REPORT OF THE 54th PLENARY SESSION OF THE COORDINATION GROUP FOR METEOROLOGICAL SATELLITES

EXTRACT
WORKING GROUP II

EUM2069756, v1 Draft
EUMETSAT HQ, Darmstadt, Germany
14-15 April 2026

Report prepared by the WGII rapporteurs

CGMS Secretariat
EUMETSAT
Eumetsat-Allee-1
64295 Darmstadt
Germany

www.cgms-info.org
http://www.eumetsat.int/

CGMS MR 54

PARALLEL WORKING GROUP SESSIONS

WG II REPORT

Co-Chairs: *XU Na, CMA & Takuya Sakashita, JMA*
Rapporteur: *Paolo Ruti, EUMETSAT & Andrew Heidinger, NOAA*

1. Opening

1.1 Meeting objectives and expected outcomes

CGMS-54-WGII-WP-01 Meeting objectives and expected outcomes (verbal) (Co-chairs)

Rapporteur Paolo Ruti explained following major topics in the objectives of WG meeting: quality of satellite data and interoperability across the different value chains, synergies of cross calibration, historical evolution towards our earth system services and the AI/ML application. Rapporteur Andrew Heidinger added GEO-Ring is a major theme to be discussed.

1. Improve Satellite Data Quality and Interoperability

A primary objective is to facilitate seamless collaboration among observations conducted by various agencies. Key areas of focus include: Consistency in calibration and validation processes; Adoption of common data formats and metadata standards; Harmonisation across satellite platforms.

Anticipated benefits include improved integration of multi-agency data into Numerical Weather Prediction (NWP) systems, Earth System applications and climate records.

2. Enhance Operational Weather Products

WG II usually focuses on derived products from satellites, such as: Cloud properties, Atmospheric motion vectors (winds), Rainfall estimates, SST / ocean monitoring, Volcanic ash / aerosols, Lightning and severe weather nowcasting products. Potential outcome: Faster and more accurate products for several operational applications.

3. Support AI / Machine Learning Readiness
CGMS-54 explicitly mentions the role of satellite data in AI/ML models. For operational agencies, this is becoming strategic. Likely agenda themes: AI-ready datasets; Training archives; Benchmarking AI forecasts vs physics-based systems; Labelled severe weather datasets; Data access for foundation models.

4. Climate Monitoring and Long-Term Records

Operational agencies increasingly support climate services. WG II likely covers: Fundamental Climate Data Records (FCDRs); Essential Climate Variables (ECVs); Greenhouse gas monitoring; Continuity between generations of satellites. Critical value of the GEO-Ring.

5. User-Driven Evolution of Future Missions

WG II prepares also for future observing system development and design.

1.2 Status of WGII co-chairs and rapporteurs

CGMS-54-CGMS-WP-14wgii Status of co-chairs, rapporteurs, and representatives at meetings (CGMS, ISWGs, VLAB…)

CGMSsec introduced the status of CGMS WG chairs and ISWG co-chairs and rapporteurs. Nomination from each CGMS agency for ISWG was welcomed.

CGMS-54-CGMS-WP-14wgii Request for nomination for WGII rapporteur & CGMS rapporteurs (IWWG, IPWG, IESWG, ICWG)

- International Cloud WG: Andrew Heidinger will step down in September, so a new rapporteur is needed.
- International Precipitation WG: Pleased to hear that JAXA has nominated a candidate.
- International Winds WG: Ilana, currently co-chair, will move to the rapporteur role.
- International Surface/ Earth WG: Looking for a rapporteur; at this stage, a NOAA interim position is envisaged.
- WG Climate Vice-Chair rotation: ESA has put forward a candidate.

2. CGMS agency reports on highlights and issues in dataset and product generation since mid-2025 (block 1)

2.1 CGMS agency reports on highlights and issues in dataset and product generation since mid-2025 (block 1) [40']

CGMS-54-CMA-WP-02 CMA agency report on highlights and issues in dataset and products since mid-2025 (XU Na)

Recent Satellite Launches & Status: Two new satellites have recently joined the operational fleet. The FY-3H, launched on September 27, 2025, is currently in the first phase of its in-orbit testing, which lasts six months. In mid-April, it will transition to the second three-month testing phase, coinciding with the expected release of its first batch of Level 1 data and a preprocessing software package for international direct-receiving stations. Meanwhile, the FY-4C was successfully launched in December 2025 and has been positioned at 133°E. It is now undergoing its own initial in-orbit testing, with its first data releases anticipated in October.

Upcoming Launch Plan & Operational Improvements: Looking ahead, two additional launches are scheduled for late 2026. The FY-4M is planned for December 2026, and it is the first Microwave Sounder (MWS) on geostationary orbit (operating in the range of 23-425 GHz) delivering 24-hour

continuous microwave observation capabilities over China and adjacent maritime areas. Shortly before that, the FY-3J will launch to continue the operational observation capabilities of the FY-3E in the dawn/dusk orbit. In terms of ongoing operations, recent technical corrections have been applied to the FY-3F MWTS scanning bias, alongside improvements to HIRAS positioning accuracy. An updated data preprocessing software package for FY-3F international direct-receiving stations—featuring enhanced fault tolerance—has also been released, and the FY-4B/GHI now includes additional crosstalk correction to mitigate abrupt brightness temperature jumps at low cloud tops.

New Product Development: Finally, significant progress has been made in product development. Leveraging both active and passive satellite payloads, new sea ice products have been created. These include critical datasets such as sea ice thickness, drift velocity, and snow depth, substantially enhancing monitoring capabilities in polar and cold-region environments.

CGMS-54-JMA-WP-01 JMA report on highlights and issues in dataset and product generation since mid-2025 (Takuya Sakashita)

Observation data quality for JMA's Himawari-9 geostationary satellite is comparable to that of Himawari-8, remaining high and stable even during a period of Himawari-8 operation from October to November 2025 due to a Himawari-9 system anomaly. Details of radiometric calibration and image navigation performance for Himawari-9 (which started operation on 13 December 2022) are provided on the JMA/MSC website.

The monitoring pages show image navigation errors are within 600 m at the sub-satellite point, while radiometric calibration biases are up to around 5% (bands 1 to 5) and 5-8% (band 6) in reflectivity for visible and near-infrared bands and less than 0.3 K in brightness temperature for infrared bands (bands 7 to 16). JMA/MSC is currently developing Principal Component Analysis for the Geostationary Hyperspectral Infrared Sounder (GHMS) on board Himawari-10.

CGMS-54-ISRO-WP-02 ISRO report on highlights and issues in dataset and product generation since mid-2025 (TBC)

Operational GEO Satellites & Intercalibration
Two Indian GEO satellites remain operational: INSAT-3DR at 74°E and INSAT-3DS at 82°E. Launched in February 2024, INSAT-3DS incorporates specific fixes to address the calibration and midnight sun intrusion issues previously observed in the 3D and 3DR series. Meanwhile, Oceansat-3 is operational and providing data from its Ku-band Scatterometer and OCM-3 instrument, all of which are accessible via the Bhuvan geoportal. In the area of calibration, the INSAT-3DS infrared channels are being intercalibrated with the IASI-B and IASI-C instruments, with plans to extend this effort to CrIS. For the visible and shortwave infrared bands, intercalibration is performed using MODIS via ray-matching, and this work is being extended to include VIIRS on the NPP satellite. The INSAT-3DR/3DS products are available through the MOSDAC portal.

Products, Upcoming Launches & Future Missions

Atmospheric Motion Vectors (AMVs) are now being generated in BUFR format and disseminated globally via the GTS. Full-disk AMVs are also under production, with quality evaluation currently ongoing. Looking ahead to launch schedules, Oceansat-3A—equipped with a scatterometer, OCM-3, MATHS, and SSTM instruments—is planned for the third quarter of 2026. Two additional satellites are slated for 2028: TRISHNA, which will provide high-spatial-resolution imaging in the thermal infrared, visible/near-infrared, and shortwave infrared bands, and G20, an environmental and climate change monitoring satellite.

CGMS-54-CNES-WP-01 Status report on the current and future satellite systems by CNES (Murielle Lafaye)

IASI Instruments & Intercalibration
The IASI-B and IASI-C instruments are currently in nominal operation. A key intercalibration campaign between IASI-C and the next-generation IASI-NG is scheduled from mid-April to mid-June, utilizing a tandem flight configuration of the Metop-C and EPS-SG-A1 satellites. The IASI Sounder Scientific Working Group, which last convened on December 8–9, 2025, is set to hold its next meeting on July 2–3, 2026. Meanwhile, the first phase of calibration is ongoing as the team works to identify the instrument's optimal operating point. Challenges persist with ice contamination, which continues to impact instrument components and validation activities; nevertheless, the satellite remains stable and operational despite some GPS jamming.

SMOS & Future Plans
For the SMOS-Ocean and FRESH missions, the annual scientific meeting is scheduled for March 30 to April 1, 2026, followed by a Quality Working Group meeting on May 19–21. A formal review has confirmed the mission's extension, which is now approved to continue through 2029. The mission has also yielded new publications in the fields of oceanography and hydrology. In terms of data reprocessing, low-resolution (LR) data have been completed, while high-resolution (HR) data processing remains in progress.

Additionally, C2OMODO (French contribution to the NASA « Atmosphere Observing System) was also presented.

CGMS-54-ESA-WP-02 ESA report on the current status of the Arctic Weather Satellite (AWS) [5'] (Armin Loescher)

As of April 2026 the Arctic Wheater Satellite (AWS) is operating nominal. The expected lifetime is until end of 2029. In March 2026 the implementation contract of EUMETSAT’s EPS-Sterna was signed with OHB-Sweden. The full contract encompassed a total of 20 satellites to provide a continuous service into the 2040s. The first batch of satellites will be launched in 2029 allowing a cross calibration with AWS to maximise the available uninterrupted, high-quality, long-term data record. This marks a major step toward better monitoring rapidly evolving weather, improving forecasts of severe events in vulnerable regions such as the Mediterranean, and closing critical data gaps over the Arctic – the fastest-warming region on Earth and a key driver of Europe’s weather systems. ESA will manage the procurement of the Sterna satellites following the established cooperation model with EUMETSAT

applied to Europe's other meteorological missions, namely the geostationary Meteosat and the polar-orbiting MetOp missions. The Sterna constellation will comprise six satellites in orbit at any given time – and these satellites will be replenished twice during the lifetime of the mission to ensure the continued delivery of data until at least 2042. In addition, to these 18 satellites, OHB Sweden will build an extra two satellites as spares. Like the prototype mission each satellite will carry a cross-track scanning microwave radiometer to provide detailed profiles of atmospheric humidity and temperature.

2.2 Roundtable/Discussion (block 1)

The GEO-ring was identified as a pivotal domain for international cooperation. Effective collaboration within this framework can drive enhancements in data collection, sharing, and utilisation across agencies. There is significant interest in advancing and harmonising GEO observations. A key objective is to achieve synchronised imaging and sounding, (e.g., coordination on orbit design and timing to maximize simultaneous observations and harmonize scanning directions (e.g., north-to-south vs. south-to-north scans)) which would contribute to improved global coverage and data consistency. Ongoing developments in GEO sounder technology, along with forthcoming satellite launches, underscore the benefits of exchanging experiences and lessons learnt among agencies. The Numerical Weather Prediction (NWP) community stands to gain considerably from the implementation of more regularly synchronised geostationary (GEO) imager observations

Lightning observation and validation continue to be critical priorities, especially for applications requiring high resolution and those focused on tropical regions. In these areas, the availability of suitable proxies is limited, making direct lightning measurements even more essential for improving the accuracy of meteorological analyses. There is a recognised need to elevate coordination on lightning observations to the international agenda. This includes the pursuit of better alignment between GEO and ground-based monitoring systems. Enhanced collaboration across these platforms would help ensure comprehensive coverage and more robust validation processes. Improved validation strategies and guidance within the GEO-ring framework are recommended to facilitate more effective integration and utilisation of lightning data, ultimately better understanding the physical representation of the different types of lightning products.

Ensuring accuracy remains a major challenge for EO products, underscoring the need for sustained ground-based observations and a deeper understanding of the physical processes represented in satellite measurements. In this context, upcoming field campaigns could be more impactful if clustered around larger coordinated scientific programmes, where dedicated in situ observations, process studies, and multi-platform measurements simultaneously strengthen product validation, improve retrieval algorithms, and maximize scientific and operational return.

Geostationary sounders were highlighted as one of the most promising next-step capabilities for operational Earth observation, with new developments and upcoming launches creating renewed momentum across agencies. Participants emphasized the importance of sharing technical experience, calibration approaches, retrieval methods, and lessons learned internationally, as GEO sounding is inherently an area where cooperation can accelerate maturity and interoperability.

Their strongest operational value lies in providing frequent temperature and humidity profiles, potentially on hourly or in the future sub-hourly cycles, enabling a much better characterization of atmospheric evolution of fast developing phenomena. Emphasis was placed on boundary layer applications, where improved monitoring of moisture, temperature inversions, and instability could substantially enhance fog forecasting, convective initiation detection, air-quality services, and urban weather applications. GEO sounders also offer major potential for faster and more continuous data assimilation into numerical weather prediction systems, helping to improve short-range forecasts, nowcasting, and high-impact weather warnings. AI-weather system can further use satellite data for both training and inference phases. The use of the full-scale spectral resolution by AI systems can be an interesting evolution for the next generation.

Regarding the GEO-Ring coordination, differences of observation capability and mechanism for imager and lightning mapper were recognized. Coordination for lightning imager validation will be discussed at the next intersessional meetings. The importance of long-term surface observation for satellite observation validation was emphasized.

3 CGMS International Science Working Groups and need for coordination (block 1) [110']

3.1 IWWG specific topics for coordination with CGMS

CGMS-54-IWWG-WP-01 IWWG specific topics for coordination with the CGMS (Iliana Genkova, co-chair (virtually))

Work continues internationally to strengthen commonality in the derivation of Atmospheric Motion Vector (AMV) products for global users, while preserving appropriate backward compatibility as algorithms evolve. A key element of this effort is the periodic AMV product survey, conducted since 2023, which gathers detailed technical information on processing approaches across agencies, including satellites and instruments used, selected channels, algorithm configurations, dependencies, and output formats. A new survey is currently in progress, following publication of previous results through the CGMS / IWWG website and mailing list in December 2025. In parallel, planning has started for the 5th AMV Intercomparison Study, coordinated with the ICWG, while a dedicated working subgroup within the International Winds Workshops continues to focus on AMV retrieval methodologies and algorithm development.

At the same time, growing attention is being given to the value of winds derived from geostationary and low Earth orbit hyperspectral infrared observations. Several agencies are actively developing Optical Flow and related approaches to retrieve three-dimensional winds from current and future hyperspectral sounders. EUMETSAT is preparing version 2 of its 3D winds software for MTG IRS and evaluating operational IASI 3D winds. CMA plans to tune its Optical Flow retrievals for FY-4C GIIRS, while JMA is developing variational Optical Flow techniques for the future hyperspectral sounder on Himawari-10. NOAA is assessing both variational and AI/ML-based Optical Flow approaches to support its future GXS instrument. Together, these activities point toward a new generation of vertically resolved wind products with strong potential benefits for data assimilation and short-range forecasting.

Work is progressing to better coordinate and enhance the use of cloud properties in high-impact applications, particularly Atmospheric Motion Vectors (AMVs) and All-Sky Radiance products. A notable current trend is the increasing use of dedicated cloud-height products, generated through advanced cloud retrieval algorithms developed by specialist cloud communities, to improve height assignment for AMVs. This is being pursued notably by EUMETSAT and NOAA. Beyond cloud-top height, however, the broader use of retrieved cloud properties remains limited, with only selective application such as quality control. Parameters including optical depth, ice water path, and cloud particle characteristics could offer further benefits for AMV quality, representativeness, and radiance interpretation. In this context, the IWWG and ICWG are discussing inclusion of this topic in the 5th AMV Intercomparison Study.

At the same time, AI and machine learning are increasingly being explored for both product generation and data-processing infrastructure. A major focus is the development of methods to derive three-dimensional wind fields from geostationary imagers and hyperspectral sounders, with active work involving NASA, NOAA, EUMETSAT, ESA, JMA, CMA, and industry partners. Additional efforts are examining how machine learning can infer horizontal motion from derived geophysical variables such as moisture, temperature, and ozone. These developments suggest that AI/ML could significantly expand the exploitation of multispectral and hyperspectral observations, while also improving the scalability and efficiency of future operational processing systems.

Recommendation for consideration by CGMS: Encourage the NWP community to assess the quality and impact of derived 3D wind products from IR sounders as soon as possible after the data comes online.

Jaime Daniels (NOAA) will step down as CGMS rapporteur. Iliana Genkova (NOAA) is nominated as the new CGMS rapporteur for plenary endorsement, and will remain co-chair until the next IWWG meeting, IWWG-18 (TBC). EUMETSAT is considering hosting IWWG-18.

3.2 ITWG specific topics for coordination with CGMS

CGMS-54-ITWG-WP-01 ITWG specific topics for coordination with the CGMS (Fiona Smith, co-chair (virtual))

The next TOVS Conference 2027 will take place in Tsukuba and was noted as an important milestone for the sounding and retrieval community. At the same time, significant challenges were highlighted in organizing international working-group conferences more broadly. Participation from CGMS member agencies is often limited, with meetings tending to attract more numerical weather prediction scientists than satellite programme staff, although strong engagement continues from EUMETSAT, NOAA and CNES. Practical constraints also remain substantial, as potential hosts frequently operate with limited budgets and may struggle to cover venue costs, while administrative capacity for managing bank accounts, registrations, and contractual arrangements can also be insufficient. These issues suggest a need for more sustainable conference support models if international technical coordination is to remain effective.

Regarding the High-Level Priority Plan (HLPP), several work areas were viewed as having largely reached maturity, including common principal component score representation and hyperspectral sounder trade-off studies, as current missions appear to be converging on similar design choices. In contrast, strong progress was recognized in areas such as hyperspectral Level-2 intercomparison, observation error characterization, and radiative transfer modelling, which continue to deliver direct operational value. Looking forward, future priorities may need to focus more explicitly on observing system resilience, particularly the risk that numerical weather prediction systems and downstream applications become overly tuned to existing observing characteristics, making future instrument changes disruptive. The integration of commercial satellite data was also identified as an emerging strategic topic. Finally, the HLPP item on AI/ML technologies for product processing and data-management infrastructure was seen as increasingly important, with open questions remaining on how such developments should be captured, coordinated, and reflected within existing survey and reporting mechanisms.

3.3 ICWG specific topics for coordination with CGMS

CGMS-54-ICWG-WP-01 ICWG specific topics for coordination with CGMS (Andrew Heidinger)

The ICWG GEO-Ring Cloud Product Intercomparison is progressing as a major collaborative initiative to compare and harmonize cloud products from global geostationary imagers. With support from NESDIS, UW-CIMSS developed a one-year prototype GEO-Ring dataset, while EUMETSAT is preparing a five-year dataset projected onto a HEALPix grid (**Hierarchical Equal Area isoLatitude Pixelization**. It is a grid system designed to partition a sphere into equal-area pixels) and will host the next GEO-Ring meeting in June 2026. The activity is coordinated among agencies including NOAA, CM SAF, Bureau of Meteorology, JMA, EUMETSAT, RAL Space and SAFNWC. The framework allows flexible product submissions in different naming conventions and formats, supports both global gridded and native satellite geometries, and includes a defined list of cloud properties together with uncertainty estimates. A common benchmark “golden day” has been selected for 1 October 2021 using four reference time slots.

Discussion on near-real-time cloud data for the GEO ring highlighted strong user interest in faster and more operationally responsive services, especially in the AI weather system contest. While increasing the full-disk observation frequency from 30 minutes to 15 minutes was considered, the current 30-minute interval remains the agreed baseline, reflecting existing nowcasting user requirements and operational commitments. Participants noted that future needs, particularly for air-quality applications, storm tracking and rapidly evolving extreme events, may strengthen the case for higher refresh rates. More broadly, there was clear support for making GEO-ring data available in near real time, with timely delivery seen as a key priority. The dissemination of this GEO-Ring data ultimately requires the permission from each contributing agency and this permission is currently being negotiated. Although there was optimism that progress can be achieved, it was recognized that building robust and reliable operational capability will require sustained effort over time, together with stronger long-term coordination arrangements, including the nomination of new rapporteurs from member organizations.

Andrew Heidinger will be stepping down as CGMS rapporteur once a replacement is found.

3.4 Q&A/Discussion (block 1) [20']

A key cross-cutting issue identified was the need for stronger and more sustained support to the International Working Groups (IWGs), particularly for maintaining web pages, communication platforms, and organizing technical conferences that remain essential for coordination and knowledge exchange. It was also suggested that impact studies proposed by the IWGs should have a better uptake from WMO, so that scientific studies and numerical experiments can be coordinated at the international level. In this context, the idea of an international impact workshop was raised as a possible mechanism to accelerate coordination between IWGs and operational weather agencies.

Finally, there was growing recognition that the hyperspectral sounder products can become relevant to the nowcasting community, as high-frequency vertical profiling of temperature and humidity could increasingly support very short-range forecasting, convective monitoring, fog prediction, and rapidly evolving high-impact weather services.

3.5 IESWG specific topics for coordination with CGMS [40']

CGMS-54-IESWG-WP-03 Progress of the IESWG and items for coordination with the CGMS (Christoph Rüdiger (ECMWF))

The progress update from the IESWG highlighted snow and ice observations as a continuing priority area where current operational performance and product maturity remain constrained, indicating scope for further improvement in retrieval capability, coverage, and validation. Growing private-sector interest in this domain was also noted, suggesting that stronger coordination across public and commercial actors may become increasingly important. In response, a possible action item was proposed to enhance collaboration and align related activities within the CGMS framework, with specific link to IPWG.

CGMS-54-IESWG-WP-01 Way forward of the IESWG (Christoph Rüdiger (ECMWF))

In response to A53.06 and discussions at CGMS-53 plenary, and for recommendation to CGMS-54 plenary

Progress in radiative transfer modelling was highlighted as an area requiring continued follow-up and stronger engagement, given its foundational importance for satellite data exploitation. Participants noted that future work should explicitly address land applications in addition to traditional atmospheric retrievals, reflecting the growing range of missions and operational use cases that depend on accurate radiative transfer representation.

In parallel, it was seen as necessary regarding long-term support for the IESWG. Multiple organizations expressed support for maintaining it as a sustained international scientific coordination structure, with

broad consensus that a long-term approach is both justified and strongly supported across the community.

In conclusion, CGMS WGII unanimously recommended the continuity of the IESWG as a CGMS International Science Working Group to plenary for endorsement.

Clara Draper (NOAA) may step down as co-chair and some point, and will continue to act as an interim CGMS rapporteur until a replacement has been found.

4 Climate and greenhouse gas observation matters for coordination with CGMS [60'] (incl. discussion)

4.1 Working papers on climate and greenhouse gases for coordination with CGMS

CGMS-54-JWGCLIM-WP-01 Joint CEOS-CGMS Working Group on Climate - update and recommendations to CGMS space agencies (Vincent-Henri Peuch, vice-chair)

On Climate Data Records (CDRs), stronger integration between International Working Group experts and CGMS/CEOS climate WG was encouraged. A central issue raised was the long-term stability of the 35 Essential Climate Variables, including the need to stress-test observing-system resilience against future disruptions, continuity breaks, or mission delays. It was noted that no comprehensive analytical framework yet appears to exist for such disruption scenario testing. Existing inventories and databases, including use of the WMO OSCAR system, already provide useful links to major international observation databases and support current gap-analysis activities. Among identified gaps, limb sounding was highlighted as particularly significant, while participants also stressed that gap analysis should extend beyond a 10-year horizon to support longer-term climate planning and continuity strategies.

Vincent Henry Peuch will become the new WGClimate Chair in autumn 2026 when Wenying Su will conclude her Chairing of the group. ESA plans to provide a nomination for the new vice Chair position.

CGMS-54-JWGCLIM-WP-02 WGClimate GHG Task Team - updates and recommendations to CGMS space agencies (Yasjka Meijer, TT lead)

The Greenhouse Gas Roadmap, endorsed by CGMS and CEOS in 2024, is focused on delivering fit-for-purpose data and moving toward operational greenhouse-gas monitoring, supported by an Action Annex with 30 near-term actions across eight thematic areas. Key priorities include tracking sensor developments and mission timelines, identifying measurement gaps, improving constellation coordination, strengthening calibration and Level-1 products through common calibration sites and portals, and advancing Level-2 product intercomparison and validation networks, including ocean coverage and remote regions such as sub-Antarctic islands. Further themes include flux inversion modelling, system development, and capacity building, reflecting the move from research missions toward sustained operational GHG services.

A second major emphasis is methane monitoring and stakeholder engagement. The Task Team reported completion of a first “Methane Common Practices” document, intended to support cooperation with New Space. Outreach to inventory agencies is progressing through “Bring Your Own Inventory Compiler” initiatives. CEOS SIT Chair and GHG TT engaged with ASI and DLR to facilitate access for IMEO to PRISMA and EnMAP. Coordination with WMO initiatives such as IG3IS and G3W was highlighted as strategically important, with recognition that sustaining momentum in coming years may remain challenging despite strong recent support, notably from JAXA during its SIT chairmanship.

CGMS-54-WMO-WP-02 Update and status of the WMO Global Greenhouse Gas Watch (G3W) initiative (Oksana Tarasova (virtually))

The WMO update outlines continued progress in implementing the Global Greenhouse Gas Watch (G3W), currently in its pre-operational phase. Following technical workshops in 2025, the initiative is advancing through integration with existing WMO programmes such as the World Weather Watch and Global Atmosphere Watch. Major workstreams include greenhouse-gas modelling as new activity under the WIPPS framework, where standardized evaluation metrics and quality assurance procedures are being developed, as well as data management efforts to map current greenhouse-gas data flows and establish exchange procedures through WIS2.0. Pilot demonstrations of data exchange are planned, alongside broader architecture development for observations, model outputs, and verification systems.

A third pillar concerns network design and operational readiness. WMO is preparing an initial observational network design under the WIGOS framework, covering application specific observational needs, observing requirements, tiered monitoring approaches, and results from global OSSE studies. Challenges include adapting the global concept to national circumstances, while ensuring long-term sustainability, governance, scalability, and data policy coherence. Priorities for 2026–2027 include demonstration pilots, development of a sustainability strategy, improved data workflows, and operational protocols for model intercomparison. For CGMS, specific requested contributions include low-latency satellite products, mapping greenhouse-gas data flows and architectures, and identifying gaps in current and planned GHG observing missions.

CGMS-54-EUMETSAT-WP-05 GEO-Ring project – Progress and plans (Jörg Schulz)

Climate Data Records (CDRs) were highlighted as increasingly relevant not only for climate applications but also for machine-learning training and inference, which is bringing near-real-time access requirements onto the agenda. It was noted that documenting lessons learned from past CDR activities has been challenging, as progress has often depended on individual expertise, sustained personal engagement, and close hands-on collaboration rather than fully institutionalized processes. Participants stressed that long-term commitment remains essential, particularly for the demanding work of sensor recalibration and cross-calibration against reference instruments, including the consistent adjustment of historical spacecraft records. These enhanced long-term datasets are expected to provide substantial value for future reanalyses and next-generation AI-enabled Earth-system services, even when not immediately used in the current production cycle.

Lightning observations were also raised as an important emerging topic, particularly regarding their status within the Essential Climate Variables framework. At present, this appears to remain largely an EUMETSAT-driven activity, suggesting further international discussion may be needed on broader recognition and coordination. Reprocessing of lightning datasets is planned, which could improve long-term consistency and climate relevance. More broadly, continued progress on the GEO-ring was noted, including an existing publication in the BAMS, with additional collaborative work still underway.

5 AI/ML

CGMS-54-WGII-WP-07 Response to action on AI, survey outcome (Elody Fluck)
In response to actions 53.07-53.07iv

Key elements from the discussion on the survey outcome.

The discussion on the AI survey outcomes showed that CGMS agencies have moved beyond general interest in artificial intelligence and are now focused on practical implementation. A key message was that **tools and usable workflows matter more than debating formats alone**. While standards remain important, participants emphasized that agencies need working solutions for discovery, access, preprocessing, annotation, benchmarking, and deployment. Regular agency status reports were seen as valuable for maintaining visibility on progress, sharing lessons learned, and helping the community track rapidly evolving capabilities across members.

Survey results indicate strong demand to improve the AI readiness of Earth Observation data and services, although maturity levels differ significantly between agencies. Common priorities include better data discoverability, more consistent metadata, cloud-native access, and direct support for machine-learning workflows. Overall, the community appears ready to move from isolated experimentation toward coordinated implementation of AI-ready EO data practices.

There was also clear support for a shared AI/ML catalog, but with the strong caveat that it must operate as a living operational resource rather than a static inventory. Such a catalog should contain structured and quality-controlled datasets, models, documentation, standards, code examples, and practical usage guidance. On governance, agencies favored a joint CGMS–WMO model with peer-reviewed contributions, ensuring both technical credibility and broad international ownership.

CGMSSEC has been invited to present the survey outcomes to the plenary and to propose actionable way forward.

6 CGMS WGIII risk assessment

The 8th Risk Assessment Report of the CGMS primarily presents the results of the risk assessment for the CGMS baseline, including the risk status of Earth observation and solar/space observation sensors, key risk areas, related action recommendations, and an update on mission data for 2026.

High-risk area: The continuity of radio occultation observations in low-inclination orbits is at risk by the end of this decade, as there are no commitments for follow-up missions after COSMIC-2. The SWCG should recommend to WGIII how to separate radio occultation and ionospheric electron density profiles in the CGMS baseline and risk assessment, and the IROWG should clarify the risk level and potential impacts of the gap in low-inclination radio occultation.

Moderate-risk areas: There is a continuity risk for ultraviolet limb spectrometers in the 2030s; WGII needs to investigate other ultraviolet limb detection capabilities to supplement JPSS. There is a slight long-term continuity risk for short-wave infrared imaging spectrometers in the mid-to-late 2030s; the GHG TT needs to indicate through WGII whether to add short-wave infrared missions for CH_4 and CO_2 to the baseline. There is a minor long-term continuity risk for precipitation radar in the late 2030s. There is a continuity risk for scatterometers from the early to mid-2030s. There is a minor continuity risk for the 2030 GEO magnetometer at 128°E. There is also a continuity risk for LEO high-energy particle sensors from the early to mid-2030s.

The WMO, in collaboration with the IPWG and GHG-TT, investigated how to present microwave (MW) and short-wave infrared (SWIR) sensor types in greater detail within the CGMS baseline (observation and orbit components) and the CGMS risk assessment to better reflect their observational capabilities and applications, and proposed corresponding updates.

In response to WGIII/A52.03, there is a need to clarify MW missions at different frequencies and their visualization in flight charts within the CGMS baseline and risk assessment. WMO conducted a study on MW frequencies and their applications, providing a document covering MW frequency applications and currently operational (or planned) instruments; the IPWG reviewed and confirmed the requirements. It is proposed to subdivide MW imagers in the CGMS baseline according to frequency ranges and applications, specifically into four ranges: <2 GHz, 2–19 GHz, 19–200 GHz, and >200 GHz, and to update CGMS agency commitments (attribute column).

In response to WGIII/52.04, the GHG-TT needs to review the representation of SWIR missions for CH_4 and CO_2 in the CGMS baseline and risk assessment. WMO and the GHG-TT jointly provided a study on SWIR frequencies relevant to CH_4 and CO_2 measurements. It is recommended to subdivide the Near-Infrared/Short-Wave Infrared (NIR/SWIR) imaging spectrometer category to better characterize instruments measuring CO_2 or CH_4, and to update CGMS agency commitments (attribute column). Specifically, subcategories should be established for CO_2 observations at 1590–1675 nm and 1990–2095 nm, and for CH_4 observations at 1660–1672 nm and 2100–2500 nm. It is also noted that the CH_4 band falls within a CO_2 band; therefore, instruments measuring in this band may simultaneously retrieve both gases and, if necessary, could be extended to other wavelength ranges for additional gases such as N_2O and CO

CGMS-54-WGIII-WP-12wgii Status and outcome of the 8th CGMS WGIII risk assessment (Melissa Johnson (NOAA))

WMO proposed responses to the following actions:

- WGIII/52.03:WGII to articulate how MW missions with different frequencies should be addressed and visualized in the CGMS Baseline and Risk Assessment.
- WGIII/52.04:GHG TT (via WGII) to indicate if SWIR missions for CH4 and CO2 missions should be added to the CGMS baseline and the risk assessment.

To be further addressed in the framework of WGII:

- WGIII/7RAWS-12: WGII to investigate other capabilities for UV limb sounding to complement JPSS
- WGIII/7RAWS-13: WGII to study and report back to WGIII the need of top of the atmosphere and spectral solar irradiance capabilities to be recorded in CGMS Risk Assessment and Baseline.
- WGIII/7RAWS-14: WGII to consider whether observations from geostationary orbit should be added to the CGMS baseline requirements for the broadband short/long wave radiometer.

Please see WGIII report for further details and the outcome of discussions.

7 Future direction 2022+ initiative

CGMS-54-CGMS-WP-3wgii Future direction: Proposal on the way forward

The CGMS-51 Plenary had endorsed the CGMS future direction strategic themes 2022+. Since then, these themes have been integrated into the working structure of the CGMS Working Groups, and progress has been achieved in several areas. In light of this progress, the CGMS Secretariat proposed concluding the initiation phase as the way forward, a proposal to which no objections were raised.

8 Reviewing and updating of the HLPP (excl. priorities related to the CGMS International Science Working Groups)

CGMS-54-CGMS-WP-06 Status of implementation of CGMS High Level Priority Plan (2025-2029) (Mikael Rattenborg)

1. (4.2.3) Establish a coherent development of volcanic ash products and applications with close user community coordination;
   - WG II will deliberate on strategies for Ash Product development, review ongoing intercomparisons, and establish appropriate parameters for end user applications in collaboration with SCOPE-NWC, IAW, and ICAO. Action pertaining to WMO will be addressed during the intersessional period.

2. (4.5.1) Report on the progress within the Nowcasting community toward the use of hyperspectral sounders and work toward common products to serve the requirements of the global community.
   - To revisit in two years' time
   - Engaging the WMO Tropical Cyclone community

3. (4.8.1) Foster the coordinated development of novel products and applications of the new generation of imagers, initially for the areas of fire, aerosols, flood-mapping and river ice break-up
    - To be removed

4. (4.8.2) Provide support to users in the WMO application areas, including for agricultural, hydrology, cryosphere, marine/ocean and other applications, with a focus on the WMO co-led UN Early Warnings for All (EW4ALL) identified priority hazards (heat, drought, flood, and tropical cyclones); and, where appropriate, identify and follow-up on opportunities by other entities (e.g. CEOS led activities);
    - WMO has initiated surveys on observational gaps in different areas.

9 CGMS agency reports on highlights and issues in dataset and product generation since mid-2025 (block 2)

CGMS-54-EUMETSAT-WP-06 EUMETSAT report on highlights and issues in dataset and product generation since mid-2025 (Mounir)

Several highlights illustrated the growing value of multi-sensor integration and advanced exploitation techniques across operational Earth observation systems. Continuous progress in resampling Sentinel-2 and Sentinel-3 Level-1C data is improving the combined use of OLCI and SLSTR observations, with MICMICS identified as an important enabling framework, particularly for fire-detection applications. More broadly, combining multiple instruments was seen as increasingly important for environmental monitoring—for example, using MTG FCI together with MTG LI to better understand convection and potential downstream fire ignition linked to transported particles. Flood mapping was also highlighted as a promising application, building on experience from ABI to exploit FCI data in future services.

Additional discussion focused on emerging atmospheric and AI-enabled applications. The variable sensitivity of MTG IRS to the boundary layer was noted, with performance depending strongly on local thermal contrast and changing through the diurnal cycle, meaning observations may not always be equally usable. Machine-learning applications for radar reproduction were also highlighted, reflecting the growing role of AI in deriving proxy products and enhancing observational coverage. Finally, a notable international cooperation example is the NOAA JPSS CrIS 3D winds demonstration, which uses the EUMETSAT IASI 3D winds algorithm based on three-dimensional optical-flow methods adapted from Heas and Memin (2008). This algorithm retrieves wind fields from temperature, humidity, and ozone profiles, and the operational IASI 3D wind product has been available since the end of 2025.

CGMS-54-JAXA-WP-01 JAXA Earth Observation Program and Data Product since mid-2025 (Moeka Yamaji)

Recent developments highlighted the scale of new Earth observation capabilities emerging from JAXA and partners. EarthCARE observations are expected to significantly improve understanding of cloud internal structure and the evolution of particles into precipitation, with potential benefits for

forecasting heavy rainfall, although the extent to which these gains are already demonstrated versus still anticipated remains to be clarified. ALOS-4 (Advanced Land Observing Satellite 4) provides enhanced land-monitoring capability through the PALSAR-3 radar instrument, delivering a wide 200 km swath at 3 m spatial resolution. In parallel, JAXA's future PMM builds on the heritage of TRMM and GPM, with a preliminary design review completed in January 2026 and planned advanced Doppler velocity and high-sensitivity precipitation observations for launch after 2028.

CGMS-54-KMA-WP-02 KMA Report on Highlights and Issues in GK2A Products and Its Application (In-chul Shin)

Key highlights focused on the growing use of AI and high-resolution data exploitation within GK2A applications. Progress was reported on enhancements to the forest fire danger index algorithm through integration of dense automatic weather station (AWS) observations with GK2A AI-derived products such as soil moisture and potential evaporation, with encouraging qualitative results for wildfire risk assessment. Additional developments included a GK2A AI proxy-radar capability, demonstrating the use of satellite data and machine learning to emulate radar-like information where direct radar coverage is limited. Machine-learning super-resolution models were also highlighted as an important area of interest for improving spatial detail from GEO observations. Looking ahead, discussion also touched on channel selection for the future GK5, indicating continued focus on next-generation GEO sensor optimization.

CGMS-54-NOAA-WP-08 NOAA report on highlights and issues in dataset and product generation since mid-2025 (Andrew Heidinger)

GOES 19 became operational as GOES East in January 2025, marking the series' 50th anniversary and its final mission in the GOES-R series of satellites. All Level 1 and 2 products are now operational From GOES-19. GeoXO algorithm developers are using MTG/FCI to assess the benefits of 0.91 micron and higher-resolution IR channels on multiple applications. GeoXO is also looking forward to accessing the MTG IRS data and using it as a proxy for the GeoXO GXS.

NEON: Quicksounder ATMS has been integrated; stratus weather imager transaction authorization is in progress; the sounder supports MW-based applications (Phases B-D); NOAA POES has been decommissioned. The SNPP satellite is considered a tertiary asset, and all users are encouraged to use NOAA-20 and NOAA-21.

The Wildland Fire Data portal now maintains a consistent software development and deployment lifecycle. This portal is meant to serve as a model for future NESDIS data dissemination approaches. All NESDIS products continue to transition to the cloud.

The POES Series, which started in 1979, are officially decommissioned.

CGMS-54-NASA-WP-02 NASA Research and Data Product Highlights since mid-2025 (Maudood Khan)

The Small Ozone Lidar (SMOL) system team continued its focus on critical hardware developments aimed that enhancing system reliability by incorporating the lessons learned from various field operations. The NASA Pandora and European Space Agency (ESA) Pandonia projects continued to collaborate, coordinate, and facilitate global monitoring air quality and changes to atmospheric composition. As of March 2026, the Pandonia Global Network (PGN) of Pandora instruments is comprised of 206 sites in 37 countries. The PACE Validation Science Team (PVST) continued to coordinate a global effort to calibrate and validate observations being acquired by the PACE mission. These efforts use a diverse suite of instruments including radiometers, sunphotometers, spectrophotometers, automatic microscopes and water sample collection systems. Using insitu and remotely sensed data acquired during various NASA airborne science campaigns, researchers developed a new optical-theory-based model that shows that the aerosol size distribution (as parameterized by the effective radius, Reff) is the most important single parameter for relating CCN and High Spectral Resolution Lidar (HSRL) observations for polluted, coastal marine conditions. Such research aims to improve our understanding of the aerosol-cloud interactions, which is a significant contributor to uncertainty associated with estimates of radiative forcing. NASA released version 3 of the Quality Controlled Lightning Imaging Sensor (LIS) data. This version of the dataset represents the culmination of over thirty years of lightning observations acquired first from the LIS instrument onboard the Tropical Rainfall Measuring Mission (TRMM) 1997 to 2015) and then from the International Space Station (ISS) (2017 to 2023).

CGMS-54-ROSHYDROMET-WP-02 ROSHYDROMET report on highlights and issues in dataset and product generation since mid-2025 (TBC)

The Russian satellite constellation consists of two HEO satellites (Arctica), two LEO (Meteor-M) satellites and two GEO (Electro-L) satellites. Electro-L 5 was launched in Feb 2026, is now in the commissioning phase. Meteor-M 3 is working with limitations. The ground segment has 3 ground stations locations in Europe (Moscow), Siberia (Novosibirsk) and Far-Eastern (Khabarovsk).

Global mosaics from VIS and IR from multiple satellites are being generated every 30 minutes. Cloud Heights and maximum wind speeds are being generated over the Arctic from Artica-M and precipitation types are being generated from Electro-L. An AI approach is being used to estimate precipitation intensity from Electro-L. Other examples shown include a neural-network derived approaches for liquid water path and sea-surface temperature from Meteor-M.

CGMS-54-WMO-WP-01 Highlights and issues by WMO for the attention of the CGMS space agencies (Natalia Donoho)

This presentation covered the outcomes of Consultative Meeting (CM)-16, highlighting the continued importance of space-based observations for WMO priorities. It outlined the role of WIGOS Vision 2050 as the guiding framework for coordinated long-term planning and evolution of the global observing system. It emphasized the growing impact of AI/ML on satellite data utilization and future requirements, including implications for data quality, timeliness, formats, and capacity development. It identified persistent gaps in data access, dissemination, and regional capacity, particularly affecting the implementation of EW4All. It highlighted the importance of WIS 2.0 as an enabling infrastructure

for improved data discoverability, accessibility, and interoperability. It addressed the need for continued coordination with CGMS and private sector actors, including through WMO Commons and related mechanisms. It noted the status of space weather activities and radio-frequency protection, including ongoing coordination needs and resource considerations. CM-17 is tentatively planned for early 2028 and will be confirmed in consultation with partners.

CGMS-54-IMD-WP-01 IMD report on highlights and issues in dataset and product generation since mid-2025 (TBC: A K Mitra)

IMD demonstrated a plethora of applications of weather satellite data. For geostationary satellites, use OLR and cloudiness for monsoon prediction. Case studies using precipitation, fog, cyclone analysis and winds were shown. The sounder products were also highlighted and the merger of lightning and satellites for thunderstorm detection were demonstrated. Examples were given for applications in the areas of hydrology, agrometeorology and climate.

Future missions include an INSAT-4th Generation with an advanced imager, a hyperspectral sounder and a lightning mapper. For Oceansat 3A, ARGOS will be replaced by a millimeter-wave atmospheric temperature and humidity sounder (MATHS). Other LEO missions include MW sounders in low-inclination orbits, dual frequency scatterometers and hyperspectral IR and MW sounders.

Future innovations include 3D mapping of the atmosphere from wind lidars, 4-D ocean fields and wave hazards from missions like SWOR and GNSS-R. Next generation geostationary lightning mappers will used to support early thunderstorm detection.

The Standard Operating Procedure (SOP) for the Satellite Meteorology Division, India Meteorological Department (IMD) has been successfully prepared. The document comprehensively covers INSAT3DR/3DS operations, products, data flow, and satellite systems. It serves as a structured guideline for operational, technical, activities within the division. and analytical. The SOP ensures standardization, efficiency, and consistency in satellite meteorological processes.

10 CGMS International Science Working Groups and need for coordination (block 2)

10.1 IROWG specific topics for coordination with CGMS

CGMS-54-IROWG-WP-01 IROWG specific topics for coordination with the CGMS (Ulrich Foelsche, co-chair)

The IROWG update emphasized the growing operational importance of radio occultation (RO) observations for numerical weather prediction, climate monitoring, and space weather, while also warning of continuity risks in the later 2020s. Current RO availability has been strengthened through recent NOAA commercial data purchases, but the long-term vulnerability of aging COSMIC-2 satellites remains a concern, particularly for low-inclination coverage essential to tropical and local-time sampling.

IROWG reiterated that the most effective future architecture combines low-inclination constellations with polar sun-synchronous systems, supported by open-data principles and unrestricted access to raw and low-level data, especially where commercial procurement is involved.
The report also highlighted strong results from the ROMEX initiative, which provides evidence-based recommendations on optimal RO observation numbers using real data from public and commercial missions. Multi-centre experiments involving agencies such as ECMWF, Météo-France, Met Office, KMA and NCEP showed overwhelmingly positive forecast impact when increasing RO assimilation up to around 35,000 profiles per day. These findings have already influenced forecasting configurations and CGMS planning. IROWG continues to endorse a sustained long-term target of 20,000 occultations per day with uniform global and local-time coverage, noting that this objective is only fully met when low-inclination components are included. The next joint IROWG-11 and OPAC-8 meeting will review ROMEX follow-on activities and future coordination priorities.

10.2 IPWG specific topics for coordination with CGMS

CGMS-54-IPWG-WP-01 IPWG specific topics for coordination with the CGMS (Giulia Panegrossi, co-chair (virtually))

IPWG shared recent advances in satellite-based precipitation estimation, including increased use of AI/ML techniques, improved passive microwave retrievals (notably for snowfall), and the expansion of active and passive microwave observing systems. It highlighted the rapid growth of new radiometers, CubeSat/smallsat constellations, and private-sector contributions, alongside increasing community engagement (more than 500 members).

IPWG emphasized emerging challenges associated with the post-GPM era, including the potential loss of a core reference system, increasing fragmentation of the observing system, calibration and intercalibration gaps, and the growing dependence of AI-based retrievals on data quality and representativeness. It also noted limitations in global validation datasets and the need to bridge the gap between research and operational applications.

The group reported progress on its Working Groups and alignment with CGMS HLPP activities, including development of a benchmark dataset for AI/ML applications, advancement of an OSSE-like satellite impact assessment framework, and continued efforts to establish the Baseline Surface Precipitation Network (BSPN) for global validation. Ongoing coordination needs with CGMS were highlighted in key areas such as intercalibration, GEO-RING use, and validation.

Key Recommendations to CGMS

IPWG presented several priorities for coordination with CGMS, emphasizing the need to ensure the consistency, quality, and sustainability of global precipitation products in the context of evolving satellite constellations and increasing use of AI/ML techniques. Specifically, IPWG recommended that:

- CGMS promote the consistent use of GEO-RING VIS/IR products, including consideration of real-time implementations, to better align research and operational precipitation products.

- CGMS, in coordination with GSICS, support development of an end-to-end intercalibration framework for microwave sensors, including CubeSats and commercial systems, to ensure traceability and consistency in the post-GPM era.
- CGMS support development of a satellite impact assessment framework (OSSE-like capability) to quantify the value of current and future observing systems for precipitation products.
- CGMS encourage contributions to the Baseline Surface Precipitation Network (BSPN) to improve validation datasets, uncertainty estimation, and AI training capabilities.
- CGMS promote development of AI-ready data quality and error characterization standards, including structured approaches to error propagation and uncertainty estimation.

IPWG also noted the increasing importance of maintaining a core reference capability for intercalibration and validation of precipitation products, and highlighted the need for coordinated international efforts to address fragmentation of the observing system and ensure long-term product consistency. CGMSsec recommended coordination with GCOS GPEX, to have unified requests to CGMS and agencies.

Dr Takuji Kubota (JAXA) was unanimously recommended by WGII to plenary as the new IPWG rapporteur.

10.3 GSICS specific topics for coordination with CGMS

CGMS-54-GSICS-WP-01 Outcomes of the recent GSICS and GSICS EP meetings and recommendations to CGMS space agencies (Mounir Lekouara)

GSICS reported continued progress in its core mission to monitor, improve, and harmonize the radiometric quality of operational weather and environmental satellite observations. Following its 2026 annual meeting in Ottawa, GSICS highlighted development of common methodologies and tools for operational calibration monitoring across agencies, including a new public dashboard to present calibration performance in a standardized format. Significant advances were also reported in lunar calibration, where improved lunar measurement datasets and models now enable some VIS-NIR calibrations with 2–3% absolute accuracy. A new LSICS framework, jointly developed by NOAA, USGS, and EUMETSAT, is helping agencies compare and operationalize state-of-the-art lunar irradiance models.

GSICS also emphasized stronger engagement with commercial data providers to help ensure that emerging private-sector missions adopt robust in-orbit calibration and inter-calibration practices consistent with GSICS standards. Looking ahead, agencies were encouraged to expand data sharing, particularly lunar observations, and to contribute to collaborative developments such as common VIS/NIR vicarious calibration documentation and adoption of tools like NASA's Spectral Band Adjustment Factor (SBAF) under the GSICS umbrella. Further work is still needed to refine uncertainty estimation methods and to consolidate calibration approaches for microwave and UVNS sensors, underlining GSICS's growing importance as a cross-agency quality backbone for increasingly diverse global observing systems.

11 Other topics of relevance to WGII

11.1 Selected topics of high priority to members

CGMS-54-WMO-WP-15 GEO Level 2 Product Baseline (Heikki Pohjola) (Follow-up from CGMS-49)

CGMS-54-CMA-WP-20 GEO MW sounding observation simulation and readiness (DOU Fangli)

CGMS-54-JMA-WP-03 Current Activity for Development of Level-2 Products on the Himawari-10 at JMA/MSC utilizing AI/ML (Kazuki Shimoji (virtually))

CGMS-54-JAXA-WP-02 Status of the Advanced Microwave Scanning Radiometer 3 (AMSR3) (Misako Kachi (online))

WMO submitted a working paper to the CGMS-54 WG IV meeting regarding the baseline for GEO Level-2 products. It aims to advance the development of a common baseline for Level-2 products from geostationary meteorological satellite imagers, building on the outcomes of the CGMS-49 discussions, in order to support the definition of core satellite data under the WIGOS.

IMD outlined progress, methods, and applications utilizing GNSS technology for atmospheric water vapour monitoring, including network development, data processing, key findings, and applications in extreme weather events.

The FY-4M Microwave Sounder is scheduled to be launched this year. It integrates traditional, hyperspectral, and new terahertz channels, and is expected to support hazardous weather monitoring, NWP model development, and improvements in short- and medium-range weather forecasting.

JMA is developing AI/ML-based Level-2 product retrieval algorithms in preparation for the next-generation geostationary satellite Himawari-10, scheduled for operations in FY2030. The retrieved three-dimensional fields will be used for assimilation into NWP systems and as the basis for near-real-time monitoring products.

An overview of the current status of the AMSR3, operated by JAXA, was presented, including its launch as the successor to GCOM-W/AMSR2, new capabilities, operational phases, data release, and cross-calibration. AMSR-3 data will be released in early July 2026, AMSR-2 will stop in Aug 2026 (delayed mode distribution will continue). Following completion of the Initial Functional Verification Operations Phase on 8 October 2025, the satellite and instruments are now in the Initial Calibration and Validation Operations Phase.

11.2 Status reports on the use of hyperspectral sounders

CMA, EUMETSAT, and JMA presented their latest advancements in polar-orbiting and geostationary hyperspectral infrared sounders. CMA's FY-3H and FY-4C satellites are currently being tested, with atmospheric composition retrieval underway. EUMETSAT showcased the impressive capabilities of IASI-NG and GEO IRS, along with new products and application results. JMA gave an overview of the Himawari-10 satellite, detailing its development plan as the successor to Himawari-8/9, onboard instruments, data formats, and service plans. Himawari-10 is expected to begin operations in fiscal year 2030.

CGMS-54-CMA-WP-16 Current Status and Applications of FY Infrared Hyperspectral Payloads (QI Chengli)

CMA reported strong progress on its FengYun hyperspectral infrared programme, highlighting the successful launch and early performance of FY-3H with the HIRAS-II sounder, whose key performance metrics meet operational requirements and show improved noise characteristics relative to earlier FY-3 missions. The instrument is already contributing to numerical weather prediction through assimilation in the CMA system, with demonstrated reductions in analysis errors, although some scan-angle-dependent biases linked to polarization effects remain under correction. FY-4C, launched in December 2025, is also progressing through on-orbit testing with the upgraded GIIRS sounder, offering hourly hyperspectral observations, finer spatial resolution, and enhanced calibration performance.

The presentation also emphasized broad application potential across weather forecasting and atmospheric composition monitoring. GIIRS observations are already supporting retrievals of temperature and water vapour profiles as well as trace gases such as ammonia, ozone, carbon monoxide, formic acid, and dust aerosols. Similarly, HIRAS observations from the polar FengYun series are being used for greenhouse gases, volcanic SO_2, and other composition products. Overall, CMA positioned its hyperspectral constellation as an increasingly important operational capability for NWP, atmospheric chemistry, and future integrated Earth-system monitoring.

CGMS-54-EUMETSAT-WP-14 Current status and applications of EUMETSAT's hyperspectral infrared soundings (Dorothee Coppens)

EUMETSAT presented the current status of its hyperspectral infrared sounding programme, highlighting operational continuity from IASI to the new IASI-NG on Metop-SGA and the first European GEO hyperspectral sounder, IRS. IASI-NG offers improved spectral resolution and lower noise, while IRS adds high-frequency (up to 48 times/day over Europe) and 4 km spatial sampling, creating major new capabilities for regional forecasting, nowcasting, severe storm warning, and 3D wind retrievals. Existing IASI observations remain among the most important data sources for numerical weather prediction, and the new generation is expected to significantly enhance this impact.

Beyond weather forecasting, the programme supports atmospheric composition, air quality, and climate monitoring. IASI-NG improves detection of pollution sources and new trace gases, while IRS offers high-temporal-resolution monitoring of rapidly changing chemistry, though sensitivity to the boundary layer varies with thermal contrast. Long-term IASI records also provide highly stable multi-decadal datasets for greenhouse gases and other climate forcers. Operational dissemination of early

Level-1 products for both IASI-NG and IRS began in 2026, with Level-2 products expected in late 2026 to early 2027.

CGMS-54-JMA-WP-10 Considerations regarding hyperspectral infrared sounding in view of the preparation of Himawari-10 (Miki Abe)

JMA outlined preparations for Himawari-10, scheduled for launch and operations in FY2030 as the successor to Himawari-8/9. The mission will carry the upgraded Geostationary Himawari Imager (GHMI), a new hyperspectral infrared sounder (GHMS), a data collection system, and radiation monitors for space weather. GHMI will improve refresh rates, spatial resolution, and spectral coverage, while GHMS will provide hourly to 15-minute atmospheric temperature and humidity sounding over Japan and target regions, supporting better severe-weather forecasting and numerical weather prediction through data assimilation.

JMA also plans to modernize data services by moving Himawari Level-1 products to NetCDF format and distributing principal component analysis (PCA) compressed sounder products rather than full raw radiances, reflecting an operational focus on efficient data delivery. The programme was strongly motivated by growing demand for better prediction of extreme rainfall and stationary mesoscale convective systems in East Asia, where enhanced water-vapour profiling is seen as particularly valuable.

12 WGII actions, status of WGII chairpersons/rapporteurs, ToRs, ISWGs, Dates of WGII activities 2026-2027, preparing for plenary

CGMS-54-WGII-WP-04 Status of CGMS-53 WGII actions and any associated plenary actions (Paolo Ruti)

To be closed:

- A53.01 - To articulate how MW missions with different frequencies should be addressed and visualised in the CGMS baseline and risk assessment – Ongoing – WMO leading
- A53.09 - IWWG to consider holding a 5th AMV Global Intercomparison Study
- A53.07 - Plenary actions on AI

Still open to be closed in 2026:

- A53.02 - To investigate other capabilities for UV limb sounding to complement JPSS to be discussed at intersessional meetings – Requesting WCRP Programme on Stratosphere to organise an intersessional talk-
  - For future intersessional meetings to expand to MW

- A49.1 - Review the baseline dissemination strategy for volcanic ash product
  - **Feb 2025:** WMO - Re-evaluation of volcanic ash product dissemination with WIS 2.0 is needed.

CGMS-54-WGII-WP-05 CGMS-54 WGII action summary, and recommendations to plenary (Paolo Ruti)

- Support to the International Working Groups (ISWGs), particularly for maintaining web pages, communication platforms, and organizing technical conferences

- It was also suggested that impact studies proposed by the IWGs should have a better uptake from WMO, so that scientific studies and numerical experiments can be coordinated at the international level. In this context, the idea of an international impact workshop was raised as a possible mechanism to accelerate coordination between ISWGs and operational weather agencies.

CGMS-54-WGII-WP-06 Decision on dates on WGII inter-sessional activities in 2025-2026 (CGMS-54 to CGMS-55) (WGII co-chairs)

The following intersessional meeting dates were agreed, all to start at 12 UTC:
15th September 2026
19th November 2026
21st January 2027
11th March 2027

The CGMS-55 working group meetings will be held on 19-23 April 2027 (pending CGMS-54 plenary endorsement) and expected to be hosted by EUMETSAT.

The CGMS-55 plenary session will be scheduled either on 1-3 June or 15-17 June 2027 (pending plenary decision in June 2026), and tentatively hosted by IMD.

13 Actions

WGII agreed the following actions:

CGMS-54 ACTIONS - WGII				
Actionee	**AGN item**	**Action #**	**Description**	**Deadline**
WG II Chairs and Rapporteurs		A54.01/WGII	Coordination for lightning imager validation methodologies and for extending the GEO-ring concept to lightning – presentations and discussion to be organized at the next intersessional meetings.	April 2027
WMO and WG II Chairs		A54.02/WGII	Encourage the NWP community to assess the quality and impact of different satellite products—such as derived 3D	April 2027

and Rapporteurs			wind products from IR sounders—as soon as possible after the data come online. 1. Explore this through NWP agencies and via WMO operational and research groups. sending a short table to Int WGs to gather the product list they would like NWP center to use for impact studies; 2. send this list to leading NWP global centers; 3. work with WMO on the impact assessment workshop and on the WMO research groups that deal with impact studies	
CGMSSEC		R54.01/WGII	There was a strong request and recommendation to the CGMS Secretariat from the International Science Working Groups (ISWGs), particularly for supporting the respective web sites, communication platforms, and the organisation of technical conferences.	

Status of CGMS-53 WGII actions following CGMS-54 WG sessions:

CGMS-53 WGII high level actions and recommendations

Action #	Actionee	Agenda item	Description	Feedback	Deadline	Status	
53.01	WMO		To articulate how MW missions with different frequencies should be addressed and visualized in the CGMS baseline and risk assessment	17 December Heikki: The CGMS baseline or Risk Assessment for passive instruments includes "microwave imagers" as one category but there are several different application areas which they serve depending on the microwave frequency range covered. These instruments are: - Sub-millimetre imager Typically above 200 GHz - Microwave imager [in SSO] Typically 19-183 GHz rang - Microwave imagery for surface	CGMS-54	**CLOSED**	*

				temperature Typically 5-10 GHz range - Low frequency microwave imagery Typically below 2 GHz range		
53.02	WGII		Ensuring the coordination on GHG supersites with existing capabilities identifying the potential gaps – Raise at CGMS pre meeting in June or Organise a call involving Wgclimate, GHG task team, GSICS, WMO-G3W, WMO-GAW	Coordination going on with interaction with CO2M MAG (Dec 2025)	CGMS-54	**CLOSED**
51.03	IESWG CGMS rapporteur	WGII report	The IESWG to report on progress to plenary CGMS-53		CGMS-53	**OPEN**

*

53.07	CGMSSEC, CGMS members, WGII, WGIV	Plenary 6	For reference only! Plenary action: CGMS Secretariat to survey CGMS contributing agencies. WGII and WGIV to propose initial standards to be presented at CGMS-54 (To facilitate the use of AI/ML by CGMS contributing agencies and meteorological data users, CGMS shall identify standards for using and converting meteorological EO data into a suitable form for Machine Learning applications. The key elements to be addressed are: + Data standards and formats, such as for example the Zarr usage best + practices Most relevant data transformation/representation per measurement type, i.e., remapping, standard vertical grids, etc. + Adoption of standard metadata per measurement type, preferably using CF metadata conventions, i.e., source of the information, AI fused or original data, error characterization of original and fused data.)		CGMS-54	**CLOSED**	*

53.07i	WGI, WGII, WGIV	Plenary 6	On data curation standards: WGI, WGII and WGIV to jointly draft standards that will be reviewed at CGMS-54 WGI/WGII/WGIV. WGI on the standardization of formats through its Task Group on Satellite Data and Codes. WGIV on the metadata aspects through its Task Group on Metadata (once a new chair has been found).		Feb 2026, April 2026	**CLOSED**	*

53.07ii	WGII, CGMSSEC	Plenary 6	AI/ML applications catalogue: Centralisation of global AI advancements for community reuse, similar to GitHub repositories. CGMSSEC to circulate a survey on model metadata as prepared by WGII		Dec 2025, Jan 2026	**CLOSED**	*
53.07iii	WGII	Plenary 6	AI/ML applications catalogue: WGII to prepare a first version cataloguing such meta data and present it to CGMS-54.		Feb 2026, April 2026	**CLOSED**	*

53.07iv	WGII, SWCG	Plenary	Space weather AI readiness: SWCG and WGII to jointly hold 2–3 online meetings in order to address the prediction of solar flares and coronal mass ejections (CMEs), as well as tackling the challenges associated with real-time forecasting.		Q1 2026, April 2026	**CLOSED (MOVED TO SPACE WEATHER)**

*

53.07v	IPWG	Plenary 6	AI error propagation framework for precipitation products: IPWG to formulate a methodology to measure the uncertainties caused by AI in operational products.		Q1 2026, April 2026	**CLOSED**	*
53.09	IWWG	Plenary 5	From plenary: IWWG to consider holding a 5th AMV Global Intercomparison Study	To be handled within the framework of WGII	CGMS-54	**CLOSED**	*

	7th RAWS: Action on WGII	7th risk assessment	WGII to consider whether observations from Geo orbit should be added to the CGMS baseline requirements for the broadband short/long wave radiometer (https://cgms-info.org/wp-content/uploads/2021/06/CGMS-Baseline-Sustained-contributions-to-the-observing-of-the-Earth-system-space-environment-and-Sun-v6-1.pdf)	25 Feb 2025 Following the 7th risk assessment: Added to the WGII LOA - HLPP link needed!!! 17 Dec 2025 Comment from USC/JOS: The CEOS/CGMS WGClimate will take this on and already had a first exchange with the co-chairs of GEWEX (see attached). There will be two meetings where this is discussed: 1. WGClimate #24, ESA-ECSAT (Harwell, UK), 9-12 February (this is also a joint meeting with the GCOS panels including AOPC in which area this falls) 2. GEWEX SSG-38, ECMWF (Bonn, Germany),	CGMS-53 WGs, March 2025 (if feasible) alternatively for the 8th risk assessment	**CLOSED**

				23-27 March WGClimate may start a task team on this to take a deep dive into this topic. CLOSE and we propose an action for the intersessional 1. Action on WGII to consider whether observations from geostationary orbit should be added to the CGMS baseline requirements for the broadband short/long wave radiometer a. As you suggested, I think we can close it b. Based on some comments in the presentation you shared, for instance "The currently achieved accuracy of Outgoing		

				Longwave and Shortwave fluxes (2.5 Wm-2) is insufficient to determine the absolute magnitude of Earth's Energy Imbalance." It would be useful to have an overview presentation during WG II intersessional meeting from GEWEX on how do they see the evolution.		

LIST OF WORKING GROUP PARTICIPANTS

CGMS-54 WGII List of Participants			
Firstname	**Lastname**	**Organisation**	**Email**
Chengli	Qi	CMA	qicl@cma.gov.cn
Di	Xian	CMA	xiandi@cma.gov.cn
Fangli	Dou	CMA	doufl@cma.gov.cn
Min	Guan	CMA	guanmin@cma.gov.cn
Na	Xu	CMA	xuna@cma.gov.cn
Tang	Shihao	CMA	tangsh@cma.gov.cn
Lei	Yang	NSMC/CMA	yangl@cma.gov.cn
Murielle	LAFAYE	CNES	murielle.lafaye@cnes.fr
Yasjka	Meijer	ESA	yasjka.meijer@esa.int
Armin	Loescher	ESA	armin.loescher@esa.int
Christian	Marquardt	EUMETSAT	christian.marquardt@eumetsat.int
Dominika	Leskow-Czyzewska	EUMETSAT	dominika.leskow-czyzewska@eumetsat.int
Elody	Fluck	EUMETSAT	elody.fluck@eumetsat.int
Frank	Kaspar	EUMETSAT	frank.kaspar@eumetsat.int
Jörg	Schulz	EUMETSAT	joerg.schulz@eumetsat.int
Miruna	Stoicescu	EUMETSAT	miruna.stoicescu@eumetsat.int
Paolo	Ruti	EUMETSAT	Paolo.Ruti@eumetsat.int
Roope	Tervo	EUMETSAT	roope.tervo@eumetsat.int
Viju	John	EUMETSAT	viju.john@eumetsat.int
Marie	Doutriaux-Boucher	EUMETSAT	marie.doutriauxboucher@eumetsat.int
Dorothee	Coppens	EUMETSAT	dorothee.coppens@eumetsat.int
Regis	Borde	EUMETSAT	Regis.Borde@eumetsat.int
Christoph	Rüdiger	IESWG/ECMWF	christoph.rudiger@ecmwf.int
Benjamin	Ruston	IESWG/UCAR/JCSDA	benr@ucar.edu
Dr. Ashim Kumar	Mitra	IMD	ashimmitra@gmail.com
Puviarasan	Narayanasamy	IMD	puvi4@yahoo.com
Hui	Shao	IROWG/JCSDA	huishao@ucar.edu
Anthony	Mannucci	IROWG/NASA (JPL)	anthony.j.mannucci@jpl.nasa.gov
Ulrich	Foelsche	IROWG/University of Graz	ulrich.foelsche@uni-graz.at
Babu Govindha Raj	Kesavannamboothiri	ISRO	govind@isro.gov.in
Pradeep	Thapliyal	ISRO	pkthapliyal@gmail.com

CGMS-54 WGII List of Participants			
Firstname	**Lastname**	**Organisation**	**Email**
Randhir	Singh	ISRO	randhir@sac.isro.gov.in
Fiona	Smith	ITWG	fiona.smith@bom.gov.au
Misako	Kachi	JAXA	kachi.misako@jaxa.jp
Moeka	Yamaji	JAXA	yamaji.moeka@jaxa.jp
Toshiyuki	Kurino	JAXA	tkurinowmo@gmail.com
Hiroshi	Suzue	JMA	hiroshi.suzue@met.kishou.go.jp
Kazuki	Yasui	JMA	k_yasui@met.kishou.gss.go.jp
Kazuki	Shimoji	JMA	kazuki.shimoji@met.kishou.go.jp
Miki	Abe	JMA	abe.miki@met.kishou.go.jp
Takuya	Sakashita	JMA	sakashita@met.kishou.go.jp
Kazuki	Shimoji	JMA	kazuki.shimoji@met.kishou.go.jp
Kotaro	Bessho	JMA	kbessho@met.kishou.go.jp
Vincent-Henri	Peuch	JWGClimate/ECMWF	Vincent-Henri.Peuch@ecmwf.int
Wenying	Su	JWGClimate/NASA	Wenying.Su-1@nasa.gov
Byungil	Lee	KMA	bilee01@korea.kr
Inchul	Shin	KMA	icshin@korea.kr
JEONG-MI	Song	KMA	s36121@korea.kr
Maudood	Khan	NASA	maudood.n.khan@nasa.gov
Giulia	Panegrossi	National Research Council of Italy (CNR)	giulia.panegrossi@cnr.it
Jaime	Daniels	NOAA	jaime.daniels@noaa.gov
Melissa	Johnson	NOAA	melissa.c.johnson@noaa.gov
Rishi	Ramsooksingh	NOAA	rishi.ramsooksingh@noaa.gov
Andrew	Heidinger	NOAA and ICWG	andrew.heidinger@noaa.gov
Ekaterina	Tverdohlebova	Roscosmos	TverdohlebovaEM@tsniimash.ru
Konstantin	Litovchenko	ROSHYDROMET	litovchenko@PLANET.IITP.RU
Heikki	Pohjola	WMO	hpohjola@wmo.int
Oksana	Tarasova	WMO	otarasova@wmo.int
Roger	Saunders	WMO	sat.metman@gmail.com
Anne	Taube	CGMS Secretariat	anne.taube@eumetsat.int
Antoine	Berment	CGMS Secretariat	antoine.berment@eumetsat.int
Mikael	Rattenborg	CGMS Secretariat	mikael@rattenborg.eu