

# CGMS future direction 2022+ overview of activities and status

CGMS-52-CGMS-WP-03

Provided to CGMS-52 plenary, item 6, for information

## Socio Economic Benefits

**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

**Champion:** JMA / Yasuhiko Sumida

**Addressed in WGIII.**

### Progress

- Exploratory meeting with WMO SEB staff
- Survey to CGMS members regarding available SEB studies
- Preparations ongoing for a dedicated area on SEBs on the CGMS website

## Hybrid Space Observations Architectures

### Identify and optimize the contributions of CGMS satellites to hybrid systems

#### Short and Medium Term

- Taking passive  $\mu$ wave 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

**Champion:** EUMETSAT / Simon Elliott

**Addressed in WGI, support from WGII**

#### Progress

- Analysis of implications of hybrid systems on CGMS submitted to WGI as CGMS-52-CGMS-WP-20
- Proposal to use the same process for evaluation of other data if/as necessary
- As part of the yearly risk assessment, WGIII would use the process to evaluate potential satellite systems to fill gaps in the baseline

**Note also that a High-level CGMS statement on hybrid infrastructures has been submitted to CGMS-52 plenary for endorsement**

## Relationship to Private Sector

**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

**Champion:** NOAA / Mara Browne

### Addressed in WGIII

### Progress

- Best practice on CGMS commercial data procurements submitted to CGMS-52 plenary for endorsement

## Research to Operations

**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;

### Champion(s)

- NASA / Will McCarty
- NOAA / Laurie Rokke and Jordan Gerth
- NOAA support / Matt Zandbergen

**Addressed in WGIV, support from WGII**

### Progress

- Survey to CGMS members on R2O practices under preparation

## Space Situational Awareness

**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, and establish best practises to support improvement
- Establish space weather observation requirements for improved STC services and space sustainability
- Establish CGMS best practises for long term space sustainability, considering a “Zero Debris Policy”

### Champion

- ESA / Juha-Pekka Luntama

### Addressed in WGI (Task Group on Space Environment Sustainability)

### Progress

- Task group has been established, first meeting 6 March 2024

## Future Information Technologies

**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

### Champions

- IOT: EUMETSAT /Antoine Jeanjean
- Cloud: NOAA/Kathryn Shontz
- AI/ML: CMA / Dr XU Na

**Addressed: IOT in WGI, Cloud in WG-IV and AI/ML in WG-II (supported by ISWGs and WG-IV)**

### Progress

- Internet-of-things (IOT) technology study was submitted to WGI
- AI/ML survey to CGMS members. Results under analysis and next steps to be addressed in plenary.
- Several ISWGs have initiated AI/ML activities
- Coordination of the three sub-themes will be initiated

## Further CGMS 2022+ strategic themes (agreed at CGMS-51 plenary)

### Climate and Earth System monitoring

Lead for establishing position paper: WMO / Albert Fischer

Status: open

### Support to Developing Countries

Lead for position paper: CMA / Xian DI

Status: open