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| WEATHER CLIMATE WATER | **World Meteorological Organization**  **COMMISSION FOR OBSERVATION, INFRASTRUCTURE AND INFORMATION SYSTEMS**  **Third Session** 15 to 19 April 2024, Geneva | **INFCOM-3/Doc. 7.1** |
| Submitted by:  President of the Commission  26.III.2024  **DRAFT 1** |

**AGENDA ITEM 7: STRATEGIC PRIORITIES**

**AGENDA ITEM 7.1: Priority activities and action plan for the Early Warnings for All initiative**

# Priority activities and action plan for the Early Warnings for All initiative

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| **Summary** |
| **Document presented by:** president of the Commission in response to the request as per [Resolution 4 (Cg-19)](https://library.wmo.int/idviewer/67177/61) and [Resolution 1 (EC-77)](https://library.wmo.int/idviewer/66333/9)  **Strategic objective 2024–2027:** 1.1, 2.1, 2.2, 2.3  **Financial and administrative implications:** within the parameters of the Strategic and Operating Plans 2024–2027  **Key implementers:** INFCOM, in consultation with SERCOM, Research Board (RB), Capacity Development Panel (CDP) and RAs  **Time frame:** 2024–2027  **Action expected:** review the proposed draft Decision and Recommendation |

# GENERAL CONSIDERATIONS

### Background: decisions of Congress and the Executive Council

1. On 23 March 2022 United Nations (UN) Secretary-General Antonio Guterres outlined a target: “Ensure every person on Earth is protected by early warning systems within five years”. To meet this challenge the World Meteorological Organization (WMO) and the United Nations Office for Disaster Risk Reduction (UNDRR) were tasked to co-lead this Early Warnings for All (EW4All) initiative with support from the International Telecommunication Union (ITU), the International Federation of Red Cross and Red Crescent Societies (IFRC), and other partners.
2. The WMO Executive Council (EC) through its [Resolution 3 (EC-75)](https://library.wmo.int/doc_num.php?explnum_id=11550#page=19) – UN Global Early Warning/Adaptation Initiative, requested the Commission for Weather, Climate, Hydrological, Marine and Related Environmental Services and Applications (SERCOM), in consultation with other WMO bodies and with the support of the Secretariat, to develop an initial action plan to respond to the EW4All initiative.
3. SERCOM and the Commission for Observation, Infrastructure and Information Systems (INFCOM) jointly hosted the [WMO Technical Conference on - the UN Global Early Warning Initiative for Climate Adaptation: Early Warnings For All](https://wmo.int/events/constituent-body/wmo-technical-conference-un-global-early-warning-initiative-climate-adaptation-early-warnings-all) (held in Geneva, in October 2022), which profiled the work of a range of stakeholders including the private sector within the framework of an early warning services value cycle and where the participants, both from the public and private sector, expressed their strong support and intentions to collaborate under the EW4All initiative through a [Joint Statement](https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocms/s3fs-public/ckeditor/files/Statement_from_the_WMO_Early_Warnings_for_All_Conference__1.pdf?S_nct4q2KLEjjp_wZCbklz4MQeHdZxTP).
4. The second session of SERCOM (SERCOM-2, held in Geneva, in October 2022) through its [Resolution 2 (SERCOM-2)](https://library.wmo.int/doc_num.php?explnum_id=11528#page=15) – UN Global Early Warnings/Adaptation Initiative, requested the President of SERCOM (P/SERCOM) to “take immediate action to advance preparations for the practical implementation of the challenge” in close coordination with other WMO bodies, and “inform a recommendation to EC-76 relating to the priority activities, proposed subsidiary body structures and supporting partnerships necessary”.
5. The [*Early Warnings for All: Executive Action Plan 2023–2027*](https://library.wmo.int/index.php?lvl=notice_display&id=22154#.ZD-oQHZByUk)was launched by the UN Secretary-General at the twenty-seventh session of the Conference of the Parties (COP27) to the United Nations Framework Convention on Climate Change (UNFCCC, held in Sharm El-Sheikh, Egypt, in November 2022). The Executive Action Plan was developed by the Pillar Leads and partners and builds on and aligns with WMO’s and other stakeholders’ foundational elements already in place to pursue the global early warning goal, notably those developed under the WMO technical commissions, Regional Associations (RAs), the Capacity Development Panel (CDP) and the Research Board (RB).
6. The Executive Action Plan is organized along the four pillars[[1]](#footnote-2) of a multi-hazard early warning system (MHEWS):
   * + 1. Pillar 1 – Disaster risk knowledge;
       2. Pillar 2 – Observations and forecasting;
       3. Pillar 3 – Dissemination and communication;
       4. Pillar 4 – Preparedness and response.
7. In [Resolution 4 (Cg-19)](https://library.wmo.int/idviewer/67177/61), Congress requested the technical commissions to identify high priority activities to address the urgent needs of Members in building effective MHEWSs falling within their terms of reference (ToR) and to incorporate them into their respective work plans for the next financial period.

### Rapid assessment by the Secretariat

1. On the margins of Cg-19, the WMO Secretariat’s Monitoring, Evaluation, Risk and Planning (MERP) Office initiated a process within the subset of 30 countries to establish a baseline on (core) capacities. MERP undertook a two-pronged approach involving:

(a) The development of a rapid methodology for appraising the monitoring and forecasting capacity of the 30 countries, including for specific priority hazards identified by these countries;

(b) The conduct a Country Hydromet Diagnostics (CHD)[[2]](#footnote-3) in all 30 countries as part of the Systemic Observations Financing Facility (SOFF) Readiness Phase. The former tool provides a detailed view on the countries’ capacity for early warnings; the latter offers a big picture perspective on the National Meteorological and Hydrological Services’ (NMHSs) operating environment and contribution to weather, climate, hydrological and environmental services, and warnings.

### Coordination through the Technical Coordination Committee

1. Through [Resolution 1 (EC-77)](https://library.wmo.int/viewer/66333/?offset=1#page=9&viewer=picture&o=&n=0&q=), it was requested to the RAs, technical commissions and RB, under the guidance of EC, to consolidate all their relevant activities under the EW4All umbrella and report back to EC; the Council, through its [Resolution 7 (EC-77)](https://library.wmo.int/idviewer/66333/17) - Subsidiary bodies of the EC, delegated the role of coordinating the technical bodies of the Organization (technical commissions, the RB, and other relevant bodies) and the RAs to the Technical Coordination Committee (TCC).
2. At its first meeting from 17 to 19 October 2023 in Geneva (TCC-1(2023)), TCC considered the five event types that were most frequently identified through the EW4All Rapid Assessment conducted with WMO Permanent Representatives (PRs) attending the Nineteenth World Meteorological Congress (Cg-19) from the 30 countries: flash floods, drought/dry spell, riverine floods, tropical cyclones, and thunderstorms/squall lines as priority hazards. To these five event types, heatwaves were added as the sixth event type because they are relatively large-scale phenomena to which global frameworks can contribute to the context of monitoring and forecasting. TCC also noted:
3. Drought/dry spells could be complemented by cold spells and snow falls;
4. Tropical cyclones could be seen in the context of a multi-hazard scenario, with extreme winds causing flash floods and storm surges;
5. Thunderstorms/squall lines could be complemented by lightning;
6. In addition, wildfires, volcanic eruptions, and marine hazards, including tsunamis and sea level rise and storm surges because of climate change should be considered.
7. TCC-1 recommended, as its Recommendation 1 – EW4All priority hazards, that:
8. The RAs identify (sub)regional priority hazards and the need for regional support in monitoring, forecasting, and warning guidance through the Regional Basic Observations Network (RBON) design process;
9. The technical commissions:
   1. Review CHD and Rapid Assessment methodologies, based on further clarifications by the Secretariat;
   2. Take note of the identification of (sub)regional priority hazards and needs for regional support based on RAs’ work;
   3. Prioritize activities for identified hazards to:
      * Develop relevant guidance and training materials
      * Strengthen and establish supports under the framework of the WMO Integrated Processing and Prediction System (WIPPS)
      * Develop and consolidate technical regulations and other guidance materials related to (MH)EWS components
      * Further development of nomenclature for emerging hazard types, such as those due to changes in the cryosphere, in the framework of the WMO Catalogue of Hazardous Events (CHE).
10. TCC-1 also considered the initial list of priority activities presented by the technical commissions and recommended in Recommendation 2 – EW4All priority activities that:
11. Regional Associations
    1. Identify priority activities in the work programmes to be adopted at their next sessions and task subsidiary bodies accordingly;
    2. Identify and communicate Members’ needs that should be addressed by the priority activities of the technical commissions;
    3. Develop their requirements for technical support relevant to the priority hazards identified by their Members through the RBON design process;
    4. Facilitate knowledge-sharing among Members.
12. Technical commissions to:
    1. Finalize a consolidated list of proposed priority activities for the work programmes to be adopted at their next sessions, including based on contributions from RAs, and task subsidiary bodies accordingly;
    2. Undertake consultation on the draft concept note and provisions for the Early Warning Services section of the [*Technical Regulations*](https://library.wmo.int/records/item/35722-technical-regulations) (WMO-No. 49) for review by SERCOM-3 with the aim of taking recommendations to Cg-Ext(2025).
13. A consolidated list of priority activities of INFCOM, SERCOM and RB was drafted by the Secretariat and was examined at the TCC online update meetings held on 22 November and 15 December 2023. Furthermore, this list, presented as [INFCOM-3/INF. 7.1](https://meetings.wmo.int/INFCOM-3/InformationDocuments/Forms/AllItems.aspx), as well as the priority hazards, were circulated for Members’ review through the WMO Regional Offices and Members feedback was consolidated in a document submitted to the TCC update meeting held on 21 February 2024.

### Action plan of the Infrastructure Commission

1. The Management Group (MG) of INFCOM, at its meeting in March 2023, established two Task Teams, with their tasks being:
2. To carry out a quick gap analysis in global frameworks for observation and prediction data provision and draft an action plan;
3. To assess available global products from traditional and non-traditional sources for riverine flood prediction, in terms of their quality and operational availability, and the possibility to include riverine flood prediction as a new WIPPS activity as a desktop study.
4. This document presents the priority activities identified by subsidiary bodies of the Commission through the work of the first Task Team, as a contribution to the EW4All initiative, to be included in the work programme of the Commissions for the next intersessional period starting from the third session of INFCOM (INFCOM-3, to be held in Geneva, in April 2024), and action plans for:
5. The RBON development;
6. Gap analysis and enhancement of access to and use of satellite products and applications;
7. Enhancement of the modelling and nowcasting products through the WIPPS framework;
8. Addressing the needs for cryosphere-related emerging hazards, as a supplementary supporting material for actions to be taken by technical bodies and RAs, coordinated through TCC.
9. The second Task Team worked on the cataloguing and analysis of global products from traditional and non-traditional sources for riverine flood prediction and proposed the demonstration through [draft](https://meetings.wmo.int/INFCOM-3/_layouts/15/WopiFrame.aspx?sourcedoc=%7bAF3FCD55-9F2A-4650-BBF7-889F6F16A8F6%7d&file=INFCOM-3-d08-4(3)-NON-TRADITIONAL-SOURCES-INTO-WIPPS-draft1_en.docx&action=default) [Recommendation 8.4(3)/1 (INFCOM-3)](https://meetings.wmo.int/INFCOM-3/_layouts/15/WopiFrame.aspx?sourcedoc=%7bAF3FCD55-9F2A-4650-BBF7-889F6F16A8F6%7d&file=INFCOM-3-d08-4(3)-NON-TRADITIONAL-SOURCES-INTO-WIPPS-draft1_en.docx&action=default).

**Expected action**

1. Based on the above, the Commission may wish to adopt [draft Decision 7.1/1 (INFCOM-3)](#_Draft_Decision_7.1/1) and [draft Recommendation 7.1/1 (INFCOM-3)](#_Draft_Recommendation_7.1/1).

# DRAFT DECISION

## Draft Decision 7.1/1 (INFCOM-3)

### Priority activities of the Commission for Observation, Infrastructure and Information Systems (INFCOM) contributing to the Early Warnings for All initiative

**The Commission for Observation, Infrastructure and Information Systems decides:**

(1) To endorse the list of priority activities of the Commission contributing to the Early Warnings for All initiative (EW4All), as presented in the [annex](#_Annex_to_draft_1) to the present draft Decision, which reflected the priorities expressed by Members through the review process conducted by the Regional Associations;

(2) To request the INFCOM’s subsidiary bodies to include them in their respective work programmes;

(3) To note the consolidated list of priority activities of INFCOM, the Commission for weather, climate, hydrological, marine and related environmental services (SERCOM) and the Research Board presented in [INFCOM-3/INF. 7.1](https://meetings.wmo.int/INFCOM-3/_layouts/15/WopiFrame.aspx?sourcedoc=%7b1CECA23C-AEBA-4358-9953-96D318B141E3%7d&file=INFCOM-3-INF07-1-PROPOSED-PRIORITY-ACTIVITIES-ON-EW4ALL_en.docx&action=default).

See [INFCOM-3/INF. 7.1](https://meetings.wmo.int/INFCOM-3/_layouts/15/WopiFrame.aspx?sourcedoc=%7b1CECA23C-AEBA-4358-9953-96D318B141E3%7d&file=INFCOM-3-INF07-1-PROPOSED-PRIORITY-ACTIVITIES-ON-EW4ALL_en.docx&action=default) for more information.

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Decision justification: [Resolution 4 (Cg-19)](https://library.wmo.int/idviewer/67177/61) – United Nations Early Warnings for All initiative, which requested the technical commissions:

* 1. To identify high priority activities to address the urgent needs of Members in building effective MHEWSs falling and to incorporate them into their respective work plans for the next financial period;
  2. To identify, catalogue, and integrate priority emerging hazards, such as those due to changes in the cryosphere, in support of the development of necessary monitoring and early warning systems for affected Members;
  3. To implement the priority activities in a collaborative, coordinated, and synergetic manner and regularly report to the Executive Council.

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[Annex: 1](#Annex_to_draftDec)

## Annex to draft Decision 7.1/1 (INFCOM-3)

## List of INFCOM priority activities contributing to the Early Warnings for All initiative

1. Implement the WMO Information System (WIS) 2.0, including the development of a Common Alerting Protocol (CAP) editor to be part of the “WIS 2.0 in a box” and the development of the WMO Hydrological Observing System (WHOS) in the pre-operational phase of WIS 2.0.
2. Implement the Global Basic Observing Network (GBON), including through the (support provided by/via the) SOFF.
3. Guide and support the development of the RBON.
4. Analyse gaps and enhance WIPPS products for priority hazards, including:
   1. Enhance the information and service cascading process of the Severe Weather Forecasting Programme (SWFP), the Climate Services Information System (CSIS), and the Tropical Cyclone Programme (TCP);
   2. Improve accessibility and usability of WIPPS products including graphical products.
5. Enhance engagement of academic and private sector players in WIPPS development.
6. Enhance the introduction of new emerging technologies (e.g. Artificial Intelligence (AI)) and science into WIPPS.
7. Catalogue and analyse gaps of satellite products and applications for priority hazards.
8. Support Members to ensure access to satellite data and products and with train-the-trainers focused on access, processing, visualization, and interpretation of satellite data.
9. Address the needs for cryosphere-related emerging hazards.

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# DRAFT RECOMMENDATION

## Draft Recommendation 7.1/1 (INFCOM-3)

### Action Plan for INFCOM contributions to the Early Warnings for All (EW4All) initiative

THE COMMISSION FOR OBSERVATION, INFRASTRUCTURE AND INFORMATION SYSTEMS,

**Recalling**:

(1) [Resolution 4 (Cg-19)](https://library.wmo.int/idviewer/67177/61)– United Nations Early Warnings for All initiative,

(2) [Resolution 1 (EC-77)](https://library.wmo.int/viewer/66333/?offset=1#page=9&viewer=picture&o=bookmark&n=0&q=) – WMO Contribution to the Early Warnings for All initiative,

(3) [Resolution 7 (EC-77)](https://library.wmo.int/idviewer/66333/17) – Subsidiary bodies of the Executive Council,

**Noting** the feedback from Members on the list of priority hazards and activities, which shows strong needs for enhancing infrastructure to monitor and forecast hazards,

**Having examined** the action plan for four activity areas to contribute to the EW4All initiative developed by the Task Team on EW4All,

**Recommends** to the Executive Council the adoption of the action plan throughthe draft Resolution provided in the [annex](#Annex_to_draft_Recommendation) to the present Recommendation.

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[Annex: 1](#Annex_to_draftRec)

## Annex to draft Recommendation 7.1/1 (INFCOM-3)

**Draft Resolution ##/1 (EC-78)**

THE EXECUTIVE COUNCIL,

**Recalling**

(1) [Resolution 4 (Cg-19)](https://library.wmo.int/idviewer/67177/61) − United Nations Early Warnings for All initiative, which requested the technical commissions:

1. To identify high priority activities to address the urgent needs of Members in building effective Multi-hazard early warning systems (MHEWS) and to incorporate them into their respective work plans for the next financial period,
2. To identify, catalogue, and integrate priority emerging hazards, such as those due to changes in the cryosphere, in support of the development of necessary monitoring and early warning systems for affected Members,
3. To implement the priority activities in a collaborative, coordinated, and synergetic manner and regularly report to the Executive Council,

(2) [Resolution 1 (EC-77)](https://library.wmo.int/viewer/66333/?offset=1#page=9&viewer=picture&o=bookmark&n=0&q=) – WMO Contribution to the Early Warnings for All initiative, which requested the Regional Associations (RA), technical commissions and the Research Board (RB), under the guidance of the Executive Council, to consolidate all their relevant activities under the EW4All umbrella and report back to the Council,

(3) [Resolution 7 (EC-77)](https://library.wmo.int/idviewer/66333/17) - Subsidiary bodies of the Executive Council, which delegated the role of coordinating the technical bodies of the Organization (technical commissions, RB, and other relevant bodies) and the RAs to the Technical Coordination Committee (TCC),

**Having examined** [Recommendation 7.1/1 (INFCOM-3)](#_DRAFT_RESOLUTION_4.2/1_(EC-64)_-_PU) - Action Plan for INFCOM contributions to the Early Warnings for All (EW4All) initiative,

**Having agreed** with [Recommendation 7.1/1 (INFCOM-3)](#_DRAFT_RESOLUTION_4.2/1_(EC-64)_-_PU),

**Endorses** the action plan for infrastructure components contributing to the EW4All as presented in the [annex](#Annex_to_Resolution) to the present Resolution, consisting of work plans to:

* 1. Consider EW4All observational user requirements and gaps through the RBON;
  2. Address the gaps in satellite data/products;
  3. Analyse gaps and enhance WIPPS products for priority hazards;
  4. Address cryosphere-related emerging hazards, which require coordinated actions by the RAs, technical commissions and the RB, as a supporting material for coordination among these bodies;

**Invites** Members to contribute to the actions through the standing committees, study groups, working groups and expert teams of the RAs, technical commissions and the RB;

**Requests**:

(1) The regional associations to lead the deliverables assigned to the regional associations in the action plan;

(2) The Infrastructure Commission to guide the technical aspect of the action plan;

(3) The Services Commission and the Research Board to support the relevant deliverables in the action plan;

(4) The Technical Coordination Committee to oversee and coordinate the implementation of the action plan and regularly report the progress to the Executive Council.

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[Annex: 1](#Annex_to_Resolution)

## Annex to draft Resolution ##/1 (EC-78)

## Action Plan for infrastructure components contributing to EW4All

Note: Deliverables highlighted in yellow indicate the high-level guidance under the responsibility of INFCOM and the Secretariat,  
while deliverables in blue indicate the regional involvement.

**Table 1. Draft Work Plan for consideration of EW4All observational user requirements and gaps through RBON**

Legend:

|  |  |  |  |
| --- | --- | --- | --- |
| PoC | Point of Contact | RBON | Regional Basic Observing Network |
| AA(s) | Application Areas | Doc. | Document |
| EW4ALL | Early Warnings for All | OSCAR | Observing Systems Capability Analysis and  Review Tool |
| MG | Management Group | WG/I | Working Group on Infrastructure |
| JET-EOSDE | Joint Expert Team on Earth Observing System Design and Evolution | ET | Expert Team |
| ESAC | Earth System Application Category | RA | Regional Association |
| SoG | Statement of Guidance | NFPs | National Focal Point |
| WIGOS | WMO Integrated Global Observing System | RWCs | Regional WIGOS Centres |
| INFCOM | Commission for Observation, Infrastructure  and Information Systems |  |  |

| ***No.*** | ***Deliverables*** | ***Format*** ***(manual, guide, template, guidelines)*** | ***Delivered to (body, e.g. INFCOM-3)*** | ***Deadline*** | ***Body responsible (Team, Secretariat, PoC, etc.)*** | ***Consultation with, support from (Team, Secretariat, PoC, etc.)*** | ***Effort type (meetings, workshops, consultancy, Secretariat)*** | ***Comment*** | ***Status*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.1 | Identification of AA(s) according to EW4All priority hazards | Mapping document | INFCOM MG via JET-EOSDE | 15 November 2023 | JET-EOSDE subgroup EW4All | PoCs | Virtual meetings |  | Completed. The mapping document was presented to INFCOM MG meeting-T14 |
| 1.2 | Guidance describing the mapping and rationale to the ESAC Coordinators and AA PoCs | Table with guidance | INFCOM MG via JET-EOSDE | 30 June 2024 | JET-EOSDE subgroup on EW4All | Secretariat | Virtual meetings |  | In progress |
| 1.3 | Update of SoG template for better reflecting observational gaps to ensure AA(s) is/are properly linked to the hazards each ESAC is addressing | SoG Template | INFCOM MG via JET-EOSDE | 30 November 2023 | JET-EOSDE EW4All subgroup | Secretariat | Secretariat work |  | Completed. The SoG template was updated accordingly |
| 1.4 | WIGOS Manual update | Manual | INFCOM-3 | 30 November 2023 | JET-EOSDE subgroup EW4All | Secretariat | Virtual meetings | Update RBON technical regulations | Draft updates included in [INFCOM-3/Doc 8.1(1)](https://meetings.wmo.int/INFCOM-3/_layouts/15/WopiFrame.aspx?sourcedoc=%7b08125CC0-7434-4BC4-AC50-4A395C77B61D%7d&file=INFCOM-3-d08-1(1)-AMENDMENTS-WIGOS-MANUAL-draft1_en.docx&action=default) for discussion |
| 1.5 | WIGOS Guide update | Guide | INFCOM-3 | 30 November 2023 | JET-EOSDE subgroup EW4All | Secretariat | Virtual meetings | Update list of RBON challenges | Draft updates included in [INFCOM-3/Doc 8.1(2)](https://meetings.wmo.int/INFCOM-3/_layouts/15/WopiFrame.aspx?sourcedoc=%7b496A6FD2-7200-4EFF-9ADA-A29CBA44C24F%7d&file=INFCOM-3-d08-1(2)-WIGOS-GUIDE-AND-RWC-GUIDELINES-UPDATE-draft1_en.docx&action=default) for discussion |
| 1.6 | Prioritization of requirements in OSCAR/ Requirements considering EW4All priority hazards and RBON typical challenges | OSCAR/Requirements database | JET-EOSDE | 31 August 2024 | AA PoCs, and AA owners | Secretariat | AA PoCs consulting with WIPPS experts and relevant groups |  | In progress |
| 1.7 | Gap analysis for a given AA with consideration of prioritization of requirements in OSCAR/Requirements according to EW4All priority hazards and RBON typical challenges | Table for SoG | ESAC owner via ESAC Coordinator | 30 November 2024 | AA PoCs and AA owners | JET-EOSDE EW4All subgroup | AA PoCs consulting with WIPPS experts and relevant groups |  | In progress |
| 1.8 | SoGs synthetized across AAs for each ESAC | SoGs | INFCOM MG | 31 March 2025 | ESAC Coordinators | JET-EOSDE | Workshops, virtual meetings |  | In progress |
| 2.1 | RA Operating Plan update | Operating Plan | RAs MG | 30 September 2024 | WG/I | Secretariat (HQ and Regional Offices) | Secretariat work |  | In progress |
| 2.2 | List of national priority hazards | Short Information document with list | RAs MG | 30 June 2024 | WG/I & Secretariat (HQ & Regional offices) | Members | Workshops and surveys, as appropriate |  | Completed in some RAs (e.g., RA II, RA VI) |
| 2.3 | Identification of priority hazards for the whole region based on the list of national priorities (it could be done by subregion if resources allow) | Short document with map(s) and hazard lists | RA MGs | 30 June 2024 | RA WGs/I and RA WGs Services and/or their specific Expert Team | Secretariat (Regional Offices) | Secretariat work |  | Completed in some RAs (e.g., RA II, RA V, RA VI) |
| 2.4 | Identification of observational requirements (required variables and criteria) for the region (it could be done by subregion if resources allow) and the priority hazard, plus summary of the most stringent requirements all hazards considered | Table of observing system types, with for each of those the list of variables to be observed, observing cycle and space & time resolution | RA MGs | 31 March 2025 | RA WGs/I | Secretariat (Regional Offices & HQ), AA PoCs and JET-EOSDE, as needed | Workshops, virtual meetings, Secretariat work | Guidance provided by the JET-EOSDE as reference based on which the key variables and their requirements for the required AAs  (Links to deliverable 1.6 above) |  |
| 2.5 | Collection of the existing observational capabilities from each Member based on the required observations to be made | List of observing stations with location, variables measured & observing cycle |  | 30 June 2025 | Secretariat (Regional Offices & HQ) | WIGOS NFPs, RWCs | Secretariat work possibly supported by consultant |  |  |
| 2.6 | RBON Gap analysis for the region (and possibly subregions if resources allow) and the considered hazards | Tables | INFCOM, RAs | 30 June 2025 | RA WGs/I & relevant ETs | Secretariat (Regional Offices & HQ), JET-EOSDE | Secretariat work possibly supported by consultant | The comparison of user requirements with observing system capabilities (links to deliverable 1.7 above) |  |
| 2.7 | Station list in each region/subregion | Table of station list | RAs | 31 December 2025 | RA WGs/I & relevant ETs | Secretariat (Regional Offices & HQ) | Secretariat work possibly supported by consultant |  |  |
| 2.8 | Midterm plan for evolution of RBON in each region/subregion to further improve the gaps | Implementation Plan | RAs | 31 December 2025 | RA WGs/I & relevant ETs | Secretariat (Regional Offices & HQ) | Secretariat work possibly supported by consultant |  |  |

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**Table 2. Draft Work Plan to address the gaps in satellite data/products in support of the EW4ALL initiative**

Legend:

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| --- | --- | --- | --- |
| EWS | Early Warning System | ET-SSU | Expert Team on Space Systems and Utilization |
| MG | Management Group |  |  |

| ***No.*** | ***Deliverables*** | ***Delivered to (body, e.g. INFCOM-3)*** | ***Body responsible (Team, Secretariat, etc.)*** | ***Consultation with support from*** ***(Secretariat, etc.)*** | ***Effort type (meetings, workshops, consultancy, Secretariat)*** | ***Estimated timeline*** | ***Comment*** | ***Status*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.1 | Preparation of the mapping exercise on the utilization of satellite data for EWS |  | RAs (e.g., Regional Coordination Groups on Satellite Data Requirements) | Secretariat (Regional Offices, SSU Division), with the guidance from ET-SSU | Virtual meetings, email exchange, Secretariat work | July 2024 |  |  |
| 1.2 | Conduct the mapping exercise among Members |  | RAs | Secretariat (Regional Offices) | Dynamic mapping exercise | September 2024 |  |  |
| 1.3 | Gap analyses in terms of access to satellite data, training on processing, visualization, and use of satellite data and products | INFCOM MG & RA MGs via Regional Coordination Groups on Satellite Data Requirements | Regional Coordination Groups on Satellite Data Requirements, with support from ET-SSU | Secretariat (Regional Offices, SSU Division), with the guidance from ET-SSU | Virtual meetings, email exchange, Secretariat work | March 2025 |  |  |
| 1.4 | Identify the minimum (region based) set of satellite products that are required to address the EW4All initiative | INFCOM MG & RA MGs via Regional Coordination Groups on Satellite Data Requirements | Regional Coordination Groups on Satellite Data Requirements, with support from ET-SSU | Secretariat (Regional Offices, SSU Division), with the guidance from ET-SSU | Virtual meetings, email exchange, Secretariat work | July 2025 |  |  |
| 1.5 | Develop regional implementation plans to address the gaps identified in the gap analyses to be included in the regional OPs | RAs | RAs | Secretariat (Regional Offices, SSU Division), with the guidance from ET-SSU | Virtual meetings, email exchange, Secretariat work | TBD by RAs |  |  |

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**Table 3. Draft Work Plan to analyse gaps and enhance WIPPS products for priority hazards**

Legend:

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| --- | --- | --- | --- |
| RSMCs | Regional Specialized Meteorological Centres | ECMWF | European Centre for Medium-Range Weather Forecasts |
| SC-ESMP | Standing Committee on Data Processing for Applied Earth System Modelling and Prediction | NASA | National Aeronautics and Space Administration |
| SWFP | Severe Weather Forecasting Programme | NWP | Numerical Weather Prediction |
| HQ | Headquarters | GDPFS | Global Data processing and Forecasting System |
| RA | Regional Association | WMCs | Workshop of World Meteorological Centres |
| RB | Research Board | SG-FIT | Study Group on Future Data Infrastructure |
| AI | Artificial Intelligence | SC-IMT | Standing Committee on Information Management and Technology |
| RSHCs | Regional Specialized Hydrological Centres | RB | Research Board |
| SERCOM | Commission for Weather, Climate, Hydrological, Marine and Related Environmental Services and Applications | RRR | Rolling Review of Requirements |
| FFGS | Flash Flood Guidance System with Global Coverage | CDP | Capacity Development Panel |
| HydroSOS | Global Hydrological Status and Outlook System | RTCs | Regional Training Centres |
| WIPPS | WMO Integrated Processing and Prediction System | RCCs | Regional Climate Centres |
| INFCOM | Commission for Observation, Infrastructure and Information Systems |  |  |

| ***No.*** | ***Deliverables*** | ***Delivered to (body, e.g. INFCOM-3)*** | ***Body responsible (Team, Secretariat, etc.)*** | ***Consultation with support from*** ***(Secretariat, etc.)*** | ***Effort type (meetings, workshops, consultancy, Secretariat)*** | ***Estimated timeline*** | ***Comment*** | ***Status*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.1 | Identify potential RSMCs for Limited Area NWP | INFCOM-4 | RAs | Consultation with Members, INFCOM/SC-ESMP, SWFP.  Support from Secretariat (HQ and Regional Offices) | Meetings, Secretariat support | April 2026 | Collocated with regional centres of SWFP if possible | Initiated in RA I |
| 1.2 | Identify potential RSMCs for nowcasting | INFCOM-4 | INFCOM | Consultation with Members including space agencies, RAs, RB.  Support from Secretariat (HQ and Regional Offices) | Meetings, pilot projects, Secretariat support | April 2026 | Work with Pilot projects on nowcasting | AI-based nowcasting pilot project is being initiated by Members |
| 1.3 | Identify potential RSHCs | INFCOM-4 | RAs & Regional Hydrological Advisors | Consultation with Members, INFCOM, SERCOM.  Support from Secretariat (HQ and Regional Offices) | Meetings, Secretariat support | April 2026 | Work with WMO initiatives (FFGS, HydroSOS) | WMO called for Members hosting RSHCs |
| 1.4 | Establish and designate RSHCs for global riverine flood prediction | INFCOM-4 | INFCOM/SC-ESMP | Consultation with Members including private and academic sectors.  Support from Secretariat (HQ) | Meetings, Secretariat support | April 2026 | Plan to integrate non-traditional sources into WIPPS | Plan is developed and submitted to INFCOM-3 |
| 1.5 | Establish and designate WIPPS Designated Centres for global climate reanalysis | INFCOM-3 | INFCOM/SC-ESMP | Consultation with Members producing global climate reanalysis.  Support from Secretariat (HQ) | Meetings, Secretariat support | April 2024 |  | ECMWF and NASA (USA) seek the designation |
| 1.6 | Provide more NWP products as core data | INFCOM-3 | INFCOM/SC-ESMP, WMCs and RSMCs for NWP | Consultation with Members.  Support from Secretariat | Meetings, Secretariat support | March 2025 | Updated the lists of mandatory/ recommended products of RSMCs for NWP to meet requirements of Members captured at GDPFS Symposium (2022) | Draft updated lists are submitted to INFCOM-3 |
| 1.7 | Provide impact-related indices defined by the WIPPS Manual | INFCOM-4 | INFCOM/SC-ESMP, WMCs and relevant RSMCs | Consultation with SERCOM and Members.  Support from Secretariat | Meetings,  Secretariat support | March 2027 |  |  |
| 1.8 | Articulate the requirements on graphical WIPPS products | INFCOM-4 | INFCOM/SC-ESMP | Consultation with SERCOM and Members.  Support from Secretariat | Meetings,  Secretariat support | March 2027 |  | WIPPS Pilot Project is established for visualization of WMCs’ products |
| 1.9 | Explore cloud computing, APIs and software code for data delivery, processing, and use | INFCOM-4 | INFCOM/SG-FIT | Consultation with SC-ESMP, SC-IMT, RB.  Support from Secretariat | Meetings,  Secretariat support | April 2024 |  |  |
| 1.10 | Develop the WIPPS Rolling Review of Requirements process | INFCOM-4 | INFCOM/SC-ESMP | Consultation with SERCOM, RB, RAs  Support from Secretariat | Meetings,  Consultancy,  Secretariat support | April 2026 | Demonstrate WIPPS RRR with SERCOM | Concept is developed and submitted to INFCOM-3 |
| 1.11 | Collect training requirements, including those on the interpretation of large ensembles, uncertainties and nowcasting products | CDP | RTCs | Consultation with SWFP and RCCs.  Support from INFCOM/SC-ESMP, Secretariat | Meetings, Secretariat support | December 2024 | Collect available training materials from WMCs |  |

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**Table 4. Draft Work Plan to address emerging hazards**

Legend:

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| --- | --- | --- | --- |
| INFCOM | Commission for Observation, Infrastructure  and Information Systems | SC-CLI | Standing Committee on Climate Services |
| MG | Management Group | GLOFs | Glacial Lake Outburst Flood |
| SERCOM | Commission for Weather, Climate, Hydrological,  Marine and Related Environmental Services  and Applications | TPE | Third Pole Environment |
| AG-GCW | Advisory Group on the Global Cryosphere  Watch | WIPPS | WMO Integrated Processing and  Prediction System |
| SC-DRR | Standing Committee on Disaster Risk  Reduction and Public Services | Third Pole RCC-Network | Third Pole Regional Climate Centre Network |
| ET-CHE | WMO Cataloguing of Hazardous Events | IACS | International Association of Cryospheric Sciences |
| SC-HYD | Standing Committee on Hydrological Services | IPA | International Permafrost Association |

| ***No.*** | ***Deliverables*** | ***Delivered to*** ***(Body, e.g. INFCOM-3)*** | ***Body responsible***  ***(Team, Secretariat, etc.)*** | ***Consultation with, support from*** ***(Secretariat, etc.)*** | ***Effort type (meetings, workshops, consultancy, Secretariat)*** | ***Estimated timeline*** | ***Comment*** | ***Status*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.1 | Publish synthesis of cryosphere-related hazard categories, their characterization, and gaps/challenges | INFCOM MG, SERCOM MG, | AG-GCW | Secretariat (Regional offices, Earth System Monitoring Division), SC-DRR/ET-CHE, SC-HYD, SC-CLI, with the guidance from AG-GCW | Consultancy, workshops, Secretariat, Publication | December 2024 | Literature based review of currently available documented hazards | Consultancy established Q1–2, 2024 |
| 1.2 | Develop and publish best practices for Glacier Lake Outburst Floods (GLOFs), include practices for inventorying glacier lakes, with their risk mapping and assessment, and observing, monitoring and prediction requirements and gaps | INFCOM MG, SERCOM MG, | AG-GCW | Collaboration with Third Pole Environment program, Secretariat (Infrastructure, Services) | Workshops, consultancy, Secretariat,  publication | July 2025 | Reflective of experience of TPE (Tibetan Plateau and Hindu Kush Himalayan)  Gaps: in-situ and satellite-based monitoring. WIPPS products | Work planning scheduled for May 2024 |
| 1.3 | Reflect the identified hazards in the WMO Catalogue on Hazardous Events (CHE) | SERCOM-4 | SERCOM/ SC-DRR/ ET-CHE | AG-GCW, Engagements of expert groups, e.g., TPE, International Association of Cryospheric Sciences, International Permafrost Association, Secretariat (Infrastructure, Services) | Workshops, consultancy,  Consultative engagements | October 2025 | This is a longer-term deliverable with multiple milestones, the first of which will be delivered to SERCOM-4 | Work planning to be initiated in Sept 2024 |
| 1.4 | Pilot recommendations by the Third Pole RCC-Network | SERCOM-4, INFCOM-4 | Third Pole RCC-Network | AG-GCW, Engagements of expert groups, e.g., TPE, International Association of Cryospheric Sciences, International Permafrost Association, Secretariat (Infrastructure, Services) | Workshops, consultancy,  Consultative engagements of expert groups (IACS, TPE, IPA) | 2025–2027 | Planning and delivery based on outputs of items 1.1 and 1.2 | Work planning to be initiated in Feb 2025 |
| 1.5 | Developing an impacts catalogue, reference in assessing future risks | SERCOM-5 | SERCOM/SC-DRR | AG-GCW, Engagements of expert groups, e.g., TPE, International Association of Cryospheric Sciences, International Permafrost Association, Secretariat (Infrastructure, Services) | Workshops, consultancy,  Consultative engagements (IACS, TPE, IPA) | 2026–2027 | Planning and delivery based on outputs of items 1.1,1.2, and 1.4 | Work planning to be initiated in Feb 2026 |

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1. UNDRR leads Pillar 1: Risk Knowledge and Management; WMO leads Pillar 2: Observations and Forecasting; the ITU leads Pillar 3: Dissemination and Communication; and the International Federation of Red Cross and Red Crescent Societies (IFRC) leads Pillar 4: Preparedness to Respond. [↑](#footnote-ref-2)
2. The CHD has been developed by the Alliance for Hydromet Development under WMO leadership and with the guidance of a multi-party Working Group. It is based on a peer approach where advanced NMHSs from both developed and developing countries undertake the diagnostics, following the standardized methodology. CHD provides a maturity assessment of NMHS operations along 10 elements of the hydrometeorological value chain. Behind each element sit various indicators, which are informed by data sources and by direct interviews and observation for validation purposes. [↑](#footnote-ref-3)