The Committee on Earth Observation Satellites (CEOS) and WCRP



CE Committee on Earth Observation Satellites



WCRP JSC 33

17 July2012 Kerry Ann Sawyer Deputy CEOS Executive Officer

CEOS Background

- Established in 1984 under auspices of G-7 Economic Summit of Industrialized Nations
 - Focal point for international coordination of space-related Earth Observation (EO) activities
 - Optimize benefits through cooperation of members in mission planning and in development of compatible data products, formats, services, applications, and policies
- Operates through best efforts of Members and Associates via voluntary contributions
- 30 Members (Space Agencies), 22 Associates (UN Agencies, Phase A programs or supporting ground facility programs)
 - WCRP and GCOS are both Associates
- As the space component of the Global Earth Observation System of Systems (GEOSS), CEOS is implementing high priority actions in support of Group on Earth Observation (GEO) Tasks

Primary Objectives of CEOS



- 1. To optimize benefits of space-borne Earth observations through:
 - Cooperation of its Members in mission planning
 - Development of compatible data products, formats, services, applications, and policies;
- 2. To serve as a focal point for international coordination of space-related Earth observation activities;
- 3. To exchange policy and technical information to encourage complementarity and compatibility of observation and data exchange systems.

CEOS Structure 2011-2012



Working Group on Climate (WGClimate)





Chair: Mark Dowell (EC/JRC) Vice Chair: John Bates (NOAA/NCDC)

The Mission of the Working Group Climate (WGClimate) is to facilitate the implementation and exploitation of Essential Climate Variable (ECV) time-series through coordination of the existing and substantial activities undertaken by CEOS Agencies. This includes the numerous iterative steps involved in the creation of ECVs and ensuring ECV life-cycle information is gathered, organized, and preserved for future generations.

WGClimate was endorsed as a full CEOS WG at the end of 2010 (the first new WG in 10 years!) and will coordinate and encourage collaborative activities between the world's major space agencies in the area of climate monitoring



Rationale for a Concerted Climate Activity in CEOS



- Many Climate Initiatives undertaken by space agencies both in and outside of CEOS
 - SCOPE-CM
 - ESA Climate Change Initiative
 - EUMETSAT Climate Programme
 - Developing NOAA Climate Services
- Many relevant existing Scientific Groups
 - IOCCG
 - GHRSST
 - Ocean surface topography
 - GEWEX
- CEOS Virtual Constellations contribute in specific ECV areas
 - Ocean Surface Topography
 - Precipitation
 - Ocean Colour Radiomtery
 - Ocean Surface Vector Wind
 - Land Surface Imaging
 - Sea Surface Temperature
- Need to have overall coherent approach
 - Responses to UNFCCC/SBSTA

Persistent Request to CEOS from UNFCCC/SBSTA





Framework Convention on Climate Change



FCCC/SBSTA/2010/13

Distr - General 1 March 2011

Original: English

Subsidiary Body for Scientific and Technological Advice

Report of the Subsidiary Body for Scientific and Technological Advice on its thirty-third session, held in Cancun from 30 November to 4 December 2010

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52. The SBSTA welcomed the coordinated response by the CEOS²¹ to the relevant needs of the GCOS implementation plan and those of the Convention, and the progress and commitment by space agencies involved in climate observations to address the space-based component of the GCOS and improve climate monitoring capabilities from space on a sustained basis.

FCCC/SBSTA/2010/13

53. The SBSTA encouraged Parties that support space agencies involved in global observations to continue, through CEOS, cooperation with and support to the GCOS and to respond to the relevant needs identified in the 2010 updated GCOS implementation plan. It invited the CEOS to provide, by SBSTA 37, an updated report on progress made on major achievements in relevant areas.

WGClimate Terms of Reference



- The CEOS Climate Working Group will:
 - Review and assess, on behalf of CEOS, the generation of Fundamental Climate Data Records (FCDRs) and derived Essential Climate Variable (ECV) climate products supported by Member space agencies, complementary with existing entities and roles;
 - Contribute to the review of compliance of satellite missions and products with the GCOS Climate Monitoring Principles and with the "Guideline for the Generation of Datasets and Products meeting GCOS Requirements" (GCOS-143);
 - Identify multi-agency implementation teams for each product and review their actions, and ensure that a coherent implementation plan exists for each and every product taking full account of other pertinent international initiatives such as SCOPE-CM and science programmes;
 - Make recommendations to the above teams and receive recommendations from them, for transmission to CEOS Agency Principals;
 - Ensure coherence of climate product generation supported by space agencies, including with other relevant international initiatives, in particular SCOPE-CM, and);
 - Undertake any other relevant activities as instructed by CEOS Chair.





2012 CEOS Work Plan and Climate Outcomes and Priorities

2012 CEOS WORK PLAN

19 February 2012

INTRODUCTION

Since the establishment of GEO in 2005, CEOS Agencies have committed themselves to a leadership role in the development and operation of the space segment for the Global Earth Observation System of Systems (GEOSS). This commitment requires substantial results in order to demonstrate the collective potential of the satellite missions deployed by CEOS Agencies, when properly coordinated and exploited. The wide-ranging and complex nature of this effort requires the development of a yearly Work Plan.

The 2012 CEOS Work Plan has been developed by the CEOS Executive Officer and Deputy Executive Officer under the guidance of the CEOS Chair (ISRO), in consultation with the CEOS Strategic Implementation Team Chair (NASA), CEOS Secretariat, CEOS Working Groups, Virtual Constellations, the CEOS membership at large, and CEOS' external stakeholders. The intention of the document is to set the priorities and outline the activities of CEOS during the 2012 calendar year.

These activities will be carried out with several key objectives in mind:

- Support the requirements for observations related to a better understanding of climate processes, established by the Global Climate Observing System (GCOS), which is recognized as the climate observing component of the GEOSS;
- Report on a yearly basis to the United Nations Framework Convention on Climate Change (UNFCCC) about the response of the community of space agencies to the GCOS Implementation Plan and its Satellite Supplement. In particular, CEOS will continue reporting to the Subsidiary Body on Scientific and Technical Analysis (SBSTA) board, as confirmed in 2010 at the 16th Council of the Parties (COP-16);
- Liaise as appropriate with the Groups of 8 and 20 (G8 and G20) industrialized nations and develop appropriate plans to enhance the use of remotely-sensed Earth observations data and information; and,
- Support the deployment of the GEOSS space component, with a particular priority given to climate-related space-based observations and to the development of a reliable operational concept ("climate monitoring architecture"), but taking into account, as far as possible, the other Societal Benefit Areas (SBAs), and compatibility with available resources and commitments of member agencies.

CEOS leadership in developing the GEOSS space segment involves a considerable number of tasks supported by the full range of CEOS participants:

- the Chair and Strategic Implementation Team (SIT) Chair;
- the CEOS Secretariat
- the CEOS Troika
- the Working Groups (Calibration and Validation; Information Systems and Services; Climate; and Capacity Building and Data Democracy);

Expected CEOS WGClimaterelated 2012 Outcomes



Improved Coordination of Space Agency Activities Related to Climate

- Completion of the CEOS Response to the 2010 GCOS Implementation Plan (IP) and its Satellite Supplement, and improvement, in quality and quantity, of the coordinated outputs for monitoring of Essential Climate Variables (ECVs)
- Development of FCDRs and related datasets (WGClimate); delivery of results of the first ECV dataset survey
- Cooperation with GEO, GCOS, WMO, and CGMS on space-based system to support climate information and adaptation
- Further alignment of CEOS Virtual Constellations objectives as building blocks of the space-based climate information strategy and as contributions to facilitating the observation of ECVs, as defined in the 2010 GCOS IP

Priorities for WGClimate



- Climate Monitoring Architecture
 - Logical architecture, basis for prioritizing WGClimate activities
 - Relation of physical architecture to ECV Inventory
- CEOS/CGMS ECV Inventory (WGClimate ToR #1)
 - Discussion on maturity index
 - Discussion on climate information stewardship issues
- ECV by ECV analysis -> Assessments
- Outreach/Networking: both internal with other CEOS WGs and VCs & external SCOPE-CM/GSICS and WCRP





CEOS/CGMS ECV/ECV Inventory



ECV CDR Assessments



ECV Inventory Questionnaire

- Joint activity with CGMS and WMO
- Call released with CEOS Missions, Instruments, and Measurements Database update on 7 Jun 12; responses requested by 5 October 12
- Questionnaire form via web-interface.
- Responses are requested at the dataset level
- Addresses both existing/past missions and future/planned missions in two separate questionnaires
- Areas:
 - General
 - Dataset Usage
 - Dataset Stewardship
 - Dataset Properties
 - Dataset Access



Questionnaire for Populating the CEOS Climate Data Record Inventory

		-
Area	Question	Response
GENERAL	0. Responder Name	Text field
	 Email contact for individual populating the questionnaire? 	Text field
	Data Set Identifier of the TCDR?	Text field
	3. Name of organisation with overall responsibility for dataset?	AgencyMenu
	4. Is the TCDR dataset the result of an international coordination activity?	Yes/No: If Yes, ProjectMenu
	Has the dataset been produced in conjunction with any external domain- specific generation and assessment body?	Yes/No; If Yes, AssessmentBodyMenu
	 Have the quality control aspects of the dataset generation process been implemented in conjunction with a relevant international coordination body? 	Yes/No; If Yes, ProcessMenu
	implemented in conjunction with a relevant international coordination body.	
DATASET USAGE	 What specific climate applications does this dataset support? 	Text field
DAIAGET GOAGE	Which ECV (or ECV product) can be generated from this dataset?	ECV Menu
DATASET STEWARDSHIP	 Which organisational entity is responsible for collecting the observations? 	Agency Menu
	2. Which organisational entity is responsible for calibrating the observations?	Agency Menu
	Which organisational entity is responsible for intercalibrating the	
	observations?	Agency Menu
	 Which organisational entity is responsible for generating and maintaining the FCDR (i.e. correcting, geolocating and applying calibration parameters to the 	Agency Menu
	observations)?	
	TCDR (i.e. conversion of the FCDR to geophysical parameters)?	Agency Menu
	 Which organisational entry is responsible for checking if the resultant I CDRs meet the relevant GCOS requirements, and identifying any required processing undates? 	Agency Menu
	 Which organisational entity is responsible for organising the independent peer review of the dataset? 	Agency Menu
	 Which organisational entity is responsible for collating, archiving and 	
	maintaining the resultant climate data records (e.g. archiving observations,	Annan Manu
	used in their generation, comparison with GCOS requirements, peer reviews.	Agency Menu
	external reference data, etc)?	
	9. Which organisational entity is responsible for servicing user requests for the	Agency Menu
	dataset?	Agency mend
	 Which organisational entity is responsible for responding to user feedback on the use of the dataset? 	Agency Menu
	4 What is the start date of the continuous dataset record?	Date Field
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	2. What is the end-date of the continuous dataset record?	Date Field
	 Ontil when are tirm commitments in place to continue this record? 	Date Field
	 What physical quantity does the dataset measure? 	TypeMeasurementsWMOMenu
	what are the units of the dataset?	AccuracyUnitsMenu
	6. Which satellite/instrument combination is used to generate the dataset?	Satellite Menu
		Instrument Menu
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How will CEOS use the ECV Inventory



- 1. Describes the current and planned monitoring capability on an ECV basis (allow easier response to e.g. GCOS IP)
- 2. Combined perspective of the logical and physical views should enable the definition of an optimum "macroscale" space system configuration and its components
- 3. Used at the ECV/product level to identify gaps and shortfalls
- 4. Formulation of a coordinated action plan to address such gaps and shortfalls...
- 5. Trigger for the medium-term activities that need to be undertaken to sustain the long-term implementation of the architecture

Relationship with WCRP



- There are different activities ongoing within WCRP (e.g. in GEWEX, WOAP -> WDAC) which are extremely compatible with WGClimate priorities:
 - ECV Inventory/Physical Architecture CEOS lead
 (?) WDAC support
 - Assessments WCRP/WDAC lead (?) CEOS support/resources



Thank you!

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