CGMS future direction 2022+ outcome and conclusions

Presented to CGMS-51 Plenary session

Coordination Group for Meteorological Satellites

CGMS

Executive summary of the WP - 1/2

This working paper proposes the recommendations from the CGMS future direction 2022+ project conducted since the CGMS-50 plenary

- The proposal covers the six strategic themes
  - Socio-economic benefits
  - Research to operations
  - Future observing (hybrid) space infrastructure
  - Future information technologies
  - Relationship with the private sector
  - Space situational awareness

- The theme “Climate and Earth system monitoring” requires further work and is proposed to be addressed before CGMS-52 by a dedicated small task team

- The Task Team identified a further topic: “Support to developing countries”. This is a part of CGMS members’ activities within their different individual mandates. It is proposed to establish a small task team to address the coordination aspects of this strategic theme before CGMS-52.

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Executive summary of the WP - 2/2

- The position papers on each strategic theme and the recommendations were developed through a series of virtual meetings in autumn and winter 2022/23 and were reviewed in detail at the face-to-face meeting of the Task team 15-16 March 2023 at EUMETSAT.

- The CGMS high-level meeting on 29 March 2023 endorsed the recommendations proposed and the way forward, noting the need for the identification of concrete implementation measures in the next year (up to CGMS-52) and a stronger link as concerns the potential interfaces.

- The recommendations presented in this set of slides addresses the comments from the high-level meeting by identifying champions to advance the themes as pilot activities within the scope of each CGMS Working Group.

- The final position papers for each of the strategic themes are provided as Information Papers on the online Plenary meeting agenda.

Socio Economic Benefits - Recommendations

Demonstrate the Socio-Economic Benefits of satellite observations for the approval of national budgets for satellite systems and for maintaining political support for the global observing system effort.

Short and Medium Term

- Collect and make available to CGMS members, SEB case studies of relevant satellite systems for the purpose of identifying common practices.
- To explore with WMO the possibility to develop a study on the SEB value of the space-based observing system responding to WIGOS 2040 in cooperation with CGMS

Interfaces

- Engage with **OECD/Space** to understand /evaluate SE trade-offs and potential private sector engagement

Lead: WGIII – Champion: TBD/JMA

Name of individual/person needed + pilot activity to be completed by and reported to CGMS-52

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Hybrid Space Observations Architectures - Recommendations

Identify and optimise the contributions of CGMS satellites to hybrid systems

Short and Medium Term

- Taking passive µwave sensing as an initial case, demonstrate the impact of CGMS contributions, as part of the integrated system, explicitly considering data buy.
- Address such aspects as orbit coordination and harmonized data access to ensure the different components of the hybrid space infrastructures provide a seamless operational service to the users.
- Conduct a critical review of WIGOS 2040 with respect to hybrid systems

Interfaces

- Strengthen dialogue with **WMO WIGOS** on the future WIGOS Vision

Lead: WGI – Champion: Simon Elliott/EUMETSAT

Identification of specific pilot activity, for completion by CGMS-52

Relationship to Private Sector - Recommendations

Harness/leverage the opportunities of a rapidly growing commercial space sector while maintaining operational standards and open data sharing

Short and Medium Term

- Identify/evaluate potential or future commercial EO technologies – and share info on pilots/testbeds/etc. to evaluate new commercial EO technologies.
- Assess the operational maturity of commercial observation technology.
- Develop best practices for End User License Agreements/Procurements

Interfaces

- Engage with private sector through the **WMO** Open Platform consultative mechanism under Geneva declaration, WMO and through technical and scientific working groups.
- Strengthen dialogue with **CEOS** NewSpace Task Group

Lead: WGIII – Champion: Mara Browne/NOAA

Identification of specific pilot activity, for completion by CGMS-52

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Research to Operations - Recommendations

Continue high-value observations demonstrated with research satellites in a sustainable way and maximize research benefits from operational satellites.

Short and Medium Term

- Collect the experience of each agency by carrying out a Research-to-Operations method survey with each agency including identification of research missions with a potential transfer to operations.
- Propose a consistent CGMS Research-to-Operations baseline process that includes flexibility and adaptability and facilitates the participation of R&D agencies.
- Encourage both CGMS agencies and R&D operations to incorporate the Research to Operations baseline process in the planning stage of the new satellite system and to report on their experiences with the application of the process;

Interfaces

- Strengthen dialogue with **R&D missions of CGMS members**

Lead: WGIV (support WGII) – Champion: TBD/TBD

Name of individual/person needed + pilot activity to be completed by and reported to CGMS-52

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Space Situational Awareness - Recommendations

Contribute to the sustainable use of outer space, to the efforts to mitigate existing space debris and to reduce production of new debris to a sustainable level.

Short and Medium Term

- Review of CGMS Member Agencies' satellite operations for collision avoidance and re-entry prediction, and establish best practises to support improvement
- Establish space weather observation requirements for improved Space Traffic Coordination services and space sustainability
- Establish CGMS best practises for long term space sustainability, considering a "Zero Debris Policy"
- Engage with UN-COPUOS to achieve global standardized approach for STC based on CGMS proposal.

Interfaces

- Strengthen dialogue with **UN-COPUOS** on SSA and Best Practices on space sustainability.

Lead: WGI (with SWCG for SWx aspects) – Champion: Juha-Pekka Luntama/ESA

Identification of specific pilot activity, for completion by CGMS-52

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Future Information Technologies - Recommendations

Maximize benefits to CGMS of emerging Information technologies, in particular AI/ML, Internet of Things and Cloud Technology

Short and Medium Term

- Assess the Internet-Of-Things technology for inter- and intra-connections between satellite and ground network.
- Explore improvements to LEO satellite systems low latency data access from both a global and regional perspective.
- Identify the actual and potential cloud and AI/ML technologies for applying to the data management infrastructure, and develop best practices
- Prepare demonstration to collaborate with private sector regarding satellite data distribution

Interfaces

- Encourage **Private Sector** participation in technical and scientific groups under CGMS

Lead: Champion x 3:

- **IOT: WGI – Antoine JeanJean/EUMETSAT**
- **AI/ML: WGII – TBD/TBD**
- **Cloud: WGIV – TBD/TBD**

Name of individuals/persons needed + pilot activity to be completed by and reported to CGMS-52

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To be considered by CGMS:

CGMS-51 plenary is requested to endorse:

I. The proposed way forward for each strategic theme as described in the previous slides.
II. The identified champions for each strategic theme to advance the implementation activities of each CGMS working group
III. Establish a small dedicated task team under the leadership of WMO and with the support of the CGMS secretariat to elaborate further the strategic theme “Earth System Monitoring and Climate”
IV. Establish a small dedicated task team under the leadership of CMA and with the support of the CGMS secretariat to elaborate further the strategic theme “Support to Developing Countries”, in coordination in particular with the WMO Education and Training programme.
V. The dissolving of the Task Team.
VI. The CGMS working groups to ensure that their intersessional agendas reflect the need to advance the implementation of the recommendations
VII. CGMS secretariat to report on the implementation at CGMS-52