**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**

**51st Session of the of the Subsidiary Body for Scientific and Technological Advice (SBSTA)**

**2-9 December 2019, Santiago, Chile**

The European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), on behalf of the Committee on Earth Observation Satellites (CEOS) and the Coordination Group for Meteorological Satellites (CGMS), is pleased to update the 51st 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 Systematic Observations facilitated by the UN’s Global Climate Observing System (GCOS).

CEOS and CGMS, international organizations of 62 Members and Associates and 16 Members, respectively, are honoured to report to the UNFCCC on space agency activities over the past year.

Space agencies continue to evolve their systematic observation of the Earth’s climate system, by implementing the Architecture for Climate Monitoring from Space published in 2013.

The web-based Inventory of existing and planned climate data records of GCOS Essential Climate Variables (ECV) observable from space updated annually currently contains information for approximately 1300 datasets. The 2019 version fills previous gaps and space agencies started to address data records for lightning, sea-surface salinity, aboveground biomass, and permafrost, the latter two having significance for analyzing the Earth’s carbon cycle. This version of the Inventory will be published by the end of 2019.

The Joint CEOS/CGMS Working Group on Climate continuously analyses the Inventory content to identify Earth observation measurement gaps that may appear in the future, thus potentially interrupting the continuity of climate data records. Space agencies use this resource to inform their planning for both mission and product generation to avoid such gaps in the future. The 2019 analysis concentrated on GCOS ECVs for which GCOS has identified issues in their long-term provision, thus providing substantial input to the 4th GCOS status report in 2021.

The 47th session of SBSTA noted the increasing capability of satellite and in situ data to monitor greenhouse gas concentrations and emissions systematically. The recently updated IPCC guidelines on the methodology used by governments to report their greenhouse gas emissions and removals includes information on the potential contributions of space-based observations for comparison with greenhouse gas emission estimates, drawing attention to data from satellites already launched and upcoming satellite missions.

A whitepaper endorsed by CEOS and CGMS in 2019, describes a constellation architecture for monitoring atmospheric carbon dioxide (CO2) and methane (CH4) concentrations, as well as their natural and anthropogenic fluxes from space[[1]](#footnote-1). It provides a reference for individual agencies planning space-based CO2 and CH4 missions as well as for the broader coordination on CO2 and CH4 measurements through CEOS and CGMS.

CEOS and CGMS have developed a road map to implement the monitoring system in several steps to maximize contributions to the Transparency Framework and the achievement of Nationally Determined Contributions and for stocktaking. The first prototype system, based on available space-based assets, could inform the first global stocktake in 2023 and a pre-operational system integrating the satellite data into an operational atmospheric CO2 and CH4 monitoring system should support the second global stocktake in 2028. CEOS and CGMS welcome Parties, and their technical agencies, to start engaging with them already from the first Stocktake in ensuring that the products and services provided are fit-for-purpose.

The Joint CEOS/CGMS Working Group on Climate coordinates the activities of the space agencies with relevant stakeholders such as the WMO IG3IS and relevant modelling centres and maintains the necessary partnerships with the relevant users, both within the inventory and policy communities, to address the needs and the overall system implementation goals.

In addition, CEOS agencies continue to coordinate annual global coverage of the world’s forested areas to ensure the necessary data in support of national reporting processes the Global Forest Observations Initiative (GFOI), and the Global Observation of Forest Cover and Land Dynamics (GOFC-GOLD) effort. In 2019, CEOS began to coordinate the use of multiple satellite missions with novel capabilities to determine above ground biomass. These data offer new prospects and will enable more direct estimates in support of forest and carbon emission reporting – including for global stocktakes.

Parties are invited to continue supporting the work of the space agencies.

\* This report was delivered by EUMETSAT on behalf of CGMS and the Indian Space Research Organisation (ISRO) being the 2020 CEOS Chair Party.

**CEOS and CGMS Agencies**

Agence Gabonaise d'Études et d'Observations

 Spatiales (AGEOS), Gabon

Agencia Espacial Mexicana (AEM), Mexico

Agensi Angkasa Negara (ANGKASA), Malaysia

Agenzia Spaziale Italiana (ASI), Italy

Australian Bureau of Meteorology (BoM)

Belgian Federal Science Policy Office (BELSPO)

Canada Centre for Mapping and Earth Observation

 (CCMEO)

Canadian Space Agency (CSA)

Centre National d’Etudes Spatiales (CNES), France\*

Centro para Desarrollo Tecnólogico Industrial (CDTI),

 Spain

China Center for Resources Satellite Data and

 Applications (CRESDA)

China National Space Administration (CNSA)\*\*

Chinese Academy of Space Technology (CAST)

Comisión Nacional de Actividades Espaciales (CONAE),

 Argentina

Commonwealth Scientific and Industrial Research

 Organisation (CSIRO), Australia

Council for Scientific and Industrial Research (CSIR)

 South Africa

Crown Research Institute (CRI), New Zealand

Deutsches Zentrum für Luft-­‐und Raumfahrt (DLR),

 Germany

Earth System Science Organisation (ESSO), India

European Commission (EC)

European Organisation for the Exploitation of

Meteorological Satellites (EUMETSAT)\*

European Space Agency (ESA)\*

Geo-­‐Informatics and Space Technology Development

 Agency (GISTDA), Thailand

Geoscience Australia (GA)

Global Climate Observing System (GCOS)

Global Geodetic Observing System (GGOS)

Global Ocean Observing System (GOOS)

Global Terrestrial Observing System (GTOS)

International Science Council (ISC)

International Geosphere-Biosphere Programme (IGBP)

India Meteorological Department (IMD)\*\*

Indian Space Research Organisation (ISRO)\*

Instituto Nacional de Pesquisas Espaciais (INPE), Brazil

Intergovernmental Oceanographic Commission (IOC)\*

International Ocean Colour Coordinating Group

 (IOCCG)

International Society of Photogrammetry and

 Remote Sensing (ISPRS)

Japan Meteorological Agency (JMA)\*\*

Korea Aerospace Research Institute (KARI)

Korea Meteorological Administration (KMA)\*

Ministry of Education, Culture, Sports, Science and

 Technology (MEXT)/Japan Aerospace Exploration

 Agency (JAXA)\*

National Aeronautics and Space Administration

 (NASA), USA\*

National Institute of Environmental Research (NIER),

 Korea

National Oceanic and Atmospheric Administration (NOAA),

 USA\*

National Remote Sensing Center of China (NRSCC)

National Satellite Meteorological Center (NSMC)/China

 Meteorological Administration (CMA)\*

National Space Agency of Ukraine (NSAU)

National Space Research Agency of Nigeria (NASRDA)

Netherlands Space Office (NSO)

Norwegian Space Centre (NSC)

Russian Federal Service for Hydrometeorology and

 Environmental Monitoring (ROSHYDROMET)\*

Russian Federal Space Agency (ROSCOSMOS)\*

Scientific and Technological Research Council of Turkey

 (TÜBITAK-­‐Uzay)

South African National Space Agency (SANSA)

Swedish National Space Agency (SNSA)

United Arab Emirates Space Agency (UAESA)

United Kingdom Space Agency (UKSA)

United Nations Economic and Social Commission for

 Asia and the Pacific (ESCAP)

United Nations Educational, Scientific and Cultural

 Organization (UNESCO)

United Nations Environment Programme (UNEP)

United Nations Food and Agriculture Organization

 (FAO)

United Nations Office for Outer Space Affairs

 (UNOOSA)

United States Geological Survey (USGS)

Vietnam Academy of Science and Technology (VAST)

World Climate Research Programme (WCRP)

World Meteorological Organization (WMO)\*

\*Denotes Agencies being Member of both CEOS and CGMS, \*\*Denotes only CGMS Agencies.

1. <http://www.ceos.org/document_management/Virtual_Constellations/ACC/Documents/CEOS_AC-VC_GHG_White_Paper_Version_1_20181009.pdf> [↑](#footnote-ref-1)