

An aerial photograph of a mountain range. The top portion of the image shows a range of mountains with significant snow cover under a clear blue sky. Below the mountains, a valley unfolds, showing a mix of green fields, some buildings, and a winding road. The overall scene is bright and clear.

Report of the 43rd Meeting of the
Coordinated Group for Meteorological Satellites

Parallel Working Group Sessions: Ad-hoc meeting on space weather report

AD-HOC MEETING ON SPACE WEATHER REPORT

1. COSPAR Space Weather roadmap

Jean-Louis Fellous, Executive Director of the ICSU's Committee on Space Research (COSPAR), introduced the roadmap developed by the COSPAR Space Weather Panel "Understanding space weather to shield society: A global road map for 2015-2025 ", which is being published in *Advances in Space Research*. The meeting noted that this community effort provides a valuable reference with recommended priorities for observations and scientific developments required to progress in space weather science and applications.

2. WMO four-year plan for space weather coordination

Terrence Onsager (NOAA, Co-chair WMO/ICTSW) introduced the activities undertaken by WMO through the Inter-Programme Coordination Team on Space Weather (ICTSW) and the four-year plan submitted to the 17th WMO Congress (Cg-17) in this respect. It was noted that the presentation of this plan to CGMS was putting emphasis on space-based observations, while its presentation to WMO Members at Cg-17 would put more emphasis on the reasons why it is relevant to WMO, in particular for preparedness to space weather hazards and support to aviation. It will also be introduced in a Cg-17 side event on space weather.

3. Space weather observations related to recent launches

Tsutomu Nagatsuma (NICT, Japan) reported on observations on board Himawari-8, which rely on SEDA-P and SEDA-E. These observations from Himawari-8 are contributing to a 3-D geospace monitoring network of solar energetic particles and magnetospheric particles, with GOES-E, GOES-W and other spacecraft such as Van-Allen Probes. It was underlined that CGMS could play a role in facilitating coordination and inter-calibration of such a geospace network.

NOAA reported on the status of the DSCOVR launched on 11 Feb 2015, which will be placed in a Lissajous orbit at L1. Comparisons with ACE magnetometer and solar wind particles show excellent consistency. Products are being developed at the NOAA Space Weather Prediction Center (SPWC) and will be available on-line and archived at the NOAA Center for Environmental Information (NCEI). International cooperation is essential to ensure real-time reception of such deep space mission data through receiving facilities distributed around the globe.

4. Updates on space weather activities and plans

Dohyeong Kim (KMA) reported KMA space weather services, which were officially established in April 2012 for space weather forecasting and warning to the public. Three Space weather instruments will be flown on GEO-Kompsat-2 spacecraft (magnetometer, charged particle detector, and surface charging sensor). A radiation dose model is being developed.

Tom Berger (NOAA/SWPC) gave an overview of NOAA/SWPC activities, including the preparation for several space weather satellite missions including (GOES-R, DSCOVR, CCOR and COSMIC-2). A wealth of products is provided on the SWPC website. The geomagnetic storm on 17 March 2015 was severe and caused ionospheric disturbances to satellite communications but no failure to the power grid network.

Elsayed Talaat (NASA) presented the NASA activities in space weather. NASA operates 33 spacecraft for heliophysics observations and implements a research program that includes data analysis, theory and model, instrumentation technology development, suborbital flights, and the development of space weather empirical and first principles modelling.

William Denig (NOAA/NCEI) reported on the spacecraft anomaly database and the important applications of such information. He encouraged CGMS members to contribute to an initial spacecraft anomaly database, which could be hosted by a member organization or third party. He further recommended establishing a Working Group and soliciting participation of commercial satellite operators e.g. Space Data Association, and suggested a recommendation from CGMS to NOAA to pursue its enhanced spacecraft anomaly mitigation programme.

W. Zhang (WMO) welcomed the presentation and suggested widening the scope of the database to ground impacts. Jérôme Lafeuille (Rapporteur) recalled CGMS-42 discussions on this subject, which had shown the importance of a clear understanding of the requirements for recording spacecraft anomaly data, and of how the information will be used, e.g. to support real time warnings, or forecast verification, or spacecraft anomaly analysis, or as a climatology information to support satellite design.

William Murtagh (NOAA/SWPC) presented an overview of the new space weather strategy adopted by the USA to raise space weather awareness and address the protection of critical infrastructures in the framework of strategic national risk assessment. The strategy involves a coordinated effort among national agencies and identifies six high-level goals: (i) Establish space weather event benchmarks; (ii) Enhance space weather response and recovery capabilities; (iii) Improve protection and mitigation efforts; (iv) Improve assessment, modelling, and prediction of impacts in critical infrastructure; (v) Improve space weather services through advancing understanding and forecasting; (vi) Increase internal cooperation. The strategy is associated with an Action Plan. Goal #6 of the strategy (Increase international cooperation) is of particular relevance to WMO and CGMS. It includes the following objectives: to build international support at policy level; to promote a collaborative approach; to increase engagement in the international community; to enable data sharing, to strengthen international coordination, and to develop international communication strategies. Alexander Karelin (Roscosmos) underlined the need to address space weather at the global level to address the needs of all countries.

5. High-level Priority Plan objectives of CGMS Space Weather activities

Suzanne Hilding (Chair) recalled the two objectives currently included in the HLPP for space weather: to establish a coordinated approach to the monitoring of space weather and the reporting of space weather-related spacecraft anomalies; to assess how CGMS is organized to address space weather

matters. With respect to the second objective, she invited the participants to express their views about the most appropriate structure to address space weather matters in CGMS in the future. Two possible paths were considered: either establishing a dedicated CGMS working group for Space Weather, or sustain it as part of WGIII and possibly the other existing working groups. WMO noted that in view of the increased international attention to space weather, including the WMO four-year space weather plan, merging space weather issues within the agenda of existing CGMS working groups would facilitate a close integration with Earth Observation matters; on the other hand, it was noted that space weather activities did not have the same maturity yet as Earth Observation. NASA favoured a separate structure to keep a focused activity. NICT supported the view that a separate structure would help the participation of other agencies that are not CGMS Members. KMA expressed interest in fostering collaboration on inter-calibration activities if a separate WG was established. EUMETSAT would support the status quo, having no particular mandate to be active in the field of space weather and recognizing that space weather has not the same level of maturity as other CGMS activities. ROSCOMOS stressed the importance of space weather issues which deserved a working group. CMA supported the view that space weather is important and recalled that the NSMC includes a space weather centre and that CMA satellites are flying space environment payloads; it considered that space weather matters should ultimately be addressed by the existing structure through integration into the terms of reference and agenda of the existing groups, however on a provisional basis it might be more practical to address space weather separately. In conclusion it was recommended to address space weather in a dedicated task team for the time being, and to review the situation when space weather activities have reached a higher level of maturity within CGMS.

6. Review of outstanding actions from previous meetings

Plenary action 41.15: CGMS Members to nominate points of contact to work with WMO/ICTSW in order to define jointly a procedure to improve the collection, availability, and use of satellite anomaly information (30 September 2013)

Points of contact for this satellite anomaly procedure have been nominated by the following CGMS members:

CMA (ZHANG Xiaoxin, xxzhang@cma.gov.cn and GUO Jianguang, guojg@cma.gov.cn),
EUMETSAT (Mike Williams, mike.williams@eumetsat.int),
JMA (Yasushi Izumikawa, satellite@ml.kishou.go.jp),
KMA(Inchul SHIN, icshin@korea.kr),
NASA (Elsayed R. Talaat, elsayed.r.talaat@nasa.gov),
NOAA (Vanessa Griffin, Vanessa.griffin@noaa.gov),

CGMS-42 actions – PLENARY (for WG III)						
Actionee	Action item	#	Description	Deadline	Status	HLPP ref
CGMS members	WG III (from Plen H.1)	A42.14	CGMS Members to establish an implementation team tasked to define detailed objectives for the implementation of CGMS space weather activities as defined in the Terms of Reference	15 Oct 2014, CGMS-43	CLOSED	HLPP# 5.2.2
CGMS members	WG III (from Plen H.1)	A42.15	The implementation team to propose next steps until CGMS-43 and objectives to be included in the HLPP. This includes space weather observations into the WIS and implementation procedures to report on spacecraft anomalies	15 Mar 2015, CGMS-43	CLOSED	HLPP# 5.2.2

It was agreed that Actions 42.14 and 42.15 would be addressed at an intersession web meeting to be held tentatively on 2 September 2015. The Terms of Reference for CGMS space weather activities, as approved at CGMS-42, will be translated into specific objectives for the HLPP.

CGMS-42 actions – Ad hoc Space Weather for WG III						
Actionee	Action item	#	Description	Deadline	Status	HLPP ref
WMO	Ad hoc space weather for WG III	A42.16	WMO to establish an e-mail list server for CGMS Space Weather activities (including CGMS members and associated organisations)	30 Sep 2014	CLOSED	HLPP# 5.2.1
CGMS members	Ad hoc space weather for WG III	A42.17	CGMS Members interested in space weather activities to indicate to the CGMS Secretariat their points of contact for inclusion into the e-mailing list.	30 Sep 2014	CLOSED	HLPP# 5.2.1

The list server CGMSSpaceWeather@wmo.int has been established by WMO as a Google Group, which includes the contact points provided by CGMS members.

Actions 41.15, 42.14, 42.15, 42.16 and 42.17 can thus be closed.

The following action and recommendation following CGMS-43 deliberations were opened:

CGMS-43 actions – Space Weather TT						
Actionee	AGN item	#	Description	Deadline	Status	HLPP ref
SWTT Chair	Ad hoc SW	A43.01	SWTT Chair to convene an intersession meeting to translate the ToRs into specific objectives for the HLPP and to define next steps for action until CGMS-44	2 Sept 2015, CGMS-44	OPEN	HLPP #

CGMS-43 recommendations – WGIV						
Actionee	AGN item	#	Description	Deadline	Status	HLPP ref
SWTT	Ad hoc SW	R43.01	Space weather matters to be addressed in a dedicated Space Weather Task Team (to be initially based on CGMSspaceweather@wmo.int) as discussed in CGMS-43 plenary.	CGMS-44	OPEN	HLPP # 5.2

The final status of all CGMS-42 actions and recommendations (plenary and working groups) following CGMS-43 discussions is available [here](http://www.cgms-info.org/documents/CGMS-42_LoAandLoR_final.pdf) (http://www.cgms-info.org/documents/CGMS-42_LoAandLoR_final.pdf)

The status of CGMS-43 actions and recommendations will be maintained on the [CGMS website](#) under MEETINGS and CGMS-43.

