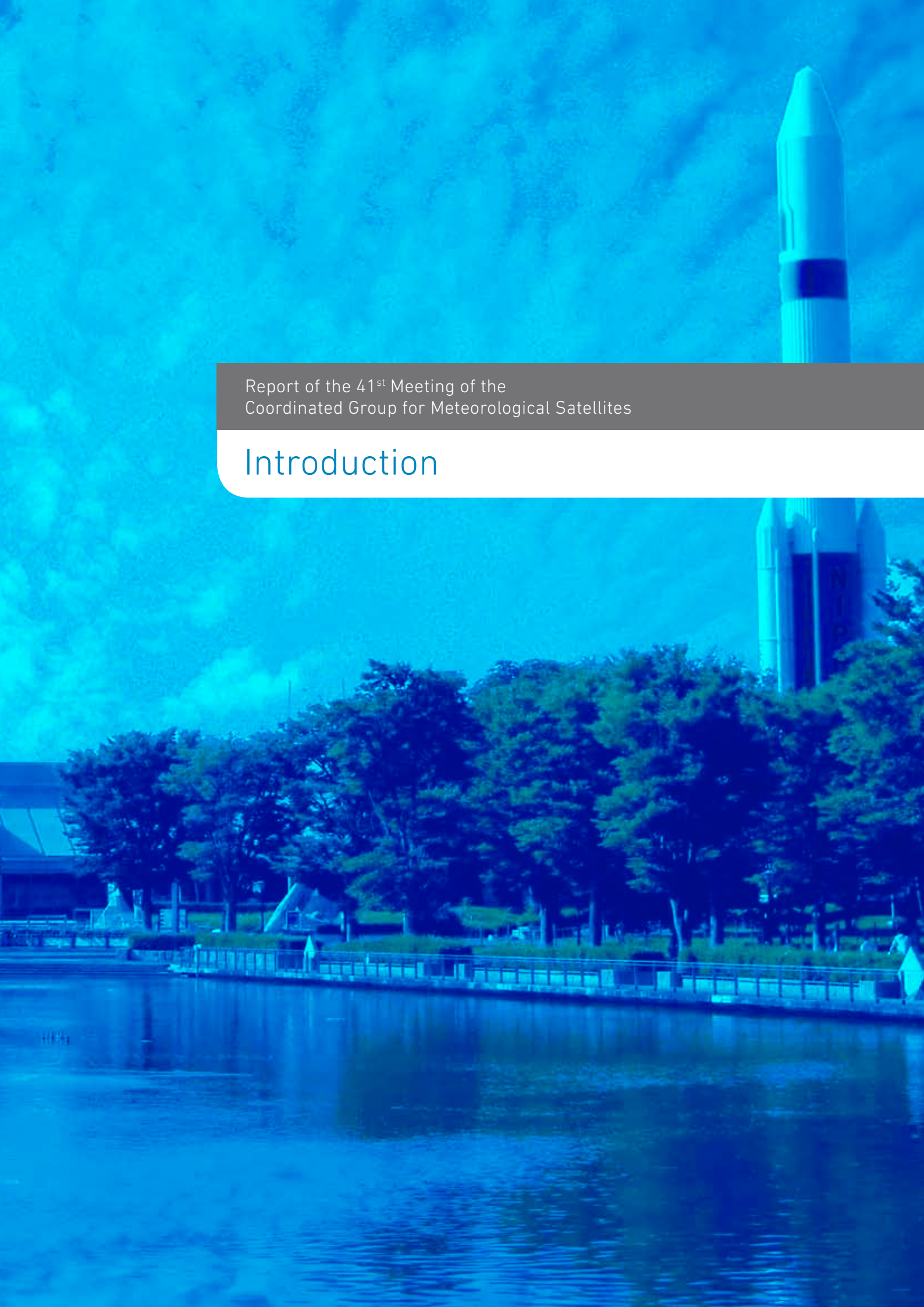


Introduction

INTRODUCTION

A OPENING SESSION

The 41st CGMS meeting was jointly organised by Japan Meteorological Agency (JMA) and Japan Aerospace Exploration Agency (JAXA)), and co-chaired by Masanori Obayashi, JMA and Alain Ratier, EUMETSAT.

The 41st plenary session of CGMS was officially opened at 9:00 on 11 July 2013 in Tsukuba, Japan. Mitsuhiko Hatori, Director-General of JMA, welcomed participants to Japan, and to the town of Tsukuba. He reflected on the achievements of CGMS since its conception, the progress in the development of meteorological satellites and the use of meteorological satellite data. Kiyoshi Higuchi, Vice-President, JAXA also welcomed participants and wished them a succesful meeting. He underlined the importance of exchanging ideas and information within the CGMS as well as outside of the group through various outreach activities.

B INTRODUCTION TO THE MEETING

The CGMS Secretariat outlined the objectives of the meeting recalling the restructuring of CGMS, the endorsement of the CGMS High Level Priority Plan at CGMS-40 and the resulting inter-sessional meetings which had been held by the CGMS Working Groups leading up to CGMS-41.

This was followed by the adoption of the agenda by the CGMS-41 plenary.

Thee CGMS Secretariat also provided a review of the outstanding plenary actions from CGMS-40 taking into account inputs provided by the Working Groups and WPs by the members, as well as by other means of correspondence, including e-mail.

In summary, the status of actions and recommendations by the end of the CGMS-41 Working Group discussions was as follows:

Type of action	Actions at CGMS-41	Closed	Comments
Actions from previous meetings (CGMS-38/-39)	10	7	3 open (new deadlines agreed)
Actions (CGMS-40)	44	29	3 open (is still expected to be closed) 12 (new deadlines agreed, or deadline later than CGMS-41)

Recommendations	46	All	Recommendations are on a best effort basis and are closed at the end of each CGMS plenary session.

The final status of the list of actions resulting from CGMS-40, updated through discussions at CGMS-41, is provided at the following link on the CGMS website: http://cgms-info.org/docs/default-source/cgms-help/here-.pdf?sfvrsn=0

C USER REQUIREMENTS

C.1 GFCS

WMO delivered an update on the Global Framework for Climate Services (GFCS) (**WMO-WP-27 PPT**). This included a presentation of the management structure of the GFCS and the draft resolution for the establishment of a management committee for the Intergovernmental Board on Climate Services (IBCS).

Three key issues for CGMS were identified:

(i) the need for CGMS members to meet the observing and monitoring needs of GFCS priority areas and therefore to contribute to the development of the architecture for climate monitoring from space;
(ii) the need to support the free and open exchange of climate-relevant space observational data and products; and
(iii) the need to assess CGMS members' future engagement in the GFCS process through the Technical Advisory Committee (TAC) and the Partner Advisory Committee (PAC).

During the discussion that followed, IOC highlighted the need for rapid access to data and suggested that a minimum time delay be considered as part of the GFCS discussions on data access.

As a result of the discussions, the following action was agreed:

CGMS-41 actions - PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
WMO	Plen C.1	41.01	WMO to report on the progress of GFCS implementation	CGMS-42	**OPEN**	HLPP #5.1.1

C.2 GCOS and WCRP

GCOS presented an update on the Global Climate Observing System (GCOS) and the World Climate Research Programme (WCRP). See also **WMO-WP-09**.

GCOS noted that a strengthened Global Climate Observing System will be important for the successful implementation of the Global Framework for Climate Services (GFCS), recognising that observations and monitoring constitute essential pillars of the GFCS. The implementation of improvements to the climate observing system will also support assessment and development of policy related to climate change.

One of the next steps of the GCOS improvement and assessment cycle will be the preparation in 2015 of the Third GCOS Adequacy Report and Progress Report on the implementation of GCOS. These reports will be based on the findings of a Workshop on Observations for Adaptation to Climate Variability and Change, on the fifth IPCC assessment process and on other workshops or symposia. The report will be developed by a writing team and the consultation process will include a public review. Progress and future needs for the development of the architecture for climate monitoring from space will be addressed in the next GCOS adequacy report and the new implementation plan that will follow for 2016. GCOS will remain engaged in the next stages of development and implementation of the architecture for climate monitoring from space.

Discussion followed on the future engagement of other user communities in the GCOS implementation plan and the challenges of the observing system's design. NASA raised the question of how the window of opportunity of the 5th IPCC assessment report might be used to set priorities on climate for space agencies. GCOS will organise a workshop for this purpose, but the WCRP/EUMETSAT Climate Symposium (see section G.3) will also be an opportunity for this discussion to take place.

The following action was agreed as a result of the discussions:

CGMS-41 actions – PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
GCOS	Plen C.2	41.02	GCOS to provide a statement documenting the importance of LEO sampling from three distributed orbits for climate observation (due 30 September 2013)	30-Sep-13	**OPEN**	HLPP #1.1.1

C.3 IOC: Ocean surface topography observations

A presentation on IOC ocean surface topography missions was given on behalf of IOC. Two examples of highly precise satellite measurements of global ocean surface topography were described: global and regional sea level variations for detection of climate and ocean weather phenomena, such as global sea level rise and upper-ocean heat content eddies, respectively. Ocean weather, which impacts the capability of the ocean to increase or decrease the intensity of tropical storms or hurricanes, is undersampled with a conventional satellite altimeter which measures ocean surface topography along the nadir direction. Even if the unlikely, but highly fortunate, situation should arise that five conventional satellite altimeters are simultaneously in complementary orbits recording ocean surface topography, the composite

dataset would be inadequate to sample a substantial portion of mesoscale motions and all submesoscale eddy motions with adequate temporal resolution. Unlike the global atmosphere, where mean motion is typically 10 times greater than eddy motion, the oceanic eddy motion is 10 times greater than the mean motion. A satellite altimetry ocean surface topography noise level of 1 cm^2/cycles per kilometer corresponds to a 3 cm s^{-1} geostrophic current error in a 10-km-diameter eddy at 45° latitude. This criterion is an objective of a wideswath satellite altimeter mission with a launch readiness date of 2020.

EUMETSAT confirmed the interest of the meteorological community in oceanography and supported the continuation of the constellation of operational classical altimetry, including SAR and interleave mode. In this context, the SWOT mission, jointly developed by NASA and CNES and referred to in the IOC presentation, should still be considered an R&D mission.

NOAA endorsed the paper and noted that ocean colour ranks high in NOAA products. The VIIRS instrument on Suomi-NPP provides ocean colour observations, and this will be continued on JPSS-1 and -2 satellites. ESA confirmed that it will continue ocean missions with Sentinel-3 and mentioned HY-2 as a potential satellite which can further cooperation on oceanography in the future. EUMETSAT noted that cross-calibration by reference missions such as Jason-type satellites is necessary to produce calibrated datasets that can be used by the modelling community.

The following action was agreed as a result of the discussions:

CGMS-41 actions – PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
IOC-UNESCO	Plen C.3	41.03	IOC to provide a paper on guidance to CGMS members on ocean colour observations	CGMS-42	**OPEN**	HLPP #3

C.4 WIGOS (including Global Cryosphere Watch and Global Atmospheric Watch matters)

The WMO Integrated Global Observing System (WIGOS) was described in **WMO-WP-10** and presented to the plenary by WMO.

The WIGOS Implementation Plan was revised following the 65th session of the WMO Executive Council (EC-65, May-June 2013). Moreover, WMO Strategic and Operational Planning for 2016-2019 further considered future strategic priorities and accorded high ranking to WIGOS.

WIGOS provides a new framework for coordination and evolution of WMO observing systems (both space-based and surface-based components), including the engagement and contributions of WMO to co-sponsored observing systems. The latest progress on WIGOS needs input and support from the space community in the following areas:

- Integration of governance and management functions through new regulatory material
- Design, planning and optimised evolution of WIGOS component observing systems (including space-based observing systems)
- Observing system operation and maintenance
- Quality management
- Standardization, system interoperability and data compatibility
- Data discovery, delivery and archival (through the WMO Information System, WIS).

As part of this process, NOAA agreed to present its requirement analysis tool at the next CGMS meeting. WMO agreed to keep CGMS informed on the status and progress of WIGOS.

The following action was agreed:

CGMS-41 actions – PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
NOAA	Plen C.4	41.04	NOAA to present its requirement analysis tool at CGMS-42	CGMS-42	**OPEN**	-

C.5 Preparedness of users for new generation of satellites

A keynote speech was given by Anthony Rea of the Bureau of Meteorology, Australia, on ensuring the preparedness of users for the new generation of satellites. He referred to **WMO-WP-21** which contained the "Guideline for Ensuring User Readiness for New Generation Satellites" adopted by the WMO Commission for Basic Systems.

A side event held at the 65th session of the WMO Executive Council in May 2013 on this topic highlighted the critical importance of launching user preparedness projects on the part of CGMS operators and user organisations in all WMO regions approximately five years prior to launch. JMA, CMA, EUMETSAT and NOAA participated in this side event, along with a representative of a user organisation (Australian Bureau of Meteorology). The outcomes of this event are particularly relevant for upcoming geostationary systems (INSAT-3D, Himawari-8, FY-4A, GOES-R, MTG-I1, GEO-KOMPSAT-2A) in the period 2014-2020.

During the discussions, EUMETSAT noted that it was important to have clarity between a plan and a user guide. WMO suggested that the focus should be to promote best practices among CGMS satellite operators, and to facilitate information enabling users to access data and products and develop applications as early as possible in the programme lifecycle. JMA noted that in RA-II a website has been established to prepare users. It was suggested that WMO host an online portal, providing dynamic information which could be fed with regular information by the operational agencies. EUMETSAT supported this approach. NOAA highlighted that it is the responsibility of agencies to prepare user guides and training, but that WMO should provide

guidance on best practices. EUMETSAT noted the importance of user feedback.

The following actions were agreed as a result of the discussions:

Actionee	Action	#	Description	Deadline	Status	HLPP ref
CGMS space agencies	Plen C.5	41.05	CGMS space agencies to nominate focal points for a task team to share experience and prepare a dynamic WMO web-based portal on initiatives taken by satellite operators to prepare users for the next generation of GEO satellites. The structure of this portal will follow the CBS user preparedness guidelines and will link to the latest information available on space agency web sites, online resources and related projects.	15-Sep-13	**OPEN**	HLPP #4.2.1, 5.3
WMO	Plen C.5	41.06	WMO to report on the progress of the task team on the WMO web-based portal for user preparedness for next generation GEO satellites.	CGMS-42	**OPEN**	HLPP #4.2.1, 5.3

D REPORTS FROM THE SPACE AGENCIES

D.1 Reports on the status of current and future satellite systems by operational space agencies

CMA reported on the status of its current and future satellite systems in **CMA-WP-02-PPT**. CMA operates the FY geostationary and polar-orbiting systems. The polar orbit observation is carried out by FY-3A in AM orbit, and FY-3B in the PM orbit. The launch of FY-3C is planned for 23-24 September 2013. Three identical FY geostationary satellites (FY-2D/E/F) are currently in orbit. FY-2C has been retired. FY-2F was launched in early 2012. It is stored in orbit for future replacement of FY-2D (or FY-2E). CMA is currently developing FY-4, its next generation of geostationary meteorological satellites, with the launch of the first FY-4 spacecraft scheduled for 2015.

EUMETSAT reported on the status of its current and future satellite systems in **EUM-WP-02 PPT**. EUMETSAT operates a fleet of meteorological satellites, and their related ground systems, to deliver reliable and cost-efficient data, images and products. These, in turn, serve requirements for weather and climate monitoring of the national meteorological services in the 27 Member and four Cooperating States, and of global partners. The present system includes two generations of geostationary Meteosat satellites. Their global view is complemented by the detailed observations provided by the Metop polar-orbiting satellite and the marine observer, Jason-2 - a joint project of space agencies in Europe and the United States.

IMD/ISRO reported on the status of current and future Indian satellites in **IMD-WP-01**.

Two satellites are currently in operation: KALPANA-1 and INSAT-3A. With the help of these two satellites, IMD is able to monitor cyclones, western disturbances, thunderstorms and other weather events and provide early

warnings to the affected areas. The next major upgrade in observations from geostationary orbit will be the INSAT-3D satellite scheduled for launch in late July 2013. GISAT, the next generation geostationary imaging satellite, is planned in the near future .

Oceansat–2, RISAT-1 and SARAL are the Indian operational polar-orbiting space missions. In addition, Megha-Tropiques is in low inclination orbit for atmospheric and oceanic science studies. RISAT-1 (Radar Imaging Satellite), launched on 26 April 2012, provides data for flood mapping, agriculture and crop monitoring, vegetation, forestry, soil moisture, geology and sea ice and coastal processes. SARAL is a joint Indo-French satellite mission which will perform altimetric measurements designed to study ocean circulation and sea surface elevation. It was successfully launched on 25 February 2013.

JMA reported on its current and future satellite systems in **JMA-WP-02**. MTSAT-2 is currently operational over the western Pacific region with MTSAT-1R as the back-up. MTSAT-1R has continued to perform imagery dissemination and data collection services even after its imaging function was switched over to MTSAT-2 on 1 July 2010.

JMA plans to launch Himawari-8 in 2014 and commence its operations in 2015, when MTSAT-2 is scheduled to end operations. The Agency also plans to launch Himawari-9 in 2016. Himawari-8 and -9 production is currently in the build and integration phase. Himawari-8 and -9 imagery will be delivered mainly via the Internet, and JMA has also completed a feasibility study on data dissemination using a commercial telecommunication satellite. The Agency has set up a web page with information on Himawari-8 and -9 at http://mscweb.kishou.go.jp/himawari89

KMA-WP-01 summarised the current status of the KMA Communication, Ocean and Meteorological Satellite (COMS) which has been operating since 1 April 2011. KMA is responsible for Meteorological Imager operation and data distribution. The Korea Ocean Satellite Center (KOSC) is responsible for GOCI (Geostationary Ocean Colour Imager) Data Processing (GDPS) and data distribution. GOCI data can be accessed on their web site and with free access for public/research purposes. KMA reported on tentative plans for COMS follow-on missions, GEO-KOMPSAT-2A (meteorological mission) and -2B (ocean and environmental mission), which are scheduled to be launched in 2017 and 2018, respectively.

NOAA reported on the status of its current and future programmes in **NOAA-WP-02-PPT**. NOAA manages a constellation of four geostationary and eleven polar-orbiting meteorological spacecraft, including six military satellites, from the Satellite Operations Control Center (SOCC) in Suitland, Maryland. These satellites provide continuous observations of weather conditions and environmental features of the western hemisphere, monitor global climate change, verify ozone depletion and land surface change, monitor the critical space environmental parameters, and support search and rescue efforts across the globe. The WP addressed the status of the geosynchronous and low-earth-orbiting spacecraft constellations.

In **ROSH-WP-04,** ROSHYDROMET and ROSCOSMOS presented the current status of the Meteor-M №1 polar-orbiting meteorological satellite and the Electro-L №1 geostationary meteorological satellite. The future Meteor-M polar-orbiting satellite system will include three meteorological and one oceanographic satellite. The future Russian geostationary constellation will consist of three Electro-L satellites. The location of Electro-L satellites in orbit will be 14.5°W, 76°E and 166°E. The Arctica-M constellation of highly elliptical orbit satellites is now under development. The system will include two spacecraft providing continuous observations over the Arctic region. The launch is scheduled for 2015–2016.

The information provided by CGMS satellite operators in their reports above was included by WMO in the OSCAR database (http://www.wmo-sat.info/oscar/spacecapabilities). Please follow the link to find out the latest status.

D.2 Reports on the status of current and future satellite systems by R&D space agencies

CGMS was informed on the status of the Earth Observing System of CNSA in WP **CNSA-WP-01**. Currently, the on-orbit functionally operating satellites of CNSA include FY-3A, FY-3B, HY-1B, HY-2, HJ-1A, HJ-1B, HJ-1C, ZY-3, and GF-1. The FY series are operational meteorological satellites. FY-3A and -B were successfully launched on 27 May 2008 and 5 November 2010, respectively. Both satellites are running stably on orbit. The HY series includes an ocean colour satellite (HY-1) and an ocean dynamics environmental satellite (HY-2). HY-1A and -B were launched on 15 May 2002 and 11 April 2007, respectively. The HY-1A satellite stopped functioning on 30 March 2004. The HY-1B satellite is still functional in orbit. HY-2 was successfully launched on 16 August 2011, and sensor calibration and validation was performed in 2013. The ZY series satellite was developed jointly by China and Brazil with the name CBERS. Three CBERS satellites, CBERS01/02/02B, were successfully launched in 1999, 2003, and 2007. Currently, all three of these satellites have completed their missions but their measurements are still used in many application areas. The environment and disaster small satellite constellation is composed of several optical satellites and microwave SAR satellites. The first stage of the constellation, the HJ-1 programme, includes two optical satellites and one SAR satellite, for environment monitoring, ecosystem protection, and disaster detection with high spatial and temporal resolutions. HJ-1A and -B were launched on 6 September 2008, and both passed their nominal design life of three years and are experiencing ageing. HJ-1C was launched on 19 November 2012 and is currently in the on-orbit test stage. GF-1 is the first satellite of the GF high spatial resolution series for observing the Earth. It was launched on 26 April 2013 and is currently in the on-orbit test stage.

In the future, China plans to launch several satellite systems, including FY-4 (in 2015), CFOSAT (in 2014), CBERS 03/04, and HJ-1C (in 2012). FY-4 is the second generation of geostationary meteorological satellite in China, which is planned to be launched in 2015. CFOSAT is being developed jointly by China and France for dynamic ocean environmental monitoring and is expected to be

launched at the end of 2014. CBERS 03/04 is the next generation of CBERS 01/02. ZY-3 is planned to be launched at the end of 2013.

The status of the current ESA Earth observation (EO) missions was reported in **ESA-WP-01**. Two of them, MSG and Metop, are in cooperation with EUMETSAT. The Gravity field and steady-state Ocean Circulation Explorer, GOCE, the first Explorer satellite launched on 17 March 2009, completed its nominal mission in April 2011. GOCE continues to provide top-quality gravity field data. The SMOS satellite was launched on 2 November 2009. SMOS level 2 data products were released at the end of October 2010. All reprocessed level 1 and 2 data have been available from the ESA Cal/Val portal since mid-March 2012. The CryoSat-2 satellite was launched on 8 April 2010. The first CryoSat Arctic sea-ice thickness map was presented in June 2011. Release of systematic CryoSat products (level 1b and 2) to the scientific community is ongoing. The Proba-V small satellite was launched on 7 May 2013. Its coarse resolution imager continues the data acquisition of the vegetation payload on board SPOT-4 and 5. About 4,000 data user projects worldwide use data from the ESA EO missions and this number is increasing further. The total volume of ESA EO mission data exceeds 100 Terabytes per year.

CGMS was further informed of the status of the future ESA EO missions. The Living Planet Programme has three lines of implementation: Earth Explorer satellites, Earth Watch satellites plus services and applications demonstration. BIOMASS, the seventh Core Explorer, has now been selected. Progress in the preparation of the forthcoming Explorer missions ADM-AEOLUS, Swarm and EarthCARE is described. GMES represents the major new initiative of European EO efforts. GMES pre-operational services began in 2008 with the provision of the relevant data. The first GMES dedicated satellites (the “Sentinels”) will be launched in 2014. Related activities are under way at all stages within the Agency, the EC and at Member State level.

CGMS was also informed of the status of the Earthwatch Programme Element, Global Monitoring of Essential Climate Variables (also known as the ESA Climate Change Initiative or CCI). The CCI programme has continued to progress well. The 13 existing project teams have made significant progress on algorithm development and in specifying a future operational system. The programme will achieve its phase 1 objectives by end-2013 and continue in phase 2 starting in early 2014.

The status of ISRO satellite systems was covered in **IMD-WP-01** (see section D.1).

JAXA reported on its current and future satellite systems in **JAXA-WP-01**. JAXA currently operates GOSAT (Ibuki) and GCOM-W1 (Shizuku). GOSAT was launched on 23 January 2009. The data products are distributed through the GOSAT User Interface Gateway (GUIG). GCOM-W1 was launched on 18 May 2012. The initial calibration and checkout of GCOM-W1 (Shizuku), was successfully conducted. The AMSR2 products are available at the GCOM-W1 Data Providing Service website. Development of the future satellites ALOS-2, GPM/DPR, EarthCARE/CPR and GCOM-C1 are underway. Both ALOS-2 and

the GPM core satellite will be launched in 2013. EarthCARE will be launched in JFY2015. GCOM-C1 will be launched in 2016.

NASA reported on its 17 Earth science missions in **NASA-WP-01**. Although all missions were conceived as research missions, it has turned out that the efficiency of the communications and ground data handling systems has supported operational and near-real-time applications. All missions are currently producing data, but several also show signs of ageing. Except for Suomi NPP (October 2011), SAC-D/Aquarius (June 2011) and LDCM/Landsat-8 (February 2013), all missions have passed their nominal design life and are currently in extended operations. NASA's Earth Science Programme ($1.8 billion budget) is implementing a balanced and robust plan to accomplish a broad set of critical Earth observation measurements from space. The programme advances knowledge of the integrated Earth system, the global atmosphere, oceans (including sea ice), land surfaces, ecosystems, and interactions between all elements, including the impact of humans. A balance of satellite measurements, science research, technology development and applications are needed to address a complex global Earth system. NASA plans the launch of 14 missions and two instruments (on a host mission) in the future.

The status of ROSCOSMOS satellite systems was covered in **ROSH-WP-04** (see section D.1).

The information provided by CGMS satellite operators in their reports above was included by WMO in the OSCAR database (http://www.wmo-sat.info/oscar/spacecapabilities). Please visit the link for the most up-to-date information.

E WORKING GROUP REPORTS

E.1 Global issues on satellite systems and telecommunication coordination (WGI)

E.1.1. Key-note - A real-time network for Suomi NPP/JPSS, POES, Metop and FY-3 satellite reception across North America and the Pacific

Liam Gumley, Space Science and Engineering Center, University of Wisconsin-Madison, provided a presentation (**GUEST-WP-03 PPT**) on the NOAA plans for implementing a real-time network for satellite reception across North America and the Pacific, a complementary service similar to RARS (Regional ATOVS Retransmission Service).

Roshydromet enquired about access to global data similar to what was provided by EUMETSAT. NOAA responded that all data are available to users but not in near-real time (NRT). Rebroadcasting had not been considered at this stage.

WMO added that it appreciated the effort made by NOAA through the University of Wisconsin-Madison but highlighted, however, the importance of

redistribution to the global community, which is an essential principle of the RARS but currently not foreseen in the project. EUMETSAT stated that the key issue is the availability for NWP, and that depending on the data volume, it might be possible to re-disseminate the data through GEONetCast. This point was confirmed to be related to the Task Team proposed to be created in WGI (see WGI report), to discuss and address topics in relation to LEO direct read-out terminals, RARS-like systems and services and associated standards. Where relevant, close coordination with WGII and WGIV would be made through a regular exchange of information between the co-chairs and rapporteurs). The Task Team will work through the planned WG inter-sessional meetings to ensure progress before the next CGMS plenary session.

This proposal was welcomed and supported by the plenary.

E.1.2 Report from WGI

The WGI rapporteur provided a summary report (**EUMETSAT-WP-20 PPT**) on the outcome of WGI discussions related to frequency management and protection, direct broadcast services, international data collection and distribution, coordination and global standards and optimisation of data collection systems, and contributions to the WIS.

One point brought to the attention of the CGMS plenary was the proposed update to the Global Specification for HRPT (CGMS Global Spec 04). The update has been technically agreed inside WGI but needed to be endorsed at plenary level. Following consultation, the CGMS plenary agreed on the proposed update of the CGMS Global Spec-04.

The actions identified in WGI were endorsed by the plenary.

It had been decided that the inter-sessional meetings by WGI will take place on
Wednesdays mid-month in October, November, December 2013, and January, February 2014.

E.2 Global data dissemination (WGIV)

E.2.1. Key-note – Status of Himawari-8/-9 data distribution/dissemination

Yoshio Shimazu, JMA, presented the status and plans of the new Himawari-8/-9 distribution and dissemination system (**JMA-WP-09 PPT**). Further information regarding the details of the Commercial Telecommunication Satellite (CTS) and receiving equipment are expected in the course of spring 2014.

JMA also informed CGMS that the first priority is to set up the system for Himawari data dissemination and assure it works, after which a possibility of an evolution of the DVB system might be envisaged.

E.2.2 Key-note – User needs/evolution of regional data dissemination requirements

Anthony Rea, Chair of WMO ET-SUP, gave a presentation on user needs related to regional dissemination requirements (**GUEST-WP-11 PPT**) and recommended that CGMS members report on their support to region-based groups maintaining satellite data access and exchange requirements as well as the creation of a new standing agenda item for Working Group IV – "Response to region-based requirements for satellite data access and exchange".

The following action was agreed as a result of the discussions:

CGMS-41 actions – PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
CGMS space agencies	Plen E.2.2	41.07	CGMS members to report on their support to WMO region-based groups maintaining satellite data access and exchange requirements	CGMS-42	**OPEN**	HLPP #2.1
CGMSSEC, WGIV	WGIV (Plen E.2.2)	41.59	CGMSSEC to add a new standing agenda item in WGIV "response to region-based requirement for satellite access and exchange"	31 Mar 2014	**OPEN**	HLPP #2.1

E.2.3 Report from WGIV

The WGIV rapporteur provided a summary report on the WGIV discussions, which focused on Global DVB satellite services, coordinated dissemination services for disaster mitigation purposes, transition to new direct-readout systems, RARS, contribution to the WIS infrastructure, coordination of metadata for satellites and instruments, Internet-based services, user dialogue and interface, and long-term data preservation (**EUMETSAT-WP-21 PPT**).

The actions and recommendations identified in WGIV were endorsed by the plenary.

It had been decided that three inter-sessional meetings with WGIV will take place in mid September and October 2013, and January 2014.

E.3 Satellite data and products (WGII)

E.3.1. Scientific presentations

E.3.1.1 Volcanic ash products science and applications

Fred Prata, Norwegian Institute for Air Research, provided a presentation on volcanic ash, SEVIRI ash detection and retrieval, and related science and applications (**GUEST-WP-06 PPT**).

The presentation followed an invitation and discussions at CGMS-40. The presentation by Fred Prata not only provided a summary of the scientific and technical issues of volcanic ash retrieval but also the broader context of user needs. It was noted that the action from the preceding WGII meeting will be an important step toward consistent volcanic ash products from CGMS agencies (Ref. action WGII/8 41.26).

E.3.1.2 SCOPE-Nowcasting: Concept, objectives and pilot activities

In **WMO-WP-22**, WMO provided an update on the Sustained Coordinated Processing of Environmental Satellite Data for Nowcasting (SCOPE-Nowcasting) initiative. SCOPE-Nowcasting aims to ensure continuous and sustained provision of consistent, well-characterised satellite products for nowcasting and severe weather risk reduction. Recent discussions including at the 7th session of WMO ET-SUP resulted in an updated set of criteria and a refined set of pilot projects that should demonstrate the added value of the initiative. The updated list of pilot projects encompasses: (i) basic nowcasting products with a focus on RGBs, (ii) advanced nowcasting products with a focus on volcanic ash, (iii) precipitation, (iv) real-time ocean products, and (v) sand and dust products.

JMA, CMA, and EUMETSAT have nominated focal points for the SCOPE-Nowcasting initiative and other CGMS members were requested to nominate their focal points of contact.

The WP was complemented by a presentation by Anthony Rea, Chair of WMO ET-SUP (**WMO-WP-31 PPT)**.

The following actions were agreed as a result of the discussions:

CGMS-41 actions – PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
CGMS members	Plen E.3.1.2	41.08	CGMS members to nominate focal points for the SCOPE-Nowcasting (NWC) initiative as appropriate	15-Aug-13	**OPEN**	HLPP #3.3
CGMS members	Plen E.3.1.2	41.09	Feedback from CGMS members sought on the final makeup of the SCOPE-NWC pilot projects by 1 September 2013	01-Sep-13	**OPEN**	HLPP #3.3

E.3.1.3 Relevance of International Precipitation Working Group (IPWG) work to improve quality and utility of satellite-derived precipitation products

Kazumasa Aonashi, IPWG co-chair, made a presentation on the relevance of the International Precipitation Working Group (IPWG) work to improve quality and utility of satellite-derived precipitation products, including the objectives, achievements, future activities and recommendations to CGMS (**JMA-WP-11 PPT)**.

IPWG-6 had made the following recommendations to CGMS:

- To ensure the long-term continuity of conically-scanning microwave imagers, as well as space-based radars, consistent with the CGMS baseline and the WMO Vision for the Global Observing System in 2025;

- Furthermore, the coordination of satellite overpass times has to be ensured including non-sun-synchronous platforms with a minimum temporal resolution of three hours;

- CGMS members and WMO to provide adequate support to ensure active participation in international meetings and training events; and

- To ensure the optimum use of satellite-based precipitation products more training is necessary. Satellite agencies were invited to cooperate in this endeavor with IPWG experts and the WMO/CGMS VLab.

E.3.1.4 Use of satellite data in JRA-55 reanalysis and related activities

Kazutoshi Onogi, Climate Prediction Division, JMA, presented JMA's JRA-55 reanalysis project. It covers more than 50 years of 4D-var data assimilations undertaken for the period 1958-2012 as a follow-on to the JRA-25, which analysed data in the 1979-2004 period (**JMA-WP-12 PPT**). The observational data for JRA-55 showed an improvement in both quality and quantity from JRA-25 because of reprocessing of an increased quantity of satellite data and the inclusion of newly available data. Furthermore, in validating JRA-55, there is much better quality compared to JRA-25, with fewer unnatural gaps than other reanalyses. The plans for autumn 2013 are to release the JRA-55 products for research use and the data will be available from JMA, DIAS. Comprehensive reports are also under preparation. In addition, the presentation covered information on the use of satellite data in JMA's operational Climate Monitoring Services.

The plenary commended JMA for the sustained reanalysis work and specifically thanked Kazutoshi Onogi for presenting the results of JRA-55 to CGMS-41.

E.3.2 Report from WGII

The WGII rapporteurs, presented the outcome of WGII discussions on 8-9 July 2013 (**EUMETSAT-WP-22 PPT**). These discussions covered agency reports on GSICS, SCOPE-CM and SCOPE-Nowcasting; in-depth discussions on intercomparing and improving volcanic ash, atmospheric motion vector, and cloud products; ocean matters for which the ocean community is looking for guidance from CGMS on data formats and real-time access; GPM Constellation and precipitation sampling matters; updates on radio-occultation activities from the IROWG including the concerns about the decline of the radio occultation constellation and access to existing radio occultation data; updates on ESA and NASA programmes and validation activities; very encouraging cal/val results from CNSA on HY-2A instruments; the importance of orbital parameters for optimising the observing system for

ocean colour; and suggestions for support from CGMS members to the ISWGs and VLab.

The rapporteurs concluded by thanking Volker Gaertner, EUMETSAT, for his many years of dedicated service to CGMS as IPWG rapporteur.

In addition, WGII raised the issue on sustained support to the CGMS-sponsored ISWGs, and as a result, the plenary raised an action on WGII:

Actionee	Action	#	Description	Deadline	Status	HLPP ref
CGMS space agencies	WGII (Plen E.3.2)	41.32	CGMS WGII chairs and rapporteurs to prepare a WP on the rationale for a structured approach to sustained support to the CGMS-sponsored ISWGs. The paper should include a description of ISWG main objectives and accomplishments, a record of past levels of support, and a proposal how to address this item at CGMS sessions. The WP should be circulated among CGMS members for comments prior to CGMS-42.	15 Dec 2013; 31 Mar 2014; CGMS-42	**OPEN**	HLPP #3.3, 4.2.4

The actions and recommendations identified in WGII were endorsed by the plenary.

It was decided that two inter-sessional meetings with WGII will take place on 26 November 2013 and 3 April 2014.

E.4 Operational continuity and contingency planning (WGIII)

E.4.1. LEO orbit coordination – follow-on to CGMS-40

E.4.1.1 Report from the Tiger Team

WMO presented the background and outcome of the Tiger Team on LEO optimisation. WMO has convened a Tiger Team to coordinate the technical evaluation of the global and regional impact of flying an FY-3 satellite in early morning orbit, in order to support CMA in the assessment process of such a potential redeployment (**WMO-WP-13, WMO-WP-13 PPT**).

There is a consensus among international experts to acknowledge that a satellite mission in an early morning orbit (around 6:00 Equatorial Crossing Time) would bring significant benefits through improved accuracy of weather forecasts, thanks to the optimum temporal distribution of sounding radiances assimilated into NWP models. Further benefits are expected from the direct use of imagery and derived products in a number of applications including tropical cyclone monitoring, fog and fire detection, air quality monitoring, climate monitoring, and solar monitoring of space weather. Moreover, early morning/late afternoon satellite observations are well timed to support the daily operational briefings held by weather services (e.g. at 8:00/20:00 local time). The FY-3 programme offers a unique opportunity for China to play this important role as one of the three major components of the global constellation besides the European programme in the mid-morning orbit and the US programme in the afternoon orbit, while complementary missions

would provide the necessary redundancy for operational robustness. The Tiger Team also stressed the need to strengthen international cooperation to maximise the benefits of the data and made the following recommendations:

- CMA to implement an FY-3 mission in an early morning orbit, with the appropriate platform and payload adaptations, and to sustain such a mission in the long term;

- WMO and CGMS to support trade-off studies (such as OSSEs) as necessary during the development phase of the FY-3 early morning mission;

- CMA and international partners to pursue strong international collaboration on data assimilation in order, as soon as possible, to maximise the benefits of future (early morning) and current FY-3 missions;

- CMA with the international community to further prepare to exploit the benefit of the early morning orbit polar satellite monitoring payload for space weather, climate monitoring, air quality and disaster monitoring; and

- WMO and CGMS to promote the use of FY-3 early morning data, contributing to a robust and efficient Global Observing System, taking advantage of the Asia-Oceania Meteorological Satellite Users Conference.

E.4.1.2 Status of investigations on using early morning orbit by FY-3 satellite

CMA reported on the status of the ongoing investigations related to early morning orbit usage of the FY-3 satellite covering the payloads, imagery usage, platform and financial implications (**CMA-WP-09 PPT**).

CMA appreciated the support provided by CGMS and WMO, in particular the Tiger Team, on the benefit assessment of the early morning orbit.

CMA is currently considering starting the procedure for redeploying FY-3 to an early morning orbit and calls on support from WMO, CGMS members and satellite operators to reach this objective. International efforts and support would be necessary during the development phase of the FY-3 early morning mission. CMA will continue to investigate the possibility of flying the mission with sounding capabilities in the early-morning orbit in order to have a better distribution of atmospheric sounding systems over the planned three orbits and to improve the global numerical weather prediction.

The plenary was informed that an action (WGIII 41.40) had been raised in WGIII for the WMO Secretary-General to send a letter to the PR of China to commend CMA on the progress made, report on the outcome of CGMS-41

discussions on FY-3 redeployment, and confirm the strong support of the international community on this endeavour.

CGMS, WMO and EUMETSAT thanked CMA for the efforts undertaken and confirmed that continued support could be expected for CMA's efforts.

E.4.2 Report from WGIII

The WGIII co-chair, provided a summary report of WGIII discussions focusing on the coordination of observing systems, advancing the architecture for climate monitoring from space, and the impact and benefit of Earth observation satellite missions (**EUMETSAT-WP-23 PPT**).

The actions and recommendations identified in WGIII were endorsed by the plenary.

It was decided that three inter-sessional meetings with WGIII will take place, on 9 October 2013, 15 January and 2 April 2014.

E.4.3 Space weather

The Chairperson of the Ad-hoc Meeting on Space Weather on 10 July 2013, reported on the outcome covering cross-cutting issues and challenges, guiding principles, setting up a team to develop the Terms of Reference for CGMS space weather activities, and collecting information on spacecraft anomalies resulting from space weather (**NOAA-WP-30 PPT**).

As a result of the discussions, the following actions were agreed by the plenary:

CGMS-41 actions – PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
CGMS members	Plen E.4.3	41.14	CGMS members to nominate a team to develop the TOR for CGMS space weather activities, taking into account the guiding principles discussed in the ad-hoc session, for consideration by CGMS-42 (Volunteers to serve on this team: CMA, NOAA, WMO, JMA [TBC], KMA [TBC])	15-Sep-13	**OPEN**	HLPP #5.2.2
CGMS members	Plen E.4.3	41.15	CGMS members to nominate points of contact to work with WMO/ICTSW in order to jointly define a procedure to improve the collection, availability, and use of satellite anomaly information (30 September 2013)	30-Sep-13	**OPEN**	HLPP #5.2.1

The minutes of the Ad-hoc Meeting on space Weather is available in the Annex.

F GEO SESSION

F.1 Status of GEO CMIN'14 preparations and GEO 2015 and beyond

The GEO Secretariat presented the progress of GEO/GEOSS and the way forward including the planned GEO ministerial summit and "GEO week" on 13-17 January 2014, as well as the development of recommendations for the post-2015 GEO/GEOSS strategy (**GUEST-WP-02 PPT**).

F.2 CGMS contribution to GEO/GEOSS – GEO Water Strategy

Toshio Koike, GEO Water Task Lead, presented the GEO Water Strategy highlighting areas for potential contributions by CGMS. The report covers primary implementation partners of the strategy; water cycle variables; water quality; data issues; water cycle integration and Interoperability; linkages; and capacity building.

The overall purpose of the report is to:

- Update and synthesise the available information about the status of water cycle observations and information systems on the basis of the IGWCO report of 2004;

- Describe a strategy for water cycle observations and information that will enable the short-term GEO objectives and the long-term community goals to be achieved;

- Provide CEOS, GEO, WMO and other agencies, including CGMS, with guidance about strategies for water cycle observations, information systems, interoperability, capacity building, etc.; and to

- Propose major initiatives to advance the overall concept.

CGMS Members were kindly requested to review the report available at ftp://ftp.earthobservations.org/TEMP/Water/ and to provide feedback by 31 August 2013 to Rick Lawford, Richard.Lawford@morgan.edu with a copy to umezawa.kazuo@jaxa.jp, yabe.shizu@jaxa.jp, and ochiai.osamu@jaxa.jp.

Concluding the discussions, the CGMS plenary warmly thanked Toshio Koike for his presentation.

G CLIMATE

G.1 Terms of Reference of proposed CEOS/CGMS Working Group on Climate

Following discussion at the 40th meeting of CGMS in Lugano on 4-8 November 2012 on the possible creation of a joint CEOS/CGMS Working Group on Climate the CGMS Secretariat (EUMETSAT) took an action: "to

explore further the possibility to coordinate Climate-related activities with CEOS in line with the work done for the preparation of the Architecture for Climate Monitoring from Space".

The secretariat reported on the positive discussions that took place with CEOS both at plenary and SIT meetings, and introduced the draft Terms of Reference for a joint CEOS/CGMS Working Group on Climate which have been developed, together with proposed transition arrangements from the existing CEOS Working Group on Climate, for endorsement by the CGMS plenary. In recognition of the complementary interests of CEOS and CGMS, the chairs will be alternately drawn from operational and R&D space agencies. CGMS members voiced strong support for the Terms of Reference. NOAA suggested that the existing badgeless team shall be a pathfinder for the working group. The Terms of Reference will be presented to the CEOS plenary in November 2013 and, assuming a positive outcome, the new joint working group will be established immediately thereafter.

CGMS-41 actions – PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
CGMS members	Plen G.1.1	41.11	CGMS members to nominate members for the CEOS/CGMS joint climate working group	31-Aug-13	**OPEN**	HLPP #5.1.9
CEOS/CGMS joint climate WG	Plen G.1.1	41.12	CGMS plenary proposes that the CGMS/CEOS joint climate WG establish an inventory of FCDRs including for each one: Information on - contributing missions and instruments - calibration and cross-calibration - contributing agencies and reference to ECV/TCDRs which could be extracted. To be done in addition to and in full consistency with the existing ECV-driven inventory of TCDRs.	CGMS-42	**OPEN**	HLPP #5.1.9
CEOS/CGMS joint climate WG	Plen G.1.1	41.13	The CEOS/CGMS joint climate working group to report to each CGMS plenary session	starting with CGMS-42	**OPEN**	HLPP #5.1.9

CGMS-41 recommendations - PLENARY						
"Actionee"	**Rec**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
Joint CEOS/CGMS climate WG	Plen G.1.2 R	41.01	Space-based climate architecture: To extend the ECV product inventory to FCDRs		**OPEN**	HLPP# 5.1
Joint CEOS/CGMS climate WG	Plen G.1.2 R	41.02	Space-based climate architecture: The design phase of new sensors should include an analysis of compatibility with heritage instruments.		**OPEN**	HLPP# 5.1

G.2 Climate Monitoring Architecture – status and way forward

NOAA, on behalf of the architecture writing team, delivered a presentation on the status of the architecture for climate monitoring from space, as well as its proposed way forward. It also recalled progress since CGMS-40. The space architecture is now a key component of the GFCS Observations and Monitoring pillar.

As a contribution to the architecture, WMO provided a mapping of the satellite missions foreseen in the CGMS baseline to the essential climate variables (ECVs) product inventory. This showed that these missions supported a large part of the datasets recorded in the inventory. Moreover, these missions had the potential to provide Fundamental Climate Data Records (FCDRs) that were important for climate monitoring but were not properly captured in the ECV product inventory.

Finally, the terms of reference of the proposed joint CEOS-CGMS working group on climate have been developed.

Regarding the architecture, ongoing implementation activity is focused on the development of the ECV inventory. There is an ongoing effort to add input to this ECV inventory and CGMS members were encouraged to contribute further.

From the discussion which followed the presentation, it was recommended to extend the ECV product inventory to include FCDRs. It was also acknowledged that the CGMS baseline has a prospective dimension which is of high value for the climate monitoring architecture, but often too generic to inform on FCDRs. WMO therefore suggested that a finer categorisation of CGMS baseline missions should be used to draw a list of sustained FCDRs coordinated by CGMS. It also proposed that the design phase of new sensors should include analysis of compatibility with heritage sensors. These points were taken up by CGMS and it was agreed that they were important for future planning.

During the discussion, EUMETSAT emphasised the need to identify FCDRs that CGMS members can commit to provide on a sustained basis and to identify the CGMS priorities and where there is complementarity with CEOS. Members agreed that the current focus is on how agencies can produce the FCDRs, but in the future the inventory should also help users. Once the FCDRs are captured with tracebility to missions, instruments and possibly the ECVs, the issue of how to ensure interaction with users shall be addressed. It was agreed that a schedule should be defined and this shall be a priority of the incoming chair of the joint working group when it is created after the endorsement of the terms of reference by the CEOS plenary meeting.

G.3 Symposium on Climate Research and Earth Observation from Space

EUMETSAT announced that the Symposium on Climate Research and Earth Observation from Space, jointly organised with the World Climate Research Programme (WCRP) and supported by the European Commission, will be held in Darmstadt, Germany from 13-17 October 2014. JAXA confirmed that they will support the symposium and noted that it will be a good opportunity to promote CEOS and CGMS contributions to climate.

More details of the Symposium are available at
www.theclimatesymposium2014.com

H EDUCATION AND TRAINING

In session H on Education and Training, the keynote presentation given jointly by WMO-CGMS highlighted major achievements of the VLab over the past year, and future plans and directions (background was provided through **WMO-WP-25**). Since October 2012, VLab Training Centres of Excellence have continued offering an array of regional training opportunities and, most importantly, strengthening the global network of trainers by coordinating training delivery in various languages.

The major activities of the VLab for this period include the Event Week on Precipitation, the WMO/NOAA Train the Trainer Workshop for WMO RA III/IV, the Virtual Round Table on Competence Requirements for Aeronautical Meteorological Personnel, the Satellite Direct Readout Events, the World Weather Briefing, and progress with the Conceptual Models for the Southern Hemisphere Project. Furthermore, VLab members are developing a response to the results of the WMO 2012 Survey on the Use of Satellite Data in the "Challenges to Training" by the end of 2013.

CGMS was invited to note the important achievements of the VLab, to provide comments, and to consider the following recommendations:

- that CGMS members provide regular, annual contributions to the WMO VLab Trust Fund to ensure the continuation of the post of the VLab TSO;

- satellite operators and WMO provide the necessary resources for the translation of relevant training resources (web sites, modules and related) into other WMO languages;

- CGMS members take note of the results of the WMO 2012 Survey and support relevant actions by the VLab to further enhance the use of satellite data.

The VLab will continue to work with India (IMD and ISRO) on their contribution to the VLab, which would fill a gap in the geographical coverage of the current network.

NOAA emphasised the importance it places on training, given that levels of investments were shrinking in many countries and that resources of international importance such as the online training library UCAR/COMET was under threat due to budget issues. Additional financial support from international users and the private sector were sought. NOAA stressed that international collaboration was essential to maintain these training repositories. The COMET ESRC is recognized by the VLab.

JMA, in a joint paper with KMA, updated the plenary session on progress with the WMO RA II WIGOS Project to develop support for NMHSs in satellite data, products, and training (**JMA-WP-03, KMA-WP-03**). The project, jointly coordinated by JMA and KMA, aims to improve the dissemination and utilisation of satellite data with WMO members in RA II, with a focus on developing countries. Since it started in 2008 as a pilot project, it has undertaken user surveys, prepared quarterly newsletters, maintained a web site, supported the Asia/Oceania Meteorological Satellites Users Conferences, and organised training events jointly with the conferences. The Project Coordination Group currently has a membership of 13 countries and EUMETSAT (as an observer) and holds meetings on an annual basis.

Regarding training, KMA reported that activities in the framework of the project are aligned with the VLab. In October 2012, KMA hosted, along with the 3rd Asia/Oceania Conference, a high-profile training event with over 30 participants from the region.

EUMETSAT reported on its five-year training strategy and stressed the importance of education and training for realising the benefits of satellites. The VLab features prominently in this strategy. Document **EUMETSAT-WP-12** described the status and future plans for training in satellite meteorology provided by EUMETSAT and the Centres of Excellence (CoE) in Africa (Kenya, Niger, Morocco, South Africa), the Middle East (Oman) and Europe. The paper also provided an overview of training workshops, distance learning activities, and the development of training material by EUMETSAT.

NASA pointed out that training activities maintained in the COSPAR and CEOS WG CapD frameworks should be coordinated with VLab to provide synergies. WMO explained that the VLab had established formal working relationships with both mechanisms. The ESA delegate, Jean-Louis Fellous, informed the session in his capacity as Director of the COSPAR Secretariat that training events (on global water cycle changes, atmospheric correction) were organised with co-sponsorship by the VLab.

WMO pointed out that education and training were a strategic priority for WMO members.

It was proposed that WMO and the CGMS Secretariat write a joint letter to all CGMS members requesting regular funding for WMO-CGMS VLab technical support. The letter will explain the level of funding needed, the expected level of contribution from CGMS satellite operators, the funding mechanism provided through the WMO VLab Trust Fund, and the terms of reference of the VLab Technical Support Officer.

CGMS-41 actions - PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
WMO/ CGMSSEC	Plen H.1	41.10	WMO and CGMSSEC to write a letter to CGMS members regarding regular contributions to the WMO VLab Trust Fund for the sustained continuation of the VLab Technical Support Officer	31-Aug-13	**OPEN**	-

I OUTREACH ACTIVITIES

A presentation was delivered by NOAA on the CGMS outreach strategy and the proposed way forward.

In response to the CGMS High Level Priority Plan and discussions at CGMS-40, NOAA agreed to develop a CGMS outreach strategy for presentation at CGMS-41. The CGMS Secretariat sent a short survey in mid-May to help inform that effort. As a result of the survey results and consultation with the CGMS Secretariat, NOAA proposed that CGMS focus on three outreach priorities: Promoting the visibility of the CGMS organisation; helping CGMS members promote the benefits of their own activities and programmes; and developing "inreach" to enhance communication among CGMS members.

Specific recommendations presented to CGMS-41 included:

- Create and display CGMS exhibit/materials at:
  - the 2013 EUMETSAT Meteorological Satellite Conference/19th AMS Satellite Conference; and
  - the 4th Asia-Oceania Meteorological Satellite Users Conference;
- Develop quarterly features for the CGMS website, highlighting a key CGMS achievement (drawing from the 40 years of achievement document);
- Develop an image gallery for the CGMS website that demonstrates the benefits of CGMS collaboration;
- Members to actively participate in the CGMS Socio-Economic Benefits Tiger Team.
- Develop regular online newsletters

CGMS members agreed to the proposed outreach strategy. NOAA agreed to work with the CGMS Secretariat to lead coordination and implementation of the recommendations. NOAA noted that successful implementation of the Outreach Strategy would require the participation and contributions of all CGMS members.

The following action was agreed as a result of the discussions:

CGMS-41 actions – PLENARY						
Actionee	**Action**	**#**	**Description**	**Deadline**	**Status**	**HLPP ref**
NOAA/ CGMSSEC	Plen I	41.60	NOAA and CGMSSEC to lead on the coordination and implementation of the outreach and "inreach" activities proposed with the support of other CGMS members. (Create/exhibit CGMS material at relevant events, develope quarterly features on the CGMS web site, develop an image web gallery, participate in the CGMS socio-economic benefits Tiger Team, develope regular online newsletters).	Sept/Oct 2013 Jan 2014 Apr 2014 CGMS-42	**OPEN**	HLPP #4.1

J REVIEW OF CGMS-41 ACTIONS AND RECOMMENDATIONS

The CGMS Secretariat reviewed all actions and recommendations related to the plenary completing them as necessary following the discussions. A final list of actions and recommendations was achieved and circulated to the CGMS group. The Working Group actions were not reviewed in the plenary since these have been reviewed extensively within each Working Group and have been endorsed by the plenary in Session E.

In summary, the status of actions and recommendations by the end of the plenary the was as follows:

Type of action	**Actions**	**Recommenda-tions**	**Comments**
Actions from previous meetings (CGMS-38--40)	12	-	New deadlines agreed, or deadline later than CGMS-41
CGMS-41			
Plenary	13	2	
WGI	2	-	
WGII	15	10	
WGIII	14	7	
WGIV	11	3	

The list of actions and recommendations resulting from discussions at CGMS-41 is available here and is also published on the CGMS website: www.cgms-info.org.

K CGMS HIGH LEVEL PRIORITY PLAN (HLPP)

The CGMS Secretariat provided a report on the status of the CGMS High Level Priority Plan (HLPP).

The first HLPP was agreed at CGMS-40 capturing the priorities of CGMS for the period 2013-2017. The HLPP is a rolling five-year plan and therefore a living document reviewed and revised by CGMS on an annual basis. The HLPP targets are to be specific, measurable and timely for the HLPP to be the basis for demonstrating and reviewing the progress of CGMS.

The aim of the HLPP session of the CGMS plenary is to review progress in the implementation of the HLPP, confirm the overall adequacy of the HLPP and endorse specific revisions of the HLPP proposed either by the Working Groups, the CGMS Secretariat or by the plenary.

The CGMS Secretariat provided an overview (**EUM-WP-25**) of the scope and structure of the HLPP and of the role of HLPP in the new overall CGMS process, in particular emphasising the role of the HLPP in driving the priorities of the CGMS working groups, both at the plenary and throughout the inter-sessional phase. The CGMS Secretariat presented the overall status of implementation of the HLPP, noting two highlights of progress since CGMS-40, namely the early morning orbit Tiger Team conclusions on forecast impact and other benefits from the three-orbit LEO baseline configuration and the agreement on new global direct read-out specifications, endorsed by the CGMS-41 plenary.

Regarding the adequacy of the HLPP, WGs I, II, III and IV all confirmed the usefulness of the HLPP and the relevance of the HLPP priorities for driving work both at and in between plenaries, but it was also recognised that for some priority areas, the coverage of actions supporting the overall priorities can be improved, and the WGs will therefore address this aspect in their inter-sessional work plan.

It was also suggested by the Secretariat that the WGs should review relevant areas of the HLPP, and in particular assess whether all targets stated are specific and timely enough to drive the CGMS work-plan over the coming four-year period.

The four Working Groups did not present any concrete proposals for revisions to the HLPP, but the Secretariat suggested that a new cross-cutting theme would be introduced in the HLPP:

Preparation of operational users for new generation of geostationary meteorological satellites

This proposal was endorsed by the plenary, and the CGMS Secretariat will issue a new version of the HLPP following CGMS-41, reflecting the new cross-cutting area. Following CGMS-41, the status of implementation of the HLPP will be reviewed by WG chairs and rapporteurs, and will be published together with the final report.

The latest version of the HLPP is available at www.cgms-info.org.

L AOB AND CLOSING SESSION

L.1 Nominations

Nominations of co-chairs and rapporteurs of the CGMS Working Groups for CGMS-42 were made as follows:

- **Working Group I on Telecommunications** will be chaired by Marlin O Perkins, NOAA, with Joaquin Gonzalez, EUMETSAT, as rapporteur;

- **Working Group II on Satellite Products** will be co-chaired by Stephan Bojinski, WMO, and Toshiyuki Kurino, JMA, with Johannes Schmetz, EUMETSAT and Mitch Goldberg, NOAA, as rapporteurs;

- **Working Group III on CGMS Global Contingency Planning** will be chaired by Suzanne Hilding, NOAA, and Peng Zhang, CMA, with Jérôme Lafeuille, WMO, as rapporteur;

- **Working Group IV on Global Data Dissemination** will be chaired by Vasily Asmus, Roshydromet (or his nomated representative) and Jaedong Jang, KMA, with Klaus Peter Renner, EUMETSAT, as rapporteur.

L.2 Any other business

L.2.1 WMO CM-12

WMO informed the CGMS-41 plenary about the WMO Consultative Meeting on High-Level Policy on Satellite Matters (CM-12). He recalled that the WMO Space Programme was established as a result of CM-2 in 2002, and that WMO Executive Council 62 in 2010 agreed to hold the CM biennially, preferably in conjunction with the Executive Council (EC) or Congress meetings.

The meeting will focus on progress in the architecture for climate monitoring from space, GFCS and associated data policies and presentations by satellite operators and space agencies, as well as the socio-economic benefits of space programmes. The meeting will be held tentatively on 21 June 2014 on the occasion of EC 66, for which most CGMS agencies confirmed their availability.

L.2.2 CGMS plenary report

In view of CGMS's overall scope and objectives, together with efforts on reducing carbon footprint, the CGMS-41 plenary endorsed the proposal made by the CGMS Secretariat that the CGMS plenary session reports will from CGMS-41 onwards be provided in electronic format only, i.e. no paper version will be provided in future. The last paper version was made available for the 40th anniversary of CGMS in 2012.

L.3 Closing

L.3.1 Date and place of next CGMS plenary sessions

Regarding the location and date of CGMS-42, CMA informed the plenary that the request to host CGMS-42 was still under review and that a response was expected in the August/September 2013 timeframe. In case CMA is unable to host the meeting, another host will have to be found at relatively short notice.

Thereafter the plenary sessions might rotate as follows:

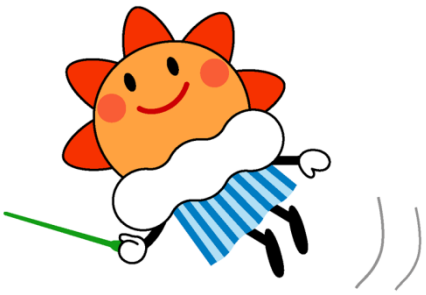
- 2015 USA
- 2016 Europe
- 2017 Korea
- 2018 India
- 2019 Russia
- 2020 WMO
- 2021 Japan

L.3.2 Closing of the meeting

The Chairperson thanked all participants for their hard work and active participation in CGMS-41, adding that there had been many interesting discussions and important developments during the Working Groups and Plenary sessions.

All participants warmly thanked JMA and JAXA for the excellent hosting and organisation of the meeting in Tsukuba, Japan.

The meeting adjourned at 17:59 on 12 July 2013.



JMA mascot "Harerun"