**Statement reporting on progress by the Committee on Earth Observation Satellites (CEOS) and the Coordination Group for Meteorological Satellites (CGMS)**

**on Coordinated Response to UNFCCC Needs for Global Observations**

Conference of the Parties (COP24)/SBSTA-­‐49,

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The European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), on behalf of the Committee on Earth Observation Satellites (CEOS), is pleased to update the 49th session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) on the coordinated response to the United Nations Framework Convention on Climate Change (UNFCCC) needs for global observations being implemented by CEOS and the Coordination Group for Meteorological Satellites (CGMS) Working Group on Climate.

CEOS and CGMS, international organizations of 60 Members and Associates and 15 Members, respectively, have had the honour to report on space agency activities to the UNFCCC on several previous occasions.

Space agencies continue to evolve their systematic observation of the climate system, now over several decades, strengthening scientific knowledge on climate, supporting provision of knowledge-­‐based information to climate services and to support decision making. Space agencies are doing this by implementing the Architecture for Climate Monitoring from Space, 2013 – developed by a team comprised of representatives from CEOS, CGMS, and the World Meteorological Organization (WMO). This architecture involves the identification of existing and potential future gaps in the provision of the climate data requested by the UN’s Global Climate Observing System Programme (GCOS).

The consolidation of space agency efforts through the establishment of the Joint CEOS/CGMS Working Group on Climate has resulted in a significant increase in efficiency in responding to the needs of Systematic Observations as required by the Convention. Using the web-based Inventory of more than 900 existing and planned climate data records of Essential Climate Variables (ECV) observable from space published in 2017, the Working Group Climate consolidated its first gap analysis. The analysis traced climate data records to contributing satellite instruments, achieved a full assessment of climate data records against GCOS criteria, and, for eight ECVs including CO2 and CH4 assessed how the use of past and current satellite measurements could be further optimised and identified gaps in planned future measurements which would prevent the continuation of climate data records. From a space agency perspective, the identification of gaps and their traceability to products and instruments registered in CEOS and WMO data bases provides a sufficient basis for future planning. CEOS and CGMS foresee annual updates of the web-based Inventory and incremental gap analyses addressing specific sets of ECVs performed by the Working Group Climate that will further improve the ability of space agencies for a targeted response to the GCOS needs.

The 47th session of SBSTA noted the increasing capability of satellite and in situ data to systematically monitor greenhouse gas concentrations and emissions. Space agencies have been active in the UNFCCC context via SBSTA and have provided a first comprehensive analysis of the state-of-the art of space based atmospheric greenhouse gas monitoring capabilities in support of international, regional and national climate policy. This analysis provides a reference for individual agencies planning missions in this domain as well as for the broader coordination of virtual and dedicated constellations of space-based CO2 and CH4 sensors among space agencies through CEOS and CGMS. To build a strong foundation for the space-based elements of an operational atmospheric CO2 and CH4 monitoring system that can be implemented within the next few years and to maximize its impact towards the achievement of Nationally Determined Contributions (NDCs) and for stocktaking, a series of specific steps is recommended to space agencies including the design and implementation of a prototype system, based on available space-based assets, in time to inform the first global stocktake in 2023 and an operational system in time to support the second global stocktake in 2028. This system shall integrate the satellite observing capability, in situ observations, modelling components, prior information and ancillary data. Space agencies will continue to work together through CEOS and CGMS to build and maintain the necessary partnerships with the relevant stakeholders to address the user needs and the overall system implementation goals. In addition, space agencies were actively engaged in the refinement process of the IPCC GHG Inventory guidelines. The Second Order Draft of IPCC GHG Inventory Guidelines was released in July 2018 for government and expert review and now contains information on the potential contributions of space-­‐based observations to the quality improvement of GHG emission estimates, in particular with the planned new satellite missions.

Finally, CEOS continues to provide systematic satellite observations for forest monitoring through the Global Forest Observations Initiative (GFOI) and is supporting countries in the use of observations for their National Forest Monitoring Systems (NFMS) to provide fully measured, reported and verified (MRV) information for the United Nations initiative on Reducing Emissions from Deforestation and Forest Degradation (REDD+) in developing countries.

\* This report was delivered by EUMETSAT on behalf of the Vietnam Academy of Science and Technology (VAST) being the CEOS Chair Party.

**CEOS Mission Statement**

**CEOS ensures international coordination of civil space-­‐based Earth observation programs and promotes exchange of data to optimize societal benefit and inform decision making for securing a prosperous and sustainable future for humankind.**

**CEOS Agencies (CGMS Agencies are asterisked)**

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| Agencia Espacial Mexicana (AEM), Mexico | Intergovernmental Oceanographic Commission (IOC)\* |
| Agence Gabonaise d'Études et d'Observations Spatiales (AGEOS), Gabon | International Ocean Colour Coordinating Group (IOCCG) |
| Agenzia Spaziale Italiana (ASI), Italy | International Society of Photogrammetry and Remote Sensing (ISPRS) |
| Agensi Angkasa Negara (ANGKASA), Malaysia | MEXT (Ministry of Education, Culture, Sports, Science and Technology/Japan Aerospace Exploration Agency (JAXA)\* |
| Australian Bureau of Meteorology (BoM) | Korea Aerospace Research Institute (KARI) |
| Belgian Federal Science Policy Office (BELSPO) | Korea Meteorological Administration (KMA)\* |
| Canada Centre for Mapping and Earth Observation (CCMEO) | National Aeronautics and Space Administration (NASA), USA\* |
| Canadian Space Agency (CSA) | National Oceanic and Atmospheric Administration (NOAA), USA\* |
| Centre National d’Etudes Spatiales (CNES), France\* | National Remote Sensing Center of China (NRSCC) |
| Centro para Desarrollo Tecnólogico Industrial (CDTI), Spain | National Satellite Meteorological Center/China Meteorological Administration (NSMC/CMA)\* |
| China Center for Resources Satellite Data and Applications (CRESDA) | National Space Agency of Ukraine (NSAU) |
| Chinese Academy of Space Technology (CAST) | National Space Research Agency of Nigeria (NASRDA) |
| Comisión Nacional de Actividades Espaciales (CONAE), Argentina | Netherlands Space Office (NSO) |
| Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia | Norwegian Space Centre (NSC) |
| Crown Research Institute (CRI), New Zealand | Russian Federal Space Agency (ROSCOSMOS)\* |
| Council for Scientific and Industrial Research (CSIR) South Africa | Russian Federal Service for Hydrometeorology and Environmental Monitoring (ROSHYDROMET)\* |
| Deutsches Zentrum für Luft-­‐und Raumfahrt (DLR), Germany | Scientific and Technological Research Council of Turkey (TÜBITAK-­‐Uzay) |
| Earth System Science Organisation (ESSO), India | South African National Space Agency (SANSA)  |
| European Commission (EC) | Swedish National Space Board (SNSB) |
| European Organisation for the Exploitation ofMeteorological Satellites (EUMETSAT)\* | United Kingdom Space Agency (UKSA) |
| European Space Agency (ESA)\* | United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) |
| Geo-­‐Informatics and Space Technology Development Agency (GISTDA), Thailand | United Nations Educational, Scientific and Cultural Organization (UNESCO) |
| Geoscience Australia (GA) | United Nations Environment Programme (UNEP) |
| Global Climate Observing System (GCOS) | United Nations Food and Agriculture Organization (FAO) |
| Global Geodetic Observing System (GGOS) | United Nations Office for Outer Space Affairs (UNOOSA) |
| Global Ocean Observing System (GOOS) | United States Geological Survey (USGS) |
| Global Terrestrial Observing System (GTOS) | Vietnam Academy of Science and Technology (VAST) |
| Indian Space Research Organisation (ISRO)\* | World Climate Research Programme (WCRP) |
| Instituto Nacional de Pesquisas Espaciais (INPE), Brazil | World Meteorological Organization (WMO)\* |

\*Denotes CGMS Agencies. In addition, China National Space Administration (CNSA), India Meteorological Department (IMD), and Japan Meteorological Agency (JMA) are CGMs Members.