but average image quality 😞

crucial "emergency response" phase

- companies sale ready-to-use products → useful
→ not accessible to all economies
- but many times also the images are → data licensing needed

a very crucial point for effective and efficient use

Much remains to be done to cooperate with New Space companies to ensure New Space satellite data accessibility and quality → cross-calibration

- companies need to be convinced that emergencies need programmes to facilitate free and open access to data
- very few commercial companies plan to launch dedicated disaster constellations in the coming years, e.g. Canadian companies



Opportunities for New Space to support science



- ✓ Global Navigation Satellite System - Radio Occultation
- ✓ Global Geodetic Observing System
- ✓ Automatic Identification System (AIS)
- ✓ Hyperspectral Imaging Spectroscopy
- ✓ Synthetic Aperture Radar
- ✓ Thermal Infrared Remote Sensing
- ✓ Very High-Resolution Commercial Optical

CEOS Working Group on Calibration & Validation (WGCV)

is to ensure long-term confidence in the **accuracy** and **quality** of EO data and products and to provide a forum for the exchange of information about calibration and validation, including the coordination of cooperative activities

↳

- ✓ images
- ✓ derived products (e.g. soil moisture)

- CEOS WGCV can provide references for:
 - ✓ calibration, validation, and data quality
 - ✓ access to tools
 - ✓ methods and protocols for cal/val
 - ✓ expertise

Current Activities Supporting New Space from CEOS (2/3)



- CEOS WGCV can provide:
 - ✓ References for radiometric calibration/validation
 - ✓ References for geometric and image quality cal/val
 - ✓ References for SAR calibration
 - ✓ References for thermal missions
 - ✓ GHG Sensor calibration resources
 - ✓ Best practices and references for cal/val

Current Activities Supporting New Space from CEOS (3/3)

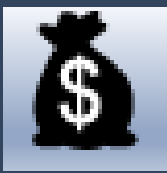


- ✓ Calibration & Validation References
- ✓ Cal/Val Maturity Matrix
- ✓ CEOS Analysis Ready Data
- ✓ CEOS Interoperability
- ✓ Open Data Cube
- ✓ ESA - NASA EO Mission Quality Assessment Framework
- ✓ CEOS Engagement with Standards Organisations
- ✓ CEOS Missions, Instruments & Measurements Database
- ✓ Combined and harmonised data streams

Conclusion and Recommendations

- ✓ **CEOS** is the **right forum** to exchange information and experiences in the satellite EO domain at a global level and, in particular, the approach to foster relationships with commercial entities
- ✓ The **user should be the ultimate beneficiary** of any partnership between CEOS and the New Space sector.
- ✓ **New Space**, is driven by **commercial economics and profit**, whilst **CEOS** seeks to **prioritise the public good** in its endeavours regardless of financial gain.

- it is very important the role of CEOs
- industry is a key player in EO and CEOs should listen to it
- it is CEOs's responsibility to:
 - ✓ act as an observer as New Space evolves within the various national ecosystems
 - ✓ be a catalyst and create homogeneity across the CEOs entities for the commercial industry
 - ✓ provide intercomparison opportunities for CEOs and New Space datasets



CEOS New Space Task Team



- ❖ NSTT now reflecting on all of the exchanges and the work that has been done thus far. Seeking to finalise the **white paper ready for submission to CEOS Principals** at Plenary. Plan to do a final review of the whole paper at SIT TW.
- ❖ Now the **focus is on the recommendations**, which also should be finalised at SIT TW.
- ❖ Current thinking is that the **NSTT will conclude at Plenary as planned**. Successful year with much information exchange and valuable white paper as a resource.
- ❖ Need further discussion on **how to maintain New Space as a longer-term discussion topic** in the absence of a dedicated task team. Activities with New Space are already ongoing at a working level and it will be incumbent on all CEOS entities to maintain their own watching brief on topics of interest and to bring them to Principal attention when required through the CEOS Sec.

Thank you

