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| WEATHER CLIMATE WATER | **World Meteorological Organization**  **COMMISSION FOR OBSERVATION, INFRASTRUCTURE AND INFORMATION SYSTEMS**  **Second Session** 24 to 28 October 2022, Geneva | **INFCOM-2/Doc. 5.2** |
| Submitted by: Chair  28.X.2022  **APPROVED** |

**AGENDA ITEM 5: CURRENT AND FUTURE WORK PROGRAMME OF THE COMMISSION**

**AGENDA ITEM 5.2: Additional organizational arrangements in response to Members’ requests**

# Subsidiary Bodies of the Commission



# GENERAL CONSIDERATIONS

With [draft Resolution 5.2/1 (INFCOM-2)](#draftres), the Commission is reviewing its working structure to best address implementation of infrastructure related aspects of the decisions of the 2021 Extraordinary Congress (Cg-Ext(2021)) and the seventy-fifth Session of the Executive Council (EC-75), and in particular:

(a) [Resolution 1 (Cg-Ext(2021))](https://library.wmo.int/doc_num.php?explnum_id=11113#page=9) – WMO Unified Policy for the International Exchange of Earth System Data;

(b) [Resolution 2 (Cg-Ext(2021))](https://library.wmo.int/doc_num.php?explnum_id=11113#page=29) – Amendments to the Technical Regulations of the Global Basic Observing Network (GBON);

(c) [Decision 10 (EC-75)](https://meetings.wmo.int/EC-75/SitePages/Session%20Information.aspx) – Approach to the Strategic Plan 2024–2027;

(d) [Resolution 4 (EC-75)](https://meetings.wmo.int/EC-75/SitePages/Session%20Information.aspx) – Development of a WMO-coordinated Global Greenhouse Gas Monitoring Infrastructure;

(e) [Decision 6 (EC-75)](https://meetings.wmo.int/EC-75/SitePages/Session%20Information.aspx) – Study on the potential integration of additional hydrological and cryosphere variables into the Global Basic Observing Network (GBON).

Further changes are also proposed to take into account the recommendations of the INFCOM Management Group.

Accordingly, the following subsidiary bodies are new from the working structure of INFCOM adopted per [Resolution 1 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=18) and [Resolution 7 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=146):

 Joint Study Group on WMO Greenhouse Gas Monitoring (JSG-GHG)

 Advisory Group on the Oceans (AG Ocean)

 Coordinator on the implementation of the WMO Unified Data Policy (C-DATA)

Through [draft Resolution 5.2/2 (INFCOM-2),](#draftres2) for new bodies and vacant positions, the president of the Commission, in consultation with the Management Group and due consideration of gender and regional balance proposed adjustments concerning the selection of Officers, chairs and vice-chairs of Standing Committees, Study Groups, Advisory Groups and Task Teams, the Management Group and Coordinators of the Commission.

# DRAFT RESOLUTIONS

## Draft Resolution 5.2/1 (INFCOM-2)

## Establishment of Standing Committees, Study Groups and Advisory Groups of the Commission for Observation, Infrastructure and Information Systems (Infrastructure Commission)

THE COMMISSION FOR OBSERVATION, INFRASTRUCTURE AND INFORMATION SYSTEMS,

**Recalling:**

(1) [Resolution 1 (Cg-18)](https://library.wmo.int/doc_num.php?explnum_id=9827#page=14) – WMO Strategic Plan, which defines the long-term goals, strategic objectives and focus areas for 2020–2023, in particular in the area of Earth System observations and prediction, and their translation into activities and deliverables of the Operating Plan ([Cg-18/INF. 3(1)](https://library.wmo.int/doc_num.php?explnum_id=9797#page=245) and updates),

(2) [Resolution 7 (Cg-18)](https://library.wmo.int/doc_num.php?explnum_id=9827" \l "page=41) – Establishment of Technical Commissions for the eighteenth financial period, which identifies the regulated and existing infrastructure elements, operational or under development, in the Infrastructure Commission, with substructures as needed to implement the WMO Strategic Plan,

(3) [Resolution 82 (Cg-18)](https://library.wmo.int/doc_num.php?explnum_id=9827#page=262) – Gender Action Plan, which decided to endorse the WMO Gender Action Plan and requested Technical Commissions, inter alia, to apply and implement the Action Plan within their areas of responsibility,

(4) [Resolution 1 (Cg-Ext(2021))](https://library.wmo.int/doc_num.php?explnum_id=11113#page=9) – WMO Unified Policy for the International Exchange of Earth System Data,

(5) [Resolution 2 (Cg-Ext(2021))](https://library.wmo.int/doc_num.php?explnum_id=11113#page=29) – Technical Regulations of the Global Basic Observing Network (GBON),

(6) [Decision 10 (EC-75)](https://meetings.wmo.int/EC-75/SitePages/Session%20Information.aspx) – Approach to the Strategic Plan 2024–2027,

(7) [Resolution 4 (EC-75)](https://meetings.wmo.int/EC-75/SitePages/Session%20Information.aspx) – Development of a WMO-coordinated Global Greenhouse Gas Monitoring Infrastructure,

(8) [Decision 6 (EC-75)](https://meetings.wmo.int/EC-75/SitePages/Session%20Information.aspx) – Study on the potential integration of additional hydrological and cryosphere variables into the Global Basic Observing Network (GBON),

(9) [*Rules of Procedure for Technical Commissions*](https://library.wmo.int/index.php?lvl=notice_display&id=21534#.YyL-gXZByUk) ([WMO-No. 1240](https://library.wmo.int/index.php?lvl=notice_display&id=21534#.XmZcEahKi70)),

**Recalling further:**

(1) [Resolution 1 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197" \l "page=18) – Establishment of standing committees and study groups of the Commission for Observation, Infrastructure and Information Systems (Infrastructure Commission), which established the standing committees and study groups of the Commission,

(2) [Resolution 7 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=146) - Global Cryosphere Watch Advisory Group,

(3) [Resolution 8 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=148) - Terms of reference of the Commission for Observation, Infrastructure and Information Systems coordinators,

**Noting** that the Chair of the Standing Committees on Information Management and Technology (SC-IMT), on Data Processing for Applied Earth System Modelling and Prediction (SC-ESMP), and on Earth Observing Systems and Monitoring Networks (SC-ON), are appointed members of the Joint WMO-IOC Collaborative Board (JCB) and with their roles, they will ensure the engagement between the INFCOM and the JCB to enhance marine related infrastructure cooperation,

**Having considered:**

(1) The Terms of Reference of the Commission for Observation, Infrastructure and Information Systems (Infrastructure Commission) [(Resolution 7 (Cg-18)](https://library.wmo.int/doc_num.php?explnum_id=9827#page=41)), Annex 1 A),

(2) The recommendations of the Transition Team established by [Resolution 7 (Cg-18)](https://library.wmo.int/doc_num.php?explnum_id=9827#page=41) - Establishment of WMO Technical Commissions for the Eighteenth Financial Period,

(3) The need for assuring appropriate coordination across the standing committees, study groups and advisory groups of the Commission with the Commission for Weather, Climate, Water and Related Environmental Services and Applications (SERCOM), the Research Board (RB), regional associations and other bodies and partner organizations on key cross-cutting issues,

**Having examined** the recommendation of the president of the Commission, who consulted with the Management Group and the Hydrological Coordination Panel (HCP),

**Decides** to establish the following standing committees, study groups, advisory groups and Coordinators for the second intersessional period, with the terms of reference provided in the [annex](#_Annex_to_draft) to the Resolution:

(a) Standing Committee on Earth Observing Systems and Monitoring Networks (SC-ON);

(b) Standing Committee on Measurements, Instrumentation and Traceability (SC-MINT);

(c) Standing Committee on Information Management and Technology (SC-IMT);

(d) Standing Committee on Data Processing for Applied Earth System Modelling and Prediction (SC-ESMP);

(e) Joint Study Group on Green House Gas Monitoring (JSG-GHG);

(f) Advisory Group on the Global Cryosphere Watch (AG-GCW);

(g) Advisory Group on the Oceans (AG Ocean);

(h) Coordinator of satellite matters (C-SAT);

(i) Coordinator of engagement and partnership (regional associations, private sector, academia) with regard to infrastructure matters (C-ENG);

(j) Coordinator for hydrology in Earth system modelling (C-HESM), and

(k) Coordinator on the implementation of the WMO Unified Data Policy (C-DATA);

**Requests**:

(1) The president with the assistance of the Management Group and the support of the Secretariat to ensure the selection of technical experts from the Expert Network to serve in the above standing committees, study groups and advisory groups, and to establish working groups and expert teams, including intercommission mechanisms, as necessary to complete the work of these bodies, taking into account the expertise required, regional and gender balance and inclusiveness, as established by the Rules of Procedure, and recommendations by the Research Board;

(2) The Management Group to strengthen coordination with Executive Council Panels, and enhance cooperation between Technical Commissions and their subsidiary bodies at technical level;

**Invites further** the Research Board, where appropriate and in consultation with the Management Group of the Infrastructure Commission, to re-confirm or nominate one or more experts to act as liaison between the Research Board and any subsidiary body of the Technical Commission; these experts will advise on the implementation of scientific and technological advances, facilitate links between the work of the subsidiary body in question and the Research Board/Research programmes, assist in avoiding duplication of effort, and report to the Research Board on the work of the subsidiary body.

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[Annex: 1](#_Annex_to_draft_3)

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Note: This Resolution replaces [Resolution 1 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=18), [Resolution 7 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=146) and [Resolution 8 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=148), which are no longer in force.

## Annex to draft Resolution 5.2/1 (INFCOM-2)

## TERMS OF REFERENCES OF STANDING COMMITTEES, ADVISORY GROUPS, AND STUDY GROUPS

**A. Standing Committee on Earth Observing Systems and Monitoring Networks (SC-ON)**

[The Terms of Reference of SC-ON are updated from the version in the Annex to Resolution 1 (INFCOM-1), with changes highlighted in manual track changes]

***Purpose***

Responding to the WMO Convention, [Article 2 (a)](https://library.wmo.int/doc_num.php?explnum_id=11187#page=12) (*Basic Documents, No. 1* (WMO-No. 15)), which states that one of the primary purposes of the organization shall be “To facilitate worldwide cooperation in the establishment of networks of stations for the making of meteorological observations as well as hydrological and other geophysical observations related to meteorology”, the Standing Committee will focus on the normative work and technical systems including the development of guidance and tools required to achieve Objective 2.1 of the WMO Strategic Plan: “{to} Optimize the acquisition of Earth system observation data through the WMO Integrated Global Observing System (WIGOS)”, with a focus on improving network design through a tiered approach and monitoring performance, and where appropriate taking into consideration existing Quality Management Framework guidance such as Hydrology (QMFH) material on hydrological services.

The activities of the Standing Committee will include the following:

(a) With the regional associations and the GOOS regional alliances, in collaboration with the other Standing Committees and Advisory Groups of the Infrastructure Commission, and in collaboration with the Services Commission, the Research Board and other bodies such as the Joint WMO-IOC Collaborative Board, and with reference to the Rolling Review of Requirements (RRR), gather and review observational user requirements across all user programmes and disciplines;

(b) Assess and advise on gaps and solutions for meeting user needs in observations for all disciplines and WMO Application Areas, and make proposals on implementation, planning and operational management of global, regional, subregional and national observing networks, across Earth system domains;

(c) Provide oversight for the transition to the evolved RRR process per the WMO Earth System approach, and the collection of observational user requirements to reflect the needs of Earth system analysis, prediction, projection, and sector-specific applications; in regard to Ocean observations this needs to happen in coordination with the GOOS Co-Design concept;

(d) Provide oversight for the development of Earth System Application Categories Statements of Guidance;

(e) Develop and maintain WMO regulatory and guidance material related to Earth observing networks, as specified in the [*Technical Regulations*](https://library.wmo.int/index.php?lvl=notice_display&id=10700#.YyMALHZByUk)(WMO-No. 49), in particular Volume I and III, and in the [*Manual on the WMO Integrated Global Observing System*](https://library.wmo.int/index.php?lvl=notice_display&id=19223#.YyMAFnZByUk)(WMO-No. 1160);

(f) Collect and specify requirements for, and guide the development, implementation, operation and maintenance of WIGOS tools (e.g. WIGOS Information Resource, the Observing Systems Capability Analysis and Review Tool (OSCAR), and the WIGOS Data Quality Monitoring System (WDQMS));

(g) Assist and guide Members to initiate, design, develop, optimize and implement integrated global, regional, subregional and national observing networks in collaboration with relevant groups and partner organizations, including satellite operators;

(h) Monitors compliance of GBON and its further implementation, and provide technical assistance to SOFF as appropriate;

(i) Define principles for GBON expansion, update the GBON concept and technical regulations and guidance as needed in collaboration with relevant bodies in the Earth System domains;

(j) Assist regional associations with regard to RBON implementation;

(k) Contribute to the WMO Unified Data Policy implementation road map concerning WIGOS core and recommended data;

(l) Develop technical regulations and criteria for the WMO tiered networks per WIGOS Observing Network Design principles in collaboration with other groups such as SC-MINT, AG Ocean, AG-GCW, the Research Board (for GAW) and HCP in particular;

(m) In collaboration with the regional associations, provide technical guidance with regard to translating WMO standard practices and procedures into operational advice that is tailored to the needs of individual Member countries and territories;

(n) Provide necessary assessments or facilitate and guide Members for undertaking such assessments to help enhance their capabilities and overall data availability, and assure optimal compliance with established requirements for all WMO Application Areas;

(o) Provide performance monitoring of the observing networks; promote the establishment, quality and continued operation of all WIGOS observing networks;

(p) Establish appropriate coordination with the Services Commission and Research Board on strengthening and designing existing and new observational networks to enhance benefits to Members;

(q) Cooperate and partner with other organizations to ensure efficient support to Members, with a view to fostering a culture of compliance with regulatory material to build capacity and increasing the overall availability of observations across all domains;

(r) Coordinate WMO requirements for radio-frequency bands and assignment of radio frequencies to meteorological telecommunications, instruments, sensors, both for operational and research purposes, and liaise with specialist radio-frequency management authorities, including the International Telecommunication Union (ITU), on frequency allocation matters;

(s) Engage with other WMO structures and programmes, co-sponsored programmes, and related international partner organizations in coordinating all relevant activities.

***Expertise required***

Expertise will be required in the following areas related to surface- and space-based observing networks across all main Earth system domains (weather, climate, atmospheric composition, oceans, hydrology and cryosphere):

 Observing network design and evolution, including observational user requirements and impact of observations, and observations compliance with relevant WMO regulations/recommendations;

 Observing network implementation;

 Observing network monitoring;

 Allocation and protection of radio frequencies for observing networks.

***Membership***

Up to 25 technical experts, including Chair and Vice-Chair(s), Leads and/or co-Leads of its subsidiary bodies, and other necessary experts selected from the Expert Network by the President of the Commission assisted by the Management Group and the Secretariat, covering the primary Earth System domains addressed by the WMO (weather, climate, atmospheric composition, oceans, hydrology and cryosphere) and the required types of expertise.

In addition to the core members, the following partners may also be invited to nominate experts in the Standing Committee or its Expert Teams based on their terms of reference:

 The Coordination Group for Meteorological Satellites (CGMS) and the Committee on Earth Observation Satellites (CEOS) concerning space-based observing networks;

 The International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO) concerning aircraft-based observations and observations in support of aviation;

 The Intergovernmental Oceanographic Commission of UNESCO (IOC) and the Global Ocean Observing System (GOOS) concerning ocean observing networks;

 The International Union of Geodesy and Geophysics (IUGG), including the International Association of Hydrological Sciences (IAHS) and the International Association of Cryospheric Sciences (IACS), concerning Hydrology and Cryosphere observing and networks;

 The Intergovernmental Hydrological Programme (IHP) of UNESCO for Hydrology and Cryosphere;

 UN Environment, the Convention on Long-range Transboundary Air Pollution (LRTAP), Air Pollution regional networks, concerning atmospheric composition observing networks;

 One expert to represent the cross-cutting system for global climate observing systems, who will relate back to the GCOS expert panels;

 Volunteer observing networks like Voluntary Observing Ships (VOSs);

 Food and Agriculture Organization of the United Nations (FAO) water programmes including the FAO Water Platform and Aquastat;

 International Maritime Organization (IMO);

 Other partners as needed.

***Duration***

Until the next ordinary session of the Commission and can be re-established if necessary.

***Modalities of work***

One face-to-face meeting during the intersessional period (i.e. 2-year cycle), prior to the next Technical Commission session. Otherwise by electronic correspondence and tele/video conference.

*Note: The 4-year budget allocated to the Technical Commissions is based on the assumption that the standing committees will meet once per 2-year period*.

***Regulatory and guidance material***

Maintenance and updating of the following current WMO regulatory and non-regulatory material:

 Relevant parts of [*Technical Regulations*](https://library.wmo.int/index.php?lvl=notice_display&id=10700#.YyMALHZByUk)(WMO-No. 49), Volumes I-III;

 [*Manual on the WMO Integrated Global Observing System*](https://library.wmo.int/index.php?lvl=notice_display&id=19223#.YyMpTnZBw2w)(WMO-No. 1160);

 [*Manual on Stream Gauging*](https://library.wmo.int/index.php?lvl=notice_display&id=540#.YyMph3ZBw2w)(WMO-No. 1044), Volumes I and II,

 *Guide to Climatological Practices* (WMO-No. 100) (part relevant to climate observations, stations and networks, supporting the Standing Committee on Climate Services );

 *Guide to Hydrological Practices* (WMO-No. 168), Volume I;

 *Guide to the Global Observing System* (WMO-No. 488);

 *Guide to the WMO Integrated Global Observing System* (WMO-No. 1165);

 *Guide to Aircraft-based Observations* (WMO-No. 1200);

 *Guide to Participation in Radio-frequency Coordination* (WMO-No. 1159);

 *Handbook on Use of Radio Spectrum for Meteorology: Weather, Water and Climate Monitoring and Prediction* (WMO-No. 1197);

 *Satellite Data Telecommunication Handbook* (WMO-No. 1223);

 *Manual on High-quality Global Data Management Framework for Climate* (WMO-No. 1238),

 *Climate Data Management System Specifications* (WMO-No. 1131).

 Forthcoming guidelines*:*

 Guidance on the implementation of regional and national AMDAR programmes;

 Guidance on the regional coordination and implementation of WIGOS and distribution of roles among RWC nodes.

***Expected outputs***

*Note: Deliverables aligned with the WMO Operating Plan 2020–2023 are listed in the annex to Resolution 3 (INFCOM-1) as appropriate.*

**B. Standing Committee on Measurements, Instrumentation and Traceability (SC-MINT)**

[The Terms of Reference of SC-MINT are the same as in the Annex to Resolution 1 (INFCOM-1)]

**C. Standing Committee on Information Management and Technology (SC‑IMT)**

[The Terms of Reference of SC-IMT are the same as in the Annex to Resolution 1 (INFCOM-1)]

**D. Standing Committee on Data Processing for Applied Earth System Modelling and Prediction (SC-ESMP)**

[The Terms of Reference of SC-ESMP are updated from the version in the Annex to Resolution 1 (INFCOM-1), with changes highlighted in manual track changes]

***Purpose***

Responding to the preamble of the WMO Convention “Recognizing the importance of an integrated international system for the observation, collection, processing and dissemination of meteorological, hydrological and related data and products” and its article 2(c) (*Basic Documents, No. 1* (WMO-No. 15)), which states, among the purposes of the organization, “{…} to ensure the uniform publication of observations and statistics ”, the Standing Committee will focus on the normative work and technical systems required to achieve Objective 2.3 of the WMO Strategic Plan: “{to} Enable access to and use of numerical analysis and Earth system prediction products at all temporal and spatial scales from the WMO seamless Global Data-processing and Forecasting System (GDPFS)”.

The activities of the Standing Committee will include the following:

(a) With the regional associations, in collaboration with the other Standing Committees and Advisory Groups of the Infrastructure Commission, and in collaboration with the Services Commission, Research Board and other bodies such as the Joint WMO-IOC Collaborative Board, gather and review requirements across user programmes, assess and advise on gaps and solutions for meeting user needs in numerical analysis and Earth system prediction products for all disciplines;

(b) Support the advancement and operationalization of probabilistic forecasting and Earth system modelling, prediction and projection, in collaboration with the Research Board and Services Commission; (Strategic Objective (SO) 2.3/Focus in 2020–2023);

(c) Develop relevant regulatory and guidance material (SO 2.3/Focus in 2020–2023), in particular the *Manual on the Global Data-processing and Forecasting System* (WMO- No. 485);

(d) Responding to new and evolving WMO programme requirements, and in collaboration with the Research Board, Services Commission and other Constituent Bodies (Resolution 58 (Cg-18)), develop and support the implementation of the seamless GDPFS, including support to tropical cyclone forecasting and severe weather forecasting, taking into consideration related initiatives such as the Climate Services Information System (CSIS) and the Global Hydrological Status and Outlook System (HydroSOS);

(e) Support and enhance the capabilities of all WMO Members to benefit from impact-based and probabilistic products, and historical data including analyses and reanalysis model output (SO2.3/Focus in 2020–2023);

(f) Support emergency response activities of Members and partner organizations (the International Atomic Energy Agency (IAEA), the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), the International Civil Aviation Organization (ICAO), etc.) (*Agreements and Working Arrangements with Other International Organizations* – *Basic Documents No. 3* (WMO-No. 60));

(g) In collaboration with the regional associations, monitor and review the performance and application of the GDPFS and promote a culture of compliance with standards and relevant regulatory material among all Members;

(h) Contribute to the WMO Unified Data Policy implementation road map concerning GDPFS core and recommended data;

(i) Any activities necessary to support the implementation of constituent body policy decisions related to analysis, modelling, prediction and projection data, including the sharing of model output data;

(j) Engage with other WMO structures and programmes, co-sponsored programmes and related international partner organizations in coordinating all relevant activities;

(k) In collaboration with the regional associations and Regional Training Centres, develop, update and promote training material and recommend competency-based training events on Earth system modelling and applications in addition to building capacity among developing Members on the use and interpretation of model output, and the development of model analysis and forecast.

***Expertise required***

 Earth system modelling and prediction (ESMP), analysis, reanalysis and projection across all time and spatial scales, both deterministic and probabilistic, scales for various disciplines, including: Seamless Earth system modelling for various components (i.e. ocean, hydrology, cryosphere, atmospheric composition) in a fully coupled manner and full value chain approach to serve all application areas (i.e. marine, aviation, water, climate, environment), Multimodel Ensemble (MME) approaches, etc.;

 Calibration and downscaling of ESM products;

 Verification of ESM outputs;

 Development of ensemble prediction and assimilation, and impact-based model products;

 Atmospheric transport and dispersion modelling for nuclear and non-nuclear emergencies;

 Space weather analysis and prediction.

***Membership***

Up to 25 technical experts, including Chair and Vice-Chair(s), Leads and/or co-Leads of its subsidiary bodies, and other necessary experts selected from the Expert Network by the President of the Commission assisted by the Management Group and the Secretariat, covering the primary Earth System domains addressed by the WMO (weather, climate, atmospheric composition, oceans, hydrology and cryosphere) and the required types of expertise.

Selected experts will represent both Government and research and development organizations, including GDPFS centres, within the following domains:

 Earth system modelling;

 Climate data-processing, monitoring, analysis, prediction and projection;

 Numerical weather prediction (NWP), ocean modelling, hydrological modelling, atmospheric transport modelling, agrometeorology, high mountain, cryosphere, air quality, space weather and nowcasting.

***Duration***

Until the next ordinary session of the Commission and can be re-established if necessary.

***Modalities of work***

One face-to-face meeting during the intersessional period (i.e. 2-year cycle) prior to next Technical Commission session. Otherwise by electronic correspondence and tele/video conference.

*Note: The 4-year budget allocated to the Technical Commissions is based on the assumption that the standing committees will meet once per 2-year period.*

***Regulatory and guidance material***

Current WMO regulatory and non-regulatory material within the remit of the Standing Committee:

 *Manual on the Global Data-processing and Forecasting System* (WMO-No. 485);

 *Guide on the Global Data-processing System* (WMO-No 305);

 *Guidelines on High-resolution Numerical Weather Prediction* (Forthcoming);

 *Guidelines on Ensemble Prediction System Postprocessing*

(WMO-No. 1254);

 *WMO Guidelines on Generating a Defined Set of National Climate Monitoring Products* (WMO-No. 1204);

 *Guidance on Verification of Operational Seasonal Climate Forecasts*

(WMO-No. 1220);

 Guidance on operational practices for objective seasonal forecasting;

 Guidance on regional climate change projections;

 WMO catalogue of Earth system data;

 *Guidelines for Nowcasting Techniques* (WMO-No. 1198);

 Future seamless Global Data-processing and Forecasting System implementation plan.

***Expected outputs***

*Note: Additional deliverables aligned with the WMO Operating Plan 2020–2023 are listed in the annex to Resolution 3 (INFCOM-1) as appropriate.*

**E. Joint Study Group on WMO Greenhouse Gas Monitoring**

**1. Mandate**

The June 2022 meeting of the Executive Council (EC-75) decided to form a joint Study Group between INFCOM, SERCOM and the Research Board, with appropriate involvement of external stakeholders, to undertake the following tasks:

*(1) To develop the concept, including identifying the future vision for WMO-coordinated GHG-related activities, its outputs and expected contributions from and benefits for Members, leveraging synergies with existing frameworks such as the Global Atmosphere Watch (GAW) and the Integrated Global Greenhouse Gas Information System (IG3IS);*

*(2) To submit a final proposal of the concept for its architecture with identified key gaps between Members’ operational needs and existing relevant WMO activities to the nineteenth World Meteorological Congress (Cg-19) in 2023;*

Furthermore, the Executive Council decided:

*to delegate the authority to develop and approve the Terms of Reference of this Study Group to the President of the Infrastructure Commission (INFCOM), the President of the Services Commission (SERCOM) and the Chair of the Research Board (RB);*

The role of the Study Group is to oversee and coordinate a number of tasks (see Section 5). Many of these will need to be completed in time to provide necessary decision materials for consideration by SERCOM-2 and INFCOM-2 in October 2022; others will support decision-making by the nineteenth World Meteorological Congress in May to June 2023.

**2. Reporting arrangements**

The Study Group will present the interim results of its work to INFCOM, SERCOM and the Research Board and seek their feedback and/or endorsements. The ultimate aim is to present a concept proposal to the nineteenth World Meteorological Congress for its deliberation and approval.

**3. Secretariat support**

The Secretariat will arrange any necessary meetings and conference calls, provide drafting of documents, record decisions and actions items, and track issues and actions as needed.

**4. Modalities of work**

Most of the work will be conducted by email and videoconference, with the possibility of holding physical meetings when deemed appropriate by the Chair and if resources are available to maximize the participation of all members [Argentina].

**5. Tasks**

(a) Oversee and guide the further development of the concept for the GHG monitoring system, as per EC-75/Resolution 4, taking into account the need to:

 Identify the primary users of GHG information and services and establish the priority needs of these users;

 Secure continued broad support for this development in the existing greenhouse gas monitoring community through building on existing activities and coordination mechanisms;

 Act without delay, given the importance of providing input to currently ongoing First Global Stocktake by the Parties to the Paris Agreement;

 Engage, as appropriate, all elements of the WMO governance structure in this development;

 Engage and closely collaborate with the wider scientific community and other UN agencies international entities (e.g. CEOS; CGMS; GEO; IOC/GOOS) with GHG monitoring activities, in particular the land surface and ocean observation and modelling communities;

 Minimize overlap with WMO activities by clearly positioning this infrastructure with respect to GAW and IG3IS;

(b) Aim to present an early version of the draft proposal for the concept of this at INFCOM-2 and SERCOM-2 in October 2022 and the Research Board in December 2022 for their feedback and preliminary endorsement;

(c) Convene a WMO Greenhouse Gas Monitoring Symposium in January 2023, with the aim of seeking input to the concept from a broad group of scientific, operational and policy-setting stakeholders;

(d) Provide a draft concept proposal to EC-76 in February 2023, with the aim of getting EC recommendation for approval by Congress-19 in May 2023;

(e) Take every opportunity to further socialize and seek input to the development of this concept, e.g. via scientific conferences, IPCC meetings, UNFCCC Workshops, COP27, IOC meetings, WMO Climate Policy Advisors.

**6. Membership**

The joint Study Group should be chaired by an INFCOM designated lead and is expected to consist of up to 20 members, representing

Infrastructure Commission (in particular SC-ON, SC-ESMP, SC-MINT);

 Services Commission (in particular SC-CLI, SG-URB and SG-ENE);

 Research Board (in particular GAW, IG3IS, WCRP, WWRP);

 GCOS

 GOOS

 CEOS

 CGMS

 GEO

 IPCC TFI

 Particular regional or national activities upon which the GHG monitoring infrastructure will be building on, e.g. from the European Union, Japan, US;

All WMO Regions ~~should~~ shall [Argentina] be represented, and gender balance needs to be accounted for, according to the Rules of Procedure of the Technical Commissions [Argentina, P/INFCOM]. In addition to the representation listed above, the Executive Council may wish to appoint (a) focal point(s) as members. Furthermore, given the high level of interest in this topic it is likely that some WMO Members may wish to nominate their own representatives as additional members. Such requests may in principle be accommodated but should be discussed on an ad hoc basis between the Chair of the group and the respective member.

**F. Advisory Group on the Global Cryosphere Watch (AG-GCW)**

**Purpose**

Under the authority of the INFCOM Management Group (MG), the Advisory Group on the Global Cryosphere Watch (AG-GCW) will provide overall coordination on the application of cryospheric sciences in the delivery of the mandate of the Commission. Specifically, AG-GCW will focus on the integration of cryosphere and polar (e.g. Antarctica) observations and data into the WMO Integrated Global Observing System (WIGOS) and the WMO Information System (WIS), the utilization of cryospheric data and products by the Global Data-processing and Forecasting System (GDPFS) towards a fully coupled cryosphere in Earth system models, and enabling the integration of cryospheric information in the development of services for weather, climate, water and the environment.

GCW-AG will function under the general terms of reference of advisory groups and:

(a) Act as the cryosphere subject-matter expert substructure of INFCOM and contributes to the goals of the Standing Committees of the Commission,

(b) Provide technical and scientific support to INFCOM MG on engagements with SERCOM, RB, the Executive Council Panel on Polar and High Mountains Observations, Research and Services (EC-PHORS), the Joint WMO-IOC Collaborative Board (JCB), the Hydrological Coordination Panel (HCP), and the WMO Regional Associations, relevant to research and services that integrate cryosphere information, e.g. for polar and high mountain regions, etc.

(c) Oversee and monitor the implementation of the pre-operational plan of the Global Cryosphere Watch, as approved by EC-73,

(d) In collaboration with the relevant INFCOM structures and EC-PHORS, foster necessary engagements and coordination on the acquisition and distribution of fundamental cryosphere satellite datasets, on the development of specific derived products for cryospheric, polar, and high mountains, and supporting their assimilation and use for validation and verification;

(e) Establish and maintain mutually beneficial partnerships and collaborations with relevant international and scientific bodies and programmes and foster the application of advances in cryospheric sciences;

(f) Seek opportunities for leveraging resources through joint activities with Members and partners for addressing gaps in the cryosphere infrastructure and information needs, (e.g. with the Global Hydrological Status and Outlook System (HydroSOS), etc.).

(g) In collaboration with the relevant INFCOM structures, establish necessary time-limited Expert and Task Teams to address specific deliverables of the INFCOM work plan;

**Composition**

AG-GCW will be comprised of up to 15 core members and will engage representatives from the relevant structures of INFCOM and WMO partners.

The membership of AG-GCW will ensure representation of all components of the cryosphere — snow, sea and freshwater ice, permafrost, glaciers and ice caps, ice sheets and ice shelves, and solid precipitation, as well as representation of cryosphere observations (surface, remote sensing, satellite), data management, data assimilation, Earth system modelling and reanalysis, and specific research and applications as called for in the INFCOM workplan.

AG-GCW will be led by a Chair and a Vice-Chair who will be members of the INFCOM MG.

The appointment of the AG-GCW Chair and Vice-Chair and the nomination and approval of its members will be made according to the Rules of Procedure of the Commission.

**Modalities of work**

AG-GCW will hold one face-to-face meeting during the intersessional period (i.e. 2-year cycle), complemented by electronic correspondence and tele/video conferences.

Deliverable-driven meetings will be organized to address priorities of the Commission, within the resource allocation and in consultation with the relevant Standing Committees.

**Deliverables**

Deliverables aligned with the work plan of INFCOM.

**G. Advisory Group on the Oceans (AG Ocean)**

**Purpose**

Under the authority of the INFCOM Management Group (MG), the AG Ocean will provide overall coordination on the application of ocean monitoring, including but not limited to observations, data management, data sharing, data utilization and products, to the activities related to the terms of reference of the Infrastructure Commission; it will function under the general terms of reference of advisory groups and carry out relevant tasks, to:

(a) Advise the INFCOM Management Group on ocean observation related matters by translating gathered needs from and for the ocean community into suggested activities of INFCOM bodies – and SERCOM as appropriate – together with the three INFCOM coordinators.

(b) With the support of the WMO Secretariat, provide advice to the INFCOM MG on the integration of ocean information for the delivery of the objectives of the WMO Strategic Plan and making sure functional connections as established by JCB are working, maintained and monitored, including in the engagements with SERCOM, the Research Board (RB) (including WCRP and WWRP), GCOS (especially OOPC), the Joint WMO-IOC Collaborative Board (JCB), and the GOOS Observations Coordination Group (OCG).

(c) Serve as focal point for ocean observing infrastructure: catalyse and support the operationalization of the infrastructure component of the JCB joint strategy and make sure requirements from users are met

(d) Guide, oversee, and monitor the integration of ocean observations into the WMO Integrated Global Observing System (WIGOS, including WIGOS Station Identifiers, OSCAR, Rolling Review of Requirements, Status of Guidance, GBON for ocean), the WMO Information System (WIS) and the utilization of ocean data and integrated products in the Global Data-processing and Forecasting System (GDPFS) framework, aligned with the needs of specific services.

(e) Contribute to the delivery of the WMO Operating Plan on all aspects related to ocean by working directly with the relevant substructures of the Commission;

(f) Supports the INFCOM Vice-Chair in charge of ocean for development of cross-cutting Earth System activities. Establish and maintain mutually beneficial engagements and facilitate the exchange of information on the ocean among scientists and practitioners and between operational and scientific communities of Members and partners, aligned with the scope of work.

(g) Establish the necessary time-limited Expert Teams and Task Teams to support development of integrated activities, within the available resources.

(h) Explore/Establish effective links with regional activities (WMO Regional Associations and GOOS Regional Alliances).

**Composition**

The AG Ocean will be comprised of up to 15 experts representing the relevant Expert Teams of all Standing Committees of INFCOM, the Standing Committee on Marine Meteorological and Oceanographic Services (SC-MMO) of SERCOM, the Research Board, WMO Regional Associations, GOOS panels, GOOS Regional Alliances and other WMO partners.

AG Ocean will be led by a Chair and a Vice-Chair who will be members of the INFCOM MG.

The appointment of Chair and Vice-Chair and the nomination and approval of membership will be made according to the Rules of Procedure of the Commission.

The engaged experts will be required to cover all components of ocean monitoring systems. The relevant expertise will be required to cover but will not be limited to ground observations, remote sensing and satellite observations, data assimilation, data and metadata management, and relevant data applications. Expert Teams and Task teams will be established as necessary.

**Modalities of work**

One face-to-face meeting during the intersessional period (i.e. 2-year cycle), prior to the next Technical Commission session. Otherwise by electronic correspondence and tele/video conference.

AG Ocean will continue until the next ordinary session of the Commission and can be re-established if necessary.

**Deliverables**

Deliverables aligned with the WMO Operating Plan 2020–2023. The AG Ocean will facilitate relevant Expert Teams activities and will help their operationalization for better outcomes to Members and partners.

**Coordinator of satellite matters (C-SAT);**

[The Terms of Reference of C-SAT are the same as in the Annex to Resolution 8 (INFCOM-1)]

**Coordinator of engagement and partnership (regional associations, private sector, academia) with regard to infrastructure matters (C-ENG);**

[The Terms of Reference of C-ENG are the same as in the Annex to Resolution 8 (INFCOM-1)]

**Coordinator for hydrology in Earth system modelling (C-HESM).**

[The Terms of Reference of C-HESM are the same as in the Annex to Resolution 8 (INFCOM-1)]

**Coordinator on the implementation of the WMO Unified Data Policy (C-DATA)**

The role of the Infrastructure Commission Data Policy Coordinator (C-DATA) is to coordinate the development of a road map, action plan and assignment of responsibilities, principally within INFCOM but as required in collaboration with SERCOM and Research Board, to ensure the implementation of the WMO Unified Data Policy for the International Exchange of Earth System Data (Unified Data Policy) per Resolution 1 (Cg-Ext(2021)). The C-DATA will work with a subgroup of INFCOM Management Group comprising the INFCOM Coordinators, the Chairs of the INFCOM standing committees together with equivalent representatives from SERCOM and the Research Board [Switzerland] to ensure the required tasks and processes are mapped into the work programs of the standing committees and their expert teams, and to ensure a smooth transition from implementation phase to ongoing exemplary practice in international data exchange, integrated within the WMO technical and governance structures.

In order to facilitate the required coordination, the C-DATA shall be a formal member of the INFCOM MG.

**Priority activities:**

 Develop a road map and detailed action plan for implementation of the Unified Data Policy based on a comprehensive analysis of the resolution, including its Annexes, and any legacy aspects of Resolution 40 (Cg-XII), Resolution 25 (Cg-XIII) and Resolution 60 (Cg-17), including:

o Responsibilities and timelines, and integration in work plans of relevant Standing Committees and other domain-specific teams,

o Process for reviewing/drafting technical regulations, and maintaining ‘living’ list of core data and extending it to embrace all/new forms of core data, including NWP,

o Alignment with GBON and SOFF implementation where relevant;

 Develop a communication/engagement plan to ensure Members, partners (e.g. the World Meteorological Centres – WMCs) and all relevant stakeholders across public, private and research sectors are engaged, consulted and ready to participate in implementation of Resolution 1 (Cg-Ext(2021));

 Develop a plan for managing compliance with the Unified Data Policy, including monitoring, reporting and follow-up procedures;

 Prepare an initial plan for the oversight, conduct and consultations/engagement (within and external to WMO) required for the periodic review of the Resolution 1 (Cg-Ext(2021)) practice; and

 Develop a plan and assign responsibilities for the update of “WMO Guidelines on Emerging Data Issues”.

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## Draft Resolution 5.2/2 (INFCOM-2)

## Officers, Chairs and Vice-Chairs of Standing Committees, Study Groups, Advisory Groups and Task Teams, Management Group and Coordinators of the Commission for Observation, Infrastructure and Information Systems (Infrastructure Commission)

THE COMMISSION FOR OBSERVATION, INFRASTRUCTURE AND INFORMATION SYSTEMS,

**Recalling** [Resolution 88 (Cg-18)](https://library.wmo.int/doc_num.php?explnum_id=9827#page=293), which elected the Officers of the Commission,

**Recalling further**

(1) [Resolution 2 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=41) - Officers, Chairs and Vice-Chairs of standing committees and study groups and the Management Group of the Commission for Observation, Infrastructure and Information Systems (Infrastructure Commission),

(2) [Resolution 9 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=151) - Chairs and Vice-Chairs of standing committees and coordinators of the Commission for Observation, Infrastructure and Information Systems, which selected the Vice-Chair of SC-ESMP and the Coordinators of the Commission,

**Noting** [*Rules of Procedure for Technical Commissions*](https://library.wmo.int/index.php?lvl=notice_display&id=21534#.YyMqTHZBw2w) (WMO-No. 1240),

**Having considered** the recommendation of the president of the Commission, who had consulted the Management Group (MG),

**Endorses** [P/SERCOM] the following chairs and vice-chairs of the standing committees and study groups, and coordinators:

(1) Standing Committee on Earth Observing Systems and Monitoring Networks  
(SC-ON)

 Chair: Estelle Grüter (Switzerland)

 Vice-Chair: Sid Thurston (United States of America);

(2) Standing Committee on Measurements, Instrumentation and Traceability (SC-MINT)

 Chair: Bruce Hartley (New Zealand)

 Vice-Chair: Janice Fulford (United States of America);

(3) Standing Committee on Information Management and Technology (SC-IMT)

 Chair: Rémy Giraud (France)

 Vice-Chair: Jeremy Tandy (United Kingdom);

(4) Standing Committee on Data Processing for Applied Earth System Modelling and Prediction (SC-ESMP)

 Chair: David Richardson (ECMWF)

 Vice-Chair: Dr Hamza Athumani Kabelwa (United Republic of Tanzania);

(5) Joint Study Group on Greenhouse Gas Monitoring (SG-GHG)

 Chair: Michel Jean (president, Canada)

 Vice-Chair: Greg Carmichael (United States of America);

(6) Advisory Group on the Global Cryosphere Watch (AG-GCW)

 Chair: Árni Snorrason (Iceland)

 Vice-Chair: Scott Lindsey (United States of America);

(7) Advisory Group on the Oceans (AG Ocean)

 Chair: To be defined (vacant)

 Vice-Chair: To be defined (vacant);

(8) Task Team on the Implementation of the Global Basic Observing Network [Secretariat/Editorial]

 Chair: Pascal Waniha (Tanzania)

 Co-Chair: Michelle Mainelli (United States of America);

(9) Coordinator on Satellite matters (C-SAT)

 Coordinator: Peng Zhang (China);

(10) Coordinator on engagement and partnership (regional associations, private sector, academia) with regard to infrastructure matters (C-ENG)

 Coordinator: Yoshiaki Sato (Japan);

(11) Coordinator hydrology in Earth system modelling (C-HESM)

 Coordinator: Narendra Tuteja (Australia);

(12) Coordinator on the implementation of the WMO Unified Data Policy (C-DATA)

 Coordinator: Simon McLellan (United Kingdom);

**Expresses** **appreciation** to the Members that are volunteering the experts;

**Re-establishes** the Management Group of the Commission with the following composition: Mr Michel Jean (president), Mr Bruce FORGAN (vice-president), Ms Nadia PINARDI (vice-president), Mr Silvano PECORA (vice-president), the GCOS Chair, [Germany] the chairs and vice-chairs of the standing committees, the chairs and vice-chairs of relevant study and advisory groups and task teams, and the coordinators; the president may invite additional experts to the Management Group, as necessary, for example, to ensure coordination with other bodies;

**Requests** the President with the assistance of the Management Group and the support of the Secretariat to ensure the selection of above vacant positions, as mandated by the Commission in accordance with the Rules of Procedure of Technical Commissions, [Argentina] and the selection of technical experts to serve in the above standing committees and study groups, taking into account the expertise required, regional and gender balance and inclusiveness, as established by the Rules of Procedure, and recommendations by the Research Board.

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Note: This Resolution replaces [Resolution 2 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=41) and [Resolution 9 (INFCOM-1)](https://library.wmo.int/doc_num.php?explnum_id=11197#page=151), which are no longer in force.